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Determinants of Students' Smartphone Acquisition Intentions as Tools for Digital and Online Learning

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Abstract

The widespread proliferation of smartphones has fundamentally altered educational landscapes, particularly in how students access digital and online learning resources. This study investigates the determinants of students' intentions to acquire smartphones as instruments for digital and online learning. Grounded in the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT2), the research examines key constructs including perceived usefulness, perceived ease of use, social influence, hedonic motivation, price-value perception, and facilitating conditions as predictors of smartphone acquisition intention. A quantitative survey approach was employed, collecting data from 320 university students through a structured questionnaire. Results from structural equation modeling (SEM) revealed that perceived usefulness, social influence, and hedonic motivation were the most significant predictors of acquisition intention, while price-value perception and facilitating conditions also demonstrated meaningful effects. Perceived ease of use, though positively associated, did not reach statistical significance. The findings contribute theoretically to the understanding of technology adoption in educational contexts and offer practical implications for institutions, policymakers, and EdTech developers seeking to promote equitable access to digital learning tools. The study recommends targeted institutional support, affordable device programs, and robust digital infrastructure to enhance students' ability to leverage smartphones effectively for academic purposes.

Keywords: smartphone acquisition, digital learning, online learning, Technology Acceptance Model, UTAUT2, technology adoption, higher education

Introduction

The digital transformation of education has accelerated significantly over the past decade, with smartphones emerging as pivotal tools that bridge the gap between formal instruction and self-directed learning. Unlike desktop computers or laptops, smartphones offer unparalleled portability, constant connectivity, and a growing ecosystem of educational applications that support diverse learning modalities. As mobile penetration rates continue to rise globally, students increasingly rely on these devices not merely for communication but as primary conduits for accessing course materials, participating in virtual classrooms, and collaborating with peers.

Despite this growing reliance, not all students possess smartphones, and acquisition decisions are shaped by a complex interplay of technological, social, economic, and personal factors. Understanding what drives a student's intention to acquire a smartphone specifically for educational purposes represents a critical area of inquiry, especially in developing economies where resource constraints intersect with expanding digital aspirations. In contexts where institutions increasingly mandate digital submissions, employ learning management systems (LMS), and host synchronous online lectures, owning a smartphone transitions from a luxury to a near-necessity.

Previous research on technology adoption in education has predominantly focused on usage behavior after acquisition, leaving a gap in understanding the antecedents to the acquisition decision itself. The Technology Acceptance Model (TAM), introduced by Davis (1989), and its extensions, particularly the Unified Theory of Acceptance and Use of Technology (UTAUT2) by Venkatesh et al. (2012), provide robust theoretical frameworks for exploring these determinants. These models identify constructs such as performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, and price value as key predictors of technology use intention, which this study adapts to the acquisition context.

This study therefore investigates the determinants of students' smartphone acquisition intentions as tools for digital and online learning. The specific objectives are to examine the influence of perceived usefulness, perceived ease of use, social influence, hedonic motivation, price-value perception, and facilitating conditions on smartphone acquisition intention among university students. The findings are expected to enrich theoretical frameworks for technology adoption in education while offering actionable insights for academic institutions and digital learning advocates.

Review of Literature

Technology Acceptance Model (TAM) and UTAUT2

The Technology Acceptance Model, originally proposed by Davis (1989), posits that two primary constructs perceived usefulness and perceived ease of use — determine an individual's attitude toward using a technology, which in turn predicts behavioral intention and actual use. TAM has been widely validated across numerous technology contexts, including mobile learning environments (Al-Emran et al., 2018; Cheon et al., 2012). Perceived usefulness refers to the degree to which users believe a technology will enhance their performance, while perceived ease of use captures the expectation that the technology will require minimal effort to operate.

Venkatesh et al. (2012) extended the original UTAUT framework by incorporating hedonic motivation, price value, and habit into the model, creating UTAUT2, which better captures the consumer technology adoption context. Performance expectancy (analogous to perceived usefulness) and effort expectancy (analogous to perceived ease of use) remain central constructs, while social influence, facilitating conditions, hedonic motivation, and price value provide additional explanatory power. This extended framework is particularly relevant when studying students' decisions to acquire consumer technologies like smartphones for personal and academic use.

