

Factors Effects the Inclination of Farmers to Usage Whats App as Agricultural Knowledge Sharing Evidence from Abd El Hakam Block, Gazera scheme, Sudan

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ABSTRACT :

The study evaluated the Factors affecting the use of the *Whatsapp* application in disseminating marketing information. The specific objectives were Measuring the extent of the respondents' knowledge and use of the *Whatsapp* application Comparison between the different methods of transmitting information through the application, and the preference of respondents for each method Explain the type of marketing information provided to respondents through various methods, identify the type of marketing information that respondents want to obtain via *Whatsapp* application, examine the relationship between the socio-economic characteristics of the respondents, and the level of respondents' satisfaction with the ways of displaying information on the *Whatsapp* application, examine the relationship between some of the socio-economic characteristics of the respondents and their level of satisfaction with the information provided to them through the *Whatsapp* application. The sample was made up of 100 farmers randomly selected from the Study Areas. Questionnaires were used in data collection. Data were analyzed by the use of percentage, mean, standard deviation and chi-square test.

It was found that the level of respondents aware of the application was significantly (3.66), as well as the degree of respondents' use of the application (3.52), the extension information provided to the respondents in the form of video is the best followed by the information provided in the form of pictures and then presented in the form of audio only and finally presented in the form of text. the most audio marketing information provided to respondents via *Whatsapp* was about the harvest (3.92) and appropriate market (3.42). Most of the marketing information pictured, such as video, provided to the respondents via the *Whatsapp* application, was about transportation (4.01), appropriate market (3.21), display methods (3.30) and preparation (2.90), respondents wish to obtain information via the *Whatsapp* application about Storage (3.04) and Display Styles (3.15). There was a significant relationship ($P < 0.05$) between respondents marital status and the information provided to the respondents about the harvest process ($r = **0.590$). There was a significant relationship ($P < 0.05$) between respondents age Group and the information provided to the respondents about the Promotion Methods ($r = **0.264$).

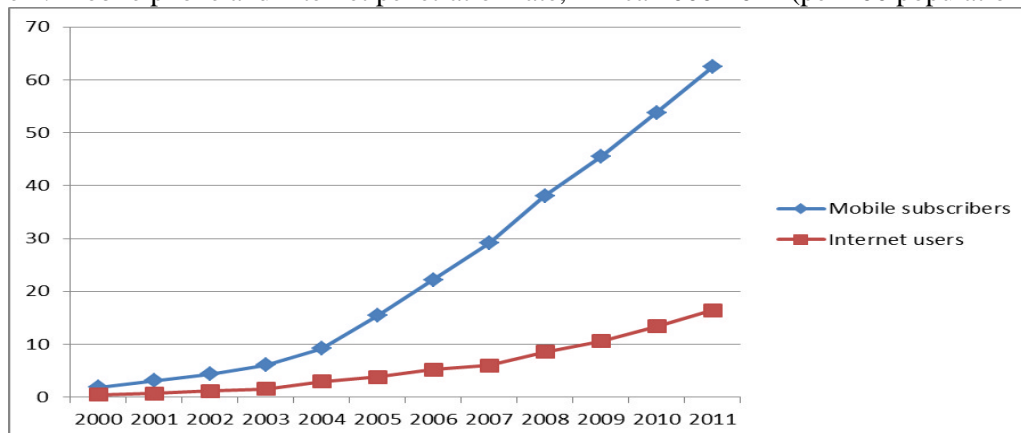
Key words: ICTs, agricultural extension services, marketing information, *Whatsapp* application

Introduction:

Information Communication Technologies (ICTs) refer to hardware, software, networks and media for collection, storage, processing, transmission and presentation of information in the format of voice, data, text and images (World Bank, 2002). The role of ICTs as an instrument for progress and development has been widely acknowledged in this 'Global Information age', and it has been observed that people with all walks of life are being impacted by the IT sector directly or indirectly. ICTs can play a significant role in rural development by helping the rural farmers to access new knowledge, up-to date information and entrepreneurship skills. There are different ICTs including computers, internet, geographical information systems, mobile phones and traditional media (*radio, television*) which are used in delivering agricultural information to the farmers (Stienen et al., 2007).

While the development and use of ICTs have increased in every corner of the African continent, mobile phones in particular have been sweeping across the landscape at a remarkable rate. Figure 1 below displays this recent swell of mobile phones on the continent.

