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Trust: A Mediator of Awareness and Young farmers' Intention to use ICT for accessing agriculture market information

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Abstract

Several previous studies have assessed the influence of awareness and Trust on behaviour intention to use ICT. However, studies that have assessed the mediation role of trust in the relationship between awareness and behaviour intention to use ICT most especially in the field of agriculture are limited. This study aimed at assessing the mediating role of trust on the influence of awareness on young farmers' intention to use ICT for accessing agriculture market information. Partial Least Square-Structural Equation Modelling (PLS-SEM) was used for statistical analysis. The assessment was done on 403 valid responses that were collected from a crossectional survey. The result revealed a partial mediating effect of trust on the relationship between awareness and behaviour intention, a significant positive relationship between awareness and trust, awareness and behaviour intention and trust and behaviour intention. It is important to understand the antecedent of behaviour intention and how they are interrelated for sustainable integration of ICT in the agriculture sector.

Key Words: Awareness, Trust, Behaviour Intention, ICT, Youth/Young Farmers, Agriculture, PLS-SEM

1. Study Background

Access to up to date information in different agriculture subsectors is one of the key factors that might lead to the prosperous of the still underperforming agriculture sector in most of the Sub-saharan countries which is also the main economic sector to most of these countries (Sennuga et al., 2020). Within Tanzania, farmers, especially smallholder farmers who have dominated the

sector are facing multiple challenges, difficult to obtain up to date and real-time market information being one them (MALF, 2017). Tanzania has about 65% of its population employed in the sector while 70% of the rural income comes from agriculture (MALF, 2016; MALF, 2017). Up to date information is essential for allowing farmers to make decisions that are well informed, such as; decisions on the prices and decisions on where and when to sell their crops profitably (Irungu et al., 2015). Within Tanzania, some Agriculture Marketing Information Systems have been introduced and those who engaged in them agreed that it was very beneficial to use them and it gave them a chance to be aware of different markets for their crops and allow them to bargain for better prices (MVIWATA, 2013; GSMA, 2015). However, it has been indicated that farmers' use of ICT for accessing agriculture market information is sluggish, most farmers engage in the use of ICT mainly for social matters (Okello et al. 2011; Wyche and Steinfield, 2015; Mandari and Chang 2018; Mng'ong'ose et al. 2018). Proper strategies for the promotion of ICT use among farmers are essential for farmers to increase their capitalization on ICT to facilitate access to relevant information on agriculture including market information. That has led to conducting of studies aiming at identifying factors that are essential in farmers' intention to use ICT, these include (Malima et al. 2015; Moya and Engotoit, 2017; Beza et al., 2018). Among other factors, awareness and trust are some of the factors which have been assessed to determine whether they influence intention to use ICT among farmers (Parmar et al., 2015; Ibitoye et al., 2016; Haruna and Baba, 2017; Beza et al., 2018). While all of the reviewed studies have assessed the direct effect of awareness and trust on the intention to use ICT. This study aimed at going further and assess the mediating role of trust on the influence of awareness on behaviour intention which has not been extensively assessed most especially in the field of agriculture as per the review of the literature.

2. Theoretical Literature Review

Behaviour intention has been identified as a key predictor for technology use by some of the prominent technological acceptance models that include Technology Acceptance Model (TAM), The Combined Technology Acceptance Model and the Theory of Planned Behaviour (C-TAM-TPB) and The Unified Theory of Acceptance and Use of Technology (UTAUT) (Davis, 1985; Taylor and Todd, 1995; Venkatesh et al., 2003). These models were formulated in the organizational context, however, there have been efforts to combine variables originate from the consumer technology use context among them being awareness and trust (Beza et al. 2018; Khazaei, 2020).

