"Service Quality and Adoption of College Mobile Application among Management Students in Higher Education Institutions of Butwal Sub-Metropolitan City"

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Abstract

This study aims to explore the relationship between the adoption of college mobile applications and service quality. It seeks to identify how different dimensions of service quality such as tangibility, usability, content quality, responsiveness, enjoyment in technology, and technological control influence the adoption of college mobile applications. The study adopted a quantitative approach, collecting responses from 383 management students from higher education institutions in Butwal Sub-metropolitan City using a structured questionnaire. A simple random sampling method was employed. The data were analyzed using statistical tools, including PLS-SEM software with techniques such as assessment of measurement items, model fit evaluation, Importance-Performance Map Analysis (IPMA) and bootstrapping for hypothesis testing. The results revealed that responsiveness, enjoyment in technology, and content quality are key predictors of the adoption of college mobile applications. These factors are significant contributors to service quality. Therefore, the management of higher education institutions should focus on these aspects to enhance service quality. By understanding and reformulating policies based on these factors, institutions can improve the overall service quality and increase adoption rates of their mobile applications.

Keywords: *Students' Attitude, College mobile application, Responsiveness, Service quality and Content Quality.*

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I. Introduction

In today's digital era, technology has revolutionized education by offering innovative tools that facilitate learning and administrative processes. Among these, college mobile applications have emerged as vital platforms that enable students to access academic resources, communicate with faculty, and manage administrative tasks conveniently (Kumar & Mohite, 2022). The adoption of such mobile applications is increasingly recognized as a key factor in enhancing educational experiences and outcomes. However, despite their potential, many higher education institutions in Butwal Sub-Metropolitan City face significant challenges related to the quality of these digital services, which adversely affect students' willingness to adopt and engage with these platforms.

Service Quality in the context of this study refers to the degree to which a college mobile application meets or exceeds students' expectations in terms of tangibility (appearance and

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design), usability (ease of use), content quality (accuracy and relevance of information), responsiveness (promptness of support), enjoyment in technology (user satisfaction and engagement), and technological control (user's ability to manage and navigate the app effectively) (Parasuraman, Zeithaml, & Berry, 1985; Kaliisa & Picard, 2017). Adoption of College Mobile Application is defined as the extent to which management students actively use and integrate the mobile application into their academic and administrative activities, reflecting acceptance and sustained engagement with the technology (Venkatesh, Morris, Davis, & Davis, 2003).

The concept of service quality was first systematically explored in the 1980s by Parasuraman, Zeithaml, and Berry (1985), who developed the SERVQUAL model to measure service quality across five dimensions: tangibility, reliability, responsiveness, assurance, and empathy. Over time, this model has been adapted to various sectors, including education, where it helps institutions understand and improve the quality of services provided to students (Athiyaman, 1997). With the advent of digital learning platforms, service quality has taken on new dimensions, emphasizing technological usability and support. The adoption of technology, particularly mobile applications in education, has been studied through models like the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT), which highlight factors such as perceived ease of use, usefulness, and social influence as determinants of technology acceptance (Venkatesh et al., 2003). However, the integration of service quality dimensions into technology adoption studies is relatively recent and crucial for understanding user engagement in educational contexts.

Despite the widespread availability of college mobile applications, many institutions in Butwal Sub-Metropolitan City struggle with ensuring high service quality, which hampers the adoption of these technologies. Common issues include poor user interface design, frequent technical glitches, lack of timely support, and inadequate training for students (Adhikari, 2024). These problems lead to user frustration, reduced engagement, and a general reluctance to rely on mobile applications for academic purposes. Consequently, the potential benefits of digital platforms—such as flexible access to learning materials and streamlined administrative processes—remain underutilized.

While numerous studies have examined service quality and technology adoption in education, most have focused on developed countries with advanced digital infrastructures (Dorofeyeva et al., 2024). There is a conspicuous lack of research addressing the specific context of developing countries like Nepal, particularly in smaller urban centers such as Butwal Sub-Metropolitan City,

where resource constraints and infrastructural challenges are prevalent (Parajuli, 2016). Additionally, prior research has often overlooked critical factors such as student motivation, digital literacy, and enjoyment in technology, which can significantly influence the adoption of mobile learning platforms (Adhikari, 2024).

This study seeks to fill these gaps by investigating how various dimensions of service quality affect the adoption of college mobile applications among management students in Nepalese higher education institutions. It aims to provide insights that are contextually relevant and actionable for institutions operating under similar constraints. Understanding the relationship between service quality and mobile application adoption is essential for several reasons. First, it enables higher education institutions to identify and address specific service quality issues that hinder student engagement, thereby improving user satisfaction and learning outcomes. Second, by focusing on management students a key demographic that often relies heavily on digital tools for academic and administrative tasks this study targets a group whose experiences can inform broader institutional strategies. Moreover, the findings will offer valuable guidance for policymakers and educational administrators seeking to optimize investments in digital infrastructure and training programs. Improved service quality can lead to increased adoption rates, better academic performance, and enhanced institutional reputation, which are critical for the competitiveness and sustainability of higher education institutions in Nepal (Karki & Sharma, 2022).

Finally, this research contributes to academic literature by expanding the understanding of service quality and adoption of college mobile applications in underexplored geographical and socio-economic contexts. It provides a foundation for future studies aimed at enhancing educational technology integration in developing countries. This study addresses a pressing need to evaluate and improve the service quality of college mobile applications and understand its impact on adoption among management students in Butwal Sub-Metropolitan City.

