



Challenges in Adoption of Technology in Agricultural Education- A Critical Analysis

¹ S. Senthil Vinayagam, ²K.Akhila, ³G.R.K. Murthy and ⁴A. Mahesh
^{1&3}Principal Scientist, ²Young Professional-II, ⁴Senior Research Fellow

Division of Education Systems Management, ICAR-National Academy of Agricultural Research Management, Hyderabad, 500030, India

Abstract

Technological interventions have brought significant advances in facilitating the research outreach over the years in learning. Based on this criteria the study “Challenges in Adoption of Technology in Agricultural Education - A Critical Analysis” was carried out to identify problems faced by the students in use of technological tools, suggestions to overcome those problems and to assess capacity needs of learners in use of technological tools,. The study was descriptive and data was collected randomly from 360 students of six Agricultural and Allied Universities by using structured and open ended questionnaire. The collected data was analyzed by using Training need index, Content analysis, Frequency and Percentage. The major problems faced by the students in use of technological tools are lack of funds (86%), advanced training (84.7%), maintenance (84.1%) and technical knowledge (83.3%) in use of technological tools. Major Suggestions to overcome those problems mentioned by students are requirement of financial support (87.5%), provision of training (86.3%), non-credit course should be mandatory (86.1%), Proper maintenance of available devices (84.7%). The results revealed that the students require training in effective use of technological tools in following training areas are preparation and use of technology based learning material (89.4%), self- evaluation of learning (89.3%) and training on advance learning applications (89.1%) which have been ranked as I, II, III positions respectively. From the study it can be deduced that, the training is necessary for students in use of technological tools which leads to changes in their learning style and also enhance the learning experience.

Key words: Technological Tools, Effective Learning, Students/learners, Capacity, Training, Problems, Suggestions

1. INTRODUCTION

Technology is an effective tool for learners. It provides so many alternatives as making learning interesting and more productive in terms of advancement. It plays a vital role in stimulating activities for learners. The use of technological tools is significant for effective learning because it enhances the way of learning in classrooms. The use of technological tools in classroom shows a real learning experience that increases learners’ responsibility. The application of multimedia also makes use of print, film, and internet gives learners the chance to collect information and also enhance learners’ linguistic knowledge (Bennett et al 2000; Drayton et al 2010; Keser et al 2011; Arifah 2014 and Pourhossein Gilakjani 2014). While using technological tools the learners were having advantages viz., provision of tools to enable students to independently solve problems, acquisition of technological skills through practice with tools and computer, cost effectiveness, developing student’s self-discipline, students are more likely to stay engaged on task and reducing behavioural problems in the classroom (Pavel, et al 2015).

Although use of technological tools has a great potential to reform or even transform education, besides the relative advantages, some of the problems were faced by the students while learning. They are related to ICT compatibility with course curriculum and internet acquaintance were also noted as significant barriers (Layfield et al., 2000; Hew & Brush 2007; Keengwe et al 2008 and Anandaraja et al., 2012). To overcome the problems facing by students, they also seemed to need preparatory training especially in ICT skills in order to enhance their learning effectiveness. Training is an essential process to increase knowledge, change attitudes and develop skills. It enhances self-confidence, competency and proficiency in communicating desired knowledge among peers and clients. Corroborating and updating the ICT course

materials and technical components should be considered through proper feedback and training mechanism. The comprehensive academic competitive situation mandates students to pay rigorous attention to develop necessary digital skills (Nallusamy et al 2015). Based on this criteria the study “Assessment of Technological Interventions for Effective Learning” was carried out with following objectives:

1. To identify problems faced by the students in use of technological tools
2. Identify suggestions to overcome those problems
3. To assess capacity needs of students in use of technological tools

2. REVIEW OF LITERATURE

According Nallusamy et al (2015) lack of ICT facilities was the major barrier in limiting the experimentation of ICT enabled academic education.

Talebianet et al (2014) stated that the Agricultural students from Iran were facing problems during use of technological tools in learning process due to lack of infrastructure facilities.

Pavel et al (2015) stated major problems in edifying process while using the ICTs are lack of knowledge, insufficient information, resistance to change, absence of a coherent and comprehensive management and quality management approaches, lack of high-quality materials and facing difficulty while using.

Azawei et al (2016) found that the lack of training programs, inadequate ICT infrastructure, low internet bandwidth, insufficient financial support, inadequate training programs, lack of technical support were the major problems faced by the learners in e-learning.

