

Adoption of Mobile Money Services among University Students in Tanzania

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Abstract— The focus of the study was to assess factors influencing adoption of mobile money services among university students in Tanzania. The study adopted a quantitative approach where questionnaire was used to collect data from students of Ruaha Catholic University. Stratified sampling was used to ensure sample representation among students from different faculty and level of education thereafter simple random sampling was used to pick a sample size of 383 of respondents from the strata developed.

Exploratory factors analysis was used to ensure construct validity of four construct. Cronbach alpha indicated that all variables had achieved an accepted range of internal consistent by yielding a Cronbach alpha p-value greater than 0.6. Using multiple regression analysis, findings revealed that students' attitude, social factor and facilitating condition are significant factors influencing university students adoption of mobile money services in Tanzania. Based on these findings this study concludes that students' attitudes, social pressure and facilitating conditions are factors influencing university students' adoption of mobile money services in Tanzania higher learning institutions. This study recommends that, for speeding up the adoption of mobile money services, service provider should attract more peer pressure that could help to increase mobile money adoption among university students.

Keywords— Mobile Money Services, University Students.

I. INTRODUCTION

Information and communication technologies (ICTs) have enmeshed the globe in digital networks, and none is as widespread as the mobile technology, a technology with more than five billion subscriptions globally (Kazi and Mannan, 2013). As it is indicated in Tanzania basic education ICT policy of 2007 that the Integrate of mobile ICT in education enhance access, equity, quality and relevance of basic education, while stimulating and

improving teaching and lifelong learning (URT, 2007). This has enabled mobile devices to provide financial information, communication and transactions to students such as checking account balances, transferring funds and accessing other banking products and services from anywhere, at any time (Aboelmaged and Gebba, 2013). As argued by Cudjoe, et al. (2015) that the convenience offered by mobile money to students has enabled students to receive and pay cash regardless of time and location. On the other hand, Hamza and Shah (2014) argued that the proliferation of handheld devices coupled with the high-speed mobile network has paved way for people to constantly interact and make transactions. According to Govender and Sihlali (2014) who argued that mobile money services help to provide time independence.

Despite of its benefits mentioned above, fast advances in the wireless technology and the intensive penetration of cell phones which have motivated banks and telecommunication companies to spend large budget on building mobile banking systems, but the adoption rate of mobile banking by university students is still underused than expected (Yu, 2012). In addition, Kabir (2013) has also indicated that internet and other technology based transaction is not safe, not practical and would lead to fraud. Given this situation, this study intended to analyze factors influencing adoption of mobile money among university students in Tanzania.

II. LITERATURE REVIEW

2.1. Theoretical Literature Review

This part aimed at selecting appropriate theory/models that informed the researcher on the variables to be included in the development of a conceptual model in the process of analyzing the critical factors influencing adoption of mobile money services.

Theory of Planned Behavioral

Ajzen (1991) developed the theory of reasoned action through adding construct perceived behavioral control into the model as a determinant of behavioral intention and

behavior, and called it as theory of planned behavior. According to Ajzen (1991) the theory of planned behavior state that individual behavioral intention to behave is determined by three factors namely attitude, subjective norms and perceived behavior control. In fact, attitude is the general feeling of people about the desirability or undesirability of a particular issue or behavior. Subjective norm refers to individual's perception of important people's opinions about doing or not doing the behavior. In other words, subjective norm is the perceptions related to opinions of society about doing or not doing the behavior by individual. The construct "perceived control of behavior" is the individual's perception about ease or difficulty of doing behavior and indicates the individual's perceptions about required skills, resources, and opportunities in doing the behavior. The applicability of theory of planned behavioral is evidenced in a number of studies (Makena and Gekara ,2014; Al-fahim, 2012). For example, Makena and Gekara (2014) on their study on behavioral intention to use services of mobile banking system found and concluded that attitude, subjective norm and perceived behavior control are significant influencing behavioral intention to adopt mobile banking. Therefore in this study, this theory helped to inform the researchers and in providing further analysis on the influence of attitude, subjective norm and behavioral control on adoption of mobile money among University students.

