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Motivational and Pedagogical Factors Influencing ICT Integration in Higher Education Teaching

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Abstract: Increased speed of information and communication technology (ICT) development requires a thorough analysis of its adoption factors. The research applies SDT together with TPB and TTF to understand the psychological as well as social factors that influence the way users interact with ICT. This research is about understanding how autonomy, competence, relatedness, subjective norms, and perceived behavioral control influenced by technology-task fit impacts users' intentions to use and actually use ICT. A quantitative analysis relies on structured survey responses from a sample of 430 participants. SmartPLS 4 using structural equation modeling (SEM) was used to explore relationships between key variables in the sample. The findings confirmed that perceived autonomy and competence and relatedness together create a stronger sense of autonomous motivation that affected people's perceived behavioral control and attitudes and helped formed subjective norms to TPB. Subjective norms are a strong indicator of ICT adoption whereas individual-technology-task fit leads to increased usage any poor task-technology fit is an obstacle to adoption. The study makes an important contribution to the literature, with a novel model that combines psychological models, behavioral patterns, and the technological context within the study of ICT adoption and use. The study offers organizations skills for effective implementation of ICT, educators with guidance on ICT implementation, and policy makers ways to increase implementation practices at their institutions that will maximize effective technology-task integration for student use.
Keywords: ICT Adoption, Self-Determination Theory (SDT), Theory of Planned Behavior (TPB), Task-Technology Fit (TTF) and Behavioral Intention.

1. Introduction

Higher education institutions now recognize Information and Communication Technology integration as a fundamental element for both teaching quality betterment and student learning experiences enhancement together with academic digital transformation progress (Leenknecht et al., 2021). Universities across the world now use digital learning environments where Information and Communication Technology has evolved beyond traditional instructional methods to create interactive teaching software together with blended educational methods and data-based educational approaches. Higher education institutions need to select digital technologies that improve teaching quality and active student engagement according to this policy directive (Alowayr & Al-Azawei, 2021). Despite significant advancements in ICT infrastructure and digital education policies, the adoption and effective utilization of ICT by university lecturers remain inconsistent. Several characteristics influence

lecturers' decision processes for ICT integration in their teaching namely individual attitudes together with external influences and technological fit and psychological determinants (Bin et al., 2020). The Theory of Planned Behavior (TPB) functions as an effective model to understand behavioral determinants through its explanations about how lecturers' attitudes toward ICT usage and social acceptability and perceived sense of control influence their decisions to use ICT (Bai, Wang & Nie, 2021). Self-Determination Theory (SDT) illustrates how behavioral intention is influenced primarily by three psychological needs, including perceptions of autonomy and competence, along with relatedness. The prediction of ICT use behaviors among university lecturers will require additional research to examine the interrelationship between psychological and motivational factors and technological aspects (Wang & Cheng, 2020).

The current research studies the teaching ICT use behavior of university lecturers and does so with the use of the Theory of Planned Behaviour (TPB) and Self-Determination Theory (SDT) with consideration for task-technology fit (TTF) and individual-technology fit (ITF). This study evaluates the relations that exist between perceived autonomy and perceived competence as well as perceived relatedness and autonomous motivation together with subjective norms and attitudes and perceived behavioral control and ICT usage behavior. The study investigates behavioral intent combined with matching between professional tasks and technological systems as well as user-computer analogies that enable institutions of higher education to use ICT successfully.

Although numerous studies have explored ICT adoption in higher education, existing research predominantly focuses on external barriers such as institutional support, technological infrastructure, and policy frameworks. However, less attention has been given to the psychological and motivational factors influencing university lecturers' ICT adoption decisions. Behavioral intention obtains high levels of explanation from TPB yet the framework does not validate intrinsic motivation as the sole trigger for voluntary technology adoption. The study of self-determination theory in education shows limited research on faculty engagement with information and communication technology despite its extensive work on student motivational aspects. A behavioral intention on its own does not lead to technology adoption thus researchers need to investigate how task-technology fit and individual-technology fit act as intermediaries between intention and use. Research has seldom studied the integrated influence of TPB together with SDT and technology fit theories to predict lecturers' utilization behaviors of ICT (Irawan, Elia & Benius, 2022). This examination contributes a complete theoretical structure that helps clarify ICT adoption factors in higher education which produces worthwhile guidelines for policymakers and university leaders and academic staff to refine their digital teaching methods and development initiatives.

1.1. Research Question & Objectives

The following research questions and objectives in table 1 are designed to explore the key factors influencing university lecturers' adoption of ICT in teaching.

The research holds importance because it presents an extensive breakdown of elements affecting lecturers' adoption of ICT based on Theory of Planned Behavior and Self-Determination Theory. The research provides important findings about lecturers' ICT usage through its analysis of psychological needs combined with motivation and behavioral intention. Task-technology fit together with individual-technology

fit play a significant role in explaining why intentions do not always become actual adoption behaviors. The research outcomes can assist administrators as well as policymakers and educators to develop strategies which promote better ICT adoption in higher education thus leading to enhanced teaching performance. This research investigation fills a research void by presenting insights into how psychological elements determine the relation between social factors and technological influences during ICT adoption processes. This research identifies both the enabling elements and obstructive factors to create a theoretical and practical approach for advancing sustainable digital transformation in university teaching.

Table 1: Research Question & Objectives.

Research Questions	Research Objectives
To what extent do university lecturers' perceived autonomy, perceived competence, and perceived relatedness lead to autonomous motivation?	To examine the relationship between perceived autonomy, perceived competence, and perceived relatedness and autonomous motivation.
Does university lecturers' autonomous motivation lead to subjective norms, attitudes, and perceived behavioral control?	To examine the relationship between autonomous motivation and subjective norms, attitudes, and perceived behavioral control.
To what extent do the subjective norms, attitudes, and perceived behavioral control of university lecturers influence their behavioral intention to use ICT in teaching?	To examine the relationship between subjective norms, attitudes, and perceived behavioral control on behavioral intention.
Does university lecturers' behavioral intention to use ICT in teaching lead to ICT usage behavior?	To examine the relationship between behavioral intention and ICT usage behavior.
Does university lecturers' behavioral intention to use ICT in teaching mediate the relationship between subjective norms, attitudes, perceived behavioral control and ICT usage behavior?	To examine the mediating effect of subjective norms, attitudes, and perceived behavioral control on the relationship between intention and ICT usage behavior.
Does university lecturers' perceived task-technology fit mediate the relationship between behavioral intention to use ICT in teaching and ICT usage behavior?	To examine the mediating effect of task-technology fit on the relationship between behavioral intention and ICT usage behavior.
Does university lecturers' perceived individual-technology fit mediate the relationship between behavioral intention to use ICT in teaching and ICT usage behavior?	To examine the mediating effect of individual-technology fit on the relationship between behavioral intention and ICT usage behavior.

2. Literature Review

The feeling that people have regarding their power to determine outcomes plays a crucial role in shaping their intrinsic motivation pattern. According to Deci and Ryan's (1985) Self-Determination Theory (SDT), autonomy is a critical psychological need that enhances an individual's engagement and motivation (Xiao, 2019). Research shows that people who sense a high level of autonomy develop autonomous motivation since it represents the desire to do things because they genuinely enjoy the activity and find happiness within itself rather than motivation. The data collected from research environments proves that people with a feeling of independence demonstrate higher commitment while generating more creative solutions and maintaining their dedication to work. People who feel autonomous in using technology will actively use digital tools in their work (Humida, Al Mamun & Keikhosrokiani, 2022).