Figure 1: Mobile phone and internet penetration rate, Africa 2000-2011 (per 100 populations)



Source: World Bank (2013).

The figure demonstrates the meteoric rise in the penetration rate of mobile phones in Africa between 2000 and 2011. During this period, the mobile phone penetration rate shot up from 1.9 percent in 2000 to 62.4 percent in 2011 (World Bank 2013). The use of mobile phones in poverty reduction and rural development has ignited much interest over the past decade. Mobile phones have become a crucial part of our daily life nowadays. Everyone has a personal cell phone of their own. Mobile phones have been developing very fast since 1995 (Chowdhury, 2012). They are used not only for making calls and messaging, but also for play music, watch a movie; access internet and a variety of applications. To give more functionality in mobile phones, many operating systems are developed such as Windows Mobile, IOS, Symbian and Android. Android is grabbing more and more user attention and thousands of Android applications are currently being developed. (Jadhav, Bhutkar, & Mehta, 2013).

Social networks are online services, platforms or sites that focus building and reflecting social relations among people, who, for example, share interests and or activities. Social networking sites are websites that allow those who have account with them to communicate with a selected group of friends (Awake, 2011). Boyd and Ellison define social networks as “web-based services that allow individuals to: (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system.” Boyd and Ellison (2007, pp.78-100). Social media and social network services such as *Facebook*, *Twitter*, *WhatsApp* enable easier accessibility and retrieval of information from anywhere and at any time. Through these apps, information is becoming intertwined with our daily lives and could either enhance productivity, efficiency and intelligence or make users vulnerable to its side effects. *WhatsApp* Messenger is a proprietary, cross platform instant messaging subscription service for smart phones and selected feature phones that uses the internet for communication. In addition to text messaging, users can send each other images, video and audio media messages as well as their location using integrated mapping features. *WhatsApp* is an application available on the new generation smart phones like iPhone, Android, Blackberry, Samsung and Sony. Users are not charged for a text sent through *WhatsApp*. This is because *WhatsApp* sends messages through an internet data connection. *WhatsApp* supports many different message types, from simple text to pictures to audio files and videos (Yeboah, Horsu and Abdulai, 2014; Bouhnik and Dshen, 2014 and Alsanie, 2015).

Mobile phone application provides existing new ways through which extension workers can reach farmers in rural areas that have in the past been very difficult to contact, particularly in developing countries. Ownership and use of mobile phone among the rural farmers has continued to increase thereby increasing the chances of contacting farmers in their communities for extension activities. Mobile phones are fast becoming the new tool for agricultural extension service. (Gakuru et al., 2009, Anderson & Fedder, 2007; Aker, 2011). We have always emphasized on the importance of the research-extension-farmer linkage, be it linear or interactive. But there are many more aspects of communication that have been out of the limelight in development perspective. Be it research-research

linkage, extension- extension linkage or farmer-farmer linkage the interaction among the homogeneous groups around the world are also of similar importance considering world a global village, and to increase this interactiveness, social media can play a vital role. Social media has changed the way we think, talk, watch TV, listen to music, and search potential employer and employee. (Saravanan, R, 2013). Social media have the potential for Agricultural Knowledge Sharing because of its unique built-in functions that offer pedagogical, social and technological affordances; and to be used for online discussions, either as an alternative to e-extension or to complement such platforms; and to create a promising virtual tool and environment to promote interaction in extension learning, and when social media is taking up a large share of the waking hours of today's and yesteryear's generation, it is predictable that agriculture will take up the platform to engage its own advocates and practitioners. Farmers, researchers, enthusiasts and professionals have taken up Social media (*WhatsApp* and *Facebook*) to share their views, their experiences and their ideas through various communities in Social media. It is said that pictures speaks a thousand words and if so, videos must tell stories and that is what different agricultural organizations are doing through YouTube to help out everyone related to agriculture. Sound cloud has made audio clips related to agriculture accessible to all and in all these; the agricultural world has become more connected than ever before. (Saravanan, R 2013).

