



Assessing the Behavioural Component of ‘Diploma in Agricultural Extension Services for Input Dealers (DAESI)’ Programme Trainees towards ICTs usage for Sustainable Agriculture in the Sub-Himalayan Region

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ABSTRACT

In the changing global scenario, agriculture been time critical and knowledge-driven system. The development and growth of agriculture depend on the appropriate knowledge and information. Agricultural Extension, in the current scenario is rapidly shifting globally and the traditional knowledge sharing mechanisms may not cater to the needs of the farmers. Information and Communication Technology (ICT) can be a key enabler and a vital component of the new knowledge-based economy and is capable of revolutionizing the process of information dissemination and knowledge. In such a resilient backdrop, the present study was conceptualized to assess the behavioural component of DAESI Programme Trainees towards ICTs usage for Sustainable Agriculture. It was conducted in two Sub-Himalayan districts of West Bengal viz. Cooch Behar and Alipurduar districts. Sixty input dealers registered under DAESI programme at KVK Cooch Behar were interviewed through a pre-tested, structured interview schedule developed to measure behavioural component of the trainees with the help of Google forms. The behavioural component namely attitude towards ICT usage of the trainees was considered as the predicted variable and fourteen other attributes were considered as the independent variables for the study. The data was processed with the help of statistical tools like frequency, percentage, mean, standard deviation, correlation and regression analyses. The result shows that among the variables of extension professional; Age is negatively and significantly associated with Attitude towards ICTs. The variables Achievement motivation, Economic motivation, Risk preference are positively and significantly associated with Attitude towards ICTs. Multiple regression analysis revealed that variables aspiration towards cutting edge technology, annual income are positively and significantly contributing and annual expenditure and smart gadget possession are negatively and significantly towards the predicted variable attitude of the DAESI programme trainees towards ICTs usage. The R² value was 0.437, which inferred that the fourteen predictor variables put together have explained 43.7 per cent variation embedded with the predicted variable Attitude towards ICT usage by the respondents

Key words: Attitude; ICTs; Sustainable livelihood; DAESI, Digital.

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INTRODUCTION

In the changing global scenario, agricultural development is very much information and knowledge intensive. The development and growth of agriculture depend on the appropriate knowledge and information along with a strong information dissemination network. Agricultural Extension, in the current scenario is rapidly shifting globally, it has been recognised as an indispensable mechanism for saving knowledge (information) and advice as an input for modern farming and the use of ICT in actualizing so has made the involvement of practitioners⁵. Farming is one of the most important sectors in India and could benefit farmers tremendously with the applications of Information and Communication Technologies (ICTs) especially in bringing changes in socioeconomic conditions of the poor in backward rural areas. According to Arkhi *et al.*⁶, considering the role of Extension in the Agricultural Information system as a connector between the farmers and the research centres, but the ground reality is hard-hitting with only one extension worker available for every 2879 farmers in India⁸, and on the other hand a recent survey conducted by National Sample Survey Office (NSSO) reported that only 41 per cent of the farm households received any assistance from either government or private extension services, and the government extension machinery covering only 11 per cent of the households who received extension assistance⁹. Some of the studies have also indicated that input dealers are consulted more frequently by farmers than any other sources. This is one of the large networks with 2.84 lakh Agri-input dealers operating in rural areas throughout the country and is regarded as the second most important source of farm information by the farming community after progressive farmers. Thus, in agricultural development input dealers occupy a prime position at the grass root level⁷. In India, according to Adhiguru, *et al*¹ in terms of accessing information sources, smallholder farmers relied primarily on progressive farmers (16.7%) followed by input dealers