Hypothesis 1: There is a positive relationship between perceived autonomy and autonomous motivation.

According to SDT the belief of an individual about their capability to complete

tasks effectively defines perceived competence. The sense of competence triggers people to develop internal motivation which leads them to act on behaviors that help demonstrate and strengthen their abilities (Gurer, 2021). Research overwhelmingly demonstrates that perceptions of confidence results in autonomous motivation across various domains from education to work activities and technological applications. In the digital world, a review reports that users that displayed capability with ICT tools tend to have applied new technologies in their day-to-day activities. Feelings of proficiency are also key determinants for how individuals cultivate their motivation to use ICT systems (Falloon, 2020).

Hypothesis 2: There is a positive relationship between perceived competence and autonomous motivation.

Within a certain domain an individual experiences perceived relatedness by feeling a deep connection with others. The perception of feeling connected with others is a fundamental psychological need in SDT that affects motivation and engagement (Huang, Zhou & Sheeran, 2021). The study suggests that we form autonomous motivation by experiencing social connectedness and receiving social support from others. The adoption of ICT systems improves when users within digital realms feel supported because they believe relationships exist between them and others. The presence of teamwork along with community spirit in digital work environments leads employees to effectively interact with and appreciate ICT tools (Frolova, Rogach & Ryabova, 2020).

Hypothesis 3: There is a positive relationship between perceived relatedness and autonomous motivation.

When people experience autonomous motivation from internal interests and beliefs they become susceptible to social pressure regarding their behavioral choices. Behavioral intentions of individuals are directly influenced by subjective norms according to the Theory of Planned Behavior. Strength of autonomous motivation causes people to follow positive subjective norms within their social environment (Nunes, Limpo & Castro, 2022). Research shows that intrinsically motivated people tend to follow the expectations from their peers alongside mentors and professional colleagues. People with self-motivated autonomy in ICT adoption use technology according to prevailing social expectations due to their implementation of digital tools as a reflection of their personal values and occupational identity (Luo, 2023).

Hypothesis 4: There is a positive relationship between autonomous motivation and subjective norms.

People evaluate specific behaviors through attitude which determines their tendency to perform that behavior. Following a path of autonomous motivation results in a strong positive attitude regarding both activities and innovative measures because people value their own interests and personal principles (Gökçearslan, Yildiz Durak & Atman Uslu, 2024). People who demonstrate autonomous motivation show better attitudes in their perspective of learning along with work and technologies they adopt. People who consider technology utilization compatible with their intrinsic needs will adopt technological tools more efficiently for ICT usage. The strength of positive attitudes required for ICT engagement becomes better because of autonomous motivation (Joshi, Vinay & Bhaskar, 2020).

Hypothesis 5: There is a positive relationship between autonomous motivation and attitude.

The capacity for a person to believe they can perform a certain behavior defines Perceived Behavioral Control (PBC). Theory of Planned Behavior PBC functions as a principal construct that demonstrates a connection with self-directed motivation (Al-Emran, 2021). Autonomous motivation enables individuals to develop enhanced self-efficacy beliefs that lead to increased perceptions of action control. People who possess self-directed motivation in digital platforms observe ICT tools as approachable technology that enhances their willingness to adopt and apply them according to their goals (Lavidas, Komis & Achriani, 2022).

Hypothesis 6: There is a positive relationship between autonomous motivation and perceived behavioral control.

Social expectations define behavioral intentions because they shape the way people perceive the social environment. Studies demonstrate that people form intentions for behavior adoption when they detect significant social support or pressure. Subjective norms demonstrate important influence during ICT adoption because they determine how individuals adopt technology as part of their work and personal activities. Staff who sense that their supervisors and co-workers advocate the use of ICT systems tend to form robust commitments toward digital tools (Maatuk et al., 2022).

Hypothesis 7: There is a positive relationship between subjective norms and intentions.

Positive or negative attitudes serve as fundamental forces that determine how a person plans to behave specifically regarding information and communication technology (ICT) use. Based on the Theory of Planned Behavior (TPB) attitudes strongly determine how behavioral intentions develop until they become the guide for genuine actions (Donitsa-Schmidt & Ramot, 2020). Human beings create their favorable or unfavorable opinions about particular behavioral activities through various mental emotional and conduct-based processes. Positive attitudes toward ICT usage lead people to develop stronger intentions regarding using ICT technology throughout their regular activities (Li, 2022). Research papers alongside additional studies establish a direct relationship between attitudes and intentions in settings like technology adoption and e-learning as well as digital transformation. In the Unified Theory of Acceptance and Use of Technology (UTAUT) developers link attitude to perceived usefulness and ease of use features which enhance users' adoption intentions toward new technological tools (Hu et al., 2021). Individuals who experience ICT tools as useful, enjoyable and beneficial during their work tasks develop more favorable attitudes toward ICT usage which leads to stronger intentions to use these technologies. The workplace attitude toward Information and Communication Technology usage depends on training levels and organizational backing as well as the use of technology in previous situations (de Wit & Altbach, 2021). The perception of ICT as productivity-enhancing software by employees leads them to form strong intentions regarding technology implementation within their professional work. Educational students who have favorable feelings about digital education tools show better participation levels and stronger motivation to utilize those tools (Huang, 2022). Multiple studies establish that attitudes powerfully influence a person's intentions to behave in particular ways. Knowledgeable organizations along

with educational institutions and policymakers should use awareness initiatives along with training programs and technology-minded strategies to create positive ICT usage conditions (Rahman et al., 2022).

Hypothesis 8: There is a positive relationship between attitudes and intentions.

The ability of someone to believe that they can execute a specific action depends on their available resources together with skills while also considering environmental limitations constitutes PBC. The theoretical model attributes PBC as one of three essential factors which shape behavioral intentions together with attitudes and subjective norms. People who strongly feel they can manage their ICT usage show higher intentions to implement technology in their activities (Dhir, Kaur & Rajala, 2020). Research in technology adoption establishes that the belief one has about their ability to control behavior determines their participation in information and communications technology activities. Self-efficacy together with resource availability function as vital elements which determine how workers adopt new technologies (Humida et al., 2022). The combination of technical competencies along with ample time and proper technical support at the workplace leads employees to establish strong intentions for using information and communication technology systems. Students who believe they possess the capability to do digital learning demonstrate greater intentions toward digital education (Tas, Subaşı & Yerdelen, 2019). User confidence regarding their skills in digital learning platforms combined with their capability to operate digital tools and handle technical problems leads students to express stronger interest in e-learning systems. Individuals who believe IT technology exceeds their control capabilities tend to avoid utilitzing it even though they recognize its potential advantages (Ma et al., 2020). Technological infrastructure together with external support systems affect the perceived behavioral control of users. The implementation of adequate technical support and user-friendly interfaces and complete training programs by organizations enhances control perceptions which drives stronger behavioral intentions from individuals (Park et al., 2021). Political entities alongside policymakers need to establish better digital literacy programs in addition to providing easy access to ICT resources. Perceived behavioral control functions as a pivotal factor which determines the intentions of people to utilize ICT. Organizations along with policymakers should aim to build trust in users while eliminating obstacles because this approach leads to increased ICT adoption rates (Bin-Hady & Al-Tamimi, 2021).