Farmers make critical decisions throughout the year include those based on choice of inputs and market transactions related to them, farm operations, post-harvest operations and transactions and others. Further, at the level of households, a number of nonfarm decisions are made related to consumption, savings, investments, education, and health, among others, which impact farm operations. Typically, farmers rely on accumulated experience and the support of local organizations for information related to both farm and non-farm decisions. They also receive information from radio and television broadcasts by experts and professionals from more distant sources. Together, these form the local knowledge system accessible to a small farmer for making decisions. Often, this system is inadequate and many decisions are made with limited information. The decisions are also subject to high transaction costs and time delays. The role of ICT in such a scenario is to provide timely information, increase choice, reduce transaction costs, and contribute to improving the efficiency of decision making to raise rural incomes and improve the quality of life of the rural populations (Rao N.H., 2007). as cited by (Sousa et al 2016) Mobile phones have become an important tool for communication in rural Africa (*Asenso-Okyere and Mekonnen 2012; Simba 2014; Mwombe et al. 2013*). With the availability of cheaper third generation (3G) mobile phones, which are imported mainly from Asia, video and Bluetooth technology have become increasingly accessible to the rural population (*Bello-Bravo et al. 2013; Hosman 2012; Botha et al. 2010; Momo 2005*). mobile phones are the most widely used ICT device in rural areas, There are no available statistics data that provide detailed on how many of these mobile phones with social network services such as *Facebook, Twitter, WhatsApp*, which would indicate how many farmers have access to different message types as an Agricultural Knowledge Sharing, from simple text to pictures to audio files and videos. In any case, the potential of social network as a component of an agricultural extension Knowledge Sharing remains quite underexplored by research. This paper aims to describe the Factors Effects the Inclination of Farmers to Usage *Whats App* as Agricultural Knowledge Sharing in Gezera state rural areas.

Methodology:

This study was conducted in the Abdel Hakam block which is one of centre group in Gezera Scheme and the nearest group to Wad Medani town (*the capital of Gezira State*). It is located between Latitudes 13°30 - 15°15 North of Equator and Longitudes 32°30 - 33°30. The target population was all farmers who grew Chick pea (*Cicer Arietinum*) in the season 2016 -2017 in Abdel Hakam block the farming population is over 670farmers. A simple random sampling of 100 respondents or farmers from the Study Areas was selected. Descriptive research methodology was used for gathering information or data from the sample. A questionnaire consisting of three main questions was constructed in line with the objectives of the study and the personal interview technique was used to

administer the questionnaire. Descriptive statistics which involves the use of frequency-distribution and percentages are used to achieve the objectives stated.

Results and discussion:

Respondents' Socio- economic Characteristics

Table 1 below indicates the distribution of the respondents according to Socio- economic Characteristics. Most of the respondents were under the age group (54-45) representing 28% followed by the age group (44 - 35) with 25 %, and (34 - 25) age group representing 24 % while the age group (20-29) represents only 5% of the total number of respondents. Respondents' distribution according to the education level 82% are Primary education, 7% Secondary 2% have Universities and 1% have Post-graduate Degree holders that mean 98% of the represents have received formal education (Primary, Secondary, Universities, Post-graduate). While 8% of the represents were illiterate, of the 100 respondents, (60%) were married, (11%) never married, (8%) widowed while (21%) were divorced.

Table (1): Percentage distribution of Respondents' according to Socio-economic Characteristics

Age Group	Frequency	Percent	Marital status	Frequency	Percent
Less than 25	7	7	Married	60	60
25-34	24	24	Divorced	21	21
35-44	25	25	Widowed	8	8
45-54	28	28	Single	11	11
55-64	10	10	Total	100	100%
More than 65	6	6	Land size	Frequency	Percent
Total	100	100%	Large	46	46
Education Level	Frequency	Percent	medium	44	44
Illiterate	8	8	Small	10	10
Primary	82	82	Total	100	100%
Secondary	7	7	Land ownership	Frequency	Percent
Universities	2	2	Owner	47	47
Post-graduate	1	1	Crops share	39	39
Total	100	100%	Grant	14	14
			Total	100	100%

1. The level of respondent's awareness and use of *Whatsapp* application :

Whatsapp application was found to be widespread in the study area, with remark (3.66) for respondents aware of the application and (3.52) for respondents' use of the application as shown under the remark columns (table I) by using a cut-off point of (2.50) which indicates the spread of the application among members of the study community with a high degree of ease of use and its suitability of the knowledge level of the respondents. so that *Whatsapp* application were found to be widespread in the study area, It is reasonable to suspect that the presence of *Whatsapp* may be similarly widespread in other blocks and groups in Gazera Scheme with similar socio-economic circumstances. These findings indicate that the whole sample had potential access to the *Whatsapp* application.

