ISSN 2409-2665
Journal of Logistics, Informatics and Service Science
Vol. 12 (2025) No. 3, pp. 20-31
DOI:10.33168/JLISS.2025.0302

An Empirical Study on the Determinants of ICT Integration in Nepalese Higher Education: The Perspectives of University Teachers on Infrastructure, Support, and Readiness

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Abstract. This study explores the integration of Information and Communication Technology (ICT) in Nepalese university classrooms, emphasizing the roles of institutional support, teacher readiness, and infrastructural accessibility. Using a quantitative design, data were collected from 384 university teachers through structured surveys. Regression analysis revealed that infrastructural accessibility was the strongest predictor of ICT use, followed by institutional support, while teacher readiness had a modest effect. These findings suggest that while infrastructure remains foundational, long-term ICT adoption in higher education requires robust policy implementation and pedagogical training. The study contributes to the TPACK and UTAUT frameworks by contextualizing them in resource-constrained educational environments and offers recommendations for equity-driven policy reforms and teacher development strategies.

Keywords: Digital divide, higher education, pedagogical competence, policy implementation, resource constraints

1. Introduction

Information and Communication Technology (ICT) has revolutionized global education systems, fundamentally changing how teaching and learning occur in the 21st century (UNESCO, 2022). In Nepal's higher education sector, where digital transformation is still emerging, university teachers face unique challenges in adopting these technologies (Karki et al., 2023; Kunwar et al., 2022; Rai et al., 2025). This study examines the perceptions and utilization of ICT by Nepalese university educators in their classrooms, focusing on aspects such as accessibility, digital literacy, pedagogical adaption, and institutional support. This study seeks to increase the discourse on technology-enhanced education in Nepal by analyzing firsthand experiences, providing insights for policymakers, educators, and stakeholders to better ICT integration in higher education. ICTs have emerged as critical tools for improving pedagogical effectiveness in higher education around the globe. In Nepal, however, ICT adoption remains uneven due to infrastructural variability, cultural resistance, and a lack of institutional support. Despite growing investments in digital infrastructure, many educators continue to use traditional lecture-based teaching methods, limiting technology's transformative potential in the classroom.

As ICT in education grows, Nepalese universities face several obstacles to its effective implementation (Dahal et al., 2025; Joshi et al., 2024). One major issue is the scarcity of adequate infrastructure, which includes unstable internet connectivity. Furthermore, frequent power outages disrupt the use of digital tools, posing obstacles to the widespread adoption of ICT. Another primary concern is the varying levels of digital literacy among university teachers. While some educators are skilled at using digital platforms, others lack training and confidence in incorporating ICT into their teaching and learning practices (Abedi, 2024; Dahal & Joshi, 2024; Ghimire et al., 2024). This disparity frequently results in uneven classroom experiences, with some teachers effectively using technology and others avoiding it entirely. Professional development programs for ICT skills are either scarce or inadequately designed, leaving many teachers unprepared to navigate modern educational technologies (Shrestha, 2023). Furthermore, resistance to change and traditional teaching mindsets impede the use of ICT (Dahal, 2018). Many Nepalese educators are used to lecture-based teaching methods and may see technology as a disruption rather than an enhancement. Without adequate motivation and institutional incentives, teachers may be hesitant to experiment with new digital tools, slowing the overall progress of ICT integration in higher education. Addressing these challenges will necessitate collaborative efforts from policymakers, university administrations, and educators to create an enabling environment for ICT in Nepali classrooms. This study fills a gap by exploring the factors influencing ICT integration among faculty in Nepalese higher education institutions. While studies emphasize teacher readiness and technological access, there is a need to empirically present an answer that how diverse infrastructures and distinct pedagogical traditions are shaped. This study adds to both theory and practice in educational settings by analyzing the relationship between institutional support, infrastructure accessibility, and teacher readiness.

This study examined factors that influence university teachers' use of ICT in Nepalese classrooms. Specifically, it assessed the impact of institutional support, teacher readiness, and infrastructure accessibility on effective ICT integration. This empirical knowledge contributes to Nepal's ongoing efforts to modernize the education system and bridge the gap between traditional teaching methods and digital pedagogical advancements.

While ICT integration in education has been extensively researched globally, a significant research gap exists regarding university teachers' experiences in Nepal. Existing research frequently focuses on student perspectives or technical aspects of ICT adoption, but it is unclear who plays an essential role in implementing technology in the classroom. Methodologically present article relates to the dual-mode survey administration, which resulted in a lower response rate for online surveys compared to field-administered surveys. This discrepancy may introduce selection bias and affect the generalizability of the findings. Another limitation is the limited geographical participation of the sample. As such, the

findings may not fully represent the broader area.