(13.1%), radio (13%), television (9.3%), newspapers (7%) and extension worker (5.7%). Yenagi, *et al*³ have also observed that most of the farmers (61.6%) approached private input dealers followed by friends, neighbours and relatives (50%) for getting the required agricultural information. With these observations, it is worthwhile to mention that at the grassroots level, agro-input dealers can play a major role in ensuring farmers' access to critical agricultural inputs as well as the information required for enhancing and sustaining the agricultural productivity and growth. In such scenario, ICTs can play its role in using the up to date information and transferring it to the farmers by input dealers. This process is acting as a catalyst, by reducing the costs and by minimising the proximity among the villages and the farmers along with the information translation which leads to sustainable agricultural management through the key enablers of the system mainly the input dealers. ICT has a significant function in linking research, extension and the market toward expanding the professional and entrepreneurship abilities, capacities among the experts and the agricultural communities for sustainable agriculture. In the Sub Himalayan region, the prime movers of the agricultural growth are not at all acquainted with latest up to date agricultural information and their dependence for agricultural management on the input dealers are very much observable. Accordingly, the growth and development of the agriculture sector towards sustainability is not up to the mark. Keeping all these in view the present study has been envisaged to assess the behavioural component of the Diploma in Agricultural Extension Services for Input Dealers (DAESI) programme trainees towards ICT usage for sustainable agricultural development in the Sub-Himalayan Region.

MATERIAL AND METHODS

Ex-post facto and exploratory research design were followed for this present study. It was conducted in two Sub-Himalayan districts of West Bengal *viz.* Cooch Behar and Alipurduar

districts. An exhaustive list of DAESI programme trainees from two districts was prepared with the help of Cooch Behar KVK of Uttar Banga Krishi Viswavidyalaya. A total number of 60 input dealers registered under DAESI programme, 30 from each district, were selected randomly for the present study. These sixty respondents were interviewed through a pre-tested structured interview schedule developed to measure behavioural component of the trainees with the help of Google forms and data were collected from the respondents over mobile phones through a URL link sent to their smartphone. Variables age, education, experience, social participation, aspiration towards cutting edge technology, annual income, annual expenditure, smart gadgets possessing, sources of agricultural information, achievement

motivation, innovativeness, economic motivation, scientific orientation, risk preference and attitude towards ICTs usage were considered as predictor variables of the study. The behavioural component namely attitude towards ICT usage of the trainees was considered as the predicted variable for the study. The data were processed with the help of statistical tools like frequency, percentage, mean, standard deviation, correlation and regression analyses.

RESULTS AND DISCUSSION

Personal Profile of the Respondents: Personal profile of the respondents has the basic information on age, education, experience, social participation, aspiration towards cutting edge technology, smart gadgets possessing and sources of agricultural information (Table 1).

Table 1: Personal profile of the Respondents (N=60)

S.No	Category	Frequency	Per cent	
1.	Age			Range =22-66
	Young Aged (22-32)	23	38.3	Mean =37.40
	Middle Aged (33-40)	18	30.0	SD=9.932
	Old Aged (41-66)	19	31.7	CV=26.55%
2.	Education			Range = 1-7
	High School	15	25.0	Mean = 6.050
	Graduate	27	45.0	SD= 0.746
	Post Graduate	18	30.0	CV= 12.33%
3.	Experience			Range =1-30
	Low (1-6 years)	29	48.3	Mean =10.35
	Medium (7-12 years)	13	21.7	SD=8.841
	High (13-30 years)	18	30.0	CV=85.42%
4.	Social Participation			Range =1-6
	Low (1-2)	34	56.7	Mean =2.91
	Medium (3-4)	9	15.0	SD=1.98
	High (5-6)	17	28.3	CV=68.07%
5.	Aspiration towards technologies			Range =16-30
	Low (16-23)	17	28.3	Mean =25.38
	Medium (24-26)	12	20.0	SD=4.25
	High (27-30)	31	51.7	CV=16.76%
6.	Smart gadgets possessing			Range =3-10
	Low (3-6)	3	5	Mean =8.35
	Medium (7-8)	3	5	SD=2.01
	High (9-10)	54	90	CV=24.13%
7.	Source of Agriculture Information			Range =1-7
	Low (1-3)	19	31.6	Mean =4.71
	Medium (4-5)	16	26.7	SD=2.059
	High (6-7)	25	41.7	CV=43.65%