2.2 Empirical Literature Review

2.2.1 The Influence of Attitude on Adoption of Mobile Money Services

Kabir (2013) on mobile banking adoption study,the findings indicate that perceived usefulness, easiness of use, relative advantages and personal innovativeness have significant effect on user's attitude thus influence the intention toward mobile banking. Aboelmaged and Gebba (2013) on their survey study on mobile banking adoption,the regression results indicated a significant impact of perceived usefulness on attitude toward mobile banking while the effect of perceived easiness of use on attitude toward mobile banking was not supported. On the other hand, Govender and Sihlali (2014) carried out a study on mobile banking adoption among university students. Using multiple regression analysis, the results suggest that trust, perceived value and perceived easiness of use account for intention to use m-banking. The positive attitude of students

towards m-banking is a great motivation towards adoption and continuance of using m-banking.

These findings posit a hypothesis (H1) which state that: *Attitude has significant influence on mobile money services adoption among university students in Tanzania.*

2.2.2 The Influence of Social Environment on Adoption of Mobile Money Services

Govender and Sihlali (2014)carried out a study on mobile banking adoption among university students. Using multiple regression analysis, the results indicated that, social influence account for the intention to use m-banking. Kabir (2013) on mobile banking adoption studies,the findings indicate that social norms have significant effect on user intention toward mobile banking. Al-fahim (2012) on his study on the impact of subjective norm on the behavioral intention to use services of banking system,the finding demonstrated that there are significant on students social pressure on intention to use banking services in the context of Yemen.

These findings posit a hypothesis (H2) which state that: *Social factor has significant influence on mobile money services adoption among university students in Tanzania.*

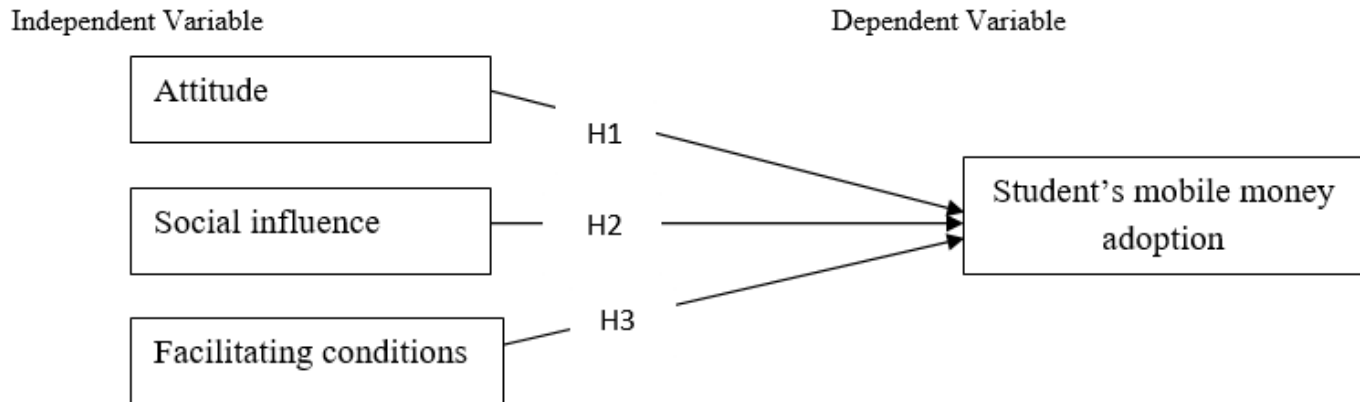
2.2.3 The Influence of Facilitating conditions on Adoption of Mobile Money Services

Makena and Gekara (2014) on their study of factors influencing the use of M-Banking by academics, the results show a positive correlation between customer service and type of bank of m-banking. Kabir (2013) on mobile banking adoption study in Zimbabwe,the findings indicated that perceived risks and costs deterred the adoption of the service. Olasina (2015) on their study of factors influencing students' intention to adopt mobile technology, The findings shows that facilitating conditions such as cost and previous experiences respectively influencing university students to adopt mobile blackboard.

These findings posit hypothesis (H3) which state that: *Facilitating condition has significant influence on mobile money services adoption among university students in Tanzania.*

3. Conceptual Frame work

This frame work composed of three independent variables namely attitude, social influence and facilitating conditions and one dependent variable namely mobile money adoption literature as discussed in the empirical literature in section above and diagrammatically described below.



