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RESEARCH ARTICLE

ATTITUDE OF AGRICULTURAL OFFICERS TOWARDS COMPUTER MEDIATED COMMUNICATION IN AGRICULTURE: A SOCIO-PSYCHOLOGICAL ANALYSIS

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ABSTRACT

A study was undertaken as an attempt to understand the attitude of the Agricultural Officers toward computer mediated communication in farming sector. The study aimed at assessing the relationship between socio-psychological characteristics, attitude and computer use efficiency of Agricultural Officers of Akshaya (e literacy programme launched by Kerala Government in one of the backward districts, Malappuram) and non-akshaya introduced districts of Kerala. The sample comprised of ninety five Agricultural Officers from Malappuram and Trichur districts of Kerala. The Agricultural Officers were selected following stratified random sampling with proportionate allocation. Age had negative and significant relationship with computer use efficiency and attitude. Education had positive and significant relationship with computer use efficiency and attitude. Trainings undergone, knowledge, communication ability, creativity, innovativeness, achievement motivation and information source utilisation showed non significant relationship with computer use efficiency as well as with attitude. It was found that there was significant difference between age, trainings undergone, knowledge about computer mediated communication, innovativeness and achievement motivation of respondents in Malappuram and Trichur districts.

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INTRODUCTION

In recent years agriculture production has become a complex business requiring the accumulation and integration of knowledge and information from many sources. The challenge therefore is to remove the urban skew and extend the benefits of science and technology using modern tools to the majority of rural people who have far greater stake in the fruits of science and technology (Swaminathan, 2003). Traditional communication channels have all along been used successfully, but these have mostly been monologue and have not allowed for much interaction with users. An extension agent has to look into basically two aspects of extension: the education function which aims to help farmers gain knowledge, acquire skills and change attitude for their own benefit, and the communication function which transfers information about suitable technologies to farmers and offers them alternative solutions to improve their situations. Therefore the aim is to transform the information into knowledge timely and accurately to create an environment for farmers to use it. Given this context, computer mediated communication offers great potential as an interactive mass medium. Information technology would bring about a sea change in agriculture and rural development by reducing cost, enhancing easiness of use and create linkages (Zijp, 1994). With convergence of communication technologies, any institution involved in the process of agricultural extension

worth the name is bound to serve the farmer with the requisitioned information at the requisitioned time. This necessitates the use of computer-mediated demonstrations related to agriculture that offer hassle free and user-friendly access to farmers. The provision of such access presupposes that a sizeable section of the farming community will be in a position to access the Internet and this will be shortly provided by States like Andhra Pradesh, Karnataka and Kerala as part of strengthening of their respective information technology networks at the Panchayat level. The State of Kerala has gone far ahead in launching Information Kerala Mission (IKM) - a project in e- governance that aims to bring about transparency and accountability (Adhiguru and Birthal, 2006). Therefore cyber extension services and users' end is well matched. Scientists across the world have stressed the importance of Information Technology in agriculture (Zaliwski, 2000 and Grbavac, 2004). A computer- aided software named "Diagnos-4", incorporating all the modern features with multimedia and graphics had been developed. This package would help in identifying the pest and diseases of major crops. The package was user- friendly and easy to operate, more attractive and aesthetic. It was hoped that this package would support the agricultural extension workers for decision-making and help them in suggesting suitable control measures of the major pest and disease of major crops of Kerala (Ganesan, 2004 and Ganesan *et al.*, 2005). Several attempts are now underway in TNAU Coimbatore, IIT Kanpur, IIITMK, Trivandrum to extend farm science through the use of Net and Mobile based platforms. The Agricultural Officer plays an important role as

an expert in the field and as a network coordinator of various stakeholders and their knowledge in computers is much essential. Therefore, utilising computer mediated communication towards farm progress, becomes an essential component in the effectiveness of the extension agent namely the Agricultural Officer. The present study is an attempt to understand the attitude of the Agricultural Officers towards computer mediated communication in the Kerala farming sector. The study would help in bringing out suggestions to improve the performance of Agricultural Officers by effectively utilising computer mediated communication.

