



Research Article

ROAD MAP FOR STRENGTHENING ICT UTILIZATION BY THE FACULTY MEMBERS IN STATE AGRICULTURAL UNIVERSITIES

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Abstract- Teaching is the most challenging profession among all other occupations. A teacher should not only be a lifelong learner but also a trend setter in reaching the students through appropriate teaching strategies. A teacher should be dynamic and always search for innovations in his teaching abilities for effective outreach of majority of students in a class. Starting from the age-old chalk and talk to the present e-learning, several Information and Communication Technology (ICT) tools were designed by the educationists to upgrade the education system. All such tools have shown tremendous effect in the teaching-learning process not only in terms of speedy delivery of the message but also improved the quality of message. The use of information and communication technology (ICT) such as Internet applications, CD-ROMs, video technology and various computer attachments and software programs have caused many changes in society. To explore such gaps and to bring a modest approach to the faculty members to learn and efficiently utilize the ICT in their teaching endeavor, the present study was taken up under ICAR extramural research project during the year 2016-17 with the objectives of assessing the constraints in ICT utilization by the faculty members in State Agricultural Universities, document the suggestions as given by them for effective utilization of ICT and to suggest a road map for strengthening the ICT utilization in Agricultural education. The study revealed that the major constraints in ICT utilization by the faculty members were Lack of expertise and skills in using ICT, lack of ICT facility at individual level in the department, poor/ limited internet speed, Poor annual maintenance of the ICT equipment, lack of ICT technicians and professionals in the vicinity etc. in parallel, the major suggestions like periodical training programmes on application of ICTs, creating awareness on importance of different ICT tools and programmes, Uninterrupted high speed internet with high quality broad band facility, Providing ICT tools like laptop, LCD projector etc., to each faculty member, engaging an ICT professional / technician on permanent basis etc., were given by the faculty members. Accordingly, the strategy has been proposed as a road map for strengthening ICT utilization in State Agricultural Universities.

Keywords- Information and Communication Technology, Utilization, constraints, suggestions, strategy, road map, strengthening ICT utilization, State Agricultural Universities

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Introduction

Information and Communication Technology (ICT) in agricultural education has paramount importance to bring reality to the teaching learning process. A great deal of research has proven the benefits to the quality of education [1]. Changed pool of teachers will come with changed responsibilities and skill sets for future teaching involving high levels of ICT and the need for more facilitative than didactic teaching roles [2]. ICTs are making dynamic changes in society. They provide opportunities in adapting learning and teaching to individual needs [3]. However, research studies show that most teachers do not make use of the potential of ICT to contribute to the quality of learning environments, although they value this potential quite significantly [4]. In spite of committed efforts, the utilization of ICT tools in agricultural education is still not reaching to the expectations of the stakeholders. [5] reported that the problems faced in ICT adoption included inadequacy of funds, shortage of IT skilled manpower, difficulties in periodic up-gradation of infrastructural facilities, frequent change and advancement of technology, high hardware and software costs, insufficient training of professionals and absence of hands-on training. Ample numbers of ICT tools were also been regularly designed and refined to suit to the teaching learning process in agricultural education. But the focus on the valid gaps for

underutilization of ICTs has not been made by the researchers in agricultural education system.

Kumar and Biradar [6] reported that, even though faculty members have shown a positive attitude towards the use of ICT applications and automation, majority expressed the need for appropriate training to make use of ICT tools. Walmiki and Ramakrishne Gowda [7] revealed that most of the universities lack sufficient hardware and software facilities, and internet with required bandwidth to exploit the benefits of digital information environment. Kannappanavar and Vijayakumar [8] observed that, though the agricultural university is having hardware and software facilities to some extent, the results are not reaching the clientele. It recommends that the faculty should be trained on IT application. Keeping in view of the above scenario, the present study was taken up with the objectives of assessing the constraints in ICT utilization by the faculty members in State Agricultural Universities, document the suggestions as given by them for effective utilization of ICT and to suggest a road map for strengthening the ICT utilization by the faculty members in State Agricultural Universities.

Materials and Methods

The study was conducted in Southern India covering Andhra Pradesh, Telangana,

Karnataka and Tamil Nadu states by using Ex-post facto research design under ICAR extramural research project during 2016-17. Two State Agricultural Universities (SAUs) from each of the selected four states were selected and thus making a total of eight SAUs. Two Colleges from each SAU were selected and thus making a total of sixteen colleges. Thirty faculty members were selected from each of the selected college thus makes a total of four hundred and eighty (480) faculty members as respondents. A well-structured data collection schedule was prepared according to the objectives of the study.