3. Empirical Literature Review and Study Hypotheses

3.1 The Influence of Awareness on Trust

Pradhan et al. (2018) contextually defined awareness as " farmers response towards ICT tools regarding their knowledge endowment related to use of ICT tools for seeking information related to agriculture" Pp. 48. Awareness is prerequisite to the formation of trust of information in someone's mind (Sastika et al., 2016). Eventually, it leads to a user's trust in the expected outcomes of engaging with the system (Sacha et al., 2016). Awareness plays a significant role in building trust (Bilgin, 2020). Stastika et al. (2016) found awareness to be influential on trust while investigating the role of brand awareness on trust in using a website for online shopping. This lead to the formation of the following hypothesis:

H1: Awareness has a significant positive influence on young farmers' trust in the market information accessible through ICT

3.2 The Influence of Awareness on Intention to use ICT

Several studies that have been conducted among farmers, shows that when farmers are not aware on the possibilities of obtaining information through ICT or not aware on how beneficial it might be to use ICT for accessing information, it negatively affects the possibility of ICT adoption (Anoop et al., 2014; Ibitoye et al., 2016; Haruna and Baba, 2017). Awareness of the ICT tools capabilities and benefits provoke one's psychology and change attitude and behaviour in favour of the tool in particular (Pradhan et al., 2018). Awareness is essential in triggering behaviour intention to utilize ICT for accessing information (Anoop et al., 2014). Awareness of the existence and possibility of using ICT for easy accessing of information is influential on behaviour intention to use (Anoop et al., 2014; Zaidi et al., 2017). Zaidi et al. (2017), recommended that to trigger the engagement in digital technology the government has to promote awareness of the same among citizens. Hence the development of the following hypothesis:

H2: Awareness has a significant positive influence on young farmers' intention to use ICT for accessing agriculture market information

3.3 The influence of Trust on Behaviour Intention to use ICT

Trust has been defined contextually by Paloz-sanchez and Saura (2018) as, " How much a user believes in the safety, reliability, efficiency, competence and validity of a system." Pp 8. Lack of trustworthiness on the information received through ICT will raise uncertainty and make it difficult for someone to have confidence in using ICT (Sastika et al., 2016; Beza et al. 2018). Within the field of agriculture, several studies that have involved the assessment of trust on the intention to use ICT have found it to be an important predictor (Parmar, 2015; Harris and Achora, 2018; Beza et al. 2018). Hence the development of the following hypothesis:

H3: Trust has a significant positive influence on young farmers' intention to use ICT for accessing agriculture market information

3.4 The Mediation Role of Trust on the Relationship Between Awareness and behaviour Intention to Use ICT

When awareness is aligned well with the targeted audience it will result to trust that lead to positive behavioural change towards the intended objective (Al-Ekam, 2016). As someone recognizes and becomes familiar with the matter, it prompts confidence that directs favourable behavioural intention on the matter in particular (Sacha et al. 2016). In the study by Al-Ekam (2016) where factors affect consumer purchase behaviour were assessed, it was found that the influence of communication (which brings about awareness) on behaviour was partially mediated by trust. Hence the formulation of the following hypothesis:

H4: Trust positively mediates the influence of awareness on young farmers' intention to use ICT for accessing agriculture market information.

4. Conceptual Framework

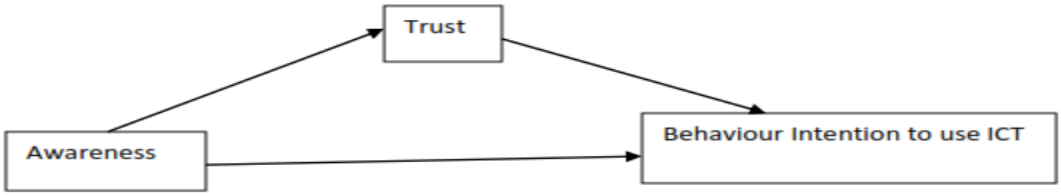

Figure 1: Conceptual Framework

5. Study Methodology

The study was based in rural Moshi (Kilimanjaro) and Ifakara (The business centre of Kilombero and Ulanga district in Morogoro). The study focused on young farmers aged (15-35) who are categorized as youth by the Tanzania National Bureau of Statistics (NBS, 2014). For this study use of ICT for accessing agriculture market information referred to the use of phone for accessing agriculture information. In that regard, the targeted respondents were young farmers who were using phones for accessing agriculture information. Young people are important manpower in economic growth (MALF, 2016). The population of youth in the rural parts of Sub-Saharan Africa is expected to keep rising until 2030 or 2040 (Proctor and Lucchesi, 2012).