Smartphone Use in Educational Settings

Smartphones have been documented as versatile learning tools that facilitate access to educational content, enable communication with instructors and peers, support multimedia consumption, and provide platforms for productivity applications (Crompton & Burke, 2018; Sung et al., 2016). Meta-analytic evidence by Sung et al. (2016) demonstrated that mobile device integration in classrooms had a moderate positive effect on student achievement, underscoring the academic value of these devices.

Research in developing country contexts, particularly in sub-Saharan Africa and South/Southeast Asia, has highlighted that smartphones often serve as the primary or sole internet-connected device for university students (Asongu & Nwachukwu, 2018; Park et al., 2014). This reality amplifies the stakes of acquisition decisions, as not owning a smartphone may effectively exclude students from digitally mediated learning opportunities. Studies from Nigeria, Ghana, and South Africa have consistently identified cost, network coverage, and digital literacy as significant barriers to smartphone-based learning (Boateng & Amankwah-Amoah, 2021).

Perceived Usefulness and Acquisition Intention

Multiple studies have confirmed the positive relationship between perceived usefulness and technology acquisition or adoption intention. Koenig-Lewis et al. (2015) found that students' perceptions of mobile learning utility significantly predicted their willingness to invest in mobile devices. Similarly, Tarhini et al. (2016) demonstrated that performance expectancy was the strongest predictor of mobile learning adoption intention among students in Lebanon and England. When students perceive that a smartphone will enhance their academic performance — through access to e-libraries, collaborative platforms, or lecture recordings — they are more inclined to prioritize its acquisition.

Social Influence and Peer Norms

Social influence, defined as the degree to which an individual perceives that significant others believe they should use a particular technology (Venkatesh et al., 2012), has emerged as a robust predictor of technology adoption in educational contexts. Suki and Suki (2011) found that peer pressure and instructor recommendations significantly influenced students' intentions to use mobile devices for learning. In collectivist cultural settings, where conformity to group norms is particularly salient, social influence may be an even stronger determinant of acquisition behavior (Park et al., 2014).

Hedonic Motivation and Price-Value Perception

Hedonic motivation the enjoyment or fun derived from using a technology — has been shown to significantly influence technology adoption decisions, often independently of utilitarian considerations (Brown & Venkatesh, 2005). Smartphones, with their multimedia capabilities and entertainment affordances, carry inherent hedonic appeal that may motivate acquisition beyond strictly academic rationales. Price-value perception, which reflects the cognitive trade-off between the monetary cost of a technology and its perceived benefits, is particularly critical when the target population comprises students with limited financial resources (Venkatesh et al., 2012; Al-Emran et al., 2018).

Facilitating Conditions

Facilitating conditions refer to the degree to which an individual believes organizational and technical infrastructure exists to support system use (Venkatesh et al., 2012). In the

educational context, this encompasses institutional Wi-Fi availability, technical support, access to digital resources, and institutional encouragement of mobile learning. Studies by Mtebe and Raisamo (2014) in Tanzania found that facilitating conditions significantly predicted mobile learning adoption, suggesting that institutional readiness is a key enabler of students' technology decisions.

Research Methodology

Research Design and Approach

This study employed a quantitative, cross-sectional survey design to examine the determinants of students' smartphone acquisition intentions. A positivist philosophical stance underpins the research, reflecting the assumption that objective relationships between theoretical constructs can be measured and statistically analyzed. The survey instrument consisted of a structured questionnaire with Likert-scale items adapted from validated scales in the TAM and UTAUT2 literature.

Population and Sampling

The target population comprised undergraduate and postgraduate students enrolled at a public university in a developing economy. A sample size of 320 students was determined using Cochran's (1977) formula for proportionate sampling, ensuring sufficient statistical power for structural equation modeling. A stratified random sampling technique was employed, with strata defined by faculty/department to ensure proportional representation across disciplines including sciences, social sciences, engineering, and humanities.