The research is structured into six sections. The introduction covers the background of the study, problem statement, study objectives, and rationale. The literature review is structured with theoretical and empirical evidence. The third section is methodology, with research design, population, sample, and analysis methods. The results and discussion section shows the overall result of the data with a discussion. Finally, the conclusion, limitation, and future scope are structured.

2. Literature Review

ICT in education is widely regarded as a transformative force in contemporary pedagogy. Global research indicates that ICT improves student engagement, facilitates interactive learning, and provides access to vast digital resources (Selwyn, 2024). Learning management systems (LMS), multimedia tools, and blended learning models have significantly improved educational outcomes in developed countries. However, ICT is effectiveness heavily depends on teachers' digital competencies and institutional support, emphasizing the importance of professional development and infrastructure investment (Ertmer & Ottenbreit-Leftwich, 2013). While these studies offer a broad understanding of ICT's potential, their findings may not directly apply to developing contexts such as Nepal, where resource constraints and cultural factors are critical (Shrestha & Dahal, 2023).

In South Asia, research on ICT in education produces mixed results. Countries such as India and Bangladesh have made significant progress in digitizing classrooms through government initiatives; however, they continue to face challenges such as unequal access, teacher resistance, and insufficient training (Gulati et al., 2024; Rahman et al., 2022). In Nepal, research has primarily focused on school-level ICT integration, with findings indicating poor infrastructure, insufficient teacher preparation, and limited policy enforcement (Lawaju et al., 2024; Khanal et al., 2022). However, there has been little research into how university teachers, who play a critical role in shaping higher education, deal with these challenges. Existing research frequently overlooks regional disparities, failing to account for the differing realities of educators in urban and rural settings. This gap emphasizes the importance of conducting a more in-depth examination of Nepalese university teachers' lived experiences.

Furthermore, while some scholars have investigated ICT policies in Nepal's higher education (for example, MoEST's Digital Nepal Framework), few have critically examined the gap between policy goals and classroom realities. For instance, despite national plans to promote e-learning, many universities lack the technical and financial resources to carry out such initiatives (Shrestha, 2023). Cultural factors, such as a preference for traditional lecture-based teaching, complicate ICT adoption (Bhattarai & Maharjan, 2022; Ghimire et al., 2023). This study expands on these fragmented insights by systematically investigating the perspectives of university teachers, bridging the gap between policy rhetoric and practical challenges. This study aims to provide actionable recommendations for long-term ICT integration in Nepal's higher education sector by combining global best practices and localized barriers.

This study is based on the Technological Pedagogical Content Knowledge (TPACK) framework (Mishra & Koehler, 2006), which argues that effective ICT integration necessitates teachers navigating the intersection of technology, pedagogy, and subject-specific content. TPACK provides a lens through which to examine how Nepalese university teachers balance these domains while dealing with infrastructural and cultural constraints. The Unified Theory of Acceptance and Use of Technology (UTAUT) contributes to understanding adoption barriers by exploring how institutional support, teachers' readiness, and infrastructural accessibility influence teachers' ICT use (Venkatesh et al., 2003). The theoretical foundation guides digital education goals, and the on-the-ground realities are shaped by existing literature. Figure 1 presents the study framework based on integrating the theoretical foundation and literature review.

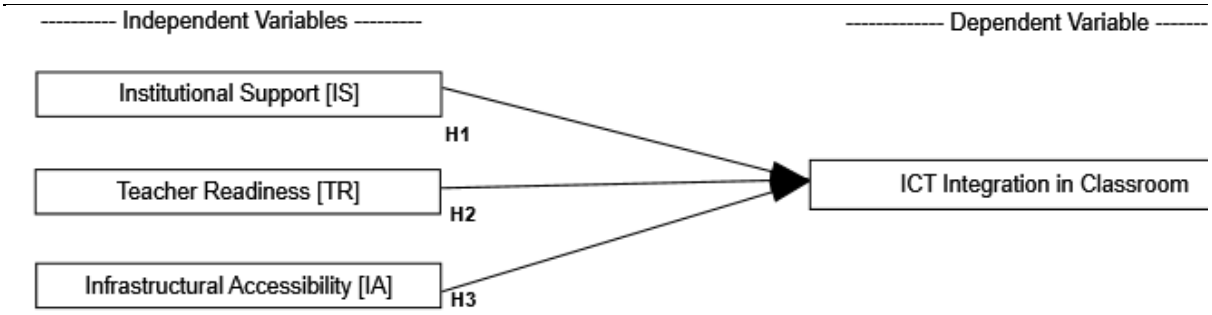

Fig. 1: The Study Framework

Study Hypotheses:

H1: Institutional support has a positive and significant influence on ICT Integration in the classroom.

