Information and Communication Technology Acceptance in Madrasa Education: Religious' Perspective in Tanzania

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Abstract: This study was intended to model information and communication technology (ICT) acceptance in Tanzanian madrasas based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model and extend it with two constructs: religious perspective and personal innovativeness. That is because there is a scarcity of studies investigating ICT acceptance in the madrasa education context. The study is a quantitative, and a survey questionnaire was distributed through google form to collect primary data. The study involved both teachers and students, with a sample of 215 respondents obtained using the snowball sampling technique. Data analysis used Partial Least Squares-Structural Equation Modelling (PLS-SEM) technique. The findings indicate that religious perspective (T=3.636; P<0.001), social influence (T=2.818; P<0.01), and personal innovativeness (T=3.301; P<0.01) are the only significant variables that determined the behaviour intention of individuals to use ICT. Also, the significant factors influencing madrasa individuals to the actual use of ICT facilities are behavioural intention (T=3.649; P<0.01) and religious perspective (T=2.428; P<0.05). Except for the social influence variable, other variables of the UTAUT model were found insignificant to influence the intention of individuals to use ICT in Islamic studies. Finally, recommendations and study limitations are also discussed.

Keywords: ICT, Islamic Education, Madrasa, UTAUT, Tanzania, Technology Acceptance

1. Introduction

Literacy in the 21st century is no longer about reading and writing only, but more about digital and information literacy among other 21st century skills due to the far-reaching information and communication technologies (ICT). The impacts posed by the advancement of ICT and globalization are manifest in various aspects of life, especially in the educational process, among other life aspects (Al Harbi, 2014; Kozma, 2011; Wilson et al., 2015). Various educational institutions are taking advantage of the advanced information technologies (IT) as a catalyst for engaging students and teachers, making learning interactive, exciting, and relevant to this digital era and hence cultivating them with various 21st-

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century skills to cope with this era (Kozma et al., 2011; Law et al., 2002). However, even though the impacts posed by the advancement of ICT and globalization are evident in various aspects of our life especially in the knowledge acquisition process, the rate of penetration, acceptance and utilization is significantly different in multiple contexts and parts of the world (Fleischmann & Srikantaiah, 2011; Stork et al., 2013).

In the Muslim world, both in minority countries such as Tanzania, Kenya, and Uganda, and majority countries like Indonesia, Pakistan, Malaysia, Saudi Arabia, the madrasa is an essential part of Islamic education for Muslims specifically and the society in general (Abbas, 2017; Daun & Arjmand, 2018a). That is due to the critical role it plays in Muslim communities. It helps Muslims preserve their identity and its potential importance in providing education even to poor and unprivileged individuals (Al-Attas, 2007; Aziz & Ismail, 2018; Baiza, 2018; Bano, 2010). The history of the madrasa educational system is as old as the coming of the Prophet Muhammad, which began in his first established masjid in Madinah City (Arjmand et al., 2018; Azra, 2019). Madrasa is the traditional Islamic educational institution where Islamic studies and social life science learning take place. It has played a vital role in different aspects of Muslim societies ever since (Arjmand et al., 2018; Basheer, 2013). So, the contribution of the madrasa educational system in academics and literacy cannot be ignored since then.

Since the impacts of globalization and ICT is manifest in the Muslim communities, madrasas as centres for Islamic education in some countries have started to transform their Islamic educational system by implementing various strategies such as curriculum reform, adding secular subjects, and integrating ICT, to mention a few, to tackle the challenges brought by globalization and ICT (Baiza, 2014; Park & Niyozov, 2008; Rehman, 2014; C. Tan, 2014). ICT skills are inevitable for madrasa communities in this 21st-century era. Recently, scholars have shown interest in the effect and influence of ICT on Muslim societies, both majority and minority. At the same time, they encourage and insist on the significance of ICT in the hope of improving and promoting knowledge and digital literacy among Muslim communities (Basheer, 2013; Daun & Arjmand, 2018b). Some studies (Arjmand, 2017; Daun & Arjmand, 2018a; Svensson, 2018) have portrayed the efforts done by some institutions and Muslim communities to modernize the madrasa education, including ICT integration.

1.1 Problem Statement and Objectives

ICT utilization in traditional Muslims' perspective is a unique matter, and hence specific factors reflecting Muslims' perceptions should be integrated into technology acceptance models. Moreover, there are many misconceptions and negative assumptions from the Western media perspective about traditional madrasas, including being backward, a source of extremism, and resistant to change, especially in accepting technological innovations (Revell, 2010; Sabic-El-Rayess, 2020; Thobani, 2007). These doubts and stereotyping can only be proved right or wrong through empirical studies involving the Muslim community in a particular context. Moreover, ICT facilities such as computers, smartphones, the Internet, and many others are penetrating at a high rate and being used by many Tanzanians (Mwalongo, 2011; Smith, 2018; URT, 2010), including Muslims. Nevertheless, there is a lack of research concerning ICT acceptance in the madrasa education context in Tanzania.