Hypothesis 9: There is a positive relationship between perceived behavioral control and intentions.

Behavioral intention creates a solid forecast about actual behavior specifically when examining ICT usage behaviors. The TPB together with the related models like the Technology Acceptance Model (TAM) says that people who show intent toward specific behaviors demonstrate higher chances of performing those behaviors (Chae & Lee, 2023). Strong intentions towards ICT usage lead people to naturally adopt new technologies in their regular activities. Docs from multiple studies confirm that behavioral intention functions as the main factor influencing people's use of ICT. Workplace employees who plan to utilize digital tools demonstrate superior actual technological implementation. Students showing determination to adopt

online learning platforms show better participation rates together with increased student engagement (Bin-Hady & Al-Tamimi, 2021). External elements which include accessibility of IT systems along with usability and organizational culture affect how strongly an intention leads to actual behavior. A process of external barriers including technical problems and absent organizational backing and negative platform reactions diminishes the strength between behavioral intentions and end results (Sanchez-Acedo et al., 2023). The alignment between organizational infrastructure components and training and user support system is vital because it enables users to succeed in employing ICT despite their stated intentions. Research evidence confirming the connection between behavioral intentions and actual behavior grants organizations and policymakers' ways to boost ICT adoption through intention-enhancing approaches. Users will transform their intentions into behavioral actions through incentives which in combination with easier systems and satisfying experiences (Moinnereau, de Oliveira & Falk, 2022).

Hypothesis 10: There is a positive relationship between intention and ICT usage behavior.

The connection between attitude and ICT usage behavior exists through a critical intermediate phase which behavioral intention maintains to enhance this link. Attitudes foster behavioral intentions within the Theory of Planned Behavior model until these intentions drive actual behaviors (Kapidani, Bauk & Davidson, 2020). Indicated by this model, people maintain a positive attitude toward ICT but refuse usage unless their intention toward adoption reaches a high level of strength. Intention plays a significant intermediate role in numerous studies about technology adoption. In accordance with the Technology Acceptance Model (TAM) alongside its extended versions users develop favorable technology perspectives such as finding ICT useful and exciting but this stance alone does not generate adoption until it becomes a solid behavioral aim (Zvi & Lavi, 2025). The research indicates that people who view digital tools favorably tend to form powerful utilization intentions that advance ICT adoption across various settings. Research in workplace settings demonstrates that staff members who embrace ICT tend to implement digital tools through their work systems when they have set objectives for integration (Zabeli & Gjelaj, 2020). The link between attitude and ICT usage behavior depends on the mediating function of intention. Increased strength of individual intentions directly leads to increased adoption of new technology (Bin-Hady & Al-Tamimi, 2021).

Hypothesis 11: There is a mediating role of intention on the relationship between attitude and ICT usage behavior.

People experience social pressures which determine their engagement in particular behaviors known as subjective norms. The TPB shows subjective norms to affect behavioral intentions that ultimately guide actual behavior. Social expectations influence ICT usage behavior but their effect mainly operates through the route of shaping individual intentions to comply with these norms (Bin-Hady & Al-Tamimi, 2021). Technology adoption research demonstrates that evaluations from peers and organizational standards along with population tendencies create substantial impacts on people's use intentions regarding ICT. Employer surveys show that workforces whose management demonstrates digital tool support tend

to form strong desires to adopt ICT systems leading to actual system use (Wang et al., 2024). The educational environment shows students develop intentions to use digital learning methods when they observe their classmates using e-learning platforms actively. One needs a strong intention to convert the influence of social factors into actual usage of ICT systems (Llamas-Díaz et al., 2022). Social norms establish their strength through organizational culture and social media trends as well as policy-driven initiatives. Official institutional policies and training programs about ICT adoption create stronger intentions to use technology in individuals which boosts their chances of actual adoption (Paolanti et al., 2023). The execution of ICT usage intent depends on whether users encounter obstacles like inaccessible systems and technical problems or not. Social influence requires the mediating effect of intention in order to turn into actual behavioral change. The adoption of ICT receives significant enhancement if individuals build stronger behavioral intentions by receiving support from peers combined with institutionally-backed motivation and positive feedback (Vincent & Frewen, 2023).

Hypothesis 12: There is a mediating role of intention on the relationship between subjective norms and ICT usage behavior.

The ability of individuals to believe in their ability to conduct certain behaviors depends on their skills together with available resources and the restrictions they experience in their environment (PBC). Under the TPB framework PBC affects people's intentions about performing specific behavior that leads to actual behavioral conduct (Chuang, 2020). People who perceive themselves able to use ICT need to form strong intentions before they adopt the technology. Research evidence demonstrates how intention acts to bridge the PBC-ICT usage pathway. Research has confirmed that people who feel capable in handling technology will develop stronger intentions to perform ICT activities (Pérez-Seijo, Vizoso & López-García, 2020). The established intentions result in technology adoption when external obstacles like infrastructure quality and organizational backing do not exist. The workplace willingness of employees to adopt ICT reaches its apex when they show behavioral intent towards digital tools while having strong perceptions of behavioral control (Choudhary & Sahu, 2023). The educational success of students using e-learning platforms depends strongly on their belief in being able to utilize the platform effectively because this belief creates stronger intentions which drive engagement levels. When people encounter unkown hurdles such as system malfunctions or insufficient training the connection between intention as a mediator is compromised (Sun & Zhang, 2024). People who believe they have the capability to use ICT systems become less likely to adopt ICT when they receive no reinforcement or external support. To increase ICT adoption organizations need to improve technology self-confidence of users in addition to developing behavioral intentions through rewards and proper training and positive feedback (Ma et al., 2020).

Hypothesis 13: There is a mediating role of intention on the relationship between perceived behavioral control and ICT usage behavior.

Research demonstrates that technology adoption success depends on the quality of relationship between work requirements and particular technological solutions. According to this theory actual ICT usage effectiveness depends on whether the

technology meets necessary work requirements even if someone has strong behavioral intentions to use it. Research reveals that people move from intended ICT usage toward actual ICT usage because technology aligns effectively with the job requirements (Park et al., 2021). Employees in business settings accept digitized tools for workflow enhancement as this leads them to follow through with existing intentions for usage. The adoption of ICT systems requires behavioral intention together with matching capabilities between technology and task requirements. When capabilities do not align with specific tasks or the tools become too complex or irrelevant a behavioral intention becomes insufficient for adoption. Organizations should solve this problem through the integration of technology solutions within work processes to match users' specific requirements (Chae & Lee, 2023).

Hypothesis 14: There is a mediating role of task-technology fit on the relationship between behavioral intention and ICT usage behavior.