Source: developed by authors from literature review(2017)

III. METHODOLOGY

Quantitative approach was used in this study. Quantitative philosophy collect data about the study objective and search for causal relationships and knowledge was developed through objective measurement (Saunders, et al., 2012). This study was used quantitative approach in order to determine the magnitude of each factor in influencing adoption of mobile money services among university students. This study was conducted at Ruaha Catholic University. This area is selected because among higher education institutions in Tanzania, Students from RUCU have been using mobile money services for long time. Therefore collecting data from RUCU, helped the researcher to mobilize evidence and get required data in

order to understand factors influencing adoption of mobile money services in Tanzanian high learning institutions. Quantitative data analysis was performed by using regression analysis to test the extent or magnitude of each factor influencing students to adopt mobile money services, this was done by using multiple regression analysis.

IV. PRESENTATION OF THE FINDING

4.1 Construct Validity Test

Before actual exploratory factor analysis was done KMO and Bartlett's Test was run to ensure sample adequacy and items are correlated enough to carry out factor analysis as it described below in Table 4.2 KMO and Bartlett's Test.

Table.4.1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.819
Approx. Chi-Square		6346.172
Bartlett's Test of Sphericity	Df	171
	Sig.	.000

In table 4.1 above, the value of KMO of 0.819 was yield which suggested that the sample was adequate for exploratory factor analysis as suggested by Hooper, et al.(2008) who argued that KMO should be either .6 or above. On the other hand Bartletttest in this study yield p-value =0.00 which signify that the variables are correlated highly enough to provide a reasonable basis for factor analysis as suggested by (ibid) that the value for Bartletttest should be significance value of less than .05 as describe in table 4.1.

After assessing sample and correlation adequacy, exploratory factor analysis with varimax rotation was conducted to assess the underlying structure for the twenty nine items of the university students' mobile money adoption questionnaire. During analysis out of twenty

nine(29) items only seventeen(17) items were retained with four factor based on the fact that the items were designed to index four constructs namely students attitudes, social pressure, facilitating conditions and adoption. These items which did not fit well to the model were deleted which include easiness of learning, clarity and understandable from Students' attitude construct, Government and Top university management from social pressure construct, agent services, University ICT policy, Government policy, Availability of services provider facilitate from Facilitating conditions and communicate from adoption construct. The Table 4.2 Rotated Component Matrix below indicate the items which were not deleted because of their fitness to the model.

Table.4.2: Rotated Component Matrix^a

Items/Dimensions	Component			
	Attitudes	Social Pressure	Facilitating Conditions	Adoption
ease to use	.885			
speed up transactions	.853			
Convenience	.791			
fitness of use	.790			
24 Hours services	.775			
Friends		.884		
Lecturers		.879		
Vendor		.871		
Sponsor		.670		
class meet		.580		
agents availability			.806	
Network Availability			.798	
low cost mobile devices			.795	
ease to register			.786	
availability of vendor facilities			.786	
Payment				.876
receive cash				.872
prompt transactions				.863
Access bank services				.547

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

4.2 Reliability Test

In this study reliability test was done using Cronbach alpha, customarily values above 0.6 of Cronbach alpha coefficients are considered significant (Hair et al.,2006).

Table.4.3: Reliability Test

Variables	No of Items	Items	Cronbach's Alpha
Students attitudes	5	Ease to use, speed up transactions, Convenience, Fitness of use and 24 Hours services	0.893
Social Pressure	5	Friends, vendor ,lecturer, sponsor and class meet	0.879
Facilitating conditions	5	agents availability, Network Availability, low cost mobile devices, ease to register and availability of vendor facilities	0.889
Students Mobile Money Adoption	4	Payment, receive cash, prompt transactions and Access bank services	0.860

In table 4.3 above, shows that all variables has the p-value of above 6 which means that the items used measures what it is purported to measure and has a good internal consistency of the measures, with items measuring different things for a given factor.

4.3 Presentation of Major Findings

4.3.1 The Influence of Students Attitudes on Student Adoption of Mobile Money Services

The significant relationship between students attitudes and adoption of mobile money services was analyzed using multiple regression are presented below on three tables

Table.4.4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.190 ^a	.036	.023	3.318

a. Predictors: (Constant), speed up transactions, 24 H ours services, fitness of use, Convenience , ease to use

The results provided in table 4.4 above showed that dependent variable “adoption of mobile money” is explained well by independent variable students attitude which has four indicators” speed up transactions, 24 H ours services, fitness of use, Convenience and ease to use” to a small extent as demonstrated by R2 of 36% which is low percent. Further analysis of the relationship between dependent and independent variable is presented in table 4.5.