Therefore, the present study aims to develop a model of ICT acceptance in Tanzanian madrasas based on the modified version of the Unified Theory of Technology Acceptance and Use (UTAUT) model by adding two constructs, namely Religious Perspective on ICT (RP) domain and Personal Innovativeness in ICT (PI) domain. These two variables are crucial for understanding Muslims' behavioural intention in adopting ICT in the madrasa education context. This paper focuses on the traditional (madrasas) Islamic education system, where most subjects taught are religious sciences.

The present study intended to realize the following objectives:

1. Exploring the factors influencing madrasa individuals to accept ICT for the teaching-learning process.

2. To analyse and understand Muslims' perspectives on ICT adoption in Islamic education.

The research hypotheses discussed in the following sections will help to reach the study's objectives.

2. Literature Review

2.1 ICT Acceptance in Education Context

A study (Asare et al., 2016) was conducted in Ghana to identify the factors affecting the behavioural intention of students in higher educational institutions to adopt e-learning platforms. The study extended the UTAUT model with four other variables, including the personal innovativeness variable. The findings proved that personal innovativeness, among other six variables, significantly influenced the behavioural intentions of students to utilize e-learning systems. The study is relevant to this proposed research as they both used the UTAUT model and done in the educational context. The main difference is that that study involved only students in the general context of higher education. In contrast, the present study involves both students and teachers specifically in an Islamic education context.

Also, another study (Mtebe & Raisamo, 2014) was conducted involving five East African higher learning institutions, including Tanzania. The study investigated students' behavioural intention in the adoption of mobile learning. The researchers applied the UTAUT model to investigate the situation. The findings indicate that all four primary constructs of the UTAUT model significantly affect students' acceptance of mobile learning. Moreover, another study (Lwoga & Komba, 2014) was done in one university in Tanzania, investigating the significant factors predicting actual use and continued usage intention of an e-learning platform. The study integrated the UTAUT model with the self-efficacy variable. The results proved that self-efficacy determined the actual usage. Meanwhile, continued intention to adopt a web-based learning platform was influenced by self-efficacy, effort expectancy, actual use, performance expectancy, and social influence.

All the studies mentioned above and many others (Kayanda et al., 2020; Lwoga & Komba, 2015; Mwantimwa et al., 2021; Ngeze, 2017; Ruzegea & Msonde, 2021) are oriented in a general education context. But, ironically, no studies were found in the literature conducted in Tanzania to investigate the level of ICT adoption focusing on Islamic education. So, this study fills the gap by modelling ICT acceptance in madrasa education using a modified UTAUT model.

2.2 The UTAUT Model Review

Several theoretical models based on socio-technic-psychology have been used to explain ICT acceptance in various aspects. Among those models include the UTAUT model, Theory of Planned Behaviour (TPB), Innovation Diffusion Theory (IDT), Theory of Reasoned Action (TRA), Motivational Model (MM), Technology Acceptance Model (TAM), Social Cognitive Theory (SCT), a combined model of TAM and TPB (C-TAM-TPB), and Model of PC Utilization (MPCU) among others (Venkatesh et al., 2003). The UTAUT model is the product synthesized from the previous eight models, namely TAM, TPB, TRA, IDT, MM, C-TAM-TPB, TRA, and IDT (Dwivedi et al., 2019; Venkatesh et al., 2003) to cover the weaknesses shown by its precursors. Literature indicates that the UTAUT model is quite robust despite being translated into different languages and can be used across different contexts and cultures (Oshlyansky et al., 2007). The UTAUT model consists of four primary constructs acting as the key influencers of intention and ICT actual usage, and these constructs are social influence (SI), effort expectation (EE), facilitating conditions (FC), and performance expectation (PE). Moreover, four variables, namely gender, voluntariness, experience, and age, were integrated to moderate the effects of the primary constructs on behavioural intention and use (Venkatesh et al., 2003).

The UTAUT model is considered a very robust model in predicting ICT acceptance (Taiwo & Downe, 2013). However, some factors are not included in UTAUT constructs, such as cultural and personality traits, which are also very important for ICT adoption to succeed (Kiwanuka, 2015). Moreover, while many extended versions of the UTAUT model are validated in various contexts, there are always certain limitations that need to be addressed to fill the gap (Dwivedi et al., 2019, 2020). Thus, this study also is intended to cover the limitations not covered in the model by extending it with convenient factors reflecting individuals in the madrasa education context. Figure 1 depicts the original UTAUT model.