Table (2): shows the level of respondent's awareness and use of *Whatsapp* application

Extension program characteristics	mean	standard deviation	Value
awareness level of the application	3.66	1.091	great
Degree of use of the application	3.52	1.051	great

2. Rank order of displaying information on *Whatsapp* application :

Table 3 shows the Rank order of displaying information on *Whatsapp* application according to preference, from the viewpoint of the respondents. From Table 3 it is clear to us that the extension information provided to the respondents in the form of video is the best, followed by the information provided in the form of pictures and then presented in the form of audio only and finally presented in the form of text. It is said that pictures speaks a thousand words and if so, videos must tell stories This is because

the way that addresses more than one person's sense of guidance work is the most capable way to reach the minds and hearts of the respondents.

Table (3): shows the Rank order of displaying information on *Whatsapp* application according to preference, from the viewpoint of the respondents

message types	Percentage of farmer and their respective ranking for the different message types (n=100)			
	1st	2nd	3rd	4th
videos	67	16	12	5
pictures	45	26	11	18
audio	10	54	8	28
Text	10	21	2	67

3. Test of Hypothesis:

To test the hypothesis (*there is no statistically significant relationship between the socio-economic characteristics of the respondents and the percentage of respondents' satisfaction with the ways of displaying information on the application*) researcher used chi-square (χ^2) test.

The age of *Whatsapp* users is seen as a variable that influences usage of the medium and the activity that one does with it Table 6 indicates that all respondents with their different levels of age receive information through different methods of presentation in the application (*text, audio and video*). The results also showed that there is a significant relationship between the respondent's age and the degree of satisfaction with the methods of presenting information through sound ($P=0.040^*$) and video ($P=0.015^*$) ($P<0.05$), meaning that the respondent's age affects the degree and satisfaction of the respondents with the way the information is presented through Audio and video.

Conclusion :

The research has attempted to find the perception and attitude of students' (teacher trainees) towards WhatsApp m learning by creating WhatsApp learning atmosphere. The findings indicate that student finds WhatsApp m learning ubiquitous aspect interesting and educationally useful. Apart from it they also find it a collaborative learning experience and helpful in increasing their social interactivity with peers and teachers. A positive attitude of students towards *Whatsapp* m learning was highlighted from the study.

Students' gave preference to *Whatsapp* m learning over traditional classroom and has also shown their willingness to use it in the future.

Moreover, according to the findings of the study, *Whatsapp* m learning is not suited to married students and they prefer traditional classroom teaching learning. This is because they it disruptive to their family life and time. This is in line with the findings of Bere, 2013.

As of now, it is possible to say that students have positive attitude towards using *Whatsapp* in education as it enables them to co-operate and work as a team which is not fully developed in the traditional classroom. But if we want *Whatsapp* m learning to become a common tool teaching and learning, there will be need of further researches in identifying its educational and pedagogical goals as well as for concluding its theoretical and practical implications. The study has dealt with teacher trainees of particularl B.Ed. programme (*a Graduate course in teacher education*); further researches should examine other courses as well.

1.Type of marketing information accessed by farmers through *Whatsapp*:

From table 4, it becomes clear to us that the most audio marketing information provided to respondents via *Whatsapp* was about the harvest (3.92) and then the appropriate market (3.42) with a degree (high) and transportation (2.20) with a degree (medium) and very weak for each of the display methods Preparation, Promotion Methods, Storage (1.57, 1.54, 1.20, 1.00) respectively. as for the most illustrated marketing information provided to the respondents via *Whatsapp*, it was about display methods (3.30) and how to transfer (3.20) with a (average) market degree (2.10) with a weak degree. and very weak for preparation, promotion, storage and harvest methods (1.58, 1.50, 1.38 and 1.21), respectively.

Most of the marketing information pictured, such as video, provided to the respondents via the *Whatsapp* application, was about transportation (4.01) with a high degree and appropriate market (3.21), display methods (2.92) and preparation (2.90) with a

medium degree for each and with a very weak degree for both the harvest (2.42) and the promotion methods (2.10) and the storage (51.0). As for the most textual marketing information provided to the respondents via *Whatsapp*, it was about display methods (3.15) storage (3.04) the harvest (2.68) with a medium degree and methods Promotion (2.55), transportation (2.11), with a weak degree, while preparation (1.53), appropriate market (1.32), was very weak.