The objectives of study are as follows:

- To examine which variable acting as necessary conditions for the adoption of college mobile application in HEIs of Butwal sub-metropolitan city.
- To analyze the effect of tangibility, usability, content quality, responsiveness, enjoyment in technology, technological control on adoption of college mobile application among management students in higher education institutions.

II. Literature Review

This section presents a literature review, focusing on the theoretical and empirical aspects relevant to the current research being pursued. The theoretical review examines related theories that support the link between the variables mentioned in the framework. Moreover, the empirical review incorporates the findings of previous research conducted on the same topic. The following theoretical and empirical reviews support the conceptual framework of the study and form the basis for the development of hypotheses.

Tangibility and Adoption of college mobile application

Theoretical studies show that tangibility plays an important role in the adoption of college mobile applications. The Technology Acceptance Model (TAM) (Davis, 1989) explains that people adopt technology based on how easy it is to use and how useful they find it, with tangible features like interface design and responsiveness playing a key role. The SERVQUAL model (Parasuraman et al., 1988) highlights tangibility as a major part of service quality, emphasizing the importance of visible and physical aspects even in digital services. Similarly, the Expectation-Confirmation Theory (ECT) (Oliver, 1980) suggests that people continue using technology when their expectations are met and tangibility in mobile apps helps fulfil these expectations.

Empirical research further supports this idea. Kim et al. (2017) found that well-designed and easy-to-navigate mobile apps improve user satisfaction and encourage adoption. Sharma and Pant (2020) studied e-learning in Nepal and found that students prefer apps with clear interfaces and interactive features. Rahman et al. (2021) also confirmed that user-friendly designs encourage students in South Asia to use mobile learning applications. Additionally, Kesharwani and Bisht (2012) found that in mobile banking, a clear and visually appealing interface builds trust and increases adoption, which is also relevant for college mobile apps in education.

Based on these studies, the following hypothesis can be formulated:

H_1: There is significant effect of tangibility on adoption of college mobile application.

Usability and Adoption of college mobile application

Theoretical frameworks such as the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), DeLone and McLean Information Systems Success Model support the relationship between usability and the adoption of college mobile applications. UTAUT emphasizes that a user-friendly app, requiring minimal effort to use, is crucial for

adoption (Venkatesh et al., 2003). The DeLone and McLean (2003) highlights that system quality, including usability, is essential for the success and widespread use of mobile apps.

Empirical studies have consistently demonstrated a positive relationship between usability and adoption of college mobile application. Al-Emran et al. (2018) found that mobile learning apps with high ease of use were more likely to be adopted by students. Khechine et al. (2014) highlighted that mobile apps with better usability, functionality and performance were linked to higher user satisfaction and adoption. Similarly, Lwoga et al. (2015) found that simple navigation and relevant features in mobile apps led to higher adoption rates in higher education. Finally, Ahmed et al. (2020) also showed that usability and service quality were key factors influencing the adoption of college mobile applications among management students in educational institutions.

Based on these studies, the following hypothesis can be formulated:

H_2: There is significant effect of usability on adoption of college mobile application.

Content Quality and Adoption of college mobile application

The Expectation-Confirmation Theory (ECT) (Oliver, 1980) explains that users adopt mobile applications when their expectations of content quality are met, leading to satisfaction and continued use. Similarly, the Uses and Gratifications Theory (UGT) (Blumler & Katz, 1974) suggests that individuals adopt technology based on how well it fulfills their informational needs.

Studies confirm the role of content quality in college mobile app adoption. Rahi et al. (2022) found that students' satisfaction with content significantly influenced continued usage. Alraimi et al. (2015) highlighted that relevant and engaging content drives adoption in higher education. (Doan, 2021) found that content accuracy and comprehensiveness were key factors in students' adoption of mobile apps.

Based on these studies, the following hypothesis can be formulated:

H_3: There is significant effect of content quality on adoption of college mobile application.

Responsiveness and adoption of college mobile application

The relationship between responsiveness and the adoption of college mobile applications in higher educational institutions is grounded in the DeLone and McLean Information Systems (IS) Success Model, which identifies responsiveness as a critical component of service quality that directly

influences user satisfaction and behavioral intention. Responsiveness refers to the ability of college applications to meet user needs promptly and effectively, which is essential for fostering a positive learning environment (DeLone & McLean, 2003). In the context of higher education, particularly in Butwal Sub-Metropolitan City, Nepal, enhanced responsiveness can facilitate student's engagement with mobile applications.

Empirical evidence reinforces the significant impact of responsiveness on the adoption of college mobile applications in educational contexts. A study by Ali (2019) demonstrated that higher levels of responsiveness in college mobile applications significantly increase user satisfaction and intentions to adopt such technologies. Additionally, research by Supriyanto et al., (2024) highlighted that when mobile applications provide timely and effective support, students are more likely to embrace these technologies for their learning needs. These findings are particularly relevant for higher educational institutions in Butwal Sub-Metropolitan City, where the swift responsiveness of mobile apps can substantially enhance student adoption and satisfaction, driving improved educational outcomes.

Based on these studies, the following hypothesis can be formulated:

H_4: There is significant effect of responsiveness on adoption of college mobile application.

Enjoyment in Technology and Adoption of college mobile application

The relationship between enjoyment in technology and the adoption of college mobile applications in higher educational institutions is supported by the Technology Acceptance Model (TAM), which posits that perceived enjoyment is a significant determinant of users' behavioral intentions to adopt new technologies. TAM suggests that when users find technology enjoyable, their perceived ease of use and perceived usefulness increases, further enhancing their intention to adopt and regularly use college mobile applications (Bhattacherjee, 2001).