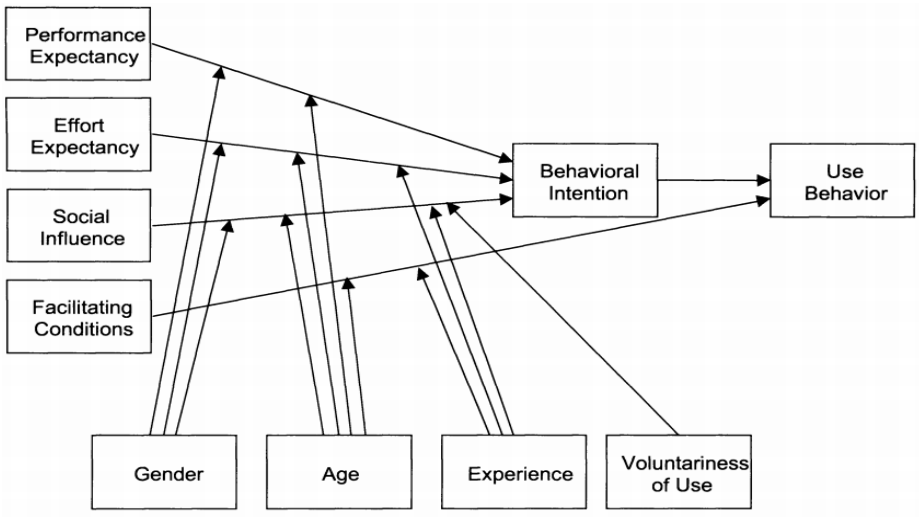

Figure 1: The original UTAUT model (Venkatesh et al., 2003).

3. Research Model

This study applies the UTAUT model as a foundational framework in the environment of ICT acceptance in Tanzanian madrasas. According to the scope of the study, modification is done by removing all the moderating variables of the original model and adding two proposed variables, namely religious Perspective (RP) and personal innovativeness (PI). The proposed research model is portrayed in Figure 2. The research model has six independent core constructs as predictors of behavioural intention and usage behaviour.

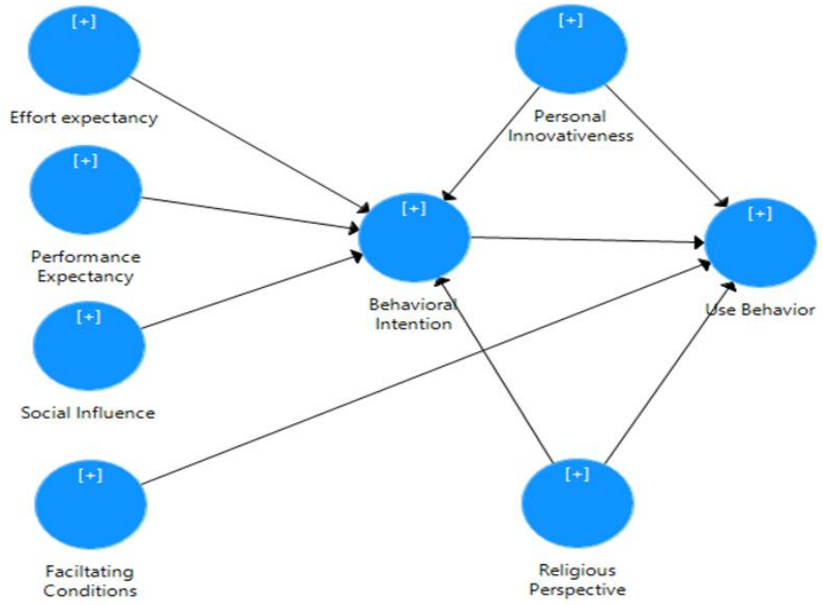

Figure 2: The proposed research model

3.1 Research Variables and Hypotheses

Following is an explanation of each predicting variable and their respective hypothesis.

3.1.1 Effort Expectancy (EE)

EE is the perceived level of easiness of using a particular technology, supposed to minimize an individual's efforts when doing their tasks (Venkatesh et al., 2003). It was argued that ease of use influences a person to adopt ICT (Davis, 1989). That is because a believed ease of use of a particular ICT makes a person feel that the technology is helpful and creates a comforting sense when interacting with it (Venkatesh & Davis, 2000). So, it can be hypothesized as below:

> *Hypothesis 1 (H1): Effort expectancy significantly influences individuals' behavioural intention (BI) of using ICT in madrasa education.*

3.1.2 Performance Expectancy (PE)

PE is the extent to which a person expects that using a particular technology helps improve their tasks' performance (Venkatesh *et al.,* 2003). It measures desired technology outcome (Compeau et al., 1999); technology extrinsic motivation and Job-fit (Davis et al., 1992); technology relative advantage (Moore & Benbasat, 1991); and perceived usefulness (Davis, 1989). All these dimensions have the same objective: knowing how far users perceive that the technology is helpful for themselves and their tasks.

