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Teachers' perceptions of factors encouraging the use of information and communication technology (ICT) in agricultural education

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Abstract
Recent research studies show that information and communication technology is an effective means of promoting educational opportunities; however, most teachers do not use this technology as an instructional delivery system or integrate it into their curriculum. Several studies have found that, a variety of factors influence teachers' decisions to use ICT in the classroom. The success of ICT integration in teaching and learning Computer studies are not determined by the presence or absence of a single factor, but rather by a dynamic process involving a number of interconnected factors. It is suggested that teachers receive ongoing professional development in order to model new pedagogies and learning tools with the goal of improving the teaching-learning process. However, it is critical for teacher educators and policymakers to understand the factors influencing the effectiveness and cost-effectiveness of various approaches to ICT use in teacher education so that appropriate training strategies can be explored to make such changes feasible for all. The goal of this study was to look into the factors that encouraging the use of ICTs by teachers in Agricultural education. The present study was conducted on "Teachers' Perceptions of factors encouraging use of information and communication technology (ICT) in agricultural education" at University of Agricultural Sciences, Dharwad with the sample size of 100 teachers. Ex-post facto research design was used for the present study. Findings of the study revealed that, facilitating factors with 3.66 mean score was on first rank. Social factors 3.64 MS got second rank, followed by economic factors 3.60 MS and technical factors 3.54 MS respectively.

Keywords: ICT tools, factors, agricultural education, encouraging

Introduction

Technology is concerned with the creation of knowledge and processes in order to create systems that solve problems and expand human capabilities. In other words, technology has the potential to alter or change how people access, gather, analyze, present, transmit, and simulate information (Kluever, 1994) [7]. One of the most pressing issues in education is the impact of technology (Schaffer, 2004) [9]. The use of information and communication technology (ICT) creates a powerful learning environment and transforms the learning and teaching process by allowing students to interact with knowledge in an active, self-directed, and constructive manner (Granger, 2002) [6]. ICT is not simply viewed as a supplement to or replacement for traditional teaching methods. ICT is regarded as an important tool for facilitating new modes of teaching and learning. It should be used to help students improve their cooperation, communication, problem-solving, and lifelong learning skills (Plomp *et al*., 1996) [8]. Integrating technology into curricula with the goal of positively influencing teaching and learning has evolved over the last 20 years (Dockstader, 1999) [2]. Technology integration has covered the continuum from instruction on programming skills, self-directed drill and practice, interactive learning software, online training, testing, instructional delivery augmentation, and Internet-based accessibility to information, communication, and publication, primarily driven by hardware and software evolution, accessibility to computers in educational settings, and popular instructional technology trends (Dooling, 2000) [3]. Technology integration, according to Flanagan and Jacobsen (2003), is intended to be cross-curricular rather than a separate course or topic in and of itself. Technology should be used as a tool to support educational goals such as information search and evaluation skills, cooperation, communication, and problem solving, all of which are important for preparing students for the knowledge society (Drent & Meelissen 2007) [4].

In fact, innovative ICT use can promote student-centered learning (Drent, 2005) [1]. As a result, every classroom teacher should use learning technologies to improve student learning in all subjects because they can engage students' thinking, decision-making, problem-solving, and reasoning behaviours (Grabe & Grabe, 2001) [5]. In an information age, youngsters must be taught these cognitive behaviours.

According to Fullan (1991), the change implementation process is divided into three stages: adoption, implementation, and institutionalization. Ten Brummelhuis (1995) stated in this regard that variables identified by theories of educational change do not have equal impact during all stages of the computer use in education innovation process. As a result, researchers must identify influencing factors at various stages of development. Based on this data, barriers to successful ICT use can be identified. Awareness of any barriers that teachers face could lead to the development of solutions to these barriers, the development of useful training programmes, and the encouragement of the use of ICT. It is true that teacher training programmes play an important role in providing the necessary leadership in training pre-service and in-service teachers to deal with today's economic and social demands. They should model new pedagogies and learning tools in order to improve the teaching-learning process. Furthermore, teacher education institutions and programmes must assist teachers in understanding how to best apply new technologies in the context of their country's culture, needs, and economic conditions. As a result, developing teachers' capacity in the use of ICT for education necessitates long-term continuous development of the lead trainers, knowledge sharing among teachers, partnerships and collaboration among educators and organizations, and support from principals and administrators. These factors must be present in order to effect change in the classroom. As a result, both teachers and trainers require ongoing support as well as opportunities to try out new skills and strategies over time.