Constraints in ICT utilization by the faculty members was measured through a set of 10 important reasons which were identified in consultation with faculty members as well as through review of literature. They were measured in three point continuum i.e. major reason, minor reason and not a reason by giving scores two, one and zero respectively. The data collected from all the respondents were coded and tabulated. Then the data were subjected to different statistical tests such as weighted sum and Percentage. The findings emerged out of the data analysis were interpreted and necessary inferences and drawn. Suggestions were asked to the faculty members in SAU in an open ended format for effective ICT utilization. Accordingly a strategy has been proposed as a roadmap for strengthening ICT utilization by the faculty members in State Agricultural Universities.

Results and Discussion

The constraints in ICT utilization by the faculty members in State Agricultural Universities as presented in the [Table-1], clearly indicated that 'Lack of expertise and skills in using ICT' was the major constraint in ICT utilization as opined by the majority (72.40%) of the respondents and was ranked first. 'Lack of ICT facility at individual level in the department' was considered as other major constraint expressed by nearly three fourth (71.25%) of the faculty members, which was ranked second followed by 'Poor/ limited internet speed' (63.23%) ranked third, 'Poor annual maintenance of the ICT equipment' (63.02%) ranked fourth and 'Lack of ICT technicians and professionals in the vicinity' (62.60 %) ranked fifth. 'Fixed curriculum with limited boundaries' (59.58%), 'Lack of ICT facility at department level' (57.92%), 'Limited budget for purchase of ICT equipment' (55.21%), Limited power supply (53.44%) and 'High cost of ICT equipment' (49.06%) were ranked sixth, seventh, eighth, ninth and tenth successively. All the constraints were more realistic and need to be prioritized while designing the programmes for enhancing ICT utilization.

Table-1 Constraints in ICT utilization by the faculty members

S. No.	Reasons for Gaps in ICT utilization by the faculty	Weighted sum	%	Rank
1	Lack of expertise and skills in using ICT	695	72.40	I
2	Lack of ICT facility at individual level in the department	684	71.25	II
3	Poor/ limited internet speed	607	63.23	III
4	Poor annual maintenance of the ICT equipment	605	63.02	IV
5	Lack of ICT technicians and professionals in the vicinity	601	62.60	V
6	Fixed curriculum with limited boundaries	572	59.58	VI
7	Lack of ICT facility at department level	556	57.92	VII
8	Limited budget for purchase of ICT equipment	530	55.21	VIII
9	Limited power supply	513	53.44	IX
10	High cost of ICT equipment	471	49.06	X

The Suggestions given by the faculty members in state agricultural universities (SAU'S) for effective utilization of ICT was shown in the [Table-2] clearly indicates that 'Periodical training programmes on application of ICTs' as one of the major suggestions and it was ranked first among all the suggestions given for the effective utilization of ICT. 'Creating awareness on importance of different ICT tools and programmes' was suggested by second majority of respondents and was ranked second followed by 'Uninterrupted high speed internet with high

quality broad band facility' ranked third, 'Providing ICT tools like laptop, LCD projector etc., to each faculty member' ranked fourth, 'Establishing WIFI in all the college campuses' ranked fifth, 'Engaging an ICT professional / technician on permanent basis' ranked sixth.

Table-2 Suggestions given by the Faculty members for effective utilization of ICT

S. No.	Suggestions	Percent	Rank
1	Periodical training programmes on application of ICTs	91.46	I
2	Creating awareness on importance of different ICT tools and programmes	88.23	II
3	Uninterrupted high speed internet with high quality broad band facility	87.41	III
4	Providing ICT tools like laptop, LCD projector etc., to each faculty member	82.19	IV
5	Establishing WIFI in all the college campuses	80.52	V
6	Engaging an ICT professional / technician on permanent basis	80.16	VI
7	Proper mechanism for annual maintenance of ICTs	74.28	VII
8	Uninterrupted power supply in the college campus	72.89	VIII
9	Hands -on training through coaching and counseling	69.05	IX
10	Improving the ICT facility at department level	67.17	X
11	Converting all the traditional class rooms as ICT based class rooms	65.84	XI
12	Allocation of enough budget to buy latest ICT tools and programmes	64.21	XII
13	Free access to all the Agri. websites, databases, e-journals, e-books etc.,	61.67	XIII
14	Exposures to ICT based teaching aids	60.95	XIV
15	Regular updating of recent advances in ICT	60.02	XV
16	Special budget for capacity building for the faculty members	58.61	XVI
17	Mandatory on line classes, on line examinations and on line evaluation	56.94	XVII
18	Publication of operation manuals for all the ICT tools	54.79	XVIII
19	Establishment of ICT laboratory in each college	52.87	XIX
20	Organizing workshops, seminars utilization	50.34	XX