> *Hypothesis 2 (H2): Performance expectancy significantly influences BI of madrasa's individuals to use ICT.*

3.1.3 Social Influence (SI)

SI measures the perception of a person who believes that the surrounding environment influences them to use a particular technology. Therefore, SI is a determinant of behavioural goals in using ICT (Venkatesh *et al.,* 2003). Furthermore, it is claimed that in specific contexts, ICT use increases the status of an individual in the social system (Moore and Benbasat, 1991)). A social system influences individual behaviour via three ways: compliance, internalization, and identification (Venkatesh and Davis, 2000). Thus, it can be argued that the greater the environmental influence on a user of ICT, the greater the interest arises from an individual to adopt the particular ICT due to the strong effect of the surrounding environment.

> *Hypothesis 3 (H3): Social influence positively affects the BI of an individual to use ICT.*

3.1.4 Facilitating Conditions (FC)

FC is described as the extent to which a person supposes that there is support from people and infrastructure to accelerate technology usage. This construct synthesizes three variables: compatibility, facilitating conditions, and perceived behavioural control obtained from previous models (Venkatesh et *al.,* 2003). In addition, empirical studies confirm that the availability of facilities significantly influences behavioural intention to adopt any technological innovation (Venkatesh and Zhang, 2010).

> *Hypothesis 4 (H4): Facilitating conditions have a significant and direct influence on ICT use behaviour (UB).*

3.1.5 Religious Perspective (RP) on ICT Domain

Religion is a vital cultural variable to be considered in some contexts as it significantly influences behaviours and attitudes of any religious society (Mokhlis, 2008). For example, researchers argue that religiosity influences the acceptance of technological innovations by religious consumers since it affects their perceptions to decide what technology to adopt (Ateeq-ur-Rehman & Shabbir, 2010). Moreover, Islam is the fundamental source of reference for most religious Muslims (Alam et al., 2011). Thus, a religious perspective of an individual plays a vital cultural force on personal behavioural intention (El-Gohary & Eid, 2013). Since there are no boundaries between secular and spiritual activities in Islam, it is worthy and vital to study values specifically from Muslims' perspectives (Eid & El-Gohary, 2015).

Hypothesis 5 (H5): Religious perspective significantly influences BI to use ICT.

Hypothesis 6 (H6): Religious perspective significantly affects ICT use behaviour.

3.1.6 Personal Innovativeness (PI) in the ICT Domain

Personal innovativeness reflects a person's willingness to adopt an introduced technology (Agarwal & Prasad, 1998). The innovativeness of a person is a trait determined when exposed to an innovation (Yi et al., 2006). PI has a unique role in predicting behavioural intention in using technological innovation. Several empirical studies (Gbongli et al., 2019; Goldsmith, 2001; Rosen, 2005) have proved the significant direct effect of PI on both intention and actual use of ICT.

Hypothesis 7 (H7): Personal innovativeness positively influences BI to use ICT.

Hypothesis 8 (H8): Personal innovativeness directly influences ICT use behaviour (UB).

3.1.7 Behavioural Intention (BI)

The BI factor determines to what extent the user intends to use a particular ICT facility. So, other variables influence this variable. Moreover, BI is the subjective plausibility of executing the behaviour and the cause of specific actions (Yi et al., 2006). Thus, intention shows motivating factors that affect behaviour and indicates how people are willing to immerse and put their efforts to engage in an actual use behaviour (Mafé et al., 2010).

Hypothesis 9 (H9): Behavioural intention (BI) positively and significantly affects ICT use behaviour.

4. Methodology

4.1 Instrumentation and Scale

This study is a quantitative, and the items to measure research variables were adapted from previous studies. Each construct consisted of four indicators. The indicators of four constructs, namely, EE, FC, PE, SI, BI, and UB, were adapted from the original UTAUT model (Venkatesh *et al.*, 2003). Meanwhile, the PI construct was adapted from the study of (Agarwal & Prasad, 1998). As for the variable RP, the items were synthesized from previous studies (Johan et al., 2020; Ribadu et al., 2020; Ribadu & Wan Ab. Rahman, 2019) explored the sharia-compliance factor in adopting different technological innovations from an Islamic perspective.

Moreover, the measurement of items was based on a Likert scale of 7-point, from 1 (= strongly disagree) to 7 (= strongly agree). The pilot study was conducted with 31 samples for checking instrument reliability and found the reliability (based on Cronbach's Alpha) of 0.973, which is more than the cut-off of 0.7 (Cronbach, 1951). Note that the instrument was translated to the Swahili language as the participants were all Swahili native speakers.

4.2 Sample and Data Collection

A total of 231 respondents participated, both students and teachers from four madrasas in Tanzania. However, about 16 responses were excluded from further analysis as they were biased due to straight-lining answering. So, the final dataset of 215 responses was used for all other statistical analyses. The questionnaire statements were entered in the Google Form, and the link was shared in WhatsApp groups and inboxes. The data collection method was non-probabilistic based on the snowballing technique as participants were very hard to reach due to the pandemic condition. Data were collected from July to December 2020.