Objectives

1. To study the socio-psychological characteristics of Agricultural Officers
2. To study the attitude of Agricultural Officers towards computer mediated communication
3. To study the relationship between socio-psychological characteristics, attitude and computer use efficiency of Agricultural Officers
4. To study the comparison between the Agricultural Officers of Akshaya introduced and non-akshaya introduced districts of Kerala

MATERIALS AND METHODS

Locale of the study

The objectives of the study necessitated the selection of Malappuram as one of the locale of research for the following reasons.

- The Akshaya e-literacy programme of Kerala was launched first in the district of Malappuram.
- Malappuram has been declared as the first e-literate district in Kerala

From among the thirteen districts, where Akshaya was not introduced, Trichur district was randomly selected from among the 13 non-Akshaya intervened districts.

Sampling procedure

The unit of analysis for the present study comprised of Agricultural Officers of different Krishi Bhavans in the selected two districts. The details of all Agricultural Officers were gathered from Principal Agricultural Offices of Malappuram and Trichur districts. Only those Agricultural Officers who have exposure to computer mediated communication was prepared for each district, which served as the sampling frame. From the list so prepared, the respondents were selected following stratified random sampling with proportionate allocation so as to obtain 30 per cent representation of the population. Accordingly 46 Agricultural Officers were selected from Malappuram and 49 Agricultural Officers were selected from Trichur. Thus a sample of 95 Agricultural Officers formed the sample of the study.

Selection of variables

Based on review of relevant literature and discussion with experts, an exhaustive list of socio-economic characteristics was prepared. To know the relevancy of each of the variable,

they were subjected to judges rating. Thirty extension scientists were chosen as judges and the responses were obtained on a five-point continuum viz., ‘most important’, ‘more important’, ‘important’, ‘Less important’ and ‘least important’. The responses thus obtained were rated using frequency analysis to select the final variables. Those independent variables that emerged as most important (those have mean value > 4.0) in the relevancy rating procedure were selected.

Dependent variable

Attitude of Agricultural Officers towards computer mediated communication

Independent variables

1. Age
2. Educational status
3. Trainings undergone
4. Knowledge about computer mediated communication
5. Communication ability
6. Computer use efficiency
7. Creativity
8. Innovativeness
9. Achievement motivation
10. Information source utilization

Operationalisation and measurement of variables/ characteristics

The selected 11 variables are operationalised and measured as follows:

Attitude of agricultural officers towards computer mediated communication

Attitude of the Agricultural Officers is operationally defined as the degree to which Agricultural Officer’s react positively or negatively towards computer mediated communication. An arbitrary scale developed for this purpose was used to quantify the attitude score. The scale consists of twelve statements. The range of score was from 12-48. The scoring procedure was as follows.

Category	SA	A	DA	SDA
Positive statements	4	3	2	1
Negative statements	1	2	3	4

The attitude score was arrived at by summing up scores of the statements.

Age

Age of the respondent was operationally defined as the number of completed years of the respondent at the time of the study. The scale used by Simi (2005) was followed for the study. Agricultural Officers are categorised as given below.

Young	< 32 years
Middle aged	32-46 years
Old	>46 years

Educational status

Educational status was operationally defined as the qualification of the respondents in terms of possession of bachelor's degree, post graduation and doctorate degree. In this study, educational qualification was assigned score as given below.

Educational qualification	Score
Bachelors degree	1
Post graduation	2
Doctorate degree	3

Trainings undergone

This was operationalised as the number of computer mediated communication training programmes attended by the respondents. The scale developed by Parimala (2003) with modifications was followed for the study. The scores assigned as given below.

Trainings undergone	Score
Nil	0
Once	1

An additional score was assigned for each additional training.

Knowledge about modern technologies

This refers to the extent of understanding and proficiency in computer mediated communication possessed by an agricultural officer at the time of filling up the questionnaires, as evidenced from his/her responses to the set of questions prepared. A teacher made knowledge test was adopted. One score was given for every correct answer and summing up scores gave the total knowledge score. The range of scores was from 0-10.

Communication ability

Communication ability is operationally defined as the ability of the respondents to transfer information, ideas or feelings effectively to the receiver. The scale used by Pratap (1999) with modifications was followed for the study. The scale consists of twelve statements. Communication ability score was arrived at by summing up scores of the entire statements. The range of score was from 12-36. The responses were collected by assigning scores as given below.