H2: Teacher readiness has a positive and significant influence on ICT Integration in the classroom.

H3: Infrastructural accessibility has a positive and significant influence on ICT Integration in the classroom.

3. Materials and Methods

This study employs a quantitative research design, utilizing a structured questionnaire survey, to systematically examine university teachers' experiences with ICT integration in Nepal. The study targeted university teachers across Nepal as its population, aiming to capture a representative sample that would ensure statistical reliability. Based on Cochran's formula for finite populations at a 95% confidence level and 5% margin of error, a minimum sample size of 384 respondents was required. This threshold was successfully met through a combination of online and field surveys, ensuring the findings are generalizable to Nepal's diverse higher education landscape while maintaining methodological rigor.

The study used primary data collected through a structured survey questionnaire. The questionnaire comprised five sections: (1) demographic information (5 items capturing background variables), followed by four thematic sections measured on 5-point Likert scales: (2) institutional support (7 items), (3) teachers' readiness (6 items), (4) infrastructural accessibility (7 items), and (5) ICT integration in classroom (assessing actual practices – 7 items). The Likert-scale items (Sections 2-5) were designed to quantitatively measure perceptions and experiences, ranging from "strongly disagree" (1) to "strongly agree" (5), thereby enabling statistical analysis of key dimensions that affect ICT adoption. The instrument was validated through pilot testing and reliability analysis to ensure internal consistency across constructs. The research instrument was adapted from validated scales based on the TPACK and UTAUT frameworks, with additional items developed to reflect the research context. Cronbach's alpha values indicated acceptable internal consistency for all constructs ($\alpha > 0.75$).

The questionnaire was validated through a pilot test with 30 university teachers to ensure clarity and reliability. Data collection employed a dual-mode approach: (1) an online survey (Google Forms) distributed to 500 teachers outside Kathmandu Valley, yielding 115 responses (23% response rate), and (2) physical questionnaires administered to 500 teachers within Kathmandu Valley, with 269 completed returns (54% response rate). Combined, these methods secured 384 valid responses (38.4% overall response rate), mitigating regional bias by capturing digital and in-person participation. The lower online response rate reflects connectivity challenges in peripheral regions, while the higher field-survey engagement underscores Kathmandu's concentrated academic population. This stratified approach enhances the study's geographic representation and robustness. A stratified sampling approach was employed, ensuring representation across disciplines (Management, humanities, social sciences).

Institutions were selected using proportional allocation based on student enrollment and ICT resource availability. This research ensured disciplinary balance, though future studies may benefit from broader sectoral inclusion.

To ensure the internal consistency of the latent variables, Cronbach's alpha (α) was computed for each construct, with all values exceeding the threshold of 0.70, confirming scale reliability. Harman's single-factor test was also conducted to assess common method bias (CMB), revealing that the most significant single factor should be below the 50% critical threshold for mitigating concerns about CMB. The results of these tests, along with the validated threshold benchmarks, are presented in Table 1, demonstrating the robustness of the measurement model.

Table 1. Reliability and CMB Insights

S. N.	Latent Variables	Observed variables	Cronbach's Alpha (α)	Harman one-factor variance
1	Institutional Support [IS]	7	0.840	
2	Teacher Readiness [TR]	6	0.745	
3	Infrastructural Accessibility [IA]	7	0.862	45.865 %
4	ICT Integration in Classroom [ICT_IC]	7	0.825	
	Suggested threshold values		≥ 0.70 (Taber, 2018)	≤ 50.0 % (Cho & Lee, 2012)

As presented in Table 1, the reliability analysis confirmed that all constructs demonstrated strong internal consistency, with Cronbach's alpha values exceeding the established threshold of 0.70 (Taber, 2018). Additionally, Harman's single-factor test revealed that the 27 study variables collectively accounted for 45.865 % of the total variance, significantly below the 50 % critical threshold Cho and Lee (2012) recommended for the CMB. These results confirm the reliability of the measurement scales and the absence of significant CMB variance.

The study utilized the Statistical Package for the Social Sciences (SPSS) for statistical analysis, employing a three-stage analytical approach. First, descriptive statistics (means, standard deviations, frequencies) were computed to summarize the distribution of key variables: institutional support (IS), teacher readiness (TR), infrastructural accessibility (IA), and ICT integration in the classroom (Y). Next, bivariate correlation analysis was conducted to examine preliminary relationships between these constructs. Finally, a multiple linear regression model ($Y = \beta + \beta_1 IS + \beta_2 TR + \beta_3 IA + \varepsilon$) was tested to quantify the predictive power of institutional support, teacher readiness, and infrastructural accessibility on ICT integration outcomes, where Y represented the dependent variable (ICT integration), β the intercept, β_1–β_3 the standardized coefficients for each independent variable, and ε the error term. Assumptions of multicollinearity (VIF < 10) and homoscedasticity (residual plots) were rigorously checked to ensure model robustness.