Hadullo et al (2018) observed that the provision of e-learning in learning process of post graduate students of Jomo Kenyatta Agricultural University faces several issues relating to course design and assessment, content support, social support, administrative support, learner characteristics, instructor characteristics and institutional factors.

Kujur et al (2019) stated that the lack of managerial skill in utilizing the available budget, inadequate number of practical classes, lack of training, maintenance, knowledge and skill about use of educational technology (ET) tools are the major problems faced by the students in learning process.

The study also revealed about suggestions of majority of the respondents viz., better management of available budget, provide more number of practical classes on ET by the department, proper maintenance of available ET devices at institutes, organizing more number of motivation classes regarding use of ET tools.

Some studies have found that the inadequate ICT and e-learning infrastructure, financial constraints, lack of affordable Internet bandwidth, lack of operational e-learning policies, lack of technical skills on e-learning, and e content development by the teaching staff are the main challenges affecting e-learning include (Ssekakubo et al., 2011; Tarus et al 2015; Makokha & Mutisya, 2016 and Muuro et al., 2014).

Modebelu and Onyali, (2011) as group of individuals that are employed in the universities and other tertiary institution to train and groom students through higher level manpower training needs.

Singh (2006) observed that the analysis of the course curricula followed by the universities of the agricultural sciences reveals that the course content has been designed keeping in view the basic idea to educate the learners, i.e., the techniques of identifying, locating and accessing information sources and provide training to develop knowledgeable.

3. RESEARCH METHODOLOGY

3.1 SAMPLE

The total sample size was 360 from six Agricultural and Allied Universities. The 60 students were selected randomly from each University.

3.2 METHOD

The descriptive type of research design was used in this study.

3.3 TOOL

The data collected by using structured and open ended questionnaire.

3.4 STATISTICAL TECHNIQUES USED

The collected data was analyzed by using Training need index, Content analysis, Frequency and percentage. Problems faced by students in use of technological tools and suggestions to overcome those problems was analyzed by using content analysis, frequency and percentage. Training is required for students to enhance their learning effectively. The capacity needs related to use of technological tools in learning can be analyzed by using training need index, the formula mentioned below:

$$\text{Traning Need Index} = \frac{\text{Total score obtained}}{\text{Maximum score obtainable}} \times 100$$

4. RESULTS AND DISCUSSION

The present study was carried out to identify the challenges in adoption of technology in agricultural education by using following parameters.

4.1 Problems Faced by the Students in Use of Technological Tools

The major challenges faced by the students in use of technological tools was analyzed by using Content analysis, which was used to measure the financial, administrative, technological, psychological, and physical or material problems faced by the students regarding use of technological tools in Agricultural Universities. The data of Table 1 shows regarding problems related to financial, the major problem faced by students was lack of funds in purchase of technological tools (86.1%) followed by lack of proper utilization of available amount (80.5%) and lack of funds for maintenance of technological tools (69.4%). Some of the administrative problems faced by them are no course for learning about technological tools (79.1%) and lack of availability of technological tools (77.7%).

According to Table 1 the technological problems faced by students are lack of advanced training in use of technological tools (84.7%) and lack of technical knowledge to access technological tools (83.3%). Regarding psychological problems that the lack of knowledge and skill about use of technological tools (81.9%) followed by lack of motivation in use of technological tools by students (81.3%), lack of awareness about technological tools (80.5%) and lack of interest in use of technological tools (76.3%). Regarding physical/ material problems that the lack of maintenance of available devices (84.1%) and lack of smart board in department (82.5%). Talebianet et al (2014), Pavel, et al (2015), Seema et al (2019) and Anandaraja et al (2012) also mentioned that the lack of knowledge, management, infrastructure facilities and difficulty in use of technological tools are the major problems.

Table 1: Problems Faced by the Students in Use of Technological Tools

Sl. No.	Problems	Frequency	Percentage
1	Financial Problems		
a	Lack of funds in purchase of technological tools	310	86.1
b	Lack of funds for maintenance of technological tools	250	69.4
c	Lack of proper utilization of available amount	290	80.5
2	Administrative Problems		
a	Lack of availability of technological tools	280	77.7
b	No course for learning about technological tools	285	79.1
3	Technological Problems		
a	Lack of advanced training in use of technological tools in learning	305	84.7
b	Lack of technical knowledge to access technological tools	300	83.3
4	Psychological Problems		
a	Lack of interest in use of technological tools	275	76.3
b	Lack of awareness about technological tools	290	80.5
c	Lack of knowledge and skill about use of technological tools	295	81.9
d	Lack of motivation in use of technological tools	293	81.3
5	Physical/Material Problems		
a	Lack of smart board in department	297	82.5
b	Lack of maintenance of available devices	303	84.1