According to Individual-Technology Fit (ITF) theory adoption of technology depends on both task alignment and how technology matches an individual's skills and their desired features and expected results. ITF focuses differentiating itself from task-technology fit by addressing the user compatibility aspects which include cognitive capability and skill level and personal technological comfort. Behavioral intention functions as the main determinant for ICT adoption based on the Unified Theory of Acceptance and Use of Technology (Berhanu & Raj, 2020). The mental declaration of wanting to use something does not automatically result in actual utilization. User compatibility between technology and personal needs determines how effectively the relationship will form between technology and actual usage. Users will adopt technology even when facing outside obstacles if the system matches their abilities along with their desired features (Lábadi et al., 2022). When system-user compatibility is off, powerful behavioral intentions fail to result in actual ICT usage. The relationship between ICT usage and three constructs has shown support through multiple scholarly investigations. Workers demonstrate higher acceptance rates of actual technology adoption when they observe their ICT tools to both fit their abilities and workflow procedures. The engagement rates of students using e-learning platforms increase when they find the platforms well-suited to their personal learning approaches. Moreover, personal factors such as technology self-efficacy, digital literacy, and cognitive workload influence ITF (Rzymski et al., 2021).

Hypothesis 15: There is a mediating role of individual-technology fit on the relationship between behavioral intention and ICT usage behavior.

The graphical illustration in figure 1 integrates SDT and TPB to demonstrate how psychological needs (autonomy competence relatedness) influence autonomous motivation. The motivational force operates in two phases where it improves both attitudes with subjective norms and perceived behavioral control and then drives intentions that lead to actual ICT use behavior. Task-Technology Fit (TTF) functions as a component to examine how tasks relate to technology systems as well as individual-user technology compatibilities in adoption processes.

The relationships between hypotheses emerging from theoretical bases appear in figure 2 as the conceptual model. The three perceived autonomy factors together with competence along with relatedness elements generate autonomous motivation that

influences both attitude and subjective norms and perceptions of behavioral control. Each factor determines motivation which then runs through the joint operation of task-technology fit and individual-technology fit to produce ICT use. The described model functions as an arranged architecture to perform empirical confirmation.

Figure 1: Theoretical Framework of this Research.

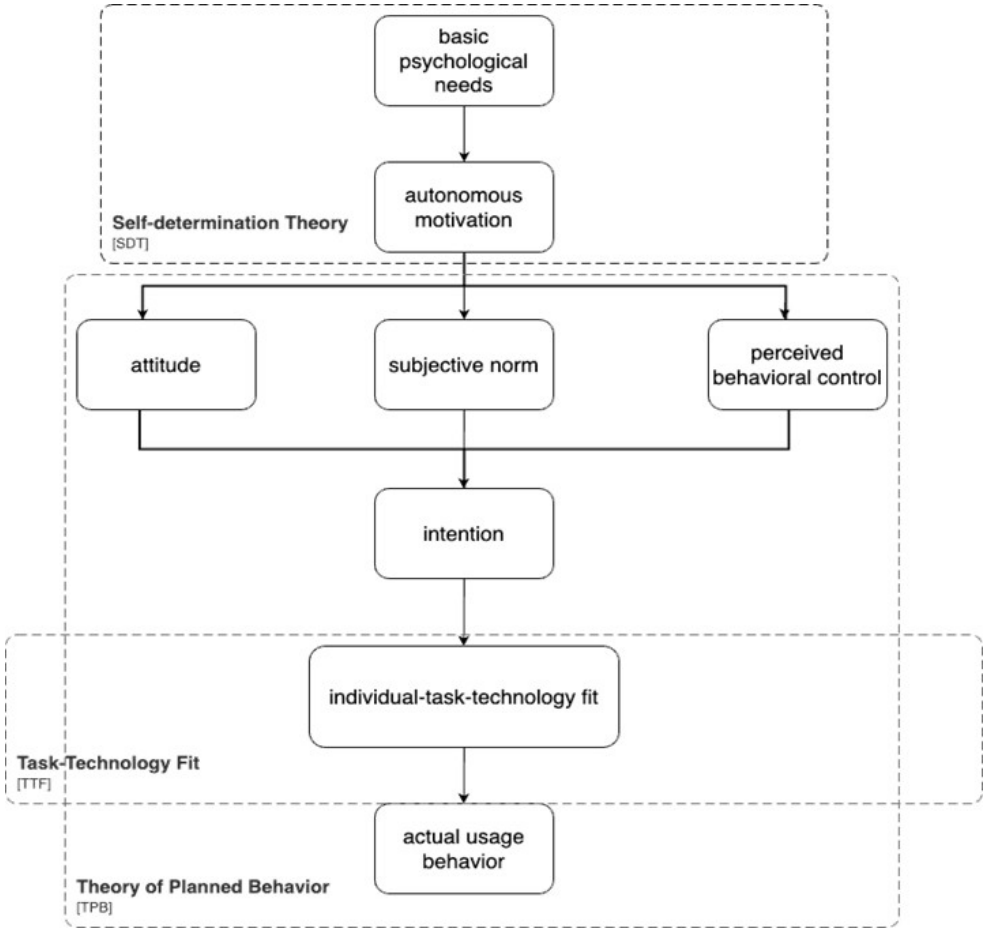
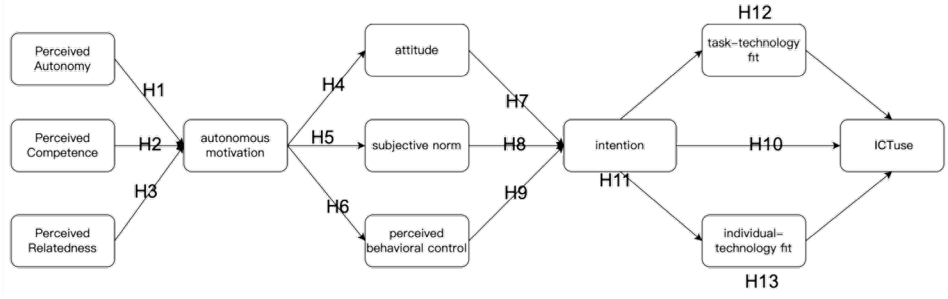


Figure 2: Conceptual Framework.



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3. Methodology

Using a cross-sectional survey design this study conducts quantitative research to evaluate the proposed relationships which exist between perceived autonomy, competence, relatedness, autonomous motivation, subjective norms, attitude, perceived behavioral control, behavioral intention, task-technology fit, individual-technology fit, and ICT usage behavior. The researcher developed their questionnaire through validated measurement scales extracted from past investigations to enhance both content validity and reliability. The organized survey questionnaire contains three distinct sections for demographic details and both psychological constructs as well as behavioral measurements. Members assessed all questionnaire items through a 5-point Likert scale which ranged from 1 (Strongly Disagree) to 5 (Strongly Agree). The research survey methodology focuses on 430 members who operate in technology fields as well as educational and ICT user roles. A probability sampling method was selected by the study to increase the generalizability of the reported findings, and a preliminary study was conducted with 30 subjects to check the instrument reliability before the broader data collection began. For data collection, both internet survey and personally administered questionnaire methods produced excellent response rates. The investigators clearly explained the research objectives to their subjects, were upfront about their confidentiality practices, and informed the subjects of their option to exit the study at any time according to ethics.

The study used Structural Equation Modeling (SEM) via SmartPLS 4 as the data analysis method to assess the conceptual model. The analysis was performed in two stages, first determining measure model evaluations to establish validity and reliability with Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE), and second designing and testing the structural model for path coefficients, R^2 values, and bootstrapping techniques for determining relationship significance. The study analyzes how behavioral intention, task-technology fit, and individual-technology fit function as a triadic mediation condition to influence usage behavior of ICT. The study followed ethical guidelines by safeguarding subject identity, confidentiality, and obtaining clear consent. The method of a structured questionnaire, PLS-SEM analysis, and clear sampling design produces consistent and reliable empirical evidence about psychological factors and technological components driving ICT usage behavior.