Material and Methods

Research Design

In the present investigation, *Ex-post facto* research design was used. This design was considered as appropriate because the phenomenon has already occurred. *Ex-post facto* research is the most systematic empirical enquiry in which the researcher does not have control over independent variables as their manifestation has already occurred as they are inherent and can't be manipulatable.

Sampling Technique

The study was conducted in University of Agricultural Sciences, Dharwad (UASD), Karnataka, India. UAS, Dharwad includes five colleges' *viz.*, College of Agriculture Dharwad, College of Agriculture Vijayapur, College of Agriculture Hanumanmatti, College of Community Science Dharwad and College of Forestry Sirsi which were selected for the study. From a total of 209 population size, a sample of 100 faculty from all five colleges were selected as respondents by following proportionate random sampling method.

Data collection procedure and period enquiry

The study was based on primary data. The primary data was collected with help of pre-tested structural schedule by personal interview method. Taking into consideration the various existing factor e.g. time and extent of available amongst the respondents, it was decided to adopt personal interview method along with schedule for the purpose of collection of data. A detailed schedule was prepared for collection of needed information. The schedule was developed in the light of the objective of the present study. The schedule was pre-tested in the sampling population to the extent of about 5 percent of the total respondents and modified according to the need of study. The purpose of study was clearly explained to the respondents at the time of data collection.

Analysis of data and statistical tools applied

Information was arranged in tabular forms and interpretation and analysis were done usually in terms of frequency, percentage, mean, standard deviation and rank.

Frequency

This measure was used to know the distribution pattern of students and faculty for each variable wise and to categorize the data.

Percentage

Percentage was used for making the simple comparison. For calculating percentage, frequency of particular cell was multiplied by 100 and divided by total number of observation or respondents. For example out of 90 respondents, 50 respondents used internet as source of information, percentage will be-

Percentage (%) = 50/90X100=55.56%

Rank

Rank refers to the positions and their occupants arranged in a hierarchy or inequality.

Ranking item question are given to record the preference of the respondents, like multi choice question, they also contain number of alternative. The difference between these two is that in multiple choice questions only one of the answers is to be selected, but in case of ranking item question order of preference is to be given for all.

Mean

The arithmetic mean is the sum of the score divided by their number. This measure was used to categorize the dependent and independent variables into low, medium and high categories.

Standard deviation

This measure was used to categorize the dependent and independent variables into low, medium and high categories.

Result and Discussion

Factors encouraging ICT usage

Economic factors

An attempt was made to know the economic factors encouraging ICT usage. For this purpose the responses were collected on a four point continuum viz., most important, important, less important and not important and the factors were ranked according to their Mean Score (MS). According to the Table 1, among economic factors, Provision of grants to buy ICTs, with 3.60 MS, obtained first rank as it was perceived most important by 66.00 per

cent of respondents, Financial inputs for training on ICT production and usage was on second rank with 3.58 MS, whereas, Availability of exclusive budget for ICT projects obtained third rank with 3.45 MS. The fourth rank was occupied by Economic support for software purchases, with 3.52 MS.