4.2 Suggestions to Overcome Problems in Use of Technological Tools

The different suggestions were mentioned by students in better use of technological tools to improve their effectiveness of learning. Suggestions were classified into five categories which were measured by using Content analysis, Frequency and Percentage. As per the data mentioned in Table 2 the financial suggestions given by students are requirement of financial support for maintenance of technological tools (87.5%) followed by proper guidance required/needed, to use the amount properly (77.7%). Regarding administrative they are suggested that non-credit course should be mandatory for exposure on technological tools (86.1%).

According to Table 2 the technological suggestions revealed by them are provision of training is necessary for students (86.3%) followed by provision of technological knowledge (70.8%). Psychological suggestions given by them are frequently conduct motivation classes regarding use of technological tools (82.7%) followed by conduct workshop to create awareness on technological tools for students (72.2%). Physical/material suggestions were suggested by them are proper maintenance of available devices (84.7%) followed by provision of smart board for every department (79.1%). Similar suggestions were mentioned by Seema et al (2019) was provision of training on knowledge, skill and conduct workshop in use of technological tools for learning purpose.

Table 2: Suggestions to Overcome Problems in Use of Technological Tools

Sl. No.	Suggestions	Frequency	Percentage
1	Financial Suggestions		
a	Requirement of financial support for maintenance of technological tools	315	87.5
b	Proper guidance required/needed, to use the amount properly	280	77.7
2	Administrative Suggestions		
a	Non-credit course should be mandatory for exposure on technological tools	310	86.1
3	Technological Suggestions		
a	Provision of training on use of technological tools for learning purpose	311	86.3
b	Provision of technical knowledge	255	70.8
4	Psychological Suggestions		
a	Frequently conduct motivation classes regarding use of technological tools	298	82.7
b	Conduct workshop to create awareness on technological tools for students	260	72.2
5	Physical/Material Suggestions		
a	Proper maintenance of available devices	305	84.7
b	Provision of smart board for every department	285	79.1

4.3 Capacity Need Assessment

Technological literacy is one of the essential skills in the contemporary knowledge-based society and have a great impact on the edifying processes and systems, researches and learning initiatives, especially within higher education institutions. According to Table 3, the students require training in effective use of technological tools in following training areas. The major training areas are preparation and use of technology based learning material (89.4%), self- evaluation of learning (89.3%) and training on advance learning applications (89.1%) which have been ranked as I, II, III positions respectively. To improve the awareness and knowledge about use of technological tools effectively while learning, the training is necessary for students which lead changes in their learning style (Modebelu and Onyali, 2011).

Table 3: Capacity needs related to Use of Technological Tools for Effective Learning

Sl. No.	Training Areas	Index*	Rank
1	Preparation and use of technology based learning material	89.4	I
2	Self-Evaluation of learning	89.3	II
3	Use of new learning technology	88.8	V
4	Recent advances in training methodology	88.9	IV
5	Designing learning modules	83.8	VI
6	Training on advance learning applications	89.1	III
7	Online learning	87.1	VII

CONCLUSION

Integration of technological tools in Agriculture and Allied Universities encourages the students to seek out additional opportunities to explore themselves, which results in effective learning. The use of technological tools not only shows positive impact for effective learning but also uncovers the problems faced by them. Finally, we identified several problems pertaining to the use of technological tools and germane suggestions. To overcome those problems the agriculture and allied institutions should engage the students in training regarding use of technological tools in appropriate training areas which were assessed in this study and also follow the suggestions mentioned by them, which results in enhancement of effective learning in directing the increase in quality of education.

