

An Analysis of Constraints in E-Learning and Strategies for Promoting E-Learning among Farmers

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Abstract

In a country like India where most of the farming communities have low access to the right information sources, extension has so much scope to enter into new vistas like e-learning which can be utilized for virtual education, training and dissemination of information. e-Learning and its promotion carry a number of barriers too along with the favourable factors. In the study undertaken among sixty e-learner farmers of Malappuram district of Kerala state to analyze the various constraints coming in the way of e-learning of agricultural technologies, the most important constraint observed was: technological constraints out of the four groups of constraints. Lack of prompt reply to online queries and information, high cost of establishment, lack of time and relevant information in the website was found to be affecting the e-learner farmers.

Keywords: e-Learning, Constraints, Farmers.

Innovative agricultural technologies that can increase food security in the developing world while conserving environmental resources do exist; yet the global difficulty is getting the appropriate and timely information to farmers. e-Learning can be one of the possible options to reduce the gap between information sources and farmers but the adoption rate of e-Learning for agriculture lags far behind that of other sectors. Although e-Learning is increasingly being adopted in developed countries to reach both traditional and non-traditional farmers, it is still relatively unused as an educational approach for farmers in developing countries. Reasons for this may be many, but to find out the solutions identification of various constraints is important.

In general, the appropriate mechanism to organize and manage research and technology dissemination for knowledge-intensive agriculture is still being debated (Abdon and Raab, 2005) and without an appropriate equipment and easy access, it is quite hard to implement any e-learning (Oliver and Towers, 2000) program among rural farmers. In fact, e-learning does not require a huge infrastructure, even a well working internet connection and supplying enough computers for end-users would be sufficient for an effective e-learning project as observed by Broadbent (2001). For this, the rural digital divide must be bridged. Otherwise e-agriculture applications will remain beyond reach of rural communities, and will merely exacerbate the existing rural digital divide - leading to an ever-widening knowledge gap between information “haves” and “have-nots” (FAO, 2005). Therefore, the critical issue is the provision and appropriation by local communities of ICTs as a development tool for rural areas. It is these communities, struggling at the margins of weak or emerging economies, who most need knowledge resources and economic opportunities” (Jayaweera, 2001).

Researchers also noted that multiple ways of representing and acquiring knowledge (Gardner, 1991) pose a challenge to teaching and learning in an information age. Further, e-learning pedagogies are constrained by institutional factors, including the technologies and applications supported by the institutions, quality assurance policies and standards, availability of staff training and support in e-learning, the existing level of staff proficiency in technology and e-learning, the perspectives of staff responsible for coordinating e-learning development, and the amount of time and funding made available for e-learning practice (Anderson, 2005).

Kerala, being the state having highest literacy rate, a major initiative was launched by the state government to take benefit of e-literacy. Several constraints may crop up in utilizing the benefits of e-learning in Kerala. Hence, this study was formulated to analyze the different constraints that hinder the adoption of e-learning among farmers.

Methodology

The study was conducted in Perinthalmanna, Ponnani and Nilambur blocks of Malappuram district in Kerala. Based on the available information on e-learning, different constraints coming in the way of web based learning of agricultural technologies were enlisted from practicing farmers, agricultural scientists, and also from different agencies engaged with e-learning in the state. Further, all the identified thirty-one constraints were categorized into four groups: social, psychological, technological and economic constraints. The respondents were given these constraints to rate them on a three point continuum from *most severe*, *severe* to *not severe*. Farmers, who were keenly involved in e-learning, formed a random sample of sixty respondents from three blocks. The farmers’ response scores were converted into ranks for one-way analysis of variance using a non-parametric test, Kruskal Wallis Test to ascertain the most important constraints among the four groups as perceived by e-learners. To find out the most important constraint within each group, two way analysis of variance using Friedman’s test, a non- parametric test, was used.

Results and Discussion

Four sets of different constraints were enlisted and farmer's response on their severity was solicited. Table 1 given below shows the calculated value of Kruskal-Wallis statistic and its level of significance.

Table 1. Computed Value of Kruskal-Wallis Statistic for Constraints in e- Learning and its Level of Significance

| Category | Values |
|----------------------|----------|
| K (Observed value) | 123.535 |
| K (Critical value) | 7.815 |
| DF | 3 |
| p-value (Two-tailed) | < 0.0001 |
| Alpha | 0.05 |

As the computed p -value is less than the significant level at one% ($p < 0.01$) it can be inferred that the level of influence of different constraints to e-learning is different according to farmers' perception. To explore it further, multiple comparisons procedure was adopted to identify the major constraints to the promotion of e-learning. Table 2 shows the mean of rank corresponding to each of the statements and also the grouping letter.