4.3 Data Analysis Technique

IBM-SPSS V.25.0 software was used to check for data consistency and demographic data analysis. Then, the data were analysed based on Partial Least Squares-Structural Equation Modelling (PLS-SEM) technique using Smart-PLS 3.3.3 software (Ringle et al., 2015).

5. Analysis Results

5.1 Respondents' Data

Demographic data consisted of Age, Status, Gender, Madrasa Location, and General Education Level as indicated in Table 1.

Table 1: Respondents demographic data (N=215)

Demographic Item	Category	Frequency	Percentage (%)
Status	1). Student	162	75.3
	2). Teacher	53	24.7
Gender	1). Male	185	86
	2). Female	30	14
Age	1). <18	23	10.7
	2). 18-25	88	40.9
	3). 26-40	82	38.1
	4). >41	22	10.2
General Education Level	1). Primary School	94	43.7
	2). Secondary School	49	22.8
	3). High school & Equivalents	40	18.6
	4). Bachelor's degree & above	32	14.9
Madrasa Location (Region)	1). Arusha	90	41.9
	2). Dar es Salaam	40	18.6
	3). Dodoma	35	16.3
	4). Mwanza	50	23.3

5.2 Measurement Model Analysis

The analysis of the outer model was carried out by using the validity and reliability tests. The validity test includes convergent and discriminant validities. In this study, convergent validity was determined using the factor loadings (FL) and the Average Variance Extracted (AVE) parameters. Meanwhile, discriminant validity testing was determined from the values of the Fornel Larcker criterion. Moreover, the reliability test is determined by the composite reliability (CR) and Cronbach's Alpha (α) values. After running the PLS Algorithm in Smart-PLS, all indicators loaded with values higher than 0.708, an acceptable cut-off (Hair et al., 2019) hence fulfilling the factor loading criterion. However, to attain the discriminant validity, it was necessary to remove some items, namely, EE3, PE1, and SI3.

The final results of the outer model are summarized in Table 2, which depicts the results of FL, α, CR, and AVE values. Table 2 indicates that loadings (FL) of all indicators ranged between 0.712 and 0.911, higher than 0.708, the minimum acceptable value. Meanwhile, the AVE values ranged between 0.598 and 0.781, higher than the minimum allowed value of 0.5 (Hair et al., 2019), and hence the convergent validity criteria were fulfilled. Also, the α values of all constructs ranged between 0.716 and 0.906, while that of CR ranged between 0.841 and 0.935, which are all greater than the minimum cut-off value of 0.7 (Hair et al., 2019) and hence the reliability criteria were established.

Table 2: Reliability and convergent validity results

Construct	CR	α	AVE	FL	Items
Effort Expectancy (EE)	0.907	0.846	0.765	0.858	EE1
				0.905	EE2
				0.860	EE4
Performance Expectancy (PE)	0.912	0.855	0.775	0.891	PE2
				0.861	PE3
				0.888	PE4
Facilitating Conditions (FC)	0.856	0.776	0.598	0.712	FC1
				0.785	FC2
				0.787	FC3
				0.806	FC4
Personal Innovativeness (PI)	0.904	0.856	0.702	0.887	PI1
				0.741	PI2
				0.834	PI3
				0.881	PI4
Religious Perspective (PI)	0.935	0.906	0.781	0.851	RP1
				0.898	RP2
				0.874	RP3
				0.911	RP4
Social Influence (SI)	0.841	0.716	0.638	0.743	SI1
				0.832	SI2
				0.819	SI4

Behavioural Intention (BI)	0.907	0.862	0.709	0.859	BI1
				0.871	BI2
				0.847	BI3
				0.788	BI4
Use Behaviour (UB)	0.907	0.864	0.710	0.853	UB1
				0.830	UB2
				0.810	UB3
				0.876	UB4

The Fornel Larcker criterion was used for the discriminant validity test, whose results are depicted in Table 3. It is seen from Table 3 that the AVE square root values (diagonal bolded values) of each construct are greater than the correlation values with other constructs. So, the discriminant validity is declared good based on Fornel-Larcker criteria (Hair et al., 2019).