4. Presentation and Analysis

Before statistical analysis, Table 2 presents the demographic profile of the 384 participating university teachers, illustrating the study's diverse representation. The sample included balanced gender distribution (Male: 58.3%, Female: 41.7%), varied age groups (25-35 years: 32%, 36-45 years: 41%, 46+ years: 27%), and comprehensive coverage of academic disciplines (Science: 28%, Management: 34%, Others: 38%). Respondents' teaching experience ranged from early-career (1-5 years: 22%) to veteran educators (16+ years: 19%), with 56% teaching in Kathmandu Valley institutions and 44% from

outside the Kathmandu Valley, ensuring geographic diversity in the findings.

Table 2. Demographic Characteristics of the Respondents (N = 384)

Variable	Category	Frequency	Percentage
Gender	Male	224	58.3 %
	Female	160	41.7 %
Age	25-35 years	123	32.0 %
	36-45 years	157	41.0 %
	46+ years	104	27.0 %
Academic Discipline	Science	108	28.0 %
	Management	145	38.0 %
	Others	131	34.0 %
Teaching Experience	1-5 years	85	22.0 %
	6-10 years	128	33.0 %
	11-15 years	98	26.0 %
	16+ years	73	19.0 %
Geographic Location	Kathmandu Valley	215	56.0 %
	Outside Kathmandu Valley	169	44.0 %
Total (each)		384	100.0 %

Table 3 presents the central tendency and dispersion measures for the four primary study variables, calculated from 384 valid responses. The results reveal moderate to high levels across independent constructs, with IA showing the highest mean score (M = 3.7039/5, SD = 0.83210), followed by institutional support (IS) (M = 3.6592/5, SD = 0.80266), while TR shows the least mean score and variability (M = 3.5061/5, SD = 0.74718). ICT integration in classroom scores (M = 3.6670/5, SD = 0.76813) suggest room for improvement in classroom implementation. The standard deviations indicate consistent response patterns, with IA displaying the widest dispersion among respondents. All variables exhibit negative skewness (scores leaning toward higher values) and mild kurtosis, confirming expected Likert-scale response tendencies without extreme deviations. The results collectively highlight infrastructure as the most pressing barrier to ICT adoption.

Table 3. Descriptive Statistics of Key Study Variables (N=384)

Variable	No. of Items	Min	Max	M	SD	Skewness	Kurtosis
Institutional Support (IS)	7	1	5	3.6592	.80266	-.511	-.307
Teacher Readiness (TR)	6	1	5	3.5061	.74718	-.370	-.168
Infrastructural Access (IA)	7	1	5	3.7039	.83210	-.905	-.086
ICT Integration in the Classroom	7	1	5	3.6670	.76813	-.859	.098

Pearson's correlation coefficients (Table 4) reveal statistically significant relationships among all

key variables ($p < .01$). IA showed strong positive correlations with teacher readiness ($r = .778$) and ICT integration in classroom ($r = .704$), while IS demonstrated moderate associations with ICT integration outcomes ($r = .591$). The strongest predictor of ICT integration was teacher readiness ($r = .728$), suggesting that pedagogical confidence is more critical than material resources.

Table 4. Pearson Correlation Matrix of Key Variables (N = 384)

Variable	IS	TR	IA	ICT Integration in Classrooms
IS	1			
TR	.695**	1		
IA	.664**	.778**	1	
ICT Integration in Classrooms	.591**	.728**	.704**	1

***p < .01 (2-tailed). Coefficients represent Pearson's r values.*

The linear regression model ($Y = \beta + \beta_1 IS + \beta_2 TR + \beta_3 IA + \varepsilon$) significantly predicted ICT integration outcomes, $F(3, 380) = 840.556$, $p < 0.001$, explaining 86.8 % of variance (Adj. $R^2 = 0.868$). As Table 5 shows, infrastructural accessibility (IA: $\beta = 0.527$, $p < .001$) emerged as the strongest predictor, followed by institutional support (IS: $\beta = 0.309$, $p < 0.001$). While teacher readiness (TR: $\beta = 0.142$, $p = 0.001$) was statistically significant, its modest beta weight suggests a relatively weaker influence. Multicollinearity was assessed using Variance Inflation Factors (VIF), with all values below 10 (Hair et al., 2018), confirming predictor independence.