3.1. Measure

Perceived Autonomy: Perceived autonomy was measured using a four-item scale (PA1, PA2, PA3, PA4) adapted from prior self-determination theory literature. The Cronbach's alpha value is 0.881.

Perceived Competence: Perceived competence was measured using a four-item scale (PC1, PC2, PC3, PC4) adapted from prior self-determination theory literature. The Cronbach's alpha value is 0.836.

Perceived Relatedness: Perceived relatedness was measured using a four-item scale (PR1, PR2, PR3, PR4) adapted from prior self-determination theory literature. The Cronbach's alpha value is 0.900.

Autonomous Motivation: Autonomous motivation was measured using a six-item scale (AM1, AM2, AM3, AM4, AM5, AM6) adapted from prior self-determination theory literature. The Cronbach's alpha value is 0.792.

Subjective Norms: Subjective norms were measured using a three-item scale (SN1, SN2, SN3) adapted from prior self-determination theory literature. The Cronbach's alpha value is 0.732.

Attitude: Attitude was measured using a three-item scale (ATT1, ATT2, ATT3) adapted from prior self-determination theory literature. The Cronbach's alpha value is 0.800.

Perceived Behavioral Control: Perceived behavioral control was measured using a three-item scale (PBC1, PBC2, PBC3) adapted from prior self-determination theory literature. The Cronbach's alpha value is 0.787.

Behavioral Intention: Behavioral intention was measured using a five-item scale (INT1, INT2, INT3, INT4, INT5) adapted from prior self-determination theory literature. The Cronbach's alpha value is 0.899.

Task-Technology Fit: Task-technology fit was measured using a four-item scale (TTF1, TTF2, TTF3, TTF4) adapted from prior self-determination theory literature. The Cronbach's alpha value is 0.839.

Individual-Technology Fit: Individual-technology fit was measured using a four-item scale (ITF1, ITF2, ITF3, ITF4) adapted from prior self-determination theory literature. The Cronbach's alpha value is 0.851.

ICT Usage Behavior: ICT usage behavior was measured using an eight-item scale (UB1, UB2, UB3, UB4, UB5, UB6, UB7, UB8) adapted from prior self-determination theory literature. The Cronbach's alpha value is 0.908.

4. Results

The measurement model assessment in Table 2 validates construct reliability and validity through factor loadings together with Cronbach's alpha, rho_A, composite reliability (CR), average variance extracted (AVE) and variance inflation factor (VIF). The research constructs achieve robust internal reliability because their Cronbach's alpha evaluations surpass 0.70 throughout the study. The measurement model performs well because all composite reliability values exceed 0.80 thereby confirming construct reliability. Data indicates strong reliability measures for autonomous motivation considered through six items (α = 0.881, CR = 0.910, AVE = 0.627). All factor loadings exceed 0.756 and reach up to 0.851 which means no multicollinearity issues exist based on VIF values below 2.50. Study results show that attitude measures three items which demonstrate excellent internal consistency (α = 0.836, CR = 0.901, AVE = 0.753) through high factor loadings (0.829 to 0.891) along with acceptable VIF values (1.758 to 2.120). Measurement data for behavioral intention through five items indicates superior reliability (α = 0.900 and CR = 0.926 and AVE = 0.715) and presents loadings between 0.785 and 0.887 as well as VIF values that reach 3.042. Individual-Technology Fit was measured through four items showing reliability with α = 0.792 and CR = 0.864 while AVE = 0.614 and including factor loadings that ranged from 0.761 to 0.814. Perceived autonomy exhibits good reliability scores through its four items (α = 0.732, CR = 0.828, AVE = 0.548) and possesses factor loading variables between 0.640 and 0.830. The three-item perceived behavioral control scale based on the data demonstrates high reliability through α = 0.800 and CR = 0.883 and AVE = 0.716 while its factor loadings span from 0.791 to 0.889. The assessment of perceived competence through four items generated established internal consistency measures (α = 0.787 CR = 0.862 AVE = 0.611) while its factor loadings ranged from 0.759 to 0.825. The measurements of perceived relatedness utilized four items that display excellent reliability indicators (α = 0.899 and CR = 0.929 and AVE = 0.767) because all factor loadings fell between 0.858 and 0.908. The three items of

subjective norms maintain high internal consistency levels at α = 0.839 while CR = 0.902 and AVE = 0.754. Factor loading values lie between 0.785 and 0.912.

Table 2: Construct Reliability and Validity.

Variables	Items	Loadings	Cronbach's Alpha	rho_A	C R	AVE	VIF
Autonomous motivation	AM1	0.786	0.881	0.883	0.910	0.627	1.960
	AM2	0.851					2.496
	AM3	0.795					2.045
	AM4	0.760					1.816
	AM5	0.801					2.373
	AM6	0.756					2.109
Attitude	ATT1	0.829	0.836	0.845	0.901	0.753	1.758
	ATT2	0.891					2.120
	ATT3	0.882					2.096
Behavioral Intention	INT1	0.836	0.900	0.902	0.926	0.715	2.176
	INT2	0.845					2.522
	INT3	0.887					3.042
	INT4	0.872					2.682
	INT5	0.785					1.851
Individual-Technology Fit	ITF1	0.761	0.792	0.798	0.864	0.614	1.416
	ITF2	0.814					1.756
	ITF3	0.762					1.807
	ITF4	0.794					1.943
Perceived Autonomy	PA1	0.712	0.732	0.765	0.828	0.548	1.556
	PA2	0.830					1.643
	PA3	0.640					1.366
	PA4	0.765					1.374
Perceived Behavioral Control	PBC1	0.791	0.800	0.804	0.883	0.716	1.445
	PBC2	0.856					2.027
	PBC3	0.889					2.177
Perceived Competence	PC1	0.782	0.787	0.790	0.862	0.611	1.643
	PC2	0.825					1.880
	PC3	0.759					1.642
	PC4	0.759					1.528
Perceived Relatedness	PR1	0.870	0.899	0.901	0.929	0.767	2.411
	PR2	0.867					2.894
	PR3	0.908					3.438
	PR4	0.858					2.295
Subjective Norms	SN1	0.902	0.839	0.883	0.902	0.754	2.168
	SN2	0.785					1.712
	SN3	0.912					2.427
Task-Technology Fit	TTF1	0.881	0.851	0.859	0.900	0.693	2.663
	TTF2	0.859					2.426
	TTF3	0.756					1.612
	TTF4	0.828					1.849
ICT Usage Behavior	UB1	0.799	0.908	0.911	0.926	0.610	2.130
	UB2	0.789					2.461
	UB3	0.767					2.304
	UB4	0.823					2.502
	UB5	0.809					2.247
	UB6	0.691					1.724
	UB7	0.797					2.602
	UB8	0.764					2.252

The reliability score reached 0.851 for Task-Technology Fit through four items while its CR reached 0.900 and AVE reached 0.693. Factor loadings ranged between 0.756 to 0.881. The assessment of ICT Usage Behavior with eight items demonstrates superior reliability through its high values of α = 0.908, CR = 0.926, AVE = 0.610 and factor loadings which range from 0.691 to 0.823. The analysis reveals that all model variables meet necessary psychometric requirements to demonstrate convergence validity and internal consistency and minimal collinearity hence validating their use for subsequent analysis.