Empirical studies have consistently shown a positive correlation between enjoyment and the adoption of college mobile applications in educational settings. For example, research conducted by Lin, Hsu, and Chen (2023) found that students who experienced higher levels of enjoyment while using mobile apps demonstrated greater intentions to adopt these technologies, leading to frequent usage. Additionally, a study by Patil et al. (2020) highlighted that enjoyment significantly influenced students' positive perceptions of mobile applications, resulting in enhanced adoption

rates among learners in higher education environments. These findings suggest enhancing service quality in college mobile applications, which can foster a more enjoyable user experience.

Based on these studies, the following hypothesis can be formulated:

H_5: There is significant effect of enjoyment in technology on adoption of college mobile application.

Technological Control on Adoption of college mobile application

The relationship between service quality and the adoption of college mobile applications in higher educational institutions is supported by the Unified Theory of Acceptance and Use of Technology (UTAUT). This theory posits that performance expectancy, influenced by service quality, significantly affects user intentions to adopt technology (Molla & Licker, 2005). In higher education, when students perceive high service quality—through responsive support and reliable functionality—they are more likely to adopt mobile applications that meet their educational needs.

Empirical evidence confirms the connection between service quality and the adoption of college mobile applications in education. Adebayo et al. (2020) found that high service quality, especially in responsiveness and reliability, significantly increased university students' inclination to adopt mobile learning technologies. Additionally, Alharbi and Alsharif (2021) demonstrated that improved service quality enhances user satisfaction, leading to a greater intention to adopt mobile apps. These findings are crucial for institutions in Butwal Sub-Metropolitan City, Nepal, emphasizing the role of service quality in promoting mobile application adoption.

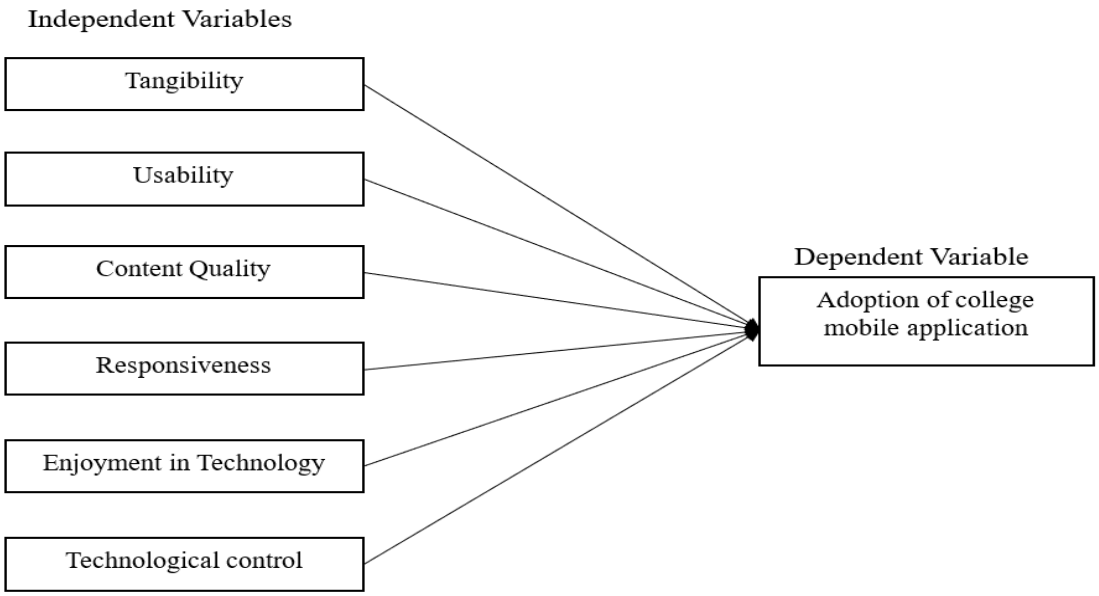
Based on these studies, the following hypothesis can be formulated:

H_6: There is significant effect of technological control on adoption of college mobile applications.

Research framework

The research framework is the structure that illustrates the relationship among dependent and independent variables. In this context, two variables are employed. Service quality is measured by six indicators such as tangibility, usability, content quality, responsiveness, enjoyment in technology and technological control as independent variables, while adoption of college mobile application is used as the dependent variable. The research framework of the study is outlined below:

Figure 1



Note: Adapted from Kaliprasad et al., (2024)

III. Research Methodology

This section deals with the research methods adopted by the researcher in conducting the research. It looks at the various methods and procedures of the research study adopted in conducting the study in order to address and answer the research problems and questions stipulated by the researcher. In this regard, It deals with different component of research design which guides researcher to decide the population and sample from the desired research area, techniques of approaching the sampled respondent, sources of data collection, research instrument used for data collection and different types of tools used to analyze the collected data. Thus, this section is organized in the following structure: research design, population, sample size, sampling technique, sources of data collection, data collection methods, tools used for data analysis.

Research Design

Research design is the blueprint for conducting a study, outlining how data will be collected, measured, and analyzed to address the research problem effectively (Pant, 2017). This study adopts Descriptive Research Design and Explanatory Research Design to achieve its objectives.