Table.4.5: ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	154.935	5	30.987	2.814	.016 ^b
Residual	4151.018	377	11.011		
Total	4305.953	382			

a. Dependent Variable: Students Mobile Money Adoption

b. Predictors: (Constant), speed up transactions, 24 H ours services, fitness of use, Convenience , ease to use

The results provided in table 4.5 ANOVA^a above showed that overall, the model applied in this study statistically significantly predict the outcome variable of relationship between dependent variable” adoption” and independent variable ”students attitudes” to a large extent as demonstrated by p-value less than 0.05 in a ANOVA table above. This indicate that the overall hypothesis which state that students attitudes is strongly significant influencing

students adoption of mobile money is accepted. These findings do support the attitude variable of the Theory of planned behavior by Ajzen (1991) who argued that attitude is the general feeling of people about the desirability or undesirability of a particular issue or behavior. Further analysis of the individual indicators on predicting adoption of mobile money services is described in the table below:

Table.4.6: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.998	.740		20.272	.000
	fitness of use	-.008	.289	-.002	-.027	.979
	24 H ours services	-.964	.457	-.329	-2.111	.035
	ease to use	-.036	.547	-.011	-.067	.947
	Convenience	1.476	.483	.486	3.054	.002
	speed up transactions	-.177	.455	-.054	-.389	.698

a. Dependent Variable: Students Mobile Money Adoption

The results provided in table 4.6 Coefficients above showed that out of five indicators only two indicator known as fitness of use and convenience were accepted.

4.3.2 The Influence of Social Pressure on Students Adoption of Mobile Money Services

This objective was developed to test the hypothesis on the relationship between social pressure and adoption of mobile money services. Finding using multiple regression are presented below on three tables

Table.4.7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.409 ^a	.167	.156	3.084

a. Predictors: (Constant), vendor, class meet, Sponsor, lecturers, Friends

The results provided in table 4.7 above showed that dependent variable “adoption of mobile money” is explained well by independent variable social pressure which has four indicators” vendor, class meet, Sponsor,

lecturers and Friends” to a small extent as demonstrated by R² of 16% which is low percent. Further analysis of the relationship between dependent and independent variable is presented in table 4.8.

Table.4.8: ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	720.202	5	144.040	15.144	.000 ^b
Residual	3585.751	377	9.511		
Total	4305.953	382			

a. Dependent Variable: Students Mobile Money Adoption

b. Predictors: (Constant), vendor, classmate, Sponsor, lecturers, Friends

The results provided in table 4.8 ANOVA a above showed that overall, the model applied in this study statistically significantly predict the outcome variable of relationship between dependent variable” adoption” and independent variable ”students attitudes” to a large extent as demonstrated by p-value less than 0.05 in a ANOVA table above. This indicate that the overall hypothesis which state that social pressure is strongly significant influencing students adoption of mobile money is accepted. This finding is supporting Ajzen (1991) theory of planned behavior who

developed subjective norm variable by argued that individual's perception of important people's opinions about doing or not doing the behavior could develop behavior intention to adopt technology. Similar, Taylor and Todd (1995) argued on subjective norm as a perceptions related to opinions of society about doing or not doing the behavior by individual. Further analysis of the individual indicators on predicting adoption of mobile money services is described in the table below:

Table.4.9: Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	11.001	.713		15.426	.000
1 Sponsor	-.332	.185	-.108	-1.798	.073
classmate	.511	.192	.156	2.657	.008
lecturers	.351	.336	.116	1.045	.297
Friends	.670	.341	.221	1.963	.050
vendor	.130	.267	.045	.486	.627

a. Dependent Variable: Students Mobile Money Adoption

The results provided in table 4.9 Coefficients above showed that out of five indicators only one indicator known as classmate were accepted.

4.3.3 The Influence of Facilitating Condition on Students Adoption of Mobile Money Services

The Significant relationship between facilitating conditions and adoption of mobile money services was analyzed by

using multiple regression are presented below on three tables

Table.4.10: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.381 ^a	.145	.134	3.125

a. Predictors: (Constant), ease to register , low cost mobile devices, Network Availability, availability of vendor facilities, agents availability

The results provided in table 4.10 above showed that dependent variable “adoption of mobile money” is explained well by independent variable facilitating condition which has four indicators” ease to register , low

cost mobile devices, Network Availability, availability of vendor facilities and agents availability” to a small extent as demonstrated by R² of 14% which is low percent.