Table 5. Regression Analysis Summary for ICT Integration Prediction

Predictor	Unstd. B	Std. Error	Std. β	t-value	p-value	VIF
Constant (β)	0.273	0.071	-	3.854	.000	-
Institutional Support (β_1)	0.295	0.050	0.309	5.938	.000	7.838
Teacher Readiness (β_2)	0.146	0.043	0.142	3.409	.001	5.014
Infrastructural Access (β_3)	0.487	0.034	0.527	14.278	.000	3.956

*Note: Dependent Variable: ICT Integration in the Classroom; Adj. $R^2 = .868$; $F = 840.556$*** (***p < .001)*

Regression analysis explains 86.8% of the variance in ICT integration (adjusted $R^2 = 0.868$), indicating a strong model fit. However, caution is advised because this high explanatory power may indicate overfitting or inflated correlations due to multicollinearity among predictors. Non-parametric tests confirmed the robustness of key findings among demographic subgroups.

The regression analysis reveals three key insights:

- IA is the most potent driver of ICT integration in the classroom ($\beta = 0.527$, $p < 0.001$), indicating that a 1-standard-deviation increase in IA predicts a 0.527 SD increase in ICT use, holding other factors constant.

- IS has a substantial influence ($\beta = 0.309$, $p < 0.001$), confirming that policy frameworks and training programs significantly facilitate classroom technology adoption.

- While TR is statistically significant (β = 0.142, p = 0.001), its modest effect size suggests teacher readiness alone is insufficient without infrastructural accessibility and institutional backing.

The low VIFs (< 10) confirm that these predictors assess distinct dimensions of the adoption process. Furthermore, Figure 2 displays the residual plots from the regression analysis, confirming the homoscedasticity assumption, a key requirement for robust linear regression.

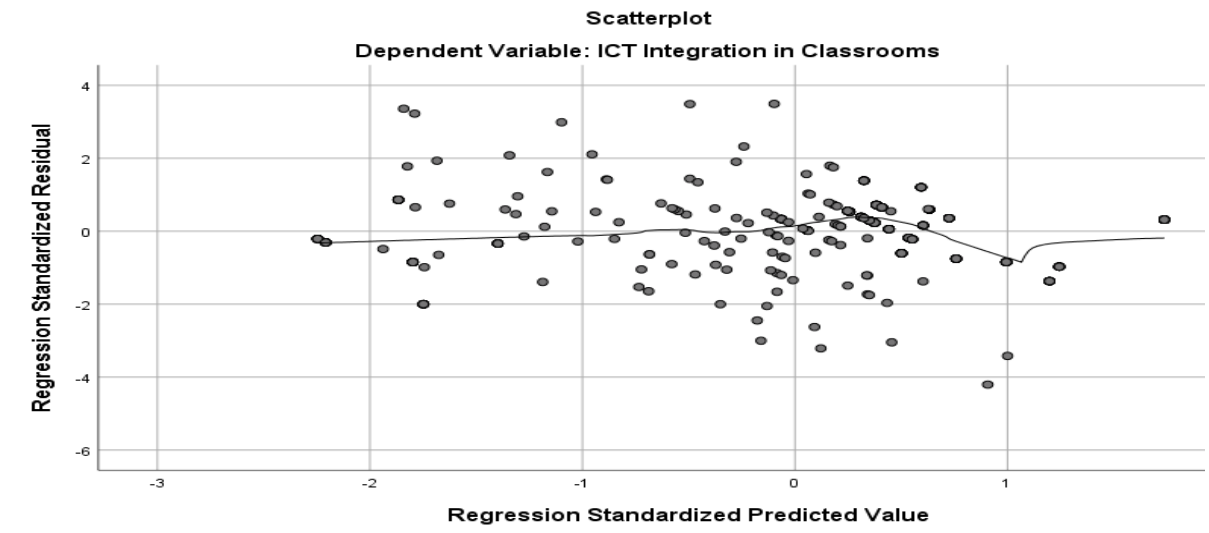

Fig. 2: The Homoscedasticity (Residual Plots)

The plots (Figure 2) reveal that residuals are randomly and evenly dispersed around the zero line, with no discernible patterns (e.g., funnel shapes or curves), indicating constant variance across predicted values of ICT integration in the classroom. This validates that the model's error terms are homoscedastic (variance-stable), ensuring reliability in coefficient estimates (β weights) and significance tests (*p*-values). Minor deviations at extreme predicted values do not violate this assumption, as the majority of data points adhere to the trend. These results reinforce the appropriateness of the linear regression model for analyzing determinants of ICT adoption in Nepal's higher education context.