The study involved the cross-sectional survey whereby primary data were collected from 409 young rice farmers from December 2018 until February 2019. The structured questionnaire of which the first part had qualifying questions used for profiling and filtering the intended respondent and the second part had a total of 14 items of point 7 Likert scale was used. Wu and Leaung (2017) championed the use of a Likert scale that has more points as it allows capturing

of more information. The collected data were subjected to the screening process and some questionnaires were dropped, the analysis involved 403 questionnaires, comprised of 209 from young female rice farmers and 194 from young male rice farmers.

Measurement Items

Construct	Measured Variable	Source
Awareness (AW) (Independent Variable)	AW1: Use of ICT awareness	Shareef et al. (2011)
	AW2: Awareness that other farmers use ICT	
	AW3: Awareness that ICT reduce cost	
	AW4: Awareness that ICT serve time	
	AW5: Awareness that ICT is reliable	
	AW6: Persistence of use due to awareness	
Trust (TR) (Mediation Variable)	TR1: ICT provide trustworthy information	Slade et al (2015), Palos-Sanchez and Saura (2018), Yan and yang 2015)
	TR2: Information received through ICT is Understandable	
	TR3: Information received support making of reasonable decisions	
	TR4: ICT serve the interest of farmers	
Behaviour Intention (BI) (Dependent Variable)	BI1: Intention to use ICT in the future	Hoque and Sorwar (2017)
	BI2: Intention to use ICT frequently	
	BI3: Intention to use ICT daily	
	BI4: Intention to make use of ICT a priority	

Partial Least Square-Structural Equation Modelling (PLS-SEM) of which the latest version of Smart PLS that is Smart PLS 3 was used for analysis. Compared to Covariance based-Structural Equation Modelling (CB-SEM), PLS-SEM has less restrictive assumptions and still provide paramount predictive accuracy (Wong, 2013). Structural equation modelling allows for testing of latent variables that have chains of relationships such as mediation effects as it was in this study (Ullman 2006).

6. Study Findings

6.1 Respondents Profile

Respondent profile was examined in terms of their gender and the district they reside as well as the rate of using phones for accessing agriculture market information.

6.1.1 Number of Respondents From Each District

The selection of respondent for each district was proportionally done as per the total population genderwise. For both Kilombero and Moshi, the number of young females who were involved in rice farming was a bit high compared to that of young male rice farmers. The figures are as per **Table 1** below:

Table 1: Respondent Gender and District

gender			Frequency	Per cent	Valid Percent	Cumulative Percent
0 Female	Valid	Kilombero (Ifakara)	156	74.6	74.6	74.6
		Moshi Vijijini	53	25.4	25.4	100.0
		Total	209	100.0	100.0	
1 Male	Valid	Kilombero (Ifakara)	146	75.3	75.3	75.3
		Moshi Vijijini	48	24.7	24.7	100.0
		Total	194	100.0	100.0	

6.1.2 Rate of using Phone for Accessing Agriculture Market Information Among Respondents

Most farmers indicated that they were using phone " Often" for accessing agriculture market information. This accounted for 49% for young female rice farmers and 48.5% of young male rice farmers. The figures show a promising future in the use of ICT for accessing agriculture market information among young farmers. The figures are as per **Table 2** below:

Table 2: Respondent Rate of using Phone for Accessing Agriculture Market Information

Gender			Frequency	Per cent	Valid Percent	Cumulative Percent
0 Female	Valid	2 Rarely	30	14.4	14.4	14.4
		3 Sometimes	43	20.6	20.6	34.9
		4 Often	103	49.3	49.3	84.2
		5 Always	33	15.8	15.8	100.0
		Total	209	100.0	100.0	
1 Male	Valid	2 Rarely	14	7.2	7.2	7.2
		3 Sometimes	34	17.5	17.5	24.7
		4 Often	94	48.5	48.5	73.2
		5 Always	52	26.8	26.8	100.0
		Total	194	100.0	100.0	

6.2 Assessment of the Measurement Model

In assessing the quality of the measurement model, indicator reliability, internal consistency reliability, convergent and discriminant validity were assessed through running the consistent PLS algorithm. **Figure 2** below shows the obtained measurement model.