Descriptive Research Design systematically presents characteristics, behaviors or phenomena without altering variables. It identifies trends, patterns, and relationships within a population (Creswell, 2014). Explanatory Research Design examines cause-and-effect relationships by comparing groups with existing differences, analyzing the impact of independent variables on

dependent variables without direct manipulation (Fraenkel & Wallen, 2009). Likewise, Kerlinger (1986) highlights ex post facto research, where past independent variables are analyzed to assess their effects on dependent variables (Kerlinger, 1986; Pant, 2012, p. 117).

By combining descriptive and explanatory designs, this study effectively examines variable relationships and their impact (Kerlinger, 1986), ensuring a structured and systematic approach.

Population and Sample Size

The population of this research study comprises all respondents within the research area. In this study, the chosen research area is Butwal Sub-Metropolitan City, and the population consists of management students in different higher education institutions located in Butwal. The total number of students in these institutions is 4948. Therefore, the population of the study is identified as 4948. The details of the institutions and their respective number of students are presented in Table 1.

Table 1 - *Total students of higher education institutions in Butwal*

S. No	Name of HEIs	Number of students
1	Kshitiz International college	675
2	Lumbini Banijya Campus	3323
3	Butwal Kalika Campus	520
4	Siddharatha Gautam Buddha Campus	430
	Total	4948

Sample is a part of a population or subset of population and denoted by n. The total sample size for this study has been obtained using the formulae developed by Yamane (1967). In case of population size is known, the Yamane formula for determining the sample size is given by:

$n= \frac{N}{1+Ne^2}$ Where, n= sample size, N= Population size, and e= Margin of error (MOE), e=0.05 based on research condition. $n= \frac{4948}{1+4948*0.05^2}$ => n= 379 => Thus, the sample size of the study is n = 379

Sampling Techniques

The sampling method is chosen to select sample respondents from the overall population for data collection. In this context, the simple random sampling method is specifically employed to approach the sample respondents. Given that the study focuses on the service quality of college mobile application among management students in higher education institutions in Butwal Sub-metropolitan city, the simple random sampling technique is deemed appropriate. This choice is made because the number of management students using college mobile applications is relatively

low, allowing for the identification and random selection of individuals from the list of students to mitigate bias among respondents.

Nature and Sources of Data Collection

This study primarily relies on quantitative data, which were collected from primary sources. A structured questionnaire was designed to gather first-hand information directly from respondents.

Survey Instrument

A self-structured questionnaire was used as the survey instrument for data collection. It was developed based on operational definitions from previous literature. The questionnaire employs a seven-point Likert scale (7 = Strongly Agree, 6 = Agree, 5 = Somewhat Disagree, 4 = Neutral, 3 = Somewhat Disagree, 2= Disagree and 1= Agree) to gather responses from participants.

A set of questions was designed to measure each independent and dependent variable, totalling 35 items. To ensure clarity and accuracy, a pilot test was conducted by distributing the questionnaire to a sample of 30 respondents. Out of 430 distributed questionnaires, 383 were fully completed, yielding a response rate of 89%.

Statistical Tools

The study utilized various statistical tools based on the nature of the data. Descriptive statistics, including mean and standard deviation (SD), were computed to analyze and interpret the responses. Additionally, a reliability test was conducted to assess the consistency of the research instrument.

For inferential analysis, correlation analysis was used to measure the strength and direction of relationships between independent and dependent variables. Regression analysis was further applied to examine the impact of independent variables on the dependent variable, allowing for the determination of the significance and magnitude of these effects. By combining descriptive and inferential statistical techniques, the study ensured a thorough and rigorous analysis of the data, supporting reliable interpretations and meaningful conclusions regarding the factors influencing the adoption of college mobile applications.

IV. Results and Analysis

Measurement Items Assessment

Table 2 - *Assessment of measurement scale items*

Variables	Items	Outer loadings	VIF	Mean	Standard Deviation
	Ado1	0.775	2.519	5.513	1.568
	Ado2	0.794	1.821	5.674	1.522
Adoption of college mobile application	Ado3	0.815	2.412	5.572	1.545
	Ado4	0.884	3.23	4.952	1.7
	Ado5	0.87	3.527	4.564	1.692
	CQ1	0.896	3.188	3.314	1.925
	CQ2	0.878	3.007	3.714	1.973
Content Quality	CQ3	0.847	2.443	3.626	2.058
	CQ4	0.835	2.446	4.074	1.956
	CQ5	0.918	4.225	3.785	1.974
	Enj1	0.878	3.061	5.955	1.399
	Enj2	0.902	3.789	5.844	1.481
Enjoyment in Technology	Enj3	0.919	4.281	5.728	1.618
	Enj4	0.758	1.905	5.088	1.778
	Enj5	0.772	1.725	5.465	1.755
	Res1	0.896	3.215	5.618	1.455
	Res2	0.88	3.047	5.054	1.764
Responsiveness	Res3	0.809	2.541	5.011	1.8
	Res4	0.862	2.769	5.105	1.852
	Res5	0.823	2.204	5.578	1.473
	Tan1	0.909	3.712	5.133	1.572
	Tan2	0.806	2.261	4.697	1.81
Tangibility	Tan3	0.867	2.938	5.085	1.537
	Tan4	0.871	2.794	5.108	1.715
	Tan5	0.755	1.669	5.884	1.526
	Tec1	0.86	2.404	5.108	1.715
	Tec2	0.814	2.162	5.133	1.81
Technological Control	Tec3	0.851	2.375	5.448	1.536
	Tec4	0.797	1.983	5.768	1.58
	Tec5	0.791	1.794	5.147	1.627
	Usa1	0.826	2.51	3.615	1.926
	Usa2	0.833	2.998	3.153	1.853
Usability	Usa3	0.908	3.366	3.717	1.889
	Usa4	0.895	3.466	3.799	1.968
	Usa5	0.795	1.963	4.686	1.925