Proper mechanism for annual maintenance of ICTs' was ranked seventh, followed by 'Uninterrupted power supply in the college campus' ranked eighth, 'Hands -on training through coaching and counseling' ranked ninth, 'Improving the ICT facility at department level' ranked tenth, 'Converting all the traditional class rooms as ICT based class rooms' ranked eleventh, 'Allocation of enough budget to buy latest ICT tools and programmes' ranked twelfth, 'Free access to all the Agri. websites, databases, e-journals, e-books etc.,' ranked thirteenth. 'Exposures to ICT based teaching aids', 'Regular updating of recent advances in ICT', 'Special budget for capacity building for the faculty members', 'Mandatory on line classes, on line examinations and on line evaluation' were ranked fourteenth, fifteenth, sixteenth and seventeenth respectively. 'Publication of operation manuals for all the ICT tools' was ranked eighteenth followed by 'Establishment of ICT laboratory in each college' ranked nineteenth and 'Organizing workshops, seminars utilization' ranked twentieth. All the suggestions given by the faculty members are worthy with varying level of significance from the point of implementation.

Road map for strengthening the ICT utilization in agricultural education

Road map for strengthening the ICT utilization in agricultural education was designed based on the exhaust and multidimensional analysis of the study including constraints and suggestions as expressed by the faculty members, a comprehensive, appropriate and practically feasible road map has been proposed to strengthen the ICT utilization in SAUs. The roadmap can be broadly divided in to three parts viz. 'unfreezing', 'moving' and 'refreezing', to bring the change effectively and fix the ICT enriched Agricultural education in SAU's by strengthening the ICT utilization by the faculty members.

Unfreezing (phase of break down)

The basic missing link for strengthening ICT utilization in Agricultural education is lack of awareness on the importance & application of ICT in education. Hence majority of the faculty members simply adopting the age old methods without much ICT interaction. The phase of 'unfreezing' primarily focusing on breaking down the preconceived ideas on ICT among the faculty members by creating awareness through different approaches. The strategic journey should start with creating a mandatory environment for ICT utilization in Agricultural education. This facilitates the faculty members to explore the ways and means for using ICT in education. Simultaneously they must be exposed to different ICT tools and programs which are essential to meet the demands of education. It is also necessary to target the attitudinal change and the faculty members towards use of ICT's in education. The glimpse of the phase should rotate around creating awareness.

Moving (Phase of progressive transformation)

This phase can be broadly divided into two components as Capacity building and Infrastructure. Both the components are supplementary and complimentary to each other. It is also necessary to maintain balance between these two components.

Capacity building

This component focuses more on enrichment of Knowledge and skills further provides the scope for updating the ongoing developments in ICTs. Four important approaches were proposed to meet the objective of capacity building were

Identification of Training needs

The most important area under capacity building of faculty members on ICT is training need identification. Training programmes on ICT were generally organized on blanket basis without considering the needs of the faculty members. Each faculty member differs in their level of awareness, knowledge and skills in using different ICTs in their day to day activities. For strengthening the ICT utilization of the faculty members of the institution, documentation of an inventory of the available ICT tools in the institution as well as the analysis of the awareness, knowledge, skills, attitude and extent of utilization of the existing ICT tools by the faculty members has to be taken up for proper Identification and assessment of ICT training needs of the each faculty member so as to design individual training strategies to suit to their pace and level of learning. To obtain more qualitative outcome from this activity, an orientation programme on the importance of ICT in agricultural education will also be arranged for the faculty members. Scientific methodology has to be followed to identify the training needs. This assessment has to be carried out regularly to design the need based training programmes.

Long term on-the job training programme

The short term and segregate training activities in a training institution on Information and Communication Technology (ICT) may not yield desired results due to enormous difference in the infrastructure and other facilities between the training institution and the host college environment. To bridge such gap, it is proposed to organize a long term on-the-job training activities of the faculty members in their natural setting through a well- designed micro lab facility during the leisure time in their working period through computer software technicians will definitely produce excellent and perpetual results. As and when a faculty member finds leisure time during the working hours of the day, he/she can attend the training classes on micro lab mode and learn the required content from the trainers. On an average five hours of time per week has to be spent for training by each faculty member. Each faculty member can continue their learning process as per training module determined for a period of one year. The programme should be purely based on the identified ICT training needs.