5. Discussions

The study's findings highlight infrastructural accessibility (IA) as the most significant predictor of ICT integration (β = 0.527, p < 0.001), supporting Mishra and Koehler's (2006) Technological Pedagogical Content Knowledge (TPACK) framework, which posits that effective technology integration requires adequate physical resources as foundational elements. However, the moderate teacher readiness (TR) scores (M = 3.5061/5) suggest that infrastructure alone is insufficient—a finding consistent with Acharya et al.'s (2021) observation that Nepalese professional development programs emphasize content mastery over technological-pedagogical skills. This dichotomy reveals a critical implementation gap: even when physical resources are available, lacking targeted training in blending technology with discipline-specific pedagogy (Koehler et al., 2014) limits effective ICT utilization. These findings advocate for a dual-focused intervention strategy that pairs infrastructure development with contextually-relevant pedagogical training.

The study found institutional support (IS) to be the second most influential predictor of ICT integration (β = 0.309, p < 0.001), which aligns with Venkatesh et al.'s (2003) Unified Theory of Acceptance and Use of Technology (UTAUT) regarding organizational influence on technology

adoption. This finding is particularly relevant in the Nepalese context, where, despite progressive policies such as the Digital Nepal Framework (Government of Nepal, 2019), implementation challenges persist. The moderate institutional support score (M = 3.6592/5) suggests a significant gap between policy formulation and execution, consistent with Kunwar et al.'s (2022) findings about bureaucratic inefficiencies in Nepalese higher education.

The relatively weak influence of teacher readiness (TR) on ICT integration ($\beta = 0.142$, $p = 0.001$) challenges conventional assumptions about technology adoption barriers in developing contexts. This finding supports recent work by Singh (2024), which suggests that Nepal's ICT challenges have evolved from hardware deficits to more complex human and systemic factors. Teacher readiness has a significant correlation with ICT integration, but becomes a weak predictor in the regression model; there is a chance of overlapping influences of variables. Interaction effects might have a role in conditional support systems translating readiness into actual ICT use. The moderate variability in TR scores ($SD = 0.74718$) reveals significant disparities between institutions, with the Kathmandu Valley typically demonstrating greater readiness than its counterparts outside the valley. This study broadens the applicability of TPACK and UTAUT in a developing country context by revealing how traditional teaching mindsets and infrastructure constraints influence expected relationships. Notably, teacher readiness demonstrated a strong bivariate correlation with ICT, implying that readiness alone is insufficient in the absence of enabling environments. These findings are consistent with regional patterns observed in India and Pakistan, where national policies have accelerated ICT adoption. In Nepal, the Digital Nepal Framework prioritizes e-learning, but implementation is fragmented. This research work advocates for better alignment between policy mandates and localized support systems, particularly professional development programs that foster both technical and pedagogical competence.

This study demonstrates that meaningful ICT integration in Nepal's higher education system depends on a balanced alignment of infrastructure, institutional support, and teacher preparedness rather than any single factor in isolation. While access to resources remains essential, the findings highlight that systemic and human dimensions—particularly institutional support and pedagogical adaptability-play equally critical roles in shaping successful technology adoption. The results call for a shift from traditional, infrastructure-focused approaches toward holistic strategies that simultaneously address equitable resource distribution, responsive policy implementation, and contextually relevant teacher training. Moving forward, sustainable ICT integration will require empowering educators as active agents of change while strengthening institutional ecosystems to create an enabling environment for innovation. By bridging these interconnected elements, Nepal's higher education sector can play a role in translating digital initiatives into effective classroom practices that serve diverse learning communities.

6. Conclusion

This study sheds light on the multifaceted variables that affect the use of ICT in Nepal's higher education system. It shows that practical adoption goes beyond just having access to technology. Most educators agree that digital tools are helpful, but not all use them effectively because of differences in institutional support and teachers' readiness. These problems are especially noticeable outside Kathmandu Valley. The findings underscore that sustainable ICT integration requires addressing both systemic barriers and human-capacity gaps, as institutional policies and teacher preparedness prove more decisive than infrastructure alone.

The research calls for a transformative approach that bridges policy intentions with classroom realities. By advocating for pedagogically informed teacher development, responsive institutional frameworks, and equitable resource distribution, it provides a roadmap for aligning Nepal's digital education ambitions with on-ground needs. Future efforts should prioritize context-sensitive strategies that empower educators as change agents while fostering institutional ecosystems conducive to innovation. Such holistic measures will be crucial for realizing the full potential of ICT in serving

Nepal's diverse academic communities.

7. Limitations and Future Scope

While this study provides valuable insights into ICT integration among Nepalese university teachers, several limitations must be acknowledged. First, relying on self-reported survey data may introduce response bias, as participants might overstate their ICT competencies or underreport institutional challenges. Second, the cross-sectional design limits causal inferences about how the identified factors (e.g., teacher readiness) directly impact ICT adoption over time. Third, although statistically robust, the sample underrepresented certain regions and disciplines, potentially overlooking context-specific barriers faced by teachers in remote areas or specialized fields, such as engineering or medicine.