It could be seen from the Table 1 that majority of the respondents belong to the age group 22-32 years renamed as young aged respondents (38.3%) followed by the age group 41-66 years renamed as old aged group respondents (31.7%) and 33-40 years renamed as middle-aged group (30.0%). When it comes to the education of the respondents, it is clear that majority of the respondents are Graduates (45%), followed by postgraduates (30%) and high school (25%). In terms of their experience, the majority of the respondents belong to a group of 1-6 years of low-level experience (48.3%) followed by 13-30 years group of high-level experience (30%) and 7-12 years group of medium-level experience (21.7%). From the above table it is also clear that majority of the respondents belong to the low level of social participation with membership in 1-2 institution/ organisation (56.7%) followed high level with membership in 5-6 institutions/ organisations *i.e.* (28.3%) and low level of social participation with membership in 3-4 institutions/ organisations

(13.8%). In the present study, aspiration towards cutting edge technologies revealed that the category of 27-30 score which represents the high level of aspiration towards ICTs is 51.7%, followed by a low level of Aspiration with 16-23 score are 28.3%, and a medium level of aspiration with 24-26 score are 20.0%. In case of smart gadgets the majority belong to the group of score 9-10 which represents high level in possessing the smart gadgets (90%), followed by 7-8 score which represents medium level in possessing the smart gadgets (5%), and 3-6 which represents low level in possessing the smart gadgets (5%). Source of agricultural information among the respondents have shown that majority belong to the group of score 6-7 which represents a high source of agricultural information (41.7%), followed by 1-3 score which represents a low source of agricultural information (31.6%), and 4-5 which represents a medium source of agricultural information (26.7%).

Table 2: Correlation Coefficient of Attitude towards ICTs Usage with 14 independent variables

Variables	Correlation Coefficient (r)
Age (X ₁)	-0.276*
Education (X ₂)	0.100
Experience (X ₃)	-0.146
Social Participation (X ₄)	-0.165
Aspiration towards cutting edge technology (X ₅)	0.175
Annual Income (X ₆)	0.092
Annual Expenditure (X ₇)	0.032
Smart Gadgets possessing (X ₈)	0.006
Sources of Agricultural Information (X ₉)	0.098
Achievement Motivation (X ₁₀)	0.262*
Innovativeness (X ₁₁)	0.038
Economic Motivation (X ₁₂)	0.313*
Scientific Orientation (X ₁₃)	0.119
Risk Preference (X ₁₄)	0.330*

** . Correlation is significant at the 0.01 level

* . Correlation is significant at the 0.05 level

Table 2 presents the Pearson’s coefficient of correlation among the dependent variable *i.e.* the attitude towards ICTs and 14 causal variables for extension professional. The result shows that among the variables of extension professional; Age is negatively and significantly associated with Attitude towards

ICTs. The variables Achievement motivation, Economic motivation, Risk preference are positively and significantly associated with Attitude towards ICTs.

Age and attitude of respondents towards ICTs

In the present study Age of the respondents has been conceptualized as the chronological age *i.e.* number of years attained by the respondent at the time of the study. From the Table 2. it is observed that age is a negatively and significantly associated with the attitude towards ICTs, so It is discernible that the among the trainees, younger the age of the respondents have shown higher the attitude towards ICTs usage which is similar to the study of Kharmudai *et al.*².

Achievement Motivation and attitude of respondents towards ICTs

Achievement motivation may be described as the want for achievement or the attainment of excellence. People can satisfy their desires or needs through totally different means and are driven to succeed for various reasons with may be both internal and external. Motivation is the basic drive for all of our actions. In the present study, the variable achievement motivation has shown a positively and significantly associated with the attitude towards ICTs usage.

Economic Motivation and attitude of respondents towards ICTs

Economic motivation can be enumerated as the drive or force to achieve the economic upliftment of the individuals within a society. It is an inner desire of an individual to enrich

his or her livelihood status. In any society, each and every individual motivates himself/herself to seek knowledge regarding the application of the information in his own situation related to the livelihood avenues which ultimately helps in achieving economic affluence. In the present study, it is found that the respondents having a more positive attitude towards taking economic motivation are positively and significantly associated with the attitude towards ICTs usage.