Table 2 presents the standardized outer loading and Variance Inflation Factor (VIF) of the scale items employed to measure the variables pertinent to this investigation. In accordance with Sarstedt et al. (2017), the outer loading of an item must exceed 0.708 to signify a substantial contribution of that item in assessing the associated variable. Nonetheless, an outer loading value surpassing 0.70 may also be deemed acceptable, provided that the Average Variance Extracted

(AVE) value of the related variable exceeds 0.50. In this analysis, one items, specifically Usa5 exhibit values below 0.70; however, the variable linked to these items demonstrates AVE values greater than 0.50. Therefore, all 35 scale items are preserved for subsequent analysis. Furthermore, the VIF values for each item are less than 5, thereby indicating no multicollinearity within the scale items (Sarstedt et al., 2014). The mean value of items are more on the higher side of the scale which indicates most of the responses are towards agreeable side. The standard deviation values are small which reflects less deviation in the responses. This indicates that the data is suitable for further analysis.

Quality Criteria Assessment

Table 3 - *Construct Reliability and Validity*

Variables	Alpha	CR (rho_a)	CR (rho_c)	AVE
Adoption of college mobile application	0.885	0.888	0.916	0.687
Content Quality	0.923	0.929	0.942	0.766
Enjoyment in Technology	0.901	0.906	0.927	0.72
Responsiveness	0.908	0.915	0.931	0.73
Tangibility	0.897	0.9	0.925	0.711
Technological Control	0.881	0.885	0.913	0.677
Usability	0.906	0.917	0.93	0.727

Table 3 contains the values of Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) to evaluate the convergent validity of the variables employed in this study. The Cronbach's Alpha coefficients for all items exceed the threshold of 0.705, signifying the adequate contribution of each scale item in the assessment of related constructs (Bland & Altman, 1997). Furthermore, the CR values for rho_A and rho_C surpass the minimum criterion of 0.70, denoting a robust measure of internal consistency (Saari et al., 2021; Hair et al., 2022). The AVE values also exceed the pivotal threshold of 0.50, suggesting that each variable accounts for more than 50 percent of the explained variance. This finding confirms the establishment of convergent validity (Hair et al., 2022). Subsequently, the outcomes depicted in the table as mentioned above satisfy all requisite of quality criteria measures.

Discriminant Validity

Table 4 - *Heterotrait-Monotrait (HTMT) ratio of correlation*

	Adop. of college mobile appl.	Content Quality	Enjoyment in Technology	Responsiveness	Tangibility	Technological Control	Usability
Adoption of college							

mobile application							
Content Quality	0.452						
Enjoyment in Technology	0.898	0.53					
Responsiveness	0.734	0.457	0.799				
Tangibility	0.878	0.492	0.752	0.726			
Technological Control	0.877	0.585	0.812	0.703	0.756		
Usability	0.452	0.889	0.472	0.35	0.475	0.589	

Table 4 contains the HTMT ratio of the correlation matrix, which evaluates the discriminant validity of the latent variables. The values of the HTMT ratio vary from 0.35 to 0.898 The HTMT ratio values need to remain below the critical threshold of 0.85; nevertheless, a range extending up to 0.90 is deemed acceptable, as posited by Henseler et al. (2015). Consequently, the presence of discriminant validity is confirmed among the reflective constructs (Hair & Alamer, 2022).

Table 5 - *Fornell-Larcker Criterion*

	Adopt. of college mob. application	Content Quality	Enjoyment in Technology	Responsiveness	Tangibility	Technological Control	Usability
Adoption of college mobile application	**0.829**						
Content Quality	-0.416	**0.875**					
Enjoyment in Technology	0.808	-0.49	**0.848**				
Responsiveness	0.802	-0.433	0.737	**0.855**			
Tangibility	0.783	-0.451	0.677	0.665	**0.843**		
Technological Control	0.782	-0.534	0.727	0.65	0.813	**0.823**	
Usability	0.416	-0.832	0.441	0.343	0.441	0.538	**0.852**

Table 5 displays the Fornell-Larcker Criterion, an important discriminant validity assessment in a structural equation model (SEM) (Fornell & Larcker, 1981). This criterion is satisfied when the average variance extracted (AVE) for every construct is higher than the squared correlation between that construct and any other construct in the model. The diagonal entries, the square root of AVE of every construct, are to be higher than the off-diagonal values for their corresponding columns and rows. As evident in Table 4, diagonal values (in bold) of Adoption of college mobile application (0.829), Content Quality (0.875), Enjoyment in Technology (0.848), Responsiveness (0.855), Tangibility (0.843), Technological Control (0.823) and

Usability (0.852) are all higher than their inter-construct correlations. This means the measurement model's discriminant validity is assured, implying that each construct is unique and taps into a distinct segment of variance (Hair et al., 2010). This ensures that the constructs do not overlap and that the measures are measuring what they should measure.

Model Fit Assessment

The SRMR indices evaluate the model's explanatory efficacy. The model's SRMR value is 0.078, below the acceptable threshold of 0.080 (Bollen & Stine, 1992). Consequently, this finding suggests that the model exhibits adequate explanatory capability.