The analysis in table 3 applies Heterotrait-Monotrait (HTMT) Ratio of Correlations to evaluate discriminant validity in structural equation modeling (SEM). Each construct obtains its square root of Average Variance Extracted (AVE) value directly on the diagonal position to demonstrate convergent validity alongside HTMT comparison ratios that appear across the off-diagonal section. Discriminant validity between constructs can be confirmed when their values stay below thresholds of 0.85 (conservative) or 0.90 (liberal). The autonomous motivation (AM) construct along with attitude (ATT) and behavioral intention (INT) demonstrate strong construct discriminant validity through their HTMT values that stay below 0.85 in the provided table. The correlation between Individual-Technology Fit (ITF) and Task-Technology Fit (TTF) has been identified as moderate (HTMT = 0.832). Nonetheless the value falls inside the acceptable range. Perceived Competence (PC) and Perceived Autonomy (PA) (HTMT = 0.727) demonstrate a medium relationship between them without losing uniqueness. The relationships between Subjective Norms (SN) and Perceived Relatedness (PR) demonstrate a weak strength of HTMT = 0.302 thus ensuring separate construct identities. Consumption Behavior (UB) shows two strong relationships with Behavioral Intention (INT) (HTMT = 0.710) and Task-Technology Fit (TF) (HTMT = 0.724) even though it demonstrates conceptual closeness with these constructs. The results show that every construct satisfies discriminant validity because the HTMT values stay below 0.85. Further analysis in this mode becomes reliable because the measured constructs demonstrate adequate differentiation from each other.

Table 3: Heterotrait-Monotrait (HTMT) Ratio.

	AM	ATT	INT	ITF	PA	PBC	PC	PR	SN	TTF	UB
AM											
ATT	0.764										
INT	0.756	0.699									
ITF	0.504	0.565	0.654								
PA	0.543	0.454	0.435	0.597							
PBC	0.536	0.456	0.590	0.746	0.471						
PC	0.718	0.549	0.542	0.671	0.727	0.616					
PR	0.439	0.421	0.283	0.250	0.301	0.427	0.370				
SN	0.597	0.603	0.621	0.641	0.466	0.716	0.540	0.302			
TTF	0.693	0.707	0.789	0.832	0.407	0.680	0.580	0.262	0.714		
UB	0.615	0.657	0.710	0.738	0.462	0.642	0.569	0.297	0.628	0.724	

Table 4 shows the correlation matrix values that represent key constructs relationships and measure their strength from -1 to 1 where strong positive links appear near 1 and negative connections near -1 and when relationships are not

significant they stay close to 0. Users who demonstrate higher motivation along with competence levels tend to experience better outcomes regarding Task-Technology Fit according to the correlation values (r = 0.789) linking Behavioral Intention to TTF. Similarly, the link between Autonomous Motivation (AM) to Perceived Competence (PC) shows a strong association at (r = 0.718). Users with better behavioral intentions exhibit similar usage behaviors with technology while Task-Technology Fit (TTF) creates a similar match to attitude (ATT) (r = 0.707) and behavioral intentions (INT) maintain similar usage behaviors (UB) (r = 0.710). The connection between Perceived Relatedness (PR) and Task-Technology Fit (TTF) measures 0.262 while Perceived Relatedness (PR) and Behavioral Intention (INT) relationship stands at 0.283 which indicates minimal association between social connections and behavioral intention or technology fit levels. A correlation matrix demonstrates variable relationship strengths which aids both variable relationship assessment and subsequent statistical analysis procedures.

Table 4: Correlation Matrix.

	AM	ATT	INT	ITF	PA	PBC	PC	PR	SN	TTF	UB
AM		0.655	0.487	0.276		0.455			0.533	0.338	0.315
ATT			0.420	0.237						0.291	0.271
INT				0.565						0.693	0.645
ITF											0.322
PA	0.163	0.107	0.080	0.045		0.074			0.087	0.055	0.051
PBC			0.225	0.127						0.156	0.145
PC	0.445	0.292	0.217	0.123		0.203			0.237	0.151	0.140
PR	0.215	0.141	0.105	0.059		0.098			0.115	0.073	0.068
SN			0.206	0.117						0.143	0.133
TTF											0.187
UB											

Table 5 shows the R-square values together with adjusted R-square values to exhibit the strength of independent variables for predicting dependent variables' variations. A total of 54.2% of Usage Behavior (UB) variance can be explained by the model according to the observed R-square value of 0.542 together with an adjusted R-square of 0.539. The analysis reveals strong predictive power in Behavioral Intention (INT) and Task-Technology Fit (TTF) because their R-square values amount to 0.484 and 0.481 while their adjusted values reach 0.481 and 0.480 respectively. The explanatory power of Usage Behavior (UB) reaches 0.542 and Attitude (ATT) and Autonomous Motivation (AM) have 0.429 and 0.428 as R-square values respectively. Research findings show that Information Technology Fit (ITF) presents an R-square of 0.320 followed by Subjective Norms (SN) and Perceived Behavioral Control (PBC) with R-square values of 0.284 and 0.207 which indicates both factors contribute significantly to the explanation of variance. All constructs maintain a stable relationship between their adjusted R-square and R-square values which demonstrates the model's robustness and stability across the variables. Studies demonstrate that the dependent variables receive different strength of influence from varying factors.

The F-square values in Table 6 assess the strength of prediction for independent variables on dependent variables within the developed model. Social Norms (SN)

together with Intention (INT) demonstrate the strongest effect size whose F-square measure reaches 0.926. The results indicate SN works as a major determinant for INT. A strong relationship exists between Autonomous Motivation (AM) and Attitude (ATT) based on the effect size of 0.752. Among the effects studied ITF demonstrates an F-square value of 0.470 towards INT while indicating a moderate relationship. The research data demonstrates that Perceived Compatibility (PC) represents a moderate impact with 0.232 while Perceived Behavioral Control (PBC) and ATT present lower impact values of 0.063 and 0.247 respectively. F-square tests indicate minimal effects of Perceived Risk (PR) with 0.072 along with SN's 0.045 value for the other constructs. PA (0.032) together with TTF explains only a small portion of UB change (0.029). Various factors with different predictive powers exist in the model because some constructs exert substantial influence while others show minimal impact on the predictions.

Table 5: R-Square and Adjusted R-Square Values.

