

Developing an Understanding of Barriers to ICT Use: Caribbean Extension Officer's ICT Use, Acceptance, and Self-Efficacy

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Introduction and Theoretical Framework

Information Communication Technologies (ICTs) include hardware and software associated with desktop, laptop, and tablet computers, cellular and land-line telephones, radio towers, televisions, DVD players and more (McCole, Culbertson, Suvedi, & McNamara, 2014). The advantages of ICTs enable extension officers to respond to audiences faster, disseminate information to larger audiences, and save travel time and expenditures (Ganpat, Webster, & Narine, 2014). Strong, Ganpat, Harder, Irby, and Lindner (2014) suggested future research should examine new extension officers' capacity for using ICT's.

The theories utilized to frame this study were Venkatesh, Morris, Davis, and Davis' (2003) Unified Theory on the Acceptance and Use of Technology (UTAUT) and Bandura's (1991) self-efficacy. The UTAUT is a method of assessing the likelihood of success for new technology introductions and enhances the understanding of what drives acceptance of technologies. The four constructs of the UTAUT are performance expectancy, effort expectancy, institutional support, and social influence (Venkatesh et al., 2003). Self-efficacy is an individual's belief in their personal capabilities and access to sufficient resources to accomplish a given task (Bandura, 1991).

Purpose and Objectives

This study was a part of a larger study seeking to understand barriers that prohibit new extension officers from using ICTs. Performance expectancy and effort expectancy are not provided here. More specifically, this study sought to:

1. Describe total ICT use by new extension officers;
2. Describe participant's institutional support to access ICTs for their extension work;
3. Describe participant's social influence impacting ICT use; and
4. Describe participant's self-efficacy with using ICTs as extension officers.

Methodology

Sixty-two ($N = 62$) new extension agents in the North and South Extension services of Trinidad, the Extension Training and Information Services and the Tobago Division of Agriculture, State assisted organizations and private extension service providers across the country were targeted during March to May 2015 using self-reporting questionnaires. The survey was conducted on a weekly basis on the mandatory office days of the agents and fifty-seven ($n = 57$) officers participated; yielding a 92% response rate. The reliability coefficients for institutional support was .89, social influence .86, and self-efficacy .93.

The survey instrument captured comprised four sections: seventeen demographic and job characteristics questions, level of access to twelve ICT tools (which included devices and applications, cellular phones, computer and network hardware and software, internet, websites, satellite GPS etc.), thirteen questions to assess level of institutional support, and eighteen questions to assess social influence on ICT use. The instrument was examined for content validity by a panel of six experts in the field of extension and edited according to the recommendations and feedback given before final approval. Descriptive statistics using means and standard deviations were used to describe the study population.

Findings and Conclusions

Most respondents were employed by the Public extension service (95%) and were Agricultural Assistants I (82%) while 14% and 4% were Agricultural Extension Aides (AEAs) and Agricultural Officers (AOs) respectively. With respect to education, 30% possessed associate degrees, 25% had an undergraduate degree, 22% completed postgraduate degrees and 14% had only a post-secondary degree. Most officers had 1-5 years of working experience (63%) while 33% and 4% had less than 1 year and 6-10 years' experience respectively. Similarly, most were between the ages of 18-30 years (77%) and 49% were males. Most officers specialized in extension (49%) and crop production (37%) while a minority had expertise in livestock production (12%) and administrative services (2%). The sample majority earned \$TT (Trinidad Dollars) 5,000 to \$7,000 (88%).

The majority of new extension officers (81%) reported using some level of ICTs in their work. The main ICTs that were perceived very useful were cellphones (86%), presentation software (70%) and emails (25%). The least useful ICT to extension officers were GPS technologies. Access to specific ICTs was not a challenge. Respondents reported a moderate level of access to computer hardware (printer, scanner and projector), the Internet, and computers.

In regards to institutional support, the majority ($n = 38$, 67%) of respondents reported that administrators understand the importance of using up to date technology in conducting extension work. Thirty-two ($n = 32$, 56.14%) respondents indicated administrators gave sufficient support for programs which involve new extension methods. However, respondents reported that lack of proper facilities existed for the use of new extension ICTs and that there were inadequate financial support and approval from administrators to conduct programs using ICTs.

The social influence construct had some level of importance on ICT use. Most respondents indicated that social influence had a significant ($p < .05$) impact on their use of computers, cell phones and the Internet. The ICTs with the least social influence impact were use of mobile apps, web based apps, and GPS technology.

In regards to self-efficacy, most ICT issues created moderate level of difficulty for extension officers. Most items had some positive influence on respondents' use of ICTs (Overall

$M = 5.96$: range 1-10). Respondents were most comfortable in using ICTs for evaluation purposes and to promote alternative/additional information to clarify confusion among clients. However, respondents were least comfortable responding to clients' questions using ICTs.

Recommendations, Educational Importance, Implications, and Application

Future studies should examine farmer's ICT use and evaluate knowledge farmer's gained through ICT use. Perpetual assessments of extension officers' ICT use is important. New extension officers need to be updated on ICT tools (McCole et al., 2014) on a regular basis and new ICTs should be made available to help extension officers achieve peak performance (Venkatesh et al., 2003).

This study underscored the importance of training extension officers to use ICTs given job demands, and thus, to help job retention and reach larger audiences faster. Training would enhance new extension officer's self-efficacy (Bandura, 1991) with ICTs and enable extension officers to use (Venkatesh et al., 2003) ICTs more to reach larger audiences in a shorter amount of time (Ganpat et al., 2014; Strong et al., 2014). ICT trainings could be offered by the Ministry of Agriculture, faculty at local Caribbean institutions studying ICT use, and faculty teaching with ICTs around the world.

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