Moreover, the effect sizes of Content quality on Adoption of college mobile application is (0.077) Weak effect, Enjoyment in Technology on Adoption of college mobile application is (0.145) Weak effect, Responsiveness on Adoption of college mobile application is (0.624) Strong effect, Tangibility on Adoption of college mobile application is (0.057) Weak effect, Technological Control on Adoption of college mobile application is (0.038) Weak effect and Usability on Adoption of college mobile application is (0.0039) Weak effect (Cohen, 1988).

Finally, the r-square values corresponding to Adoption of college mobile application is 0.853. This signifies that Adoption of college mobile application possess moderate predictive ability (Hair et al., 2013).

Structural Equation Model

Figure 2 - *Path Relationship Model*

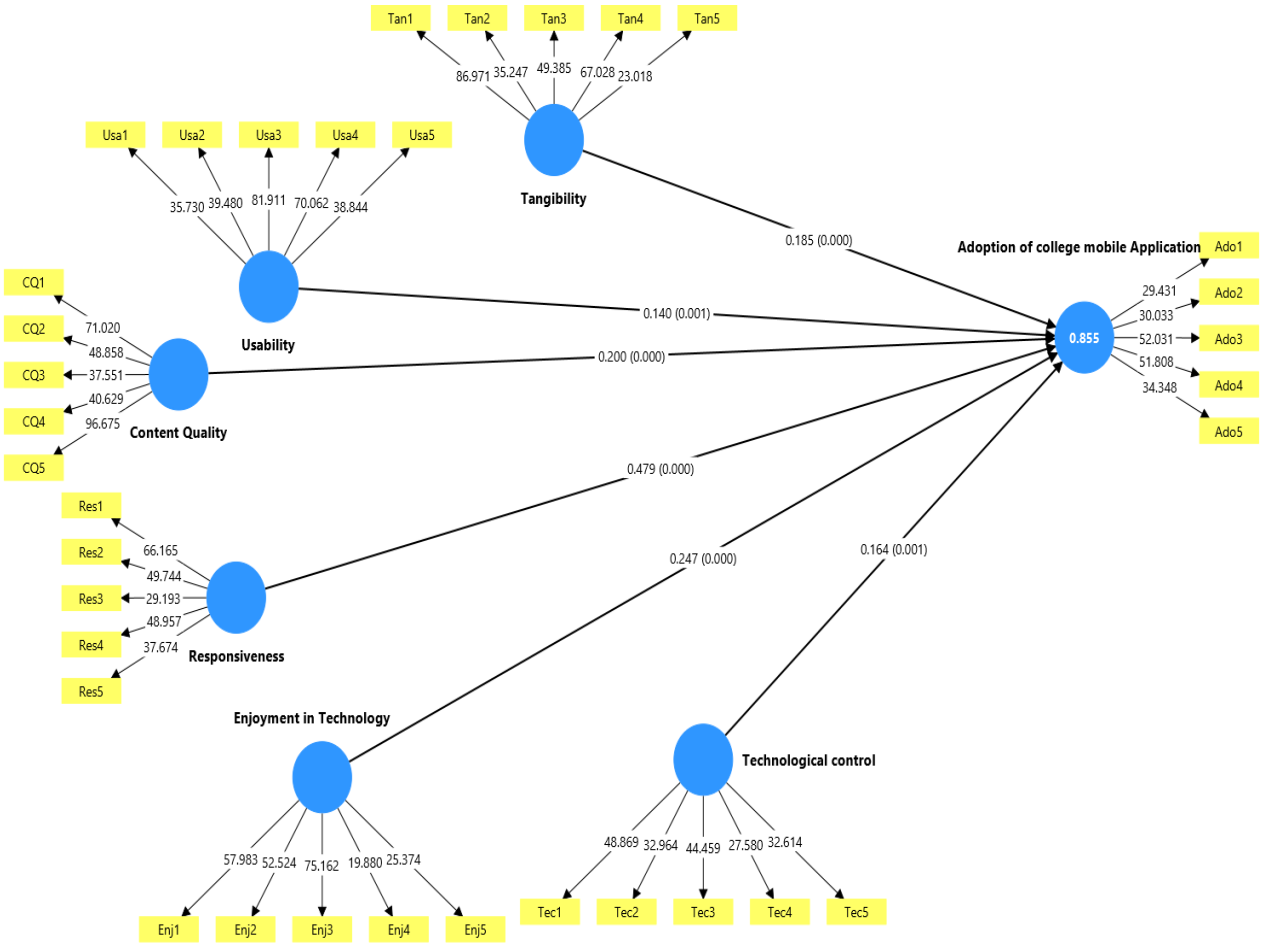


Table 6 - Hypothesis *Testing Using Diagram*

Hypothesis	β	Mean (M)	STD EV	Confidence Interval 2.5%	Confidence Interval 97.5%	T statistics	P values	Decision
H1: Tangibility -> Adoption of college _mobile application	0.185	0.184	0.052	0.084	0.289	3.57	0	Accepted
H2: Usability -> Adoption of college _mobile application	0.14	0.138	0.041	0.058	0.218	3.427	0.001	Accepted
H3: Content Quality -> Adoption of college mobile application	0.2	0.199	0.042	0.118	0.282	4.771	0	Accepted
H4:Responsiveness -> Adoption of college _mobile application	0.479	0.477	0.041	0.395	0.556	11.621	0	Accepted

H5: Enjoyment in Technology -> Adoption of college mobile application	0.247	0.25	0.046	0.166	0.347	5.345	0	Accepted
H6: Technological Control -> Adoption of college _mobile application	0.164	0.164	0.049	0.067	0.26	3.315	0.001	Accepted

Figure 2 and Table 6 report the results of a bootstrapping analysis performed with 10,000 subsamples, which examine decisions regarding the proposed hypotheses. Hypotheses H1, H2, H3, H4, H5 and H6 have achieved acceptance at a significance threshold 0.05. There is a positive and significant impact of Tangibility, Usability, Content Quality, Responsiveness, Enjoyment in Technology and Technological Control on Adoption of College Mobile application.