Table.4.11: ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	625.387	5	125.077	12.812	.000 ^b
Residual	3680.566	377	9.763		
Total	4305.953	382			

a. Dependent Variable: Students Mobile Money Adoption

b. Predictors: (Constant), ease to register , low cost mobile devices, Network Availability, availability of vendor facilities, agents availability

The results provided in table 4.11ANOVAa above showed that overall, the model applied in this study statistically significantly predict the outcome variable of relationship between dependent variable” adoption” and independent variable ”facilitating condition” to a large extent as demonstrated by p-value less than 0.05 in a ANOVA table above. This indicates that the overall hypothesis which state that facilitating condition is strongly significant influencing students’ adoption of mobile money is accepted. This

findings is supporting Ajzen (1991) who argued that individual's perception about ease or difficulty of doing behavior and indicates the individual's perceptions about required skills, resources, and opportunities on adopting a particularly technology.

Further analysis of the individual indicators on predicting adoption of mobile money services is described in the table below:

Table.4.12: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.715	.827		11.748	.000
	low cost mobile devices	.573	.278	.166	2.064	.040
	agents availability	.908	.518	.241	1.754	.080
	Network Availability	-.056	.256	-.016	-.218	.827
	availability of vendor facilities	-.016	.257	-.005	-.061	.952
	ease to register	.162	.472	.046	.342	.732

a. Dependent Variable: Students Mobile Money Adoption

The results provided in table 4.12 Coefficients above showed that out of five indicators only one indicator known as low cost mobile devices were accepted.

V. CONCLUSIONS

This part focuses on the major conclusions in lieu of the research objectives:

5.1 The influence of attitude on adoption of mobile money services among university students

Through survey data of university students at Ruaha Catholic University, the study confirms that university students' attitude in Tanzania influence students' adoption of mobile money services. While many dimensions were subjected explain the influence of attitude on adoption of mobile money services, base on the findings this study conclude that only two dimensions namely increasing services accessibility in 24 hours and convenience of services accelerate students attitudes toward adoption of mobile money services. On the other hand, this study conclude that attitudes construct which was borrowed from Theory of planned behavior is applicable in studying students' adoption of mobile money services when modified to fit the social context.

5.2 The influence of social environment on adoption of mobile money services among university students

The study examined the relationship between social pressure and university students' adoption of mobile money services. Results indicate that social pressure is significant influencing university students' adoption of mobile money services. Generally there were significant relationship between social pressure and university students' adoption of mobile money services based on the following dimensions namely vendor, classmate, Sponsor, lecturers, Friends , it is observed that classmate and friends has significant influence on social factor while vendor, Sponsor and lecturers has insignificant influence on social factor to influence university students adoptions of mobile money services. This leads to the conclusion that social pressure which is significantly explained by classmate and friends in this study have a significant relationship with students' adoption of mobile money services.

5.3 The Influence of Facilitating Conditions on Adoption of Mobile Money Services

This study examined the relationship between facilitating conditions and students mobile money adoptions using the following dimensions of facilitating conditions namely ease to register , low cost mobile devices, Network Availability, availability of vendor facilities, agents availability. In all the dimensions of facilitating conditions only low cost mobile devices indicate a strong positive relationship with students'

mobile money adoptions. It is therefore concluded that the more low cost of mobile devices are, the more likely they are to facilitate students' mobile money adoption. A general conclusion is drawn that facilitating conditions in the view of the current study is a function of students' mobile money adoption in higher learning institutions.

VI. RECOMMENDATIONS

This part explains recommendations for action:

It was found that, students' attitudes strongly influencing university students adoption of mobile money services in Tanzania. Based on these findings it is recommended that mobile phone vendors and banks they have to design the mobile money services which are increasing the attitude of university students towards adoption of mobile money services by increasing services accessibility in 24 hours and convenience of services to the users who are university students.

Based on the survey data of this study, it was found that social pressure strongly influencing university students' adoption of mobile money services in Tanzania. For speeding up the adoption of mobile money services in higher learning, this study recommend that services provider to attract more peer pressure such as classmate and friends to use mobile money which will in turn help to increase adoption pressure among university students.

In this study facilitating conditions was strongly influencing adoption of mobile money services among university students, it is therefore recommended that the university and mobile money vendor they have to create conducive facilities which include low cost of mobile devices which will enable the adoption of mobile money services among university students in Tanzania.

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