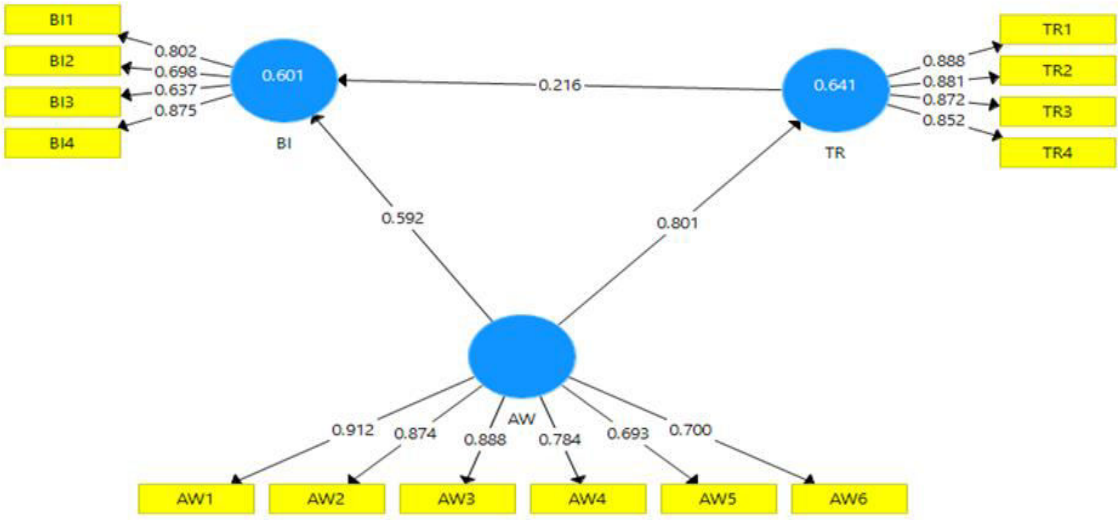

Figure 2: Measurement Model

6.2.1 Indicators reliability

This involved assessment of the factor loadings. Figure 2 above shows the loadings for each indicator, all of the loadings were above 0.6. Hair et al. (2014) indicated that standardized factor loadings of between 0.6 and 0.7 are acceptable to represent factor reliability.

6.2.2 Internal consistency reliability of the constructs

Cronbach Alpha and Composite reliability were used to assess the internal consistency reliability. The values obtained for both Cronbach Alpha (α) and Composite Reliability (CR) were all above 0.8 as indicated in **Table 3**. Vaske et al. (2017) indicated that values > 0.65 are acceptable in showing the reliability of the construct. On the other hand, Bagozzi and Yi (1988) displayed Composite Reliability values ≥ 0.6 as adequate for the indication of the construct reliability.

6.2.3 Convergent Validity

Average Variance Extracted (AVE) was used for the assessment of convergent validity. All the values of AVE obtained were above 0.5 as displayed in **Table 3**. It has been indicated by Fornell and Larker (1981) that AVE values of > 0.5 are adequate to display convergent validity. The same threshold was indicated by Hair et al. (2014).

Table 3: Cronbach's Alpha, Composite Reliability and Average Variance Extracted Values

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
AW	0.920	0.921	0.662
BI	0.846	0.842	0.575
TR	0.927	0.928	0.762

6.2.4 Discriminant Validity

Fornell and Larcker (1981) presented that when the square root of the AVE value is greater than the inter-factor correlation values then it is the indication of discriminant validity. From the obtained results it was found that the square root of the AVE values were greater than the inter-factor correlation values as presented in **Table 4** below.

Table 4: Fornell-Larcker Criterion for Discriminant Validity

	AW	BI	TR
AW	**0.814**		
BI	**0.764**	**0.759**	
TR	**0.801**	**0.689**	**0.873**

6.2.7 Collinearity Assessment

Collinearity occurs when a predictor variable is highly correlated with another predictor variable in a regression model (Hair et al., 2014). In this study, the Variance Inflation Factor (VIF) was assessed to determine whether the collinearity problem exists, according to O'brrien (2007) the VIF values of above 5 and above 10 have been used to indicate the collinearity problem. For this study, the VIF values obtained were less than 3 as presented in **Table 5** below.