Table 3: Fornel Larcker criterion results

Construct	BI	EE	FC	PE	PI	RP	SI	UB
BI	0.842							
EE	0.654	0.874						
FC	0.680	0.614	0.773					
PE	0.719	0.846	0.664	0.880				
PI	0.810	0.747	0.744	0.777	0.838			
RP	0.800	0.703	0.655	0.782	0.772	0.884		
SI	0.676	0.576	0.712	0.680	0.618	0.683	0.799	
UB	0.791	0.654	0.645	0.695	0.741	0.775	0.620	0.843

5.3 Inner Model Analysis

The structural (inner) model is assessed based on the criteria of predictive relevancy coefficient (Q^2) determined by blindfolding technique and determination coefficient (R-square, R^2) for dependent variables in a model. The R^2 coefficient indicates how powerful the predicting variables can explain the variance of a particular dependent variable within a model. Moreover, the Q^2 coefficient measures to what extent all independent constructs are relevant in predicting a specific dependent construct. For example, when the values of Q^2 are 0.02, 0.15, or 0.35, then are respectively considered weak, moderate, and strong, meanwhile, for R^2 values of 0.70, 0.50, and 0.25 indicate respectively high, medium, and low (Hair Jr et al., 2017; Kline, 2016). Table 4 depicts the results of Q^2 and R^2.

Table 4: Determination Coefficients and predictive relevance results

	SSO	SSE	Q^2 (=1-SSE/SSO)	R Square (R^2)
BI	920	448.825	0.512	0.746
EE	690	690		
FC	920	920		
PE	690	690		
PI	920	920		
RP	920	920		
SI	690	690		
UB	920	479.137	0.479	0.694

From Table 4, it can be seen that the R^2 value of behavioural intention (BI) is 0.746 and that of a usage behaviour (UB) is 0.694, which are both in a pretty high category (Kline, 2016) of variance explained and hence good enough. That implies that the dependent variable BI variance was 74.6%, explained by the variables religious perspective, effort expectancy, social influence, personal innovativeness, and performance expectancy. The remaining percentage is explained by other external factors not included in this study. Also, the dependent variable UB was 69.4%, explained by the variables personal innovativeness, religious perspective, BI, and facilitating conditions, while the rest of the percentage is explained by external factors excluded from this study. Moreover, values of Q^2 shown in Table 8 are 0.512 (for BI variable) and 0.479 (for UB variable), which are both greater than 0.1 and in a strong category (Kline, 2016) of predictive relevance, implying that the prediction power of the proposed model is highly relevant enough for ICT acceptance prediction.

5.4 Hypotheses Test Results

The analysis was continued by performing the bootstrapping method on Smart-PLS 3.3.3 software to determine whether there are significant effects of exogenous variables on endogenous variables. Testing the hypothesis is done by using the t-test to verify if the structural path parameters are statistically significant. The critical value of the path coefficients indicated by the t-value for the two-tailed (2-tailed) hypothesis is 1.97 (based on the t-distribution table) for the data of 215 samples (respondents) with a significance level of 5% (0.05). The significance of the influence between latent variables can be seen from the statistical significance *P*-value. The significance value of the parameter coefficients in the Smart-PLS application was calculated using the PLS bootstrapping method with 5000 subsamples. Figure 3 and Table 5 depict the hypotheses testing results.

The results portrayed in Figure 3 and Table 5 indicate that there are five direct paths with coefficients (T-Statistics) greater than 1.97. These paths are (SI → BI), (RP → BI), (RP → UB), (PI → BI), and (BI → UB), with all having *P*-values less than 0.05, which implies that these paths are significant. Meanwhile, the remaining four paths have coefficients less than 1.97, and their P-values are higher than 0.05; hence they are not significant. In other words, five hypotheses were supported namely, H3 (T = 2.818; $P < 0.01$), H5 (T = 3.636; $P < 0.001$), H6 (T = 2.428; $P < 0.05$), H7 (T = 3.301; $P < 0.01$), and H9 (T = 3.649; $P <$

0.001). Meanwhile, the rest of the four hypotheses (H1, H2, H4, and H8) were not supported as their coefficients were not statistically significant, indicated by *P*-values being greater than the significant level of 0.05.

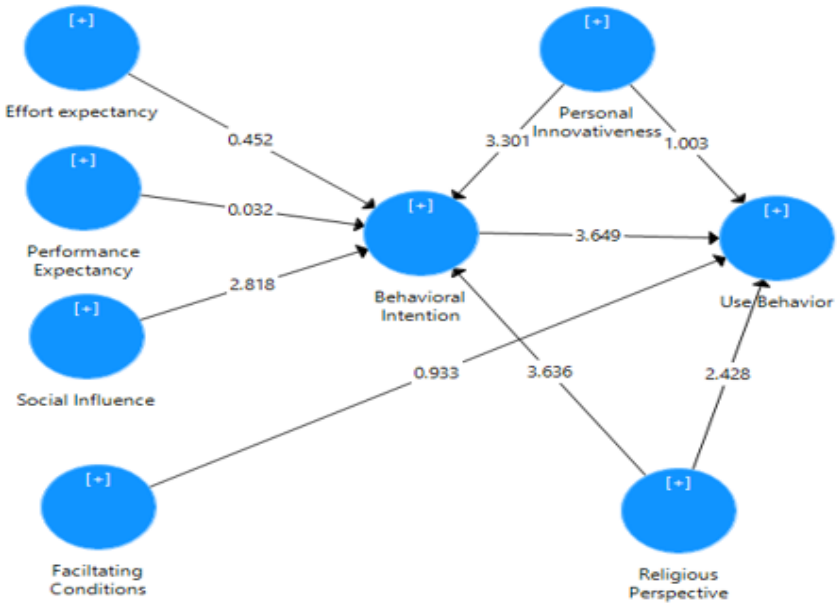

Figure 3: Path analysis bootstrapping results

Table 5: T-Statistics and significance results (t-Table = 1.97)