The findings carry significant implications for higher education stakeholders in Nepal. For policymakers, the results underscore the need to move beyond infrastructure-centric approaches and instead invest in comprehensive teacher training programs that blend technological skills with pedagogical strategies. Additionally, the study emphasizes the importance of monitoring and evaluation frameworks to ensure that national digital education policies, such as the Digital Nepal Framework, are effectively implemented and lead to tangible classroom improvements. This study focuses on direct predictors of ICT integration and does not account for key mediating variables. Future variables include pedagogical self-efficacy and participation in professional development programs. These variables may explain how institutional support influences actual classroom technology use. A revised conceptual model for these mediators is proposed for future research.

Future studies could address this study's limitations while building on its findings. A longitudinal design would help track how changes in institutional policies or teacher training programs affect ICT integration over time. Additionally, comparative studies across South Asian countries could identify regional best practices. At the same time, discipline-specific investigations (e.g., science vs. humanities) might reveal tailored strategies for optimizing ICT use in different academic contexts. Such research would refine evidence-based interventions for Nepal's evolving higher education landscape.

Acknowledgement

The University Grants Commission (UGC) Nepal funded this study under UGC Award Number SRDIG-80/81-Mgmt-02. The authors express their sincere gratitude to the UGC, Nepal, for its generous support.

References

Abedi, E. A. (2024). Tensions between technology integration practices of teachers and ICT in education policy expectations: implications for change in teacher knowledge, beliefs and teaching practices. *Journal of Computers in Education*, *11*(4), 1215–1234. https://doi.org/10.1007/s40692-023-00296-6

Acharya, A., Subedi, S., Gyawali, N., Poudyal, N., Lamichhane, G., Bastola, G., Aryal, B., Bhattarai, B. R., Adhikari, B., Marahatha, R., Bhatta, M., Paudel, M., & Parajuli, N. (2021). Digital learning initiatives, challenges and achievement in higher education in Nepal amidst COVID-19. *International Journal of Asian Education, 2*(3), 415–428. https://doi.org/10.46966/ijae.v2i3.224

Bates, O. (2015). *The impacts of domestic media and ICT: A study of digital technology, energy consumption, data demand and everyday practice*. [Doctoral Dissertation, Lancaster University, United Kingdom].

Bhattarai, S., & Maharjan, S. (2020). Determining the factors affecting digital learning adoption among the students in Kathmandu Valley: An application of the technology acceptance model (TAM). *International Journal of Engineering and Management Research (IJEMR)*, *10*(3), 131-141. https://doi.org/10.31033/ijemr.10.3.20

Cho, Y. J., & Lee, J. W. (2012). Performance management and trust in supervisors. *Review of Public Personnel Administration, 32*(3), 236–259. https://doi.org/10.1177/0734371X11421496

Dahal, R. K. (2018). Students' perception towards master of business studies (MBS) semester system: A case study of Nepal Commerce Campus. *Pravaha – A Journal of Management*, *24*(1), 181–195. https://doi.org/10.3126/pravaha.v24i1.20237

Dahal, R. K., & Joshi, S. P. (2024). The application of e-recruitment by job seekers and the impact of perceived values in Nepal. *Journal of Management Changes in the Digital Era, 1*(1), 108–128. http://dx.doi.org/10.33168/JMCDE.2024.0108

Dahal, R. K., Ghimire, B., Sharma, D. R., Karki, D., & Joshi, S. P. (2025). Bridging the gap: How career development learning mediates higher education and employability outcomes in Nepal. *Problems and Perspectives in Management, 23*(1), 643–655. http://dx.doi.org/10.21511/ppm.23(1).2025.48

Ertmer, P. A., & Ottenbreit-Leftwich, A. (2013). Removing obstacles to the pedagogical changes required by Jonassen's vision of authentic technology-enabled learning. *Computers & education*, *64*, 175-182. https://doi.org/10.1016/j.compedu.2012.10.008

Ghimire, B., Dahal, R. K., & Rai, B. (2023). The attitude of flexible work arrangement on academics' job satisfaction: The emerging market case. *Journal of System and Management Sciences, 13*(2), 370–383. http://dx.doi.org/10.33168/JSMS.2023.0226

Ghimire, B., Dahal, R. K., Sharma, D. R., Karki, D., & Joshi, S. P. (2024). Beyond the classroom: How practical experience and social networks shape entrepreneurial intention among university students? *Pravaha, 30*(1), 63–74. https://doi.org/10.3126/pravaha.v30i1.76892

Government of Nepal. (2019). Digital Nepal Framework: Unlocking Nepal's Growth Potential. Ministry of Communication and Information Technology. https://nepalindata.com/media/resources/items/15/bEN_Digital_Nepal_Framework_V7.2March2019.pdf

Gulati, N., Sharma, S., & Tyagi, S. (2024). A comparative analysis of IIT libraries and major southeast Asian technical libraries: evaluating digital resources, user accessibility, and technological integration. *Library of Progress-Library Science, Information Technology & Computer*, *44*(3).

