Factors impact agricultural extension training service quality in Vietnam

Bui Huy Khoi

Industrial University of Ho Chi Minh City

Ho Chi Minh City, Vietnam

e-mail: buihuykhoi@iuh.edu.vn

Abstract— This paper aims to assess the quality of agricultural extension training in Vietnam. The data was surveyed and collected from 434 farmers in Vietnam. The proposed research model is based on the researches on service quality theory. The reliability and validity of the scale are verified by Cronbach's Alpha, Average Variance Extracted (Pvc), and Composite Reliability (Pc). The analysis of the research model shows that farmer satisfaction with the agricultural extension training quality is reflected by the assurance (ASS) and empathy (EMP).

Keywords- Vietnam; agricultural extension; farmer; service quality

I. INTRODUCTION

In the world, many studies are confirming the positive impact of agricultural extension on agricultural production efficiency (Owens et al., 2003). However, for the recent specific agricultural extension programs in the key areas of rice production in Vietnam, only a few studies have been conducted on the effects of the "Three to three increases" program on the effects of the technology "Three decreases three increases" and "One increase must decrease five" in Vietnam. Therefore, there should be research on the impact of the New Technology Transfer Program "Three Decreases and Three Decreases" and "One and Five Decreases" in Vietnam to the income of rice farmers as a basis for promoting Strong program in the coming time, especially in the context of ongoing climate change.

On the other hand, new technologies in agriculture such as *"Three reductions and three increases"*, *"One and five reductions"* are transferred to farmers mainly through agricultural extension, which is the type of service in agriculture. Good quality extension services will effectively transfer new technologies to farmers, improve farmers' capacity for efficient production, increase incomes, and improve the lives of rice farmers. However, up to now, research on service quality has mainly been conducted in the fields of commerce and services, but not in agriculture. Quality and satisfaction are related, quality service leads to customer satisfaction, it is not advisable to measure the quality of service without assessing customer satisfaction (Cronin Jr and Taylor, 1992; Kotler, 2013; Olajide, 2011). Therefore, researching the quality of agricultural extension services through its impact on farmer satisfaction is essential to improve the quality of agricultural extension programs that transfer new technological and technological advances in agriculture Vietnam. This paper determines the effect of the agricultural extension training program on the transfer of new technical and technological advances in agriculture to the income of rice farmers; On the other hand, identifying important factors of the quality of agricultural extension services. On that basis, suggested solutions to promote and improve the quality of agricultural extension to promote agricultural development in depth, efficiency, and sustainability; improve the lives of rice farmers in Vietnam.

II. LITERATURE REVIEW

The influence of service quality for business performance has been recognized in the literature through the direct effect on customer satisfaction and the indirect effect on customer loyalty Various scales and indexes to measure service quality such as Technical and Functional Quality model (Grönroos, 1984), SERVQUAL (A Parasuraman et al., 1988), Synthesized model of service quality (Brogowicz et al., 1990), SERVPERF (Cronin Jr and Taylor, 1992), and Antecedents and mediator model (Dabholkar et al., 2000) have been developed and extensively used by academics and practitioners. Among them, SERVQUAL is often considered as the most commonly applied in numerous empirical studies across various service industries and many countries.

SERVQUAL measure was originally formed by (Anantharanthan Parasuraman et al., 1985) by comparing expectations with perceptions on 10 service quality aspects. By 1988, this scale was further identified with 5 dimensions of service quality, namely Tangibles, Reliability, Responsiveness, Assurance, and Empathy (A Parasuraman et al., 1988). These five dimensions are thus assessed by a total of 44 items in which 22 items to measure the general expectations of customers concerning service, and the remaining 22 items to measure the perceptions of customers regarding the levels of service provided by the firm within that service classification (Ladhari, 2009).

According to (Cronin Jr and Taylor, 1992), service quality is a prefix of customer satisfaction and influences purchasing trends. Therefore, customers tend to be willing to satisfy in banking service when they are satisfied with the service quality of agricultural extension training classes. In the service consumption process, the quality of service is expressed in the interaction process between the provider and the user (Svensson, 2002). Therefore, this paper will apply the theory of service quality to analyze factors affecting agricultural extension training class quality.

These factors measure agricultural extension training class quality through five distinct dimensions, namely Tangible, Reliability, Responsiveness, Assurance, and Empathy. These dimensions have also been broadly accepted and applied by many academics and practicing managers in various industries.

- Tangible: the appearance of agricultural extension training service and agricultural extension training staff, physical facilities at agricultural extension training service, and visual materials for agricultural extension training.

- Reliability: agricultural extension training service's ability to perform services accurately and on time right at the first time.

- Responsiveness: agricultural extension training service's willingness and flexibility to serve and help the farmer.

- Assurance: agricultural extension training service's ability to build trust in farmers about agricultural extension training services, agricultural extension training service staff's knowledge and skills.