Table 1: Distribution of the respondents based on their perception about economic factors encouraging ICT usage n=100

SI. No.	Items	Most Important	Important	Less Important	Not Important	Mean	Rank
1	Provision of grants to buy ICTs	66 (66.00)	30 (30.00)	2 (2.00)	2 (2.00)	3.60	I
2	Financial inputs for training on ICT production and usage	66 (66.00)	28 (28.00)	2 (2.00)	4 (4.00)	3.58	II
3	Economic support for software purchases	60 (60.00)	30 (30.00)	2 (2.00)	8 (8.00)	3.52	IV
4	Availability of exclusive budget for ICT projects	62 (62.00)	30 (30.00)	2 (2.00)	6 (6.00)	3.54	III

(Figures in parenthesis indicate percentage)

Facilitating factors

The result shown in Table 2 revealed that, among facilitating factors, Availability of software, with 3.66 MS, was on first rank. Availability of sufficient number of ICT tools got second rank, with 3.3.63 MS. Whereas, Investments of the institution/ university on infrastructure for ICTs on third rank with 3.3.53 MS. Developing the policies and plans for usage of ICTs for dissemination of agricultural information', with 3.50 MS, obtained the fourth rank respectively.

Table 2: Distribution of the respondents based on their perception about facilitating factors encouraging ICT usage n=100

Sr. No.	Items	Most Important	Important	Less Important	Not Important	Mean	Rank
1	Availability of sufficient number of ICT tools	69 (69.00)	28 (28.00)	0 (0.00)	3 (3.00)	3.63	II
2	Investments of the institution/ university on infrastructure for ICTs	65 (65.00)	25 (25.00)	5 (5.00)	5 (5.00)	3.53	III
3	Availability of software	70 (70.00)	26 (26.00)	2 (2.00)	2 (2.00)	3.66	I
4	Developing the policies and plans for usage of ICTs for dissemination of agricultural information	64 (64.00)	28 (28.00)	2 (2.00)	6 (6.00)	3.50	IV

(Figures in parenthesis indicate percentage)

Social and Psychological Factors

According to the Table 3, among social and psychological factors, ICT improves self- efficacy, with 3.64 MS, was on first rank. Adequate familiarity and expertise in ICT with 3.54 MS was on second rank. The third rank was occupied by felt need to use ICT, with 3.52 MS and rewarding the scientists using ICTs, with 3.33 MS was on fourth rank respectively.

Table 3: Distribution of the respondents based on their perception about social and psychological factors encouraging ICT usage n=100

SI. No.	Items	Most Important	Important	Less Important	Not Important	Mean	Rank
1	Adequate familiarity and expertise in ICT	62 (62.00)	33 (33.00)	2 (2.00)	3 (3.00)	3.54	II
2	ICT improves self- efficacy	66 (66.00)	28 (28.00)	2 (2.00)	4 (4.00)	3.64	I
3	Felt need to use ICT	60 (60.00)	36 (36.00)	2 (2.00)	2 (2.00)	3.52	III
4	Rewarding the scientists using ICTs	57 (57.00)	36 (36.00)	4 (4.00)	3 (3.00)	3.33	IV

(Figures in parenthesis indicate percentage)

Technical Factors

Data in Table 4 indicated that, among technical factors, Easy access to expertise to solve technical difficulties, with 3.54 MS, was on first rank. In-service training for using/producing ICTs with 3.52 MS was on second rank. The third rank was availability of ICT tools acquiring scientist's
interest in ICT usage, with 3.50 MS and Investments of the institution/ university on the support services of ICTs, with 3.49 MS was on fourth rank respectively.

Table 4: Distribution of the respondents based on their perception about technical factors encouraging ICT usage n=100

SI. No.	Items	Most Important	Important	Less Important	Not Important	Mean	Rank
1	In-service training for using/producing ICTs	59 (59.00)	36 (36.00)	3 (3.00)	2 (2.00)	3.52	II
2	Easy access to expertise to solve technical difficulties	56 (56.00)	42 (42.00)	2 (2.00)	0 (0.00)	3.54	I
3	Investments of the institution/ university on the support services of ICTs	59 (59.00)	34 (34.00)	4 (4.00)	3 (3.00)	3.49	IV
4	Availability of ICT tools acquiring scientists interest in ICT usage	60 (60.00)	34 (34.00)	2 (2.00)	4 (4.00)	3.50	III

(Figures in parenthesis indicate percentage)

Conclusion

On the basis of findings and observations made, it may be concluded that, facilitating factors with 3.66 mean score was on first rank. Social factors 3.64 MS got second rank, followed by economic factors 3.60 MS and technical factors 3.54 MS with third and fourth rank respectively.

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