Table 7 - *Necessary Condition Analysis (NCA) - Bottleneck values*

	LV scores - Adoption of college mobile application	LV scores - Content Quality	LV scores - Enjoyment in Technology	LV scores - Responsiveness	LV scores - Tangibility	LV scores - Technological control	LV scores - Usability
0.00%	17%	NN	NN	NN	NN	NN	NN
10.00%	26%	NN	NN	24%	NN	25%	NN
20.00%	34%	NN	NN	27%	NN	25%	NN
30.00%	42%	NN	30%	30%	NN	25%	NN
40.00%	50%	NN	30%	39%	NN	25%	NN
50.00%	59%	NN	30%	39%	25%	40%	NN
60.00%	67%	NN	30%	43%	25%	40%	NN
70.00%	75%	NN	30%	51%	25%	40%	NN
80.00%	83%	NN	30%	51%	48%	55%	NN
90.00%	92%	NN	30%	51%	66%	55%	NN
100.00%	100%	NN	30%	86%	85%	83%	NN

Table no 7 represent bottleneck value of latent variable Using Necessary Condition Analysis. To achieve 17% of the Adoption of college mobile application no factors are necessary. Similarly, 26% of the Adoption of college mobile application 24% of Responsiveness and 25% of Technological control is necessary. Likewise, to achieve 34% of Adoption of college mobile

application, 27% of Responsiveness and 25% of technological Control are necessary. Alike, to achieve 42% of Adoption of college mobile application, 30% of Enjoyment in Technology, 30% of Responsiveness and 25% of Technological control are necessary. Also, 100% of Adoption of college mobile application, 30% of Enjoyment in technology, 86% of Responsiveness, 85% of Tangibility and 83% of Technological Control are necessary.

Table 8 - *Importance Performance Map Analysis*

	LV performance	Importance
Content Quality	44.759	0.2
Enjoyment in Technology	77.673	0.247
Responsiveness	72.122	0.479
Tangibility	70.19	0.185
Technological control	72.02	0.164
Usability	47.412	0.14
Mean	64.02933	0.235833

Figure 3

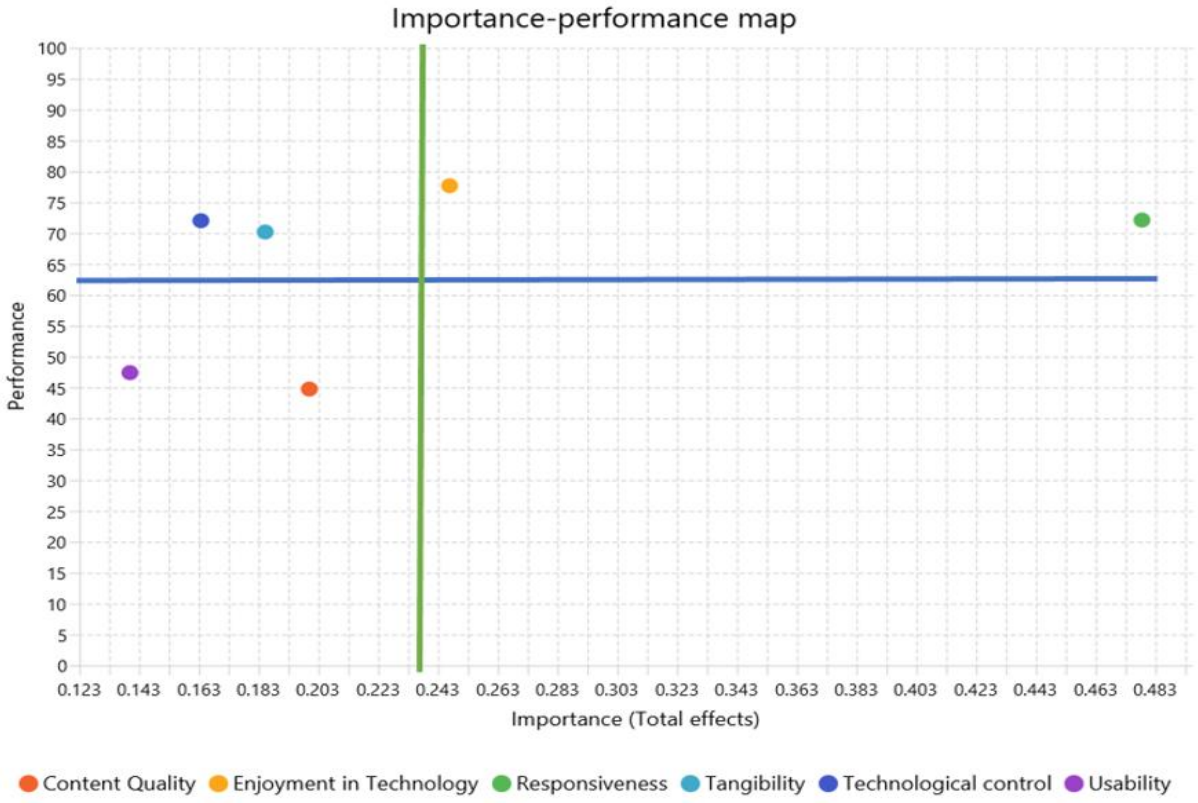


Table 8 shows the total effects of Tangibility, Usability, Content Quality, Responsiveness, Enjoyment in Technology and Technological change on Adoption of College Mobile application for the unstandardized effects. These effects are the same as the unstandardized weights of ordinary

least square regression modelling (Hair et al. 2010). Furthermore, the performance of Adoption of college mobile application attitude was calculated as 77.673.