Measurement Instrument

The questionnaire comprised two sections. The first section captured demographic information including age, gender, academic level, and current smartphone ownership status. The second section contained 28 items measuring the six independent constructs (perceived usefulness, perceived ease of use, social influence, hedonic motivation, price-value perception, and facilitating conditions) and the dependent variable (smartphone acquisition intention). All items were adapted from Davis (1989), Venkatesh et al. (2012), and Al-Emran et al. (2018), and rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Face

and content validity were established through expert panel review, and a pilot study involving 35 students confirmed reliability, with Cronbach's alpha values exceeding .70 for all constructs.

Data Collection and Analysis

Data were collected over a six-week period through face-to-face and online (Google Forms) administration. Of 350 questionnaires distributed, 320 were returned complete and usable, yielding a response rate of 91.4%. Data were analyzed using IBM SPSS Statistics 27 for descriptive statistics and reliability analysis, and SmartPLS 4.0 for partial least squares structural equation modeling (PLS-SEM). PLS-SEM was preferred given its suitability for exploratory research and non-normally distributed data (Hair et al., 2019). The assessment followed a two-stage approach: first evaluating the measurement model (reliability and validity), then testing the structural model (path coefficients and significance).

Analysis and Discussion

Table 1. Descriptive Statistics and Sample Profile

Characteristic	Category	Percentage (%)
Gender	Male	54.4%
	Female	45.6%
Age Group	18–24 years	68.1%
	Other age groups	31.9%
Smartphone Ownership	Owns a smartphone	74.7%
	Does not own a smartphone	25.3%
Mean Construct Scores	Range across all constructs	3.41 – 4.12
Scale	5-point Likert scale	N = 320

Note. N = 320. Mean construct scores are based on a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

The sample consisted of 320 respondents, with a near-balanced gender distribution (54.4% male, 45.6% female). The predominance of the 18–24 age cohort (68.1%) is consistent with the study's focus on an undergraduate population, lending ecological validity to findings within this demographic. The high rate of existing smartphone ownership (74.7%) suggests that the majority of respondents possess direct experiential knowledge of the product category, which may positively influence the reliability of attitude and intention measures. The 25.3% non-owner segment constitutes the primary group of interest for acquisition intention analyses. Mean construct scores ranging from 3.41 to 4.12 on a five-point scale indicate moderately high agreement across all measured constructs, suggesting that respondents generally held favorable perceptions toward the constructs examined a baseline conducive to meaningful variance in predictive modeling.

Table 2. Measurement Model Assessment (PLS-SEM / CFA)

Criterion	Threshold	Result in Study	Met?	Ref.
Composite Reliability (CR)	> .80	All CR > .80	✓ Yes	—
Average Variance Extracted (AVE)	> .50	All AVE > .50	✓ Yes	Fornell & Larcker (1981)
Discriminant Validity (HTMT)	< .85	All HTMT < .85	✓ Yes	—
Factor Loadings	> .70	All loadings > .70	✓ Yes	—

Note. CR = Composite Reliability; AVE = Average Variance Extracted; HTMT = Heterotrait-Monotrait Ratio. Thresholds based on Fornell and Larcker (1981) for AVE, and standard PLS-SEM guidelines for CR and HTMT.

The measurement model demonstrated sound psychometric properties across all four evaluation criteria. Composite reliability values exceeding .80 for all constructs confirm strong internal consistency, indicating that items within each construct reliably measure the same underlying latent variable. Average variance extracted (AVE) values surpassing the recommended .50 threshold (Fornell & Larcker, 1981) establish convergent validity, confirming that a majority of variance in the indicators is explained by their respective constructs rather than

by measurement error. Discriminant validity was supported through the HTMT criterion, with all ratios remaining below the conservative .85 threshold, indicating that each construct is empirically distinct from the others. Finally, all factor loadings exceeding .70 reflect strong item-to-construct alignment, suggesting that individual indicators are robust and valid representations of their intended constructs. Collectively, these results provide confidence in the measurement model's reliability and validity, justifying subsequent structural model analysis.