Risk Preference and attitude of respondents towards ICTs

Risk preference facilitates the process of critical analysis of a situation by individuals and thereby identifying the potential risk and uncertainty associated with the situation. Similarly, farming practices today face several threats arising due to several factors which ultimately increase the risk of production as well as marketing. In this situation, farmers are required to obtain up-to-date information about various aspects of farming so that they can avert the risk and cope with the changing situation. In the present study, it has been found that the respondents who have a more positive attitude towards taking risk are positively and significantly associated with the attitude towards ICTs usage. And showing a positive interest in using ICT technologies as a source of information.

Table 3: Multiple regression analysis of Attitude towards ICTs usage with 14 predictor variables

Variables	Standardized regression coefficient (β)	Unstandardised regression coefficient (b)	S.E of 'b'	t-value
Age (X ₁)	-0.247	-0.133	0.090	-1.474
Education (X ₂)	-0.017	-0.125	1.087	-0.115
Experience (X ₃)	-0.062	-0.038	0.101	-0.373
Social Participation (X ₄)	-0.242	-0.651	0.335	-1.944
Aspiration towards cutting edge technology (X ₅)	0.342	0.429	0.197	2.174*
Annual Income (X ₆)	0.965	0.214	0.071	3.019**
Annual Expenditure (X ₇)	-0.966	-0.223	0.093	-2.404*
Smart Gadgets possession (X ₈)	-0.394	-1.044	0.411	-2.539*
Sources of Agricultural Information (X ₉)	0.122	0.317	0.316	1.003
Achievement Motivation (X ₁₀)	0.274	0.363	0.254	1.430
Innovativeness (X ₁₁)	-0.175	-0.186	0.156	-1.192
Economic Motivation (X ₁₂)	.029	.059	.293	0.200
Scientific Orientation (X ₁₃)	.022	.032	.278	0.114
Risk Preference(X ₁₄)	.272	.533	.327	1.632

** Correlation is significant at the 0.01 level, * Correlation is significant at the 0.05 level

R² = 0.437

Table 3 depicts the multiple regression analysis of the DAESI trainees behavioural components mainly attitude towards ICT usage for sustainable agriculture with fourteen predictor variables. The result showed that the variables aspiration towards cutting edge technology, annual income are positively and significantly contributing and the predictor variables annual expenditure and smart gadget possession are negatively and significantly contributing in case of characterising the predicted variable the behavioural component mainly the attitude of the DAESI programme trainees.

Aspiration towards cutting edge technology and Attitude towards ICT usage

Technology is more present than ever. Young people are interested in technological products, but their opinions on education and careers in technology are not particularly positive. In the present scenario of technology-driven society, it is not surprised that the majority of the youth are fascinating towards aspiration towards cutting edge technology and rural youth are not an exception. The present study has shown that majority of the respondents are youth and have also shown a significant relation towards ICTs. They have the ability to use ICT tools and a high level of access higher than the old aged DAESI trainees. That is why the variable 'aspiration towards cutting edge technology' is significantly and negatively contributing towards characterizing the predicted variable 'attitude towards ICT usage'. The variable 'aspiration towards cutting edge technology' is directly contributing 34.2% towards characterizing 'attitude towards ICT usage'. One unit change of the variable is delineating 0.429 unit change in the predicted variable 'attitude towards ICT usage' technology is more present than ever. Young people are interested in technological products, but their opinions on education and careers in technology are not particularly positive Technology is more present than ever. Young people are interested in technological products, but their opinions on education and careers in technology are not particularly positive technology is more present than ever.