Category	Always	Sometimes	Never
Positive statements	3	2	1
Negative statements	1	2	3

Computer use efficiency

It was operationally defined as the extent of working knowledge and skill of the Agricultural Officers in operating and utilising computers. An arbitrary scale developed for this purpose was used to quantify the computer use efficiency. The scale consisted of thirteen statements. The range of score was from 0-13. The responses were collected by giving scores as given below. Yes -1, No - 0.

Creativity

Creativity of the Agricultural Officers is operationally defined as use of imagination or original ideas in order to create something productive and resourceful in the agricultural sector. The scale used by Stevens (1999) was adopted for the study. The scale consists of eleven statements. The range of score was from 0 -11. The responses were collected by giving scores as given below.

Yes - 1, No - 0.

Innovativeness

Innovativeness was operationalised as the degree to which the Agricultural Officer is relatively earlier in adopting new ideas. The scale used by Simi (2003) with slight modifications was followed for the study. The scale consists of six statements. The range of score was from 6-18. Innovativeness score was arrived by using summing up scores of entire statements. The responses were collected by giving scores as given below.

Category	Always	Sometimes	Never
Positive statements	3	2	1
Negative statements	1	2	3

Information source utilization

Information source utilisation was operationally defined as the use of various sources of information by the respondents in order to get information on agricultural technology. The procedure adopted by Ramachandran (1992) and Manoj (1998) was followed with slight modification. The respondents were asked to indicate the frequency of use of these sources on a three-point continuum viz., 'regularly', 'occasionally' and 'never' with scores of 3, 2 and 1 respectively. For extent of information, a three point continuum viz., 'adequate', 'somewhat adequate' and 'inadequate' with scores of 3, 2 and 1 respectively were scored by the respondents. The score given for the frequency of utilisation was multiplied with the score given for the extent of information, for all the sources and then added up to get the final score. Based on the maximum score that could be obtained on the variable, the respondents were divided into three groups on their utilisation of various information sources. Categorisation of respondents according to their information source utilisation

Information source utilisation	Score
Low	Below 71
Medium	71- 103
High	Above103

Achievement motivation

It is operationally defined as the inner driving force for attaining higher goals. The scale used by Alexander (1996) with slight modifications was followed for the study. The scale consists of seven statements. The range of score was

from 7-21. The responses were collected by giving scores as given below.

Category	Always	Sometimes	Never
Positive statements	3	2	1
Negative statements	1	2	3

Achievement motivation was arrived by summing scores of the statements.

Data Collection

The data for the present study were collected using questionnaires.

Categorisation of respondents based on the independent variables viz. age, education, trainings undergone, communication ability, computer use efficiency, creativity, innovativeness, achievement motivation and information source utilization is shown in Table 1. Respondents are categorized into three groups based on mean and standard deviation (Agricultural Officers who are above mean + standard deviation, those Officers in between mean-standard deviation and mean + standard deviation and who are below mean-standard deviation). Table 2 reveals that 18.95% of the respondents come under the young group. Respondents from 32 to 46 years of the age come under the middle age group. Middle age group constitutes 65.26 %. Respondents from 47-54 years form the next group. The old age group constitutes 15.79%.

Table 1: Mean and Standard Deviation of the Variables

Sl.No.	Variable	Mean	SD	Mean-SD	Mean+SD
1	Age	38.88	6.91	31.97	45.79
2	Education	1.42	0.53	0.88	1.95
3	Trainings undergone	0.36	0.61	0.24	0.98
4	Knowledge	4.63	2.28	2.34	6.91
5	Communication ability	31.13	3.11	28.02	34.24
6	Creativity	7.01	1.72	5.29	8.73
7	Innovativeness	13.34	1.67	11.67	15.01
8	Achievement motivation	18.18	2.15	16.03	20.34
9	Information source utilisation	86.97	16.00	70.97	102.98
10	Computer use efficiency	7.80	3.84	3.95	11.64
11	Attitude	36.22	4.46	31.75	40.68