Notably, we derived the four quadrants successfully based on the mean values of the constructs' importance and performance value. As per Fig. 3, if we increase 1 unit in responsiveness from 72.122 to 73.122, Adoption of College Mobile application increases from 71,161 to 71.64. Similarly, if we increased 1 unit in Usability from 47.412 to 48.412, then Adoption of College Mobile application grew from 71.161 to 71.301. Therefore, out of the six determinants of Adoption of College Mobile application, the most critical factor was noted to be Responsiveness.

Findings of the Study

The findings of this study indicate that Tangibility has positively and significant impact on Adoption of College Mobile application. Alike, Usability has positively and significant impact on Adoption of College Mobile application. Similarly, Content Quality has positively and significant impact on Adoption of College Mobile application. Likewise, Responsiveness has positively and significantly impact on Adoption of College Mobile application. Also, Enjoyment in Technology has positively and significantly impact on Adoption of College Mobile application and Technological Control positively and significant effect on Adoption of College Mobile application.

V. Discussions

The findings of the research show that tangibility, usability, content quality, responsiveness, enjoyment in technology, and technological change all have positive and significant effects on adoption of college mobile application by higher education management students in Butwal Sub-Metropolitan City. This aligns with the overall mobile learning adoption literature, which highlights how both technical and experiential factors are to blame for technology acceptance. Tangibility is defined by attributes such as clarity of interface and device compatibility, creates a ground-level impression to enable user trust and engagement (Almaiah et al., 2020). Usability remains a ground-level attribute; easy navigation and human-centered design affect perceived ease of use and usefulness directly, as per the Technology Acceptance Model (Davis, 1989; Al-Emran et al., 2016). Similarly, content quality i.e., relevance, accuracy, and clarity sustains the motivation of users to always use the application (Almaiah et al., 2016). Moreover, responsiveness of technical support and responsiveness of real-time feedback significantly determine user satisfaction and intentions for future usage (Sarrab et al., 2015). The technology acceptance role

of fun stresses the potential of intrinsic motivation to lead learning towards accepting digital means when enjoyable and game-like, there are better odds that students will explore and rely on mobile means (Al-Emran & Shaalan, 2022).

Lastly, technological change also focuses on organizational readiness and adaptation — those that adapt positively in their incorporation of digitalization among them obtain improved uptake among their students (Venkatesh et al., 2012). Taken together, these variables suggest that the successful implementation of college mobile applications depends not only on functional characteristics but also on emotional, cognitive, and contextual variables that define Nepalese higher education students' experiences.

VI. Conclusion and Implications

Conclusion

The research shows that all suggested factors have a significant effect on the adoption of mobile applications in colleges, although with different levels of influence. Notably, responsiveness emerges as the most significant predictor, succeeded by enjoyment in technology and content quality. These results suggest that prompt assistance, interactive and engaging features, along with high-quality content, are essential elements driving the adoption of mobile applications in higher education. Additional factors such as tangibility, technological control and usability also contribute significantly, albeit with a comparatively lesser impact.

Consequently, TAM, ECT and UGT, demonstrate that students' adoption of college mobile applications is significantly and favorably impacted by tangibility, usability, content quality, responsiveness, enjoyment of technology, and technological change. It can be inferred that if organizations prioritize enhancing responsiveness, fostering enjoyable user experiences, and elevating content quality-while also ensuring usability and user control-there is an increased likelihood of boosting student engagement and achieving successful integration of mobile applications within educational environments. Such enhancements can result in improved learning outcomes and heightened satisfaction among users, ultimately facilitating the digital transformation of higher education.

Implication

This study extends the research in the areas of Technology Acceptance Model (TAM), Expectation-Confirmation Theory (ECT), and Unified Theory of Acceptance and Use of

Technology (UTAUT) by incorporating additional variables such as tangibility, usability, content quality, responsiveness, enjoyment in technology and technological change. These findings affirm that both experiential and technical aspects play a significant role in influencing students' adoption intention of college mobile apps. The results validate the relevance of perceived usefulness and ease of use in TAM, satisfaction through expectation confirmation in ECT and motivational variables like enjoyment and effort expectancy in UTAUT in a developing country like Nepal. This adaptation of Western-based theories to suit the South Asian education setting contributes to the more refined conceptualization of technology adoption in diverse environments.

The practical implications offer actionable guidelines for institutions, developers, and policymakers seeking to promote the adoption of college mobile applications. Nepalese educational institutions must focus on developing user-friendly, appealing, and content-rich mobile applications. Since usability and content quality were identified as strong determinants of adoption, institutions must focus on functionality and relevance to curriculum. Responsiveness and enjoyment were also involved, implicating that instant support and interactive content (e.g., interactive learning) can drive continued use. App developers must keep apps updated and technically reliable to adapt to technological changes. Policymakers, on the other hand, must finance digital infrastructure and training programs to bridge the technology divide in higher education.

VII. References

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