Table 2. Comparison of Constraints in e-Learning based on Mean Ranks

| Constraints | Frequency | Mean of Ranks | Groups | | | |
|---|-----------|---------------|--------|--|---|---|
| Psychological Constraints | 60 | 4677.000 | A | | | |
| Economic Constraints | 60 | 5346.000 | A | | | |
| Social Constraints | 60 | 7408.000 | | | B | |
| Technological Constraints | 60 | 11489.000 | | | | C |
| Mean ranks having same letter are not significantly different | | | | | | |

It can be seen from the Table 2 that the mean rank corresponding to *Technological Constraints* is more and hence it was the major constraint to the promotion of e-learning and was not on par with any other constraints. Hence it can be concluded that technology constraint was perceived to be most severe and significant by the e-learning farmer respondents. Social constraints were moderately severe and economic and psychological constraints had less significance as constraints to e-learners.

Each of the sets of constraints discussed above was studied in detail by collecting information on specific constraints under each set, based on farmers' perception of severity of constraints to e-learning.

Psychological Constraints

Among the set of psychological constraints, seven specific psychological constraints were considered and the data were analyzed statistically and results are given in Table 3.

Table 3. Computed Value of Friedman’s Test for Psychological Constraints and Its Level of Significance

| Category | Values |
|------------------------------|----------|
| Q (Observed value) | 186.981 |
| Q (Critical value) | 12.592 |
| DF | 6 |
| <i>p</i> -value (Two-tailed) | < 0.0001 |
| Alpha | 0.05 |

As the *p*-value is less than 0.01 it is very evident from here that the seven psychological constraints are significantly different from each other. A pair wise multiple comparisons procedure was done for the same specific psychological constraints to exploit more possibilities and the results are given in Table 4.

Table 4. Comparison of Psychological Constraints in e-Learning based on Mean Ranks

| Psychological Constraints | Frequency | Mean of ranks | Groups | | | | |
|---|-----------|---------------|--------|---|---|---|---|
| Fear about technology | 60 | 2.317 | A | | | | |
| Lack of self confidence | 60 | 2.550 | A | B | | | |
| Difficulty in online reading online | 60 | 3.525 | | B | C | | |
| Lack of motivation | 60 | 3.700 | | B | C | | |
| Lack of readiness | 60 | 4.608 | | | C | D | |
| Lack of conviction in ICT services | 60 | 5.208 | | | | D | E |
| Lack of prompt reply to online queries and information | 60 | 6.092 | | | | | E |
| Mean ranks having same letter are not significantly different | | | | | | | |

Here, each of the seven specific psychological constraints was found to be different from each other not only with mean ranks but also with their grouping letters. The psychological constraint associated with statement: *lack of prompt reply to online queries and information* (mean rank of 6.092) was perceived by the e-learners as the most severe among all the seven psychological constraints.

Economic Constraints

Three specific economic constraints were considered for eliciting responses from e-learner respondents and the data were analyzed statistically and the results are given in Table 5.

Table 5. Computed value of Friedman's Test for Economic Constraints and Its Level of Significance

| Category | Values |
|------------------------------|--------|
| Q (Observed value) | 8.467 |
| Q (Critical value) | 5.991 |
| DF | 2 |
| <i>p</i> -value (Two-tailed) | 0.014 |
| Alpha | 0.05 |

Here, as the *p*-value is 0.014 it is explicit that the three aspects of economic constraints is significantly different from each other. The multiple comparisons procedure result is given in the Table 6.

Table 6. Comparison of Different Economic Constraints in e-Learning based on Mean Ranks

| Economic Constraints | Frequency | Mean ranks | Groups |
|---|-----------|------------|--------|
| High cost of internet connection | 60 | 1.842 | A |
| High cost of information retrieval | 60 | 1.967 | A |
| High cost of establishment | 60 | 2.192 | A |
| Mean ranks having same letter are not significantly different | | | |

It can be inferred from Table 6 that *high cost of establishment* of the facilities like computer, modem etc. for availing e- connectivity was perceived to be the most severe economic constraint perceived by the e-learner farmer respondents. Here the three constraints were on par as it got the same grouping letter. Hence it can be concluded that these three sets of constraints were perceived to be significant by the farmers.

Social Constraints

The response of e-learning respondents on specific social constraints was analyzed and the results are given in Table 7. The Table given below shows the calculated value of Friedman's statistic and its level of significance.

Table 7. Computed Value of Friedman's Test for Social Constraints and its Level of Significance

| Category | Values |
|------------------------------|----------|
| Q (Observed value) | 254.350 |
| Q (Critical value) | 16.919 |
| DF | 9 |
| <i>p</i> -value (Two-tailed) | < 0.0001 |
| Alpha | 0.05 |

Since the computed *p*-value is less than the significant level at 1per cent ($p < 0.01$) it can be inferred that at least one among the ten aspects of social constraints used in the study was significantly different for e-learners. Table 8 shows the significant difference among the ten specific social constraints with the help of multiple comparisons procedure.