Table 2: Category of Respondents Based on the Selected Variables

Age	Young	Middle Age	Old
Frequency	18	62	15
Percentage	18.95	65.26	15.79
Education	B.Sc.(Ag)	M.Sc. (Ag)	Ph.D
Frequency	57	36	2
Percentage	60.00	37.90	2.10
Trainings Undergone	None	one Training	Two Trainings
Frequency	67	21	7
Percentage	70.53	22.10	7.37
Knowledge	Low	Medium	High
Frequency	15	67	13
Percentage	15.79	70.53	13.68
Communication Ability	Low	Medium	High
Frequency	13	62	20
Percentage	13.69	65.26	21.05
Computer Use Efficiency	Low	Moderate	High
Frequency	17	69	9
Percentage	17.90	72.63	9.47

Table 3: Category of Respondents Based on the Selected Variables

Creativity	Low	Medium	High
Frequency	6	81	8
Percentage	6.32	85.26	8.42
Innovativeness	Low	Medium	High
Frequency	12	76	7
Percentage	12.63	80.00	7.37
Achievement motivation	Low	Medium	High
Frequency	8	76	11
Percentage	8.42	80.00	11.58
Information source utilisation	Low	Moderate	High
Frequency	14	64	17
Percentage	14.74	67.37	17.89
Attitude	Low	Medium	High
Frequency	14	67	14
Percentage	14.74	70.52	14.74

Table 4: Relationship between Attitude and Socio-psychological Characteristics

Sl. No.	Factors	Correlation coefficient
1	Age	-0.3520**
2	Education	0.2211*
3	Trainings undergone	-0.1022 ^{NS}
4	Knowledge	0.0084 ^{NS}
5	Communication ability	0.06375 ^{NS}
6	Creativity	0.0093 ^{NS}
7	Innovativeness	0.0022 ^{NS}
8	Achievement motivation	0.0569 ^{NS}
9	Information source utilization	0.00009 ^{NS}

* Significant at 0.05 level of probability; ** Significant at 0.01 level of probability; NS - Non Significant

Table 5: Relationship between Computer Use Efficiency and Socio-Psychological Characteristics

Sl.No.	Computer use efficiency	Correlation coefficient
1	Age	-0.2352*
2	Education	0.2303**
3	Trainings undergone	0.1687 ^{NS}
4	Knowledge	0.1616 ^{NS}
5	Communication ability	0.0095 ^{NS}
6	Creativity	-0.0002 ^{NS}
7	Innovativeness	0.1073 ^{NS}
8	Achievement motivation	0.0089 ^{NS}
9	Information source utilization	0.0084 ^{NS}

* Significant at 0.05 level of probability; ** Significant at 0.01 level of probability; NS - Non Significant

Table 6: Comparison between the Variables in Malappuram and Trichur Districts

Sl.No.	Variables	Malappuram		Trichur		't' value
		Mean	SD	Mean	SD	
1	Age	36.89	6.72	40.75	6.55	2.8047**
2	Education	1.52	0.58	1.32	0.46	1.7896 ^{NS}
3	Trainings undergone	0.52	0.65	0.22	0.54	2.3943*
4	Knowledge	5.13	2.41	4.16	2.04	2.0869*
5	Communication ability	31.26	2.83	31.02	3.34	0.3728 ^{NS}
6	Creativity	6.78	1.86	7.22	1.54	1.2486 ^{NS}
7	Innovativeness	12.73	1.59	13.91	1.53	3.6325**
8	Achievement motivation	17.73	2.54	18.61	1.58	1.9953*
9	Information source utilisation	87.15	17.35	86.81	14.62	0.1011 ^{NS}
10	Attitude	36.00	4.36	36.42	4.54	0.4630 ^{NS}
11	Computer use efficiency	8.10	4.11	7.51	3.54	0.7522 ^{NS}

* Significant at 0.05 level of probability; ** Significant at 0.01 level of probability; NS - Non Significant