	R-square	R-square adjusted
AM	0.428	0.424
ATT	0.429	0.428
INT	0.484	0.481
ITF	0.320	0.318
PBC	0.207	0.205
SN	0.284	0.283
TTF	0.481	0.480
UB	0.542	0.539

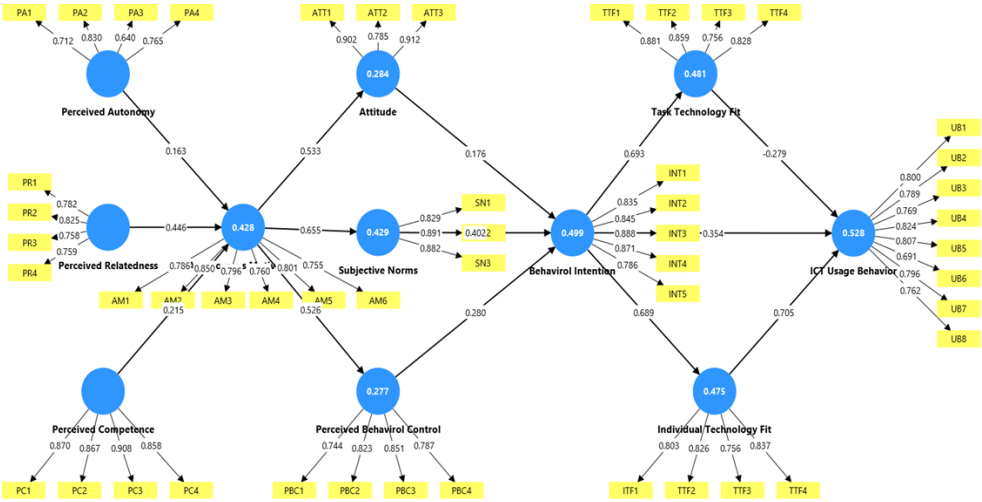
Table 6: F-Square Effect Size Analysis.

	AM	ATT	INT	ITF	PA	PBC	PC	PR	SN	TTF	UB
AM		0.752				0.261			0.397		
ATT			0.247								
INT				0.470						0.926	0.123
ITF											0.114
PA	0.032										
PBC			0.063								
PC	0.232										
PR	0.072										
SN			0.045								
TTF											0.029
UB											

Figure 3 provides the structural model that uses analysis results to validate the conceptual framework by presenting both path coefficients and factor loadings. Research results validate the entire sequence of reported relationships between perceived autonomy, relatedness and competence which leads directly to autonomous motivation that leads to attitude subjective norms perceived behavioral control and behavioral intention. Behavioral intention receives two types of influence from behavioral determinants before task-technology fit and individual-technology fit create usage behavior changes. The research depicts theoretical constructs through blue nodes together with yellow boxes that represent measured items. Relationship intensity

within the model is demonstrated by the combination of path coefficients with factor loadings for connection significance measurement.

Figure 3: Structural Model.



The model fit indices in Table 7 show the results from the saturated model together with the estimated model. The Standardized Root Mean Square Residual displayed 0.063 in the saturated model which outperformed the 0.128 reported in the estimated model. The d_ULS (Squared Euclidean Distance) value sets a stronger benchmark for model fit in the saturated model at 4.665 since it registers below the estimated model value of 19.393. The Geodesic Distance (d_G) values indicate 2.152 for the saturated model and 2.547 for the estimated model which shows a minor variation in model-to-data suitability. The Chi-square value reaches 4932.196 when measuring the saturated model yet rises to 5395.598 when evaluating the estimated analysis of fit because it reveals the gap between observed and model-based covariance matrices. The Normed Fit Index (NFI) shows that the saturated model achieves better fit with a value of 0.685 than the estimated model which has a value of 0.655.

Table 7: Model Fitness.

	Saturated model	Estimated model
SRMR	0.063	0.128
d_ULS	4.665	19.393
d_G	2.152	2.547
Chi-square	4932.196	5395.598
NFI	0.685	0.655

The relationships between main model constructs emerge from the results displayed in Table 8. Autonomous motivation receives strong positive influence from perceived autonomy ($\beta = 0.163$, $p = 0.001$) and perceived competence ($\beta = 0.215$, $p < 0.001$) beside perceived relatedness ($\beta = 0.446$, $p < 0.001$). Also, autonomous motivation has positive effects on both attitude ($\beta = 0.533$, $p < 0.001$) and subjective norms ($\beta =$

0.655, $p < 0.001$) and perceived behavioral control ($\beta = 0.526$, $p < 0.001$) thus stressing the importance of motivation in influencing individual perceptions. The study validates behavioral intention as the primary element in ICT usage behavior analysis because it demonstrates strong direct effects ($\beta = 0.354$, $p < 0.001$) while showing significant predictors in attitude ($\beta = 0.121$, $p < 0.001$), subjective norms ($\beta = 0.277$, $p < 0.001$), and perceived behavioral control ($\beta = 0.280$, $p < 0.001$). The path from behavioral intention toward ICT adoption follows three different indirect routes which are defined by attitude ($\beta = 0.062$, $p = 0.002$) and subjective norms ($\beta = 0.142$, $p < 0.001$) as well as perceived behavioral control ($\beta = 0.099$, $p < 0.001$). The study investigates how task-technology fit ($\beta = -0.194$, $p = 0.024$) and individual-technology fit ($\beta = 0.486$, $p < 0.001$) serve as adjustment variables in defining ICT usage behavior. Individual-technology fit strengthens the link between behavioral intentions and ICT use, thereby reducing the potential of task-technology fit to moderate this link, highlights a potential fit issue. The data supported the conceptual model because both autonomous motivation and behavioral intention with fit factors of technology drive ICT usage.

Table 8: Path Coefficients and Hypothesis Testing Results.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (IO/STDEVI)	P Values	Results
PA>AM	0.163	0.165	0.048	3.418	0.001	Accepted
PC>AM	0.215	0.215	0.046	4.671	0	Accepted
PR>AM	0.446	0.445	0.047	9.473	0	Accepted
AM>ATT	0.533	0.534	0.036	14.855	0	Accepted
AM>SN	0.655	0.656	0.031	20.936	0	Accepted
AM>PBC	0.526	0.528	0.037	14.211	0	Accepted
ATT>INT	0.121	0.122	0.031	3.859	0	Accepted
SN>INT	0.277	0.277	0.034	8.19	0	Accepted
PBC>INT	0.28	0.281	0.04	6.982	0	Accepted
INT> ICT UB	0.354	0.353	0.056	6.309	0	Accepted
ATT>INT> ICT UB	0.062	0.063	0.02	3.165	0.002	Accepted
SN>INT> ICT UB	0.142	0.142	0.029	4.849	0	Accepted
PBC>INT>ICT UB	0.099	0.099	0.02	4.853	0	Accepted
INT>TTF>ICT UB	-0.194	-0.193	0.086	2.252	0.024	Accepted
INT>ITF>ICT UB	0.486	0.487	0.083	5.852	0	Accepted

5. Discussion

The results of this research provide strong empirical evidence to support the theoretical model it proposes, showing how psychological motivation, behavioral intention, and technology fit constructs come together to drive ICT adoption. The document supports all of the postulated relationships, emphasizing the viability of SDT and TPB in ICT usage behavior. This study shows that perceived autonomy (H1: $\beta = 0.163$, $p = 0.001$), perceived competence (H2: $\beta = 0.215$, $p < 0.001$), and perceived relatedness (H3: $\beta = 0.446$, $p < 0.001$) all positively predict autonomous motivation. While all three motivation constructs are significantly predictive, perceived relatedness had the overall greatest effect, suggesting that social support and interpersonal connection are elements that are motivating individuals' intention to engage with ICT. Similarly, perceived competence and perceived autonomy had positive influences on autonomous motivation as well, suggesting that when users perceive themselves as capable of performing a task and