Table (4) :shows the Type of marketing information accessed by farmers through *WhatsApp*

Marketing information	Percentage of farmer and their respective ranking for the different ICT (n=100)							
	audio		pictured		Video		text	
	mean	standard deviation	mean	standard deviation	mean	standard deviation	mean	standard deviation
Harvest	3.92	0.956	1.21	1.033	2.42	1.005	2.68	1.290
Transportation	2.20	1.068	3.20	1.064	4.01	0.883	2.11	0.986
Storage	1.00	1.068	1.38	0.956	51.0	0.899	3.04	1.228
Preparation	1.54	1.132	1.58	1.095	2.90	0.825	1.53	1.225
Appropriate Market	3.42	0.999	2.10	1.260	3.21	0.767	1.32	1.079
Display Styles	1.57	1.000	3.30	1.127	2.92	0.836	3.15	1.042
Promotion Methods	1.20	1.071	1.50	1.223	2.10	0.892	2.55	0.767

2. Type of marketing information accessed by the farmers:

From the above table it becomes clear to us that respondents wish to obtain information via the *Whatsapp* application about Storage (4.10) and the appropriate market (3.68) to a large degree and with a medium degree of information about transportation (3.23) preparation (3.23) harvest (3.13) methods of promotion (2.93) Display Styles (2.83).

Table (5) :shows the type of marketing information accessed by the farmers

Type of marketing information	mean	standard deviation	Rank order
Harvest	3.13	1.095	I
Transportation	3.23	1.015	II
Storage	4.10	0.951	III
Preparation	3.23	1.064	IV
Appropriate Market	3.68	1.033	V
Display Styles	2.83	0.977	VI
Promotion Methods	2.93	1.071	VII

The relationship between the socio-economic characteristics of the respondents and the percentage of respondents' satisfaction with the ways of displaying information on the application

Type of marketing information	Age Group	Education Level	Marital status	Land size	Land ownership p
Harvest	0.158	-0.015	**0.590	0.002	0.110
Transportation	0.015	0.015	0.115	0.025	- 0.002
Storage	0.049	-0.129	0.067	0.131	0.042
Preparation	0.042	0.013	0.079	0.185	0.001
Appropriate Market	0.018	0.132	- 0.140	0.001	- 0.101
Display Styles	0.041	0.156	0.005	0.044	0.034
Promotion Methods	** 0.264	0.009	0.008	0.009	0.035

To test the significance of the relationship between the socio-economic characteristics of the respondents and the percentage of respondents' satisfaction with the ways of displaying information on the application presented to them via the *Whatsapp*, the following statistical hypothesis has been formulated (*there is no relationship between the percentage of respondents' satisfaction with the ways of displaying information on the application presented to them via the Whatsapp and the socio-economic characteristics of the respondents*) and to test this relationship a simple correlation coefficient was used for Pearson and the value of the Pearson correlation coefficient (0.110) is smaller than its tabular counterpart at a significant level (0.05) which equals (0.199). This indicates that there is no significant relationship between the ownerikh; ughrm `hj lghgm Ypwhzdm

ownership of the respondents and the level of their knowledge of the marketing information about the harvest presented to them through the *Whatsapp*. Based on this, the previous statistical assumption can be accepted, and therefore there is no correlation between the level of respondents' knowledge of the harvest marketing information provided to them through the *Whatsapp* and their ownership of ownership.

Table (6): shows the respondents socio-economic characteristics and Level of satisfaction with the ways of displaying information on the application

socio-economic characteristics	respondents' satisfaction with the ways of displaying information through the application		
	audio	text	Video
Age Group			
Less than 25	9	18	26
25-34	15	45	41
35-44	25	16	14
45-54	13	9	7
55-64	31	6	7
More than 65	7	6	5
Chi-square Estimates	0.040*	0.689	0.015*
Education Level			
Illiterate	7	8	6
Primary	79	76	77
Secondary	10	12	13
Universities	2	2	2
Post-graduate	2	2	2
Chi-square Estimates	0.176	0.016*	0.002**
Marital status			
Married	62	69	54
Divorced	21	20	31
Widowed	8	5	8
Single	9	6	7
Chi-square Estimates	0.241	0.025*	0.026*
Land size			
Large	30	52	38
medium	48	27	43
Small	22	21	19
Chi-square Estimates	0.224	0.003**	0.051
Land ownership			
Owner	46	43	37
Crops share	31	32	43
Grant	23	25	20
Chi-square Estimates	0.253	0.073	0.061