Table 5: Collinearity Assessment (VIF Values)

	BI	TR
AW	**2.785**	**1.000**
TR	**2.785**	

6.3 Coefficient of Determination

The results indicated that the predictor variables explained the dependent variable (behaviour intention) by 60.1%. In assessing the extent of the prediction accuracy, the R-square of 0.67, 0.33 and 0.19 are regarded as the presentation of significant, moderate and weak prediction (Chin, 1998). While, Baig et al. (2017) presented R-Square of 0.75, 0.50 and 0.25 as strong, moderate and weak. In this study the obtained R-square fall between moderate and strong

prediction with the value that is greater than the threshold values for the indication of the moderate prediction provided by both by Chin (1998) and Baig et al. (2017).

6.4 Hypotheses Test Assessment

To test for direct and the indirect hypothesized casual links, the consistent PLS bootstrapping was run.

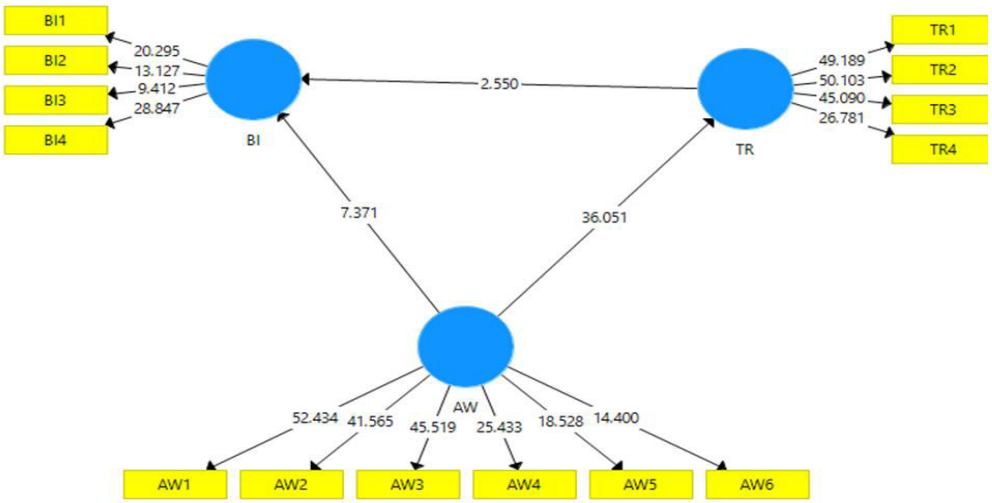

Figure 3: Structural Model

The study had four hypotheses, three direct hypotheses, H1, H2. H3 and one indirect hypothesis, H4. All of the four hypotheses were supported. Such that as it was stated in H1, awareness had a positive and significant influence on young farmers' trust in the market information accessible through ICT. This was evidenced by a positive path coefficient of 0.801, a t-statistic of 35.942 which was greater than ± 1.96 at 95% confidence level and a P-value of less than 0.001. H2 stated that the influence of awareness on young farmers' intention to use ICT was positively significant. This was evidenced by a positive path coefficient of 0.592, t-statistic of 7.2 and a P-value that was less than 0.001. H3 which hypothesized that "trust" will have a positive and significant influence on young farmers' intention to use ICT. This was supported by the reveal of a positive path coefficient of 0.801, the t-statistic of 2.487 and a p-value that was less than 0.001.

Table 6: Direct Effect Hypotheses

Hypotheses	Relations	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Conclusion
H1	**AW -> TR**	0.801	0.801	0.022	35.942	0.000	Accepted
H2	**AW -> BI**	0.592	0.597	0.082	7.200	0.000	Accepted

H3	**TR -> BI**	0.216	0.213	0.087	2.487	0.013	Accepted

H4 which was the hypothesis for the indirect relationship, whereby trust was hypothesized to mediate the relationship between awareness and behaviour intention. The support of this hypothesis was evidenced by a significant t-statistic of 2.475 and a consequent significant P-value of 0.013. This is presented in **Table 7** below. The result revealed a partial mediation as the direct relationship between awareness and intention (H2) was also significant.