Two third of the Agricultural Officers are with B.Sc. (Ag.) qualification without any additional degree. 37.90% have post graduation in agricultural sciences. The percentage of Agricultural officers holding Ph.D. degree is still less (2.10%). More than two third of respondents have not undergone any training in computer mediated communication. Only 22.10% of the Agricultural Officers are exposed to at least one training programme. The percentage of Agricultural Officers exposed to two trainings programmes are comparatively very less (7.37%). It could be observed that four fifth of the respondents are in the category of low to medium level of knowledge with respect to computer mediated communication. Majority (70.53%) of Agricultural Officers are with medium level of knowledge. A small percentage (13.68%) of Agricultural Officers is highly knowledgeable. It could be observed from the above table that majority (65.26%) of Agricultural Officers communicate well. While 21.05% feel they are highly able in their communication, those who feel they are less communicative are 13.69%. 17.90% of the Agricultural Officers are low in their efficiency in computers and 72.63% are moderately efficient. Those who are highly efficient in computers are very less (9.47%). Thus four fifth of the

respondents are with low to moderate level of efficiency in computer usage. Agricultural Officers who are less creative constitute only a small percentage (6.32%). Among the respondents, 85.26% are creative and 8.42% are highly creative. Agricultural Officers who are innovative constitute 80.00%, those who are less innovative are only 12.63% and those who are highly innovative are 7.37%. Agricultural Officers with low achievement motivation are 8.42%, those with medium achievement motivation are 80.00% and those who have high achievement motivation are 11.58%. Majority (67.37%) of Agricultural Officers use information source moderately. The percentage of Agricultural Officers who use information source less are 14.74% and those who utilise information source very much are 17.89%. Agricultural Officers who are less inclined to computer mediated communication are 14.74%. A high percentage (70.52%) of respondents seems to be favourably disposed towards computer mediated communication and those who show slight orientation towards computer mediated communication are 14.74%. An examination of Table 4 brings the relationship between attitude and independent variables. Age had negative and significant relationship with attitude at one per cent level of probability. Education had positive and significant relationship with attitude at five per cent level of probability.

Trainings undergone, knowledge about computer mediated communication, communication ability, creativity, innovativeness, achievement motivation, information source utilisation showed non significant relationship with attitude. This also means that though Agricultural Officers are highly creative and innovative in their fields, they are not affected by the lack of agricultural information packages needed for the farmers. An examination of Table 5 brings home the relationship between computer use efficiency and all independent variables. Age had negative and significant relationship with computer use efficiency at five per cent level of probability, which means the young age group is more efficient in computer use. This is in conformity with the findings of Babu (2005). It is only natural that the younger officers are more trained in computer use and potential, which is why they also show proficiency in computer use. Education had positive and significant relationship with computer use efficiency at one per cent level of probability. It is a known and established fact, that education in the form of knowledge and skill enhances productivity. Trainings undergone, knowledge, communication ability, creativity, innovativeness, achievement motivation, information source utilisation showed non significant relationship with computer use efficiency. There was significant difference between age, trainings undergone, knowledge about computer mediated communication, innovativeness and achievement motivation of respondents in Malappuram and Trichur districts. The mean age of Agricultural Officers in Malappuram is 36.89 and of those in Trichur district is 40.75. While mean score for trainings undergone is 0.52 in Malappuram that of Trichur is only 0.22 which is comparatively less than Malappuram. This reveals the impact of trainings by Akshaya programme. In knowledge of computer mediated communication mean score is 5.13 for Malappuram Agricultural Officers and 4.16 for Trichur Agricultural Officers and the difference is significant. Mean score for innovativeness in Agricultural Officers in Malappuram is 12.73 and 13.91 for those in Trichur district. Majority of Officers in Trichur are innovative and the difference is significant. Achievement motivation mean score of the Agricultural Officers in Malappuram is 17.73 and of those in Trichur district is 18.61 and the difference is significant. Education, communication ability, creativity, information source utilisation, computer use efficiency, attitude and perception towards computer mediated communication showed non significant difference between Agricultural Officers of Malappuram and Trichur districts. As the *Akshaya programme* was launched in Malappuram, there are significant differences in the training programmes undergone by the Agricultural Officers of Malappuram and the knowledge they have acquired is more compared to the Agricultural Officers of Trichur district. The Agricultural Officers in Malappuram district are also younger than the officers in Trichur district. Thus with the exception of dependent variables, the *Akshaya programme* does not seem to have influence on the variables like innovativeness and achievement motivation.

However the innovativeness and achievement motivation of the Agricultural Officers are independent of their interest and awareness of computer mediated communication.

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