H	Path	Original Sample (o)	Standard Deviation (STDEV)	T-Statistics ((|O/STDEV|))	*P*-Values
H1	EE → BI	-0.034	0.074	0.452	0.651
H2	PE → BI	-0.003	0.085	0.032	0.975
H3	SI → BI	0.172	0.061	2.818	0.005
H4	FC → UB	0.087	0.094	0.933	0.351
H5	RP → BI	0.356	0.098	3.636	0.000
H6	RP → UB	0.325	0.134	2.428	0.015
H7	PI → BI	0.456	0.138	3.301	0.001
H8	PI → UB	0.125	0.124	1.003	0.316
H9	BI → UB	0.370	0.102	3.649	0.000

6. Discussion and Implications

The first hypothesis (H1) was not supported, as demonstrated in Table 5. That implies that the intention to use ICT by madrasa individuals is not influenced by the perception of ease of use of ICT tools like smartphones and computers in Islamic education instead by other factors. The finding of an insignificant effect of effort expectancy on intention to use ICT products is also found in some previous studies (Kayanda et al., 2020; Salloum & Shaalan, 2019), contrary to the findings of other studies (Lwoga &

Komba, 2015; Mtebe et al., 2016; Muries & Masele, 2017) which found that EE variable significantly affected behavioural intention. Thus, this study's context implies that the intention to adopt ICT facilities in Tanzanian madrasas isn't associated with the expected ease of use factor. Future studies can integrate interview methods to dig deep and verify the influence of the variable EE concerning ICT behavioural intention and use in the madrasa education context.

The second hypothesis (H2) was also rejected based on the results shown in Table 5. This finding is not per the findings of some previous studies (Mtebe & Raisamo, 2014; Muries & Masele, 2017), which found the significant effect of variable PE on BI to use ICT facilities in the educational context. However, this finding is in line with some past studies (Mtebe et al., 2016; Rozmi et al., 2019) in which they found no significant effect of PE on BI to use ICT technologies in education or other life aspects. That means that people in Tanzanian madrasas are not influenced by their perception of ICT usefulness and benefits for the learning process.

The third hypothesis (H3) was supported, as indicated in Table 5. This finding implies that in madrasas, social interactions significantly influence adopting ICT facilities for the learning process. That includes the influence of important individuals in Muslim communities whom many individuals look upon to imitate good deeds. That means individuals' intention to use ICT in madrasas will increase if they get social support and appreciation from friends or teachers who they think are close and important to them in their social life circle. This finding supports the findings of previous studies (Lwoga & Komba, 2014, 2015; Mtebe et al., 2016; Mtebe & Raisamo, 2014), which also found the significant effect of SI on BI to adopt ICT tools and facilities in education and social contexts.

The fourth hypothesis (H4) was not supported, as shown in Table 5. This finding is not in line with the mainstream results of previous literature (Hasif & Ahmad, 2019; Venkatesh et al., 2003; Venkatesh & Zhang, 2010) in which the variable FC was found to significantly influence the usage behaviour of ICT products, though, in some of those studies, FC was moderated by other variables such as age, experience, and gender. However, this study supports the findings of some previous studies (Handoko, 2019; Macedo, 2017), which found that the FC has no significant effect on ICT actual usage behaviour. Therefore, in this study, individuals in madrasas don't perceive that the available facilities influence them to use ICT for Islamic studies. This present study explored an individual level of ICT acceptance, so facilitating conditions are on a personal consumer level and not organizational based.

The fifth hypothesis (H5) was supported. This finding implies that participants of this study have a positive perception of ICT usage in the madrasa context and believe that it is compatible with Islamic rulings, making them intend to adopt ICT facilities for madrasa education. Similar to this finding, past studies (Johan et al., 2020; Ribadu et al., 2020; Saleh et al., 2020) done in Muslim perspective indicate that religious Muslims have the intention to adopt a particular innovation or technology as long as they feel and perceive that the innovation is not against Islamic regulations. Moreover, the sixth hypothesis (H6) was also accepted. This finding means that Muslims in Tanzanian madrasas have a positive perspective on ICT use for different life purposes, including madrasa education. That is to say, as long as individuals in madrasas perceive that the use of a particular ICT facility is acceptable with Islamic rulings, then they adopt it. This study's finding supports the previous literature (Eid & El-Gohary, 2015; Mokhlis, 2009),

which shows that many religious individuals in Islam are driven explicitly by Islamic rulings and regulations when it comes to technologies and innovation adoption in their life activities.