* significant at 0.05

**significant at 0.01

Level of education was included in the study since it is expected that understanding the features of *Whatsapp* and how they work is influenced by the level of education that the respondents have attained. The results in Table 6 show that the level of education of the respondents affects their degree of satisfaction with the ways of displaying information on the application where the results of the chi-square analysis indicate a relationship between the level of education of the respondents and the degree of their satisfaction with the ways of displaying information through text and video ($P=0.016$ and $P=0.002$) respectively, and the results indicate that the degree of satisfaction of respondents with receiving information through text and video varies between learners and those with limited education, meaning that the higher level of education of the respondents, is greater the level of satisfaction with the information provided via text and video.

The study sought to find out the marital status of the respondents with a view to measure whether it has an influence on the level of satisfaction with the ways of displaying information through the application. the results in Table 6 show that all respondents with different marital cases receive information through the different presentation methods in the application (*text, voice, and video*). Where the results of the chi-square indicate a significant relationship between the social status and the degree of satisfaction of the respondents with the methods of presenting information through the text ($p= 0.025$) and the video ($P= 0.026$), and this confirms that the social status of the respondents is one of the factors affecting their level of satisfaction with receiving information through text and video, where the presence of both spouses affects the degree of their satisfaction with the

ways in which information is presented through text or video negatively or positively Table 6 indicates that the size of the tenure affects the degree of satisfaction of the respondents through the presentation of information on the application through the text (0.003**), meaning that the increase in the size of cultivated land increases the degree of satisfaction among the respondents about providing information through the texts.

Also the results in Table 6 show that there is no relationship between the degree of satisfaction of the respondents by means of presenting information on the application and their level of ownership of lands in the study area.

Results suggest that:

- Many of the extension agents did not have access to *ICTs*.
- Consequently, the extension agents did not make use of *ICTs* in disseminating research information to farmers.
- A lot of constraints are facing the extension agents in the use of *ICTs*.
- The extension agents still depended much in the use of individual contact method of extension delivery.
- The constituted governments and NGOs should provide and stimulate the use of *ICTs*.
- Appropriate legislation should be made on the use of *ICTs*.

Recommendations:

Based on the conclusions drawn from this study, authors have made the following recommendations to the respective policy makers, Agricultural extension and advisory services organizations, extension agents and farmers.

Recommendations to Policy Makers:

1. Ministry of Agricultural should consider allocating more funds towards the connectivity of Internet in all agricultural extension services office. Internet access is essential for successful adoption of *Whatsapp* mobile extension services.
2. More efforts should be exerted to train extension officers and beneficiaries on the use of modern *ICTs*
3. The government should lessen mobile tariffs, particularly through encouraging rigorous competition between mobile phone providers in rural areas so that many farmers afford both buying and running cost of mobile phones

Recommendations to Agricultural extension and advisory services organizations:

1. University councils and senate should enforce the prohibition of the use of phones during lectures. It is advisable that students should stop accessing social networking sites during lectures as it would disturb others.
2. Higher education institutions should organize more seminars and conferences to enlighten students on the negative impacts of using social networking sites since most of the students get addicted with the Internet use and thus neglected their studies.
3. The government, NGOs and other development agencies should introduce Social networks especially in rural areas through which farmers could be capable to communicate agricultural information
4. Education seemed to have an influence on farmers degree of satisfaction in the study area provision of education to farmers concerning social networking use could make social networking better used in communicating agricultural information. provision of education to farmers concerning mobile phones use could make social network better used in communicating agricultural information. provision of education to rural people on the use, modes of application and benefits associated with mobile phones could be important.

Recommendations to Educators:

1. An assessment that addresses teachers' inadequacies in *ICT* should be carried out to ensure teachers' effective use of computers.
2. Senior or elder teachers require more *ICT* training as they are incompetent in *ICT* affairs.
3. The constraints which are facing the use of *ICTs* in the agricultural extension services in the State should be solved by all concerned partners.

Recommendations to Parents:

1. Parents should possess positive attitudes towards the adoption of *ICT* by preparing

their children in ICT competence.

2. Parents should improve the limited ICT facilities and resources at home in order for their children to adopt ICT learning.

Recommendations to Students:

1. Students who are heavy users of Internet should moderate the use of social networking sites to avoid addiction.

2. Students should realize the benefits and dangers associated with the use of social media sites and create a balance between their online and offline lives

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