in control of their actions, they are more likely to adopt ICT. Autonomous motivation proved to be a significant predictor of attitude (H4: $\beta = 0.533$, $p < 0.001$), subjective norms (H5: $\beta = 0.655$, $p < 0.001$), and perceived behavioral control (H6: $\beta = 0.526$, $p < 0.001$), demonstrating the pivotal role that motivation plays in shaping an individual's perceptions toward using ICT. A highly motivated individual is likely to form a positive attitude construct, receive social endorsement support, and feel a high degree of perceived ability to utilize these ICT tools. This research provides empirical support for attitude (H7: $\beta = 0.121$, $p < 0.001$), subjective norms (H8: $\beta = 0.277$, $p < 0.001$), and perceived behavioral control (H9: $\beta = 0.280$, $p < 0.001$) as predictors of behavioral intention. Subjective norms have the highest impact on behavioral intention, suggesting that peer impact and social expectations are influential in making ICT adoption decisions. This pertain particularly in environmentally constructed situations in which ICT use is expected or required, such as school or at work. The behavioral intention to use ICT, has a positive impact on actual ICT usage (H10: $\beta = 0.354$, $p < 0.001$), indicates that individuals with a strong intention to use ICT technology are more likely to actually use it. The indirect effects show that attitude (H11: $\beta = 0.062$, $p = 0.002$), subjective norms (H12: $\beta = 0.142$, $p < 0.001$), and perceived behavioral control (H13: $\beta = 0.099$, $p < 0.001$) all function as mediators in the relationship between behavioral intention and ICT usage behavior. The study also utilizes the constructs of task-technology fit (H14: $\beta = -0.194$, $p = 0.024$) and individual-technology fit (H15: $\beta = 0.486$, $p < 0.001$) as moderators.

While individual-technology fit positively influences the relationship between intention and ICT usage, task-technology fit has a negative effect. This suggests that when the ICT tool is not well-fit with the specific tasks, users may experience challenges when adopting the technology, even with a high behavioral intention. This reveals that an intention to use ICT is not sufficient; the technology must be well-fit with the individual's needs for the specific tasks. All hypotheses in this present study were determined to be statistically significant and accepted, thereby confirming the mixed, integrated model of SDT, TPB, and Task-Technology Fit to predict ICT adoption. The findings illustrate the important role of psychological motivation, social influences, and technology-task fit on behavioral intention to use technology. The outcome of this study adds to the theoretical knowledge and practical possibilities for better reviewing ICT implementation and adoption.

6. Conclusion

The study explored the main factors influencing ICT use behavior through the integration of Self-Determination Theory (SDT) and the Theory of Planned Behavior (TPB) with Task-Technology Fit. The user's intention and actual ICT usage behavior are influenced by psychological motivation and social influence and technology fit significantly. The research proves that subjective experiences of autonomy and competence and feelings of relatedness improve individual motivation within an autonomous framework which confirms SDT results. The data shows that people who maintain feelings of capability and control together with social connections tend to use ICT more actively. The research verifies all essential TPB constructs by revealing that attitudes and subjective norms together with perceived behavioral control drive intentions to adopt ICT. Social expectations have a strong influence on technology

adoption as per the research findings which demonstrate subjective norms' high impact. The study enriches current research by utilizing TTF and ITF as variables that influence and affect the results.

The positive effects of individual-technology fit on ICT usage come against the backdrop of negative consequences from task-technology fit because misalignment between technological systems and specific tasks inhibits adoption success. Research findings stress out the necessity to confirm that Information and Communication Technology solutions are compatible with particular user requirements. The research fulfilled its intended goals through analyzing motivational factors for ICT adoption and detecting behavioral related intentions and usage while assessing how technology-task alignment moderation operates. Several theories coalesce to develop a coherent framework of user behavior concerning technology adoption. The statistical analyses verified all the hypothesized relationships involving motivation, behavioral intention, and technology fit. This study adds richness to the understanding of IT adoption, as it demonstrates that intrinsic motivations along with social influences and technology fit serve as motivational factors that increase user engagement with digital tools.

6.1. Implications

This research produces significant insights that connect Self-Determination Theory with Theory of Planned Behavior and Technology Task Fit within one research model for ICT adoption. The research finds evidence to support that the variables of intrinsic motivation specifically autonomy competence and relatedness can lead to behavioral intentions subsequently leading to actual use of ICT as proposed by Self-Determination Theory. The research findings confirm the Theory of Planned Behavior through the evidence that attitudes and subjective norms stated as perceptions of behavioral control, are influential determinants of intentions to use ICT, therefore supporting the social norms use and user capabilities in technology adoption. Technology task fit is an important theoretical premise that influences the ICT adoption process. Individual technology fit enhances ICT use and task technology fit limits the use of ICT because there needs to be appropriate technology development for full adoption. The new findings from the research add to the existing models of ICT adoption, through individual and task assessment to better inform the factors that influence digital technology utilization. The research identifies important knowledge points for ICT adoption improvement strategies, which can be used by organizations, education institutions, and policymakers as beneficial starting points.

The combination of autonomy and competence and relatedness relates to greater motivation to use technology, which demonstrates organizations should foster supportive digital environments. Training initiatives that work towards building user competence and digital literacy will increase users' confidence when fully adopting ICT solutions. Findings highlight that subjective norms have an important role to influence ICT use, as humans will invariably respond to peer-related support and social or leadership support, and even digital community social engagement to use technology. When it comes to social influence in organizations, community mentoring initiatives that occur at the formal and social level, collaborative platforms and technology incentive programs can all further support user engagement directly or indirectly in digital transformation culture. The research further illustrates that ICT tools need a technology fit specific

to the user and work, for them to work effectively. This means, when motivated users find technology to not match their work requirements, they come across obstacles at their adoption process of ICT. For example, to have functionality that represents what meets user needs, the organizations' usability testing of digital solutions needs to be performed through users feedback and tool updates or modifications. Organizations achieve greater efficiencies and better outputs in digital transformation when they achieve the optimal specific use of their technology related to their tasks.

6.2. Limitations and Future Suggestions

Specific limitations within this investigation need understanding despite its prominent discoveries. The main analytical approach of the study uses cross-sectional data to show the relationships between variables at a single moment. The research model does not allow researchers to determine direct cause-and-effect patterns between the studied variables. Research needs to implement future studies that track temporal developments of motivation and social influence and task-technology fit dynamics as well as their sustained effect on ICT adoption. The research findings are not widely applicable because it occurred within a detailed cultural organizational context. Business sectors and cultural locations tend to demonstrate different strengths regarding motivation coupled with behavioral intentions together with unique technology acceptance dynamics. Future investigators need to research industry-specific data alongside cultural variations because this would help scientists understand how variables connect in different environments.

The study combines Self-Determination Theory (SDT) with the Theory of Planned Behavior (TPB) and Task-Technology Fit (TTF) but fails to evaluate external elements including technological infrastructure as well as organizational support or regulatory policies. The adoption of information and communication technology depends heavily on these additional factors which particularly impact large organizations and institutions of government. Additional research needs to integrate external environmental elements to produce an interactional model that explains ICT usage practices better. This study depend mainly on self-reported data that could be affected by social desirability bias and common method variability since researchers only use self-reporting methods. Research should implement additional methods for assessing ICT use through system data reports or direct observation and integration with subjective self-reported data. Future research should examine how emerging technologies such as artificial intelligence, virtual reality, and blockchain influence users' motivation and behavior in ICT systems adoption. A proper understanding of how emerging technologies impact motivation level and the relationship between task & technology is paramount to developing digital transformations in the future.

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