The seventh hypothesis (H7) was also supported, as indicated in Table 5. It implies that madrasa individuals are curious, daring, and courageous towards adopting ICT for learning activities. This personality trait of PI is found in the IT adoption literature (Agarwal & Prasad, 1998; Goldsmith, 2002) to be very potential for ICT adoption prediction. This finding of significant effect of PI on BI to use ICT supports the previous studies on mobile technologies and other electronic-based technologies (Asare et al., 2016; Gbongli et al., 2019) with the similar finding like this, though contradicts with other studies (Gunasinghe et al., 2018; G. W.-H. Tan et al., 2014) found an insignificant influence of PI variable on BI to use certain technologies.

Meanwhile, the eighth hypothesis (H8) was rejected. That means that the individuals in Tanzanian madrasas aren't influenced to use ICT even though they perceive themselves curious in behavioural intention to adopt ICT. The insignificant effect of PI on UB was also found in the past study (Rosen, 2005) but contrary to other studies (Farooq et al., 2017; Gunasinghe et al., 2018), which found a significant effect of PI on actual UB.

The ninth hypothesis (H9) was supported, as depicted in Table 5. That means madrasa individuals have the intention to use ICT to help their learning process. Several previous studies (Gunasinghe et al., 2018; Salloum & Shaalan, 2019) have also found that behavioural intention (BI) can increase the actual usage of certain ICT technologies. Thus, the BI of individuals in madrasas led to the actual use of ICT facilities for Islamic learning.

The findings of this study provide a new theoretical view of the modified UTAUT model. The model used in this study can be used to predict ICT acceptance and use from the end users' point of view, especially from the Islamic perspective. The study's results can be used to reference further studies to determine the factors that influence the acceptance and use of ICT by Muslims in different contexts. In other words, the findings of this study provide recommendations for succeeding in the integration of ICT facilities in madrasa education. Two additional variables and UTAUT core variables used in this study successfully found out what variables can influence the ICT acceptance for Islamic studies. The use of ICT by students and teachers in madrasas can be seen from how much the effect of social influence of Muslim figures influences the entire society in and outside madrasas on using ICT for Islamic education. The implication of the three variables, namely SI, RP, and PI explained above, are significant factors to be considered by madrasas stakeholders and policymakers when planning to integrate ICT facilities for Islamic education. That way can increase ICT use by individuals within and outside the madrasa environment for learning purposes.

7. Conclusion, Limitations, and Recommendation

This study modelled the factors influencing the acceptance and use of ICT facilities in Tanzanian madrasas at an individual level. The study used the UTAUT model and extended it with two variables. The method used to analyse the data is PLS-SEM. Based on the analysis of the research results, it can be concluded that the factors that significantly influenced the behavioural intention (BI) on ICT acceptance are personal

innovativeness (PI), social influence (SI), and religious perspective (RP) on ICT with RP variable having the highest effect on BI. That implies that individuals in Tanzanian madrasas positively perceive ICT usage for their madrasa education activities. Also, the BI and RP were the only significant variables affecting the actual use of ICT by madrasa individuals. Moreover, the study variables explained 74.6% of the variance for BI and 69.4% for the actual use of ICT, meaning that the remaining percentage is explained by variables external to this study.

The research findings are interesting, particularly in terms of validation and explanation of the modified UTAUT model in understanding the factors that affect the acceptance of ICT facilities in Tanzanian madrasas for Islamic education. Despite this, some limitations need to be considered. First, the research sample includes only four madrasa institutions from four regions in Tanzania where accessibility and individual ownership of ICT facilities are low. Thus the generalizability of findings should be limited to countries and areas with a similar level of ICT advancement and infrastructure. Second, the research is a cross-sectional study; thus, the study couldn't explain the changing effects of research variables on behavioural intention and ICT actual usage over several periods. Third, the study excluded the moderating variables such as age, gender, and experience. Finally, it was limited to only six independent variables whose variance explained in the research model was not beyond 80%, meaning that other important factors were excluded from this study.

Based on the limitations found in this study, future studies can expand the model applied in this study to predict the intention and use of ICT facilities by Muslim Individuals. That can be done by adding variables such as technology anxiety, ICT self-efficacy, perceived price value, moderating factors of age, religious affiliation, technology experience, general education level, and gender that can affect the acceptance and use of ICT. Lastly, future studies can use a longitudinal approach to predict intention and use over time. Thus, the model must be validated at various points in time. For example, future research should investigate behavioural intentions in stages, such as pre-adoption and post-adoption of a particular ICT facility.

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