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Annual income and Attitude towards ICT usage

The annual income of the respondents will directly reflect and influences the economic viability, stability and rational behaviour of an individual. The probable reasons for having a positive and significant relationship of this variable with an attitude of DAESI trainees towards ICT usage is the fact that respondents with higher income groups have more awareness on the technological updates and also have a higher level of accesses to ICT tools and devices. That is why the variable 'annual income' is significantly and positively contributing towards characterizing the predicted variable 'attitude towards ICT usage' which is similar to the study of Kharmudai *et al.*². The variable 'annual income' is directly contributing to 96.5% towards characterizing 'attitude towards ICT usage'. One unit change of the variable is delineating 0.214 unit change in the predicted variable 'attitude towards ICT usage'.

Annual expenditure and Attitude towards ICT usage

Annual expenditure indicates the costs incurred annually in maintaining the farm and home for an individual family. Annual expenditure, in contrast to the annual income, stimulates an individual to identify the areas where the cost can be reduced by taking certain cost-saving strategies. In the present modern technology society, there is always a chance of increased cost. But, increased cost always poses a barrier in the development of favourable attitude towards technology. Consequently, an increase in the expenditure of the individuals will ultimately reduce the interest in ICTs. That is why the variable annual expenditure is negatively and significantly contributing in case of characterizing the predicted variable, attitude towards ICTs usage. In the present study, it is found that variable annual expenditure is directly contributing 96.5 per cent in case of

characterizing the attitude towards ICTs usage. One unit change of the variable management orientation is delineating the 0.124 unit change in the predicted variable, 'attitude towards ICTs usage'.

Smart gadget possession and Attitude towards ICT usage

In rural areas, the farm family has a number of assets like radio, television, mobile, etc. are believed to be the most successful and profitable farmer. In the present study, it has been observed that most of the farmers have given more importance to adopt new technologies and mechanised instruments for their farming. Most of the input dealers are young aged and they are interested in using modern ICTs tools as a source of agriculture information and to get more profit from less investment. For this reason, most of the families having a medium level of assets possession would like to become aware of ICT tools to take any new initiatives in farming. This may be the plausible reason that the variable 'Smart gadget possession' is significantly and positively contributing to characterizing the predicted variable awareness of ICT tools. The variable 'annual income' is directly contributing to 39.4 % towards characterizing 'attitude towards ICT usage'. One unit change of the variable is delineating 1.044 unit change in the predicted variable 'attitude towards ICT usage'.

The R^2 value being 0.437, it is to infer that the fourteen predictor variables put together have explained 43.7 per cent variation embedded with the predicted variable Attitude towards ICT usage by the respondents. Still, 56.3 per cent variable embedded with predicted one remains unexplained. Thus it would be suggested that inclusion of some more contextual variables possessing a direct bearing on the attitude towards ICTs could have increased the level of explicability.

CONCLUSION

In the present digital era, the information and communication technology (ICT) tools like computers, smartphones and other digital tools are emerging as a vital component of new

technology and knowledge-based economy. Realizing the attention of the ICTs in the country, numerous integrated approach towards the inclusion of the ICTs into the national development through a strategies promotional plan in all the aspects of economic activities for harnessing the benefits of ICTs in transforming a nation into a knowledge vibrant e-learning society. ICT driven extension services are expected to have a crucial role in facilitating the information and knowledge sharing among various actors of the knowledge generation, knowledge dissemination, input supply and knowledge consumption systems holistically. In view of the findings of the present study, it can be concluded that young aged DAESI trainees with 1-6 years of service expertise were found to own additional interest towards using ICT technologies for dissemination of agricultural information and advisory services to farmers. The attitude or the behaviour component of the input dealers in a very larger extent just in case of promoting scientific agricultural practices, accessing the trendy ICT tools for agricultural information and managing market-led agriculture. The scarcity of extension workers for providing extension services within the rural areas is pressing the necessity of utilizing ICT enabled extension services within the era of the digital revolution. Since majority of the farmers in rural areas are still depending on the input dealers for agriculture information, young trained DAESI input dealers can be transformed into extension professional by improve their practices knowledge on agriculture with the help of modern ICT enabled extension services and provide recommended agriculture information to the farmers from various online authentic sources like mobile apps.

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