Table 7: Indirect Effect Hypothesis

Hypotheses	Relations	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Conclusion
H4	**AW -> BI**	0.173	0.170	0.070	2.475	0.013	Accepted

7. Discussion of the Findings

The study purpose was to examine the mediating role of trust on the influence of awareness on young farmers' intention to use ICT for accessing agriculture market information. The study revealed that awareness is positive and significance in building trust such that it built a foundation for young farmers to be willing to use phones for accessing agriculture market information. These findings complement findings from Sastika et al. (2016) and Bilgin (2020) who also showed that awareness was influential in suppressing hesitation, overshadowing uncertainty and create confidence and positive expectation on the subject in particular. Likewise, awareness was found to be significantly positive and significantly influential on young farmers' intention to use ICT. In that sense, it indicated that if young farmers become aware that they can use phones for accessing agriculture market information as well as becoming aware on the benefits of using phones for accessing information, then it will act as a catalyst and stimulate their intention to engage into the use of phones for accessing agriculture market information. Similar findings were reported by Anoop et al. (2015) and Baba and Haruna (2017). Nevertheless, as it has been indicated in the results, trust was significantly positive in influencing the behaviour intention of young farmers. This implied that, as young farmers found the agriculture market information accessed through ICT to be understandable, accurate and reliable; henceforth, allow them to make decisions that are beneficial to them it induced their intention to engage into using ICT for accessing agriculture market information. Beza et al. (2018), Harris and Achora (2018), and Parmar (2015) also found trust to be positively influential in predicting behaviour intention to use ICT among farmers.

Trust was found to have a significant mediating effect on the relationship between performance expectancy and behaviour intention while at the same time the results also revealed that

awareness had a positive and significant influence on behaviour intention. This implies that the mediating effect of trust on the relationship is partial. That is to say, awareness affects behaviour intention through trust and also has some direct effect on behaviour intention that are not explained through trust. These results are similar to Al-Ekam (2016), however, they differ from Pramudya (2018) who found trust to have no mediation effect between awareness and behaviour intention of airline online ticket buyers. An indication that different context may lead to a different outcome when the same variables are assessed.

8. Study Contribution

While several studies have assessed the influence of awareness on the intention to use ICT in the field of agriculture such as (Anoop et al., 2015 and Baba and Haruna, 2017). No study has been found to assess the mediation role of trust on the relationship between awareness and behaviour intention to use ICT in the agriculture field as per the review of literature by the researcher. This study becomes an addition to the limited literature on the same in the field of agriculture.

Second, the study has focused on youth in the rural areas who have been indicated to have less interest in investing in agriculture following low returns from the sector(MALF, 2016; Castella et al., 2018). Since the use of ICT has been labelled to have potential in improving different agriculture sub-sectors and among them being easy to access market information and hence increase in profitability. Better understanding on what motivate youth to engage in the use of ICT and being able to promote it among them and give them a chance to see the benefits of doing so can induce their involvement in the sector. As the number of youth in the rural area in Sub-Saharan Africa is keeping on increasing Proctor and Lucchesi (2012) and at the same time agriculture is the major source of income in the rural areas to most of the Sub-Saharan African countries including Tanzania (MALF, 2017). The involvement of youth into the sector becomes essential to the sustainable economic development of the rural areas and the country at large. This study adds to the limited number of literature that has solely focused on youth.

9. Conclusion and Recommendation

Awareness and Trust have been found to play an important role in intention to use ICT among young farmers. It is therefore recommended that, for the successful integration of ICT among young farmers in the rural areas, government and other stakeholders need to make sure that they create awareness on how ICT can be used to access market information and the importance of the same. Awareness is essential in changing the traditional way of accessing information which has hindered access to up to date and real-time appropriate agriculture information here being market information. Awareness brings about confidence (trust) on the expected benefits hence stimulate the intention to use ICT which is prerequisite to actual use. Use of ICT for accessing agriculture market information has proved to be profitable to farmers and the agriculture sector

in general (GSMA, 2015; MVIWATA, 2013). Hence the proper integration of ICT among farmers is essential.

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