Structural Model Results and Hypotheses Testing

The structural model explained 61.3% of the variance in smartphone acquisition intention ($R^2 = .613$), indicating a substantial explanatory capacity. Bootstrapping with 5,000 subsamples was used to assess path coefficient significance at the 95% confidence interval. Perceived usefulness demonstrated the strongest positive effect on acquisition intention ($\beta = .341$, $p < .001$), confirming that students who believe smartphones will enhance their academic performance are significantly more inclined to acquire one. This finding aligns with Davis (1989) and Tarhini et al. (2016), reinforcing the central role of performance expectancy in technology adoption decisions.

Social influence also emerged as a significant predictor ($\beta = .278$, $p < .001$), suggesting that peer behavior, instructor recommendations, and family expectations meaningfully shape acquisition intentions. This corroborates findings by Suki and Suki (2011) and underscores the social embeddedness of technology decisions, particularly in communal cultural contexts. Hedonic motivation exhibited a significant positive effect ($\beta = .214$, $p < .01$), reflecting that students' perceptions of smartphones as enjoyable and entertaining devices beyond their educational utility also drive acquisition intention.

Price-value perception was positively and significantly associated with acquisition intention ($\beta = .189$, $p < .01$), indicating that students who believe smartphone value outweighs cost are more likely to intend to acquire one. This is particularly noteworthy in resource-constrained environments, where affordability is a critical barrier. Facilitating conditions showed a modest but significant effect ($\beta = .143$, $p < .05$), suggesting that institutional support including reliable campus internet, digital literacy programs, and e-resource access contributes to acquisition motivation.

Notably, perceived ease of use did not reach statistical significance ($\beta = .092$, $p = .118$), suggesting that in 2024, students largely regard smartphone operation as inherently intuitive and are not significantly deterred by concerns about complexity. This finding mirrors results from

Al-Emran et al. (2018), who reported diminishing relevance of effort expectancy as smartphones become ubiquitous. The convergence of results across constructs validates both TAM and UTAUT2 as applicable frameworks for understanding smartphone acquisition in educational contexts.

Discussion of Key Findings

The primacy of perceived usefulness reaffirms that students approach smartphone acquisition with academic utility firmly in mind. Institutions that actively promote digital learning platforms, LMS engagement, and e-learning resources may indirectly strengthen students' perception of smartphone usefulness and thereby motivate acquisition. The significant role of social influence suggests that peer-learning communities and faculty advocacy can serve as informal drivers of device acquisition, particularly among students who are yet to own smartphones.

Price-value perception's significance points to the economic sensitivity of acquisition decisions among students. Subsidy programs, installment payment schemes, and partnerships between universities and mobile device manufacturers could lower financial barriers and democratize access to digital learning tools. The role of facilitating conditions further highlights that acquisition intention is not shaped in isolation — the broader educational ecosystem, including infrastructure and institutional support, must be conducive to mobile learning for students to perceive acquisition as worthwhile.

Conclusion

This study has contributed to the literature on technology adoption in education by identifying the key determinants of students' smartphone acquisition intentions as tools for digital and online learning. Drawing on TAM and UTAUT2, the findings demonstrate that perceived usefulness, social influence, hedonic motivation, price-value perception, and facilitating conditions are significant predictors of acquisition intention among university students. Perceived ease of use, while positively oriented, did not significantly influence acquisition decisions, likely reflecting the maturation of smartphone interfaces and widespread digital familiarity among the student population.

The study underscores the importance of a multidimensional approach to promoting mobile-enabled education. Academic institutions are encouraged to invest in digital infrastructure, advocate for affordable student device programs, and cultivate a digital learning

culture that reinforces smartphones' educational value. Future research should extend this framework to longitudinal designs to track actual acquisition behavior following stated intentions, and should explore moderating variables such as gender, socioeconomic status, and geographic location that may amplify or attenuate the identified relationships. Qualitative inquiries could further illuminate the lived experiences and decision-making processes underlying smartphone acquisition, providing richer contextual insight beyond what survey instruments can capture.

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