REFERENCES

- Al-Azawei, A., Parslow, P., & Lundqvist, K. 2016. Barriers and opportunities of e-learning implementation in Iraq: A case of public universities. *The International Review of Research in Open and Distributed Learning*, 17(5). doi: <http://dx.doi.org/10.19173/irrodl.v17i5.2501>
- Anandaraja, N., Balasubramaniyam, R., Amasubramanian, M., & Sebastian, S. 2012. Orientation and Utility of Information and Communication Technology Tools by Agricultural Students and Research Scholars. *Journal of Agricultural Extension Management*, 13 (1), 47-60.
- Arifah, A. 2014. Study on the use of technology in ELT classroom: Teachers' perspective. M.A. Thesis, Department of English and Humanities, BRAC University, Dhaka, Bangladesh.
- Bennett, D., Culp, K. M., Honey, M., Tally, B., & Spielvogel, B. 2000. It all depends: Strategies for designing technologies for educational change. Paper presented at the International Conference on Learning Technology, Philadelphia, PA.
- Drayton, B., Falk, J. K., Stroud, R., Hobbs, K., & Hammerman, J. 2010. After installation: Ubiquitous computing and high school science in three experienced, high-technology schools. *Journal of Technology, Learning, and Assessment*, 9(3), 1-57. <https://eric.ed.gov/?id=EJ873677>
- Hadullo, K., Oboko, R., & Omwenga, E. 2018. Status of e-learning quality in Kenya: Case of Jomo Kenyatta University of agriculture and technology postgraduate students. *International Review of Research in Open and Distributed Learning*, 19(1).
- Hew, K. F., & Brush, T. 2007. Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational technology research and development*, 55(3), 223-252.
- Keengwe, J., Onchwari, G., & Wachira, P. 2008. Computer technology integration and student learning: Barriers and promise. *Journal of science education and technology*, 17(6), 560-565.
- Keser, H., Uzunboylyu, H., & Ozdamli, F. 2012. The trends in technology supported collaborative learning studies in 21st century. *World Journal on Educational Technology*, 3(2), 103-119.
- Kujur, S., Vinayagam, S. S., Awasthi, H. K., & Murthy, G. R. K. 2019. Constraints Faced by the Students in Use of Educational Technology for Learning. *Communication Approaches*, 37, 12.
- Layfield, K.D., Radhakrishna, R.B., & Scanlon, D.C. 2000. An assessment of Pennsylvania secondary agricultural teachers' perception of and use of the Internet. *Journal of Southern Agricultural Education Research*, 50(1), 54-61.
- Makokha, G., & Mutisya, D. 2016. Status of e-learning in public universities in Kenya. *The International Review of Research in Open and Distributed Learning*, 17(3). doi: <http://dx.doi.org/10.19173/irrodl.v17i3.2235>
- Modebelu, M.N. & Onyali, L.C. 2011. Introducing creativity into University Lecturers administration of knowledge management competencies in Nigeria. *Nigerian Journal of Educational Administration and Planning*

11 (3), 91-104

14. Muuro, M., Wagacha, W., Kihoro, J., & Oboko, R. 2014. Students' perceived challenges in an online collaborative learning environment: A case of higher learning institutions in Nairobi, Kenya. *The International Review of Research in Open and Distributed Learning*, 15(6). <http://dx.doi.org/10.19173/irrodl.v15i6.1768>
15. Nallusamy, A., Balasubramaniam, S., & Chellappan, S. K. 2015. Use of information and communication technology (ICT) to achieve information literacy in agriculture. *International Journal of Agricultural Extension*, 3(2), 111-122.
16. Pavel, A. P., Fruth, A., & Neacsu, M. N. 2015. ICT and e-learning–catalysts for innovation and quality in higher education. *Procedia economics and finance*, 23, 704-711.
17. Pourhossein Gilakjani, A. 2014. A detailed analysis over some important issues towards using computer technology into the EFL classrooms. *Universal Journal of Educational Research*, 2(2), 146-153. doi: 10.13189/ujer.2014.020206
18. Singh, N. 2006. Restructuring LIS user education courses in universities of agricultural sciences: A study.
19. Ssekakubo, G., Suleman, H., & Marsden, G. 2011. Issues of adoption: Have e-learning management systems fulfilled their potential in developing countries? In SAICSIT '11: Proceedings of the South African Institute of Computer Scientists and Information Technologists Conference on Knowledge, Innovation and Leadership in a Diverse, Multidisciplinary Environment (pp. 231- 238). Doi: 0.1145/2072221.2072248
20. Talebian, S., Mohammadi, H. M., & Rezvanfar, A. 2014. Information and communication technology (ICT) in higher education: advantages, disadvantages, conveniences and limitations of applying e-learning to agricultural students in Iran. *Procedia-Social and Behavioral Sciences*, 152, 300-305.
21. Tarus, J., Gichoya, D., & Muumbo, A. 2015. Challenges of implementing e-learning in Kenya: A case of Kenyan public universities. *The International Review of Research in Open and Distributed Learning*, 16(1). <http://dx.doi.org/10.19173/irrodl.v16i1.1816>.