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). *Multivariate data analysis* (8th ed.). United Kingdom: Cengage Learning.

Joshi, B. M., Acharya, U., & Khatiwada, S. P. (2024). Policy versus reality: Challenges of implementing ICT in higher education in Nepal. *Pragyaratna 6*(2), 226–234. https://doi.org/10.3126/pragyaratna.v6i2.71003

Karki, D., Karki, N., Dahal, R. K., & Bhattarai, G. (2023). Future of education in the era of artificial intelligence. *Journal of Interdisciplinary Studies*, *12*(1), 54–63. https://doi.org/10.3126/jis.v12i1.65448

Khanal, S., Bhattarai, S. B. S., Adhikari, U., Sharma, D., & Pandey, M. (2021). Disparities between developed and emerging economies in digital divide and ICT gap to bring agricultural sustainability. *Fundamental and Applied Agriculture*, *6*(3), 309–322. https://doi.org/10.5455/faa.78371

Koehler, M. J., Mishra, P., Kereluik, K., Shin, T.S., Graham, C.R. (2014). The Technological Pedagogical Content Knowledge Framework. In: Spector, J., Merrill, M., Elen, J., Bishop, M. (eds) *Handbook of research on educational communications and technology.* Springer, New York, NY.

https://doi.org/10.1007/978-1-4614-3185-5_9

Kunwar, R., Shrestha, A. K., & Phuyal, S. P. (2022). The impact of force paradigm shift in teaching and learning higher education in Nepal: A study on behavior perspective. *European Journal of Education and Pedagogy*, *3*(2), 12–17. https://doi.org/10.24018/ejedu.2022.3.2.270

Lawaju, P., Adhikari, S. U., & Devkota, J. (2024). Impact of AI in education: An evidence from use of ChatGPT in management education in Nepal. *Quest Journal of Management and Social Sciences*, *6*(3), 621–642. https://doi.org/10.3126/qjmss.v6i3.72875

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, *108*(6), 1017–1054. https://doi.org/10.1177/016146810610800610

Rahman, S., Islam, M. Z., Hossain, M., Abdullah, D. A., & Jasimuddin, S. M. (2022). Organizational factors, ICT support, and affective commitment: the case of Bangladesh-based service organizations. *Journal of Global Information Management (JGIM)*, *30*(1), 1–18. https://doi.org/10.4018/jgim.302914

Rai, B., Dahal, R. K., Ghimire, B., & Shrestha, I. (2025). Assessing the brand equity dimensions of the largest university in Nepal: A study of Tribhuvan University governance. *Journal of Governance & Regulation, 14*(2), 176–185. https://doi.org/10.22495/jgrv14i2art18

Selwyn, N. (2024). Digital degrowth: Toward radically sustainable education technology. *Learning, Media and Technology*, *49*(2), 186–199. https://doi.org/10.1080/17439884.2022.2159978

Shrestha, I., & Dahal, R. K. (2023). Assessment of the relevance of Goleman's emotional intelligence model among the managers of commercial banks in Nepal. *NCC Journal, 8*(1), 22–31. https://doi.org/10.3126/nccj.v8i1.63122

Shrestha, R. (2023). Teachers' experience of using digital technology in implementation of inclusive education for children with disabilities in Kathmandu valley. *Available at SSRN 4700017*. https://doi.org/10.2139/ssrn.4700017

Shrestha, S. (2023). *ICT in education in crisis contexts: An activity theoretical study of teaching and learning in Nepal during the COVID-19 pandemic* [Doctoral dissertation, Dublin City University].

Singh, R. K. (2024). Digital transformation in Nepali education: Opportunities and challenges. *European Journal of Innovation in Nonformal Education, 4*(9), 17–22. https://inovatus.es/index.php/ejine/article/view/4005

Taber, K. S. (2018). The use of Cronbach's Alpha when developing and reporting research instruments in science education. *Research in Science Education, 48*(1), 1273–1296. https://doi.org/10.1007/s11165-016-9602-2

UNESCO. (2022). *ICT in education: A roadmap for sustainable development.* United Nations Educational, Scientific and Cultural Organization. https://doi.org/10.54675/YFRE1448

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478. https://doi.org/10.2307/30036540

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 425–478. https://doi.org/10.1037/t57185-000