Table 8. Comparison of Different Social Constraints in e-Learning based on Mean Ranks

| Social Constraints | Frequency | Mean of ranks | Groups | | | |
|---|-----------|---------------|--------|---|---|---|
| Lack of facility at individual level | 60 | 3.300 | A | | | |
| Low literacy | 60 | 3.583 | A | | | |
| Low IT literacy | 60 | 3.658 | A | | | |
| Reduced social and cultural interaction | 60 | 4.225 | A | B | | |
| Lack of skill to use IT gadgets | 60 | 4.892 | A | B | | |
| Inequitable accessibility | 60 | 5.617 | | B | C | |
| Lack of social support | 60 | 5.883 | | B | C | |
| Biased content | 60 | 7.333 | | | C | D |
| Lack of social learning system | 60 | 7.850 | | | | D |
| Lack of time | 60 | 8.658 | | | | D |
| Mean ranks having same letter are not significantly different | | | | | | |

In Table 8, the high mean rank given for the specific social constraint: ‘*lack of time*’ clearly indicated that it was the major social constraint and the similar grouping for social constraints showed this factor was also on par with the lack of social learning system and biased content. Lack of facility at the individual level was perceived as the least severe constraint by the e-learners. This factor was also on par with low literacy, low IT literacy, reduced social and cultural interaction and lack of skill to use modern IT gadget

Technological Constraints

Among the technological constraints, responses to eleven specific technological constraints were analyzed statistically and the results are given in the following Table 9.

Table 9. Computed Value of Friedman’s Test for Technological Constraints and Its Level of Significance

| Category | Values |
|------------------------------|----------|
| Q (Observed value) | 245.521 |
| Q (Critical value) | 18.307 |
| DF | 10 |
| <i>p</i> -value (Two-tailed) | < 0.0001 |
| Alpha | 0.05 |

Here also the computed p -value is less than the significance level $\alpha=0.05$ which explicitly conveys that there are significant differences between the response pattern to various statements under technological constraints. The results of pair wise multiple comparisons procedure are given in Table 10.

Table 10. Comparison of Technological Constraints in e-Learning based on Mean Ranks

| Technological Constraints | Frequency | Mean ranks | Groups | | | | | | |
|---|-----------|------------|--------|---|---|---|---|---|--|
| Cumbersome operating process | 60 | 2.275 | A | | | | | | |
| Power failure | 60 | 4.333 | | B | | | | | |
| Poor connectivity | 60 | 4.417 | | B | | | | | |
| Lack of systematic evaluation | 60 | 4.908 | | B | C | | | | |
| Lack of user friendliness | 60 | 5.617 | | B | C | D | | | |
| Lack of information in local language | 60 | 6.167 | | B | C | D | E | | |
| Lack of management system to enhance the quality of e- learning | 60 | 6.542 | | | C | D | E | | |
| Low quality of the content | 60 | 7.392 | | | | D | E | F | |
| Lack of update information | 60 | 7.725 | | | | | E | F | |
| Lack of systematic presentation of content | 60 | 7.825 | | | | | E | F | |
| Lack of relevant information | 60 | 8.800 | | | | | | F | |
| Mean ranks having same letter are not significantly different | | | | | | | | | |

From Table 10 it is clear that *lack of relevant information in the website* was the most severe technological constraint coming in the way of adoption and spread of e-learning from the respondent farmers' perspective. Cumbersome operating process was perceived as the least important technological constraint by the e-learners.

Strategies for Improving e-Learning

Any study would be incomplete without suggestions for development in the field of investigation. Some of the strategies emerged from focused group discussion with various stakeholders for effective utilization of e-learning are:

1. Create awareness among people about the potential of e-learning
2. Trainings to extension officers as well as the officials in agricultural department and other line departments to promote e-learning
3. Trainings to farmers about how to utilize the information available on the internet
4. Provide information in local language
5. Regularly update information

6. Provide location specific and problem specific relevant information
7. Establishment of more information centre exclusive for e-learning at Panchayat level
8. Linking of e-learning centre with State Agricultural University, Krishi Vigyan Kendra, ICAR Institutes, State Department of Agriculture and other development departments
9. Prompt reply by experts to the online queries and information asked by the farmers
10. Video conferencing with experts to help farmers for on-line identification of the problem and for getting instant solution for the problem
11. Facilities for on-line marketing of farm produce
12. Use of low cost tablet to reduce the digital divide and to promote e-learning

Conclusion

Though e- learning was a promising option for the dissemination of information among farmers and extension workers there are several constraints which hinder the efficient employment of e-learning. From the results of analysis for different constraints coming in the way of the e-learning of agricultural technologies, it was obvious that all the enlisted constraints were important in one way or the other. However, still those related to the technological aspects had a major role in creating obstacles to promotion of e-learning and its spread in the state. The strategies listed above may be adopted by all the stakeholders in order to enhance the e-learning movement in a long way.

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