Workshops & Seminars

To up keep the efficiency of ICT utilization as well as exposure to innovative ICT tools, there is every need to organize workshops & seminars at frequent intervals. This acts as opportunity for the faculty members to refresh their existing

knowledge and skills. ICT interventions and refinement of existing ICTs also will emerge out of workshops and seminars. Hence the entire faculty should be given opportunity to attend these workshops or seminars regularly.

Peer learning

Even though peer learning appears to be very informal, it will play a significant role in enriching the application proficiency of the faculty members. Peer learning acts as a source of inspiration for the faculty members. It encourages group dynamics and group learning through effective interaction and sharing of technical opportunities. It is also recommended to create a competitive environment for strengthening the concept of peer learning.

Infrastructure

This component focuses more on basic facilities, services and installations needed for providing the scope and opportunity for better utilization of the ICT by the faculty members. Four important approaches were proposed to meet the objective of infrastructure were

Recruitment of permanent ICT professional

Engaging an ICT Professional or a Technician on permanent basis for each institution is another strategic step in bridging the gaps in ICT utilization. The major limiting factor in effective utilization of ICT by the faculty members is lack of timely guidance. Any obstruction at any point of time while handling ICT will shift the faculty towards traditional tools. That spur of movement is going to play a major role in sustaining the interest on ICT. If the obstruction resolved then and there with the timely technical support of a professional, the faculty will save the time as well as continue to use the ICT.

ICT enriched Departments

At the department level also, there must be common ICT facility has to be made available, so that the faculty use them frequently and develop their proficiency. Special budget should be allotted every year to replace the outdated ICT tools and programmes. This facilitates the faculty members to upgrade their skills.

IC Laboratory

To have rigorous and continuous up gradation of credentials on ICT, it is also essential to establish an ICT laboratory in each institution. The laboratory must be equipped with latest ICT's with an ICT professional who will take the lead to upgrade the ICT skills among the faculty members.

Individual ICT tools

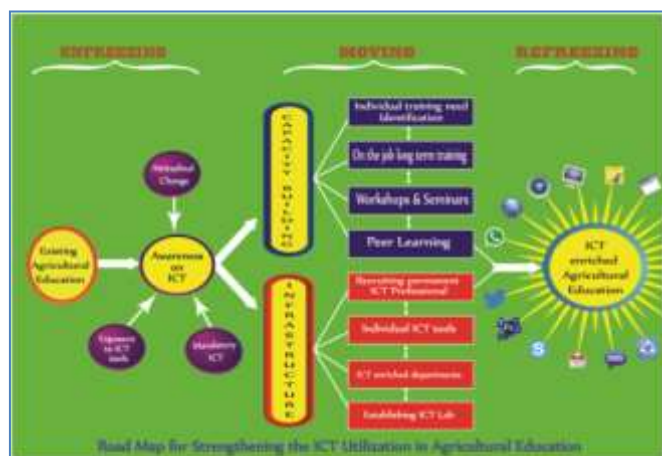
Each faculty member should be provided with one laptop access to internet, LCD Projector and related audio visual aids so that they can have more access to such ICT definitely be an inspiration for the faculty so as to effectively use ICT in their academic environment. At the department level also common ICT facilities has to be made available so that they can use them freely with lot of enthusiasm and pride.

Refreezing (Phase of establishment)

Once the faculty members were gradually transformed from traditional to digital world, they will try to fix their changed mode of functioning and restructure their activities towards career development. A constant reinforcement and encouragement from the organization will play a major role to produce excellent proceedings from this phase. Comprehensively the roadmap projected the ways of handling psychological component of an individual as well as the means for inculcating the digital culture among the faculty members.

Conclusion

This strategic journey from tradition friendly education system to digital friendly education system will strengthen the ICT utilization by the faculty members in State Agricultural Universities.



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Application of research: The designed strategy can be implemented keeping in view of the training needs of farming interests of their ICT. Simultaneously the priority areas in agricultural education can be identified for effective implementation of ICT by the faculty.

Research Category: Information Communication Technology, Agricultural Extension

Abbreviations: ICT- Information Communication Technology

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