- Empathy: agricultural extension training service's attention and cares to each farmer.

Service quality measures how well the delivered service could match customer's expectations while delivery service quality refers to meeting and satisfying the bank's expectations consistently and positively (Anantharanthan Parasuraman et al., 1985). Based on the literature, several empirical studies found the linkage between the firm's satisfaction with Tangible, Empathy, Responsiveness, and Reliability. The main target of this study is to investigate the factors affecting the service quality of agricultural extension training service.

The proposed research model in function 1 consists of 5 independent variables [tangibles (TAN): facilities of tax support service, reliability (REL): the reliability of farmers, assurance of farmers (ASS), the responsiveness of agricultural extension training service (RES), the empathy of farmers (EMP), and 01 dependent variables (SAT: service quality in banking)]. Respectively, there are five research hypotheses proposed in Function 1.

$$SAT = \beta_0 + \beta_1 TAN + \beta_2 RES + \beta_3 ASS + \beta_4 EMP + \beta_5 REL$$

So we proposed hypotheses:

"**Hypothesis 1 (H1).** *There was a positive impact of* **TAN** (tangibles) on the **SAT**."

"**Hypothesis 2 (H2).** *There was a positive impact of* **RES** (responsiveness) on the **SAT**."

"**Hypothesis 3 (H3).** *There was a positive impact of* **ASS** (assurance) on the **SAT**."

"**Hypothesis 4 (H4).** *There was a positive impact of* **EMP** (empathy) on the **SAT**."

"**Hypothesis 5 (H5).** *There was a positive impact of* **REL** (reliability) on the **SAT**."

III.   METHODS

Applying the above theories, we conducted a survey of 434 farmers in 2020 to collect data. The method of random selection and direct interview with the questionnaire is designed according to five factors affecting the quality of the agricultural extension training service on a scale of 1 - 5. The research team conducted a trial with10 samples, based on which the questionnaire is adapted to reality. Then conduct a mass survey at the transaction office. The model consists of 5 factors and 26 observed variables (each factor has many observed variables). Based on the analysis model, we receive a system of farmers satisfaction rating on agricultural extension training quality (SAT) for five factors: TAN: facilities, equipment, communication, REL: Reliability and accuracy when performing tasks, ASS: Service capability demonstrates professional qualifications and courtesy of employees, creating a trust for farmers, RES: Response shows timely service delivery and willingness to help farmers, EMP: Sympathy shows kindness, consideration for each farmer. This measurement bases on a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree).

The questionnaire answered by respondents was the main tool to collect data. The survey was conducted in 2020. Data processing and statistical analysis are used by Smartpls software. The reliability and validity of the scale were tested by Cronbach's Alpha, Average Variance Extracted (Pvc), and Composite Reliability (Pc) (Hair Jr et al., 2016). PLS path modeling is a variance-based structural equation modeling (SEM) technique that is widely used in education, business, and social sciences in the past two decades (Henseler et al., 2016; Klesel et al., 2019). In the first step of PLS analysis, the measurement model was assessed, and in the second step of PLS analysis, the structural model was assessed. Path significance has been estimated using bootstrapping resampling technique with 5000 sub-samples, as suggested by (Avkiran and Ringle, 2018). While analyzing data, we followed the guidelines specified by (Henseler et al., 2016; Klesel et al., 2019).

IV.   ANALYSIS AND DISCUSSION

A. Consistency and Reliability

All measurement scales were examined for their psychometric properties (reliability, convergent validity, and consistency) before testing hypotheses (bootstrapping with 5000 subsamples) (Hair Jr et al., 2016). While all items did not meet the assessment requirements of the measurement model, it was excluded from further analysis.

Internal consistency and reliability were examined by composite reliability (Pc), where the value should be more than 0.6. For assessment of validity, two validity subtypes are usually used: the convergent validity and the discriminant validity. For convergent validity, Fornell and Larcker's assessment criteria have been used: the average variance extracted (Pvc) for each construct should exceed 0.50. Each of our six factors had value Pc above 0.6 and Pvc above 0.50, value Pvc of ASS, REL RES, and TAN below 0.5 so these factors need to continue to test (Table 1). Some factors are significant at $p < 0.01$ (Table 1). Our measurement scales meet the conditions for convergent validity. Pvc is also used to establish discriminant validity by the Fornell and Larcker criterion. For our model values of the square root of Pvc are higher than correlations between factors, which appear below it (Table 1).

Table 1. Reliability and Validity

Construct	Cronbach's Alpha	rho_A	Pc	Pvc
ASS	0.659	0.671	0.775	0.369
EMP	0.718	0.738	0.823	0.538
REL	0.645	0.676	0.786	0.483
RES	0.631	0.667	0.779	0.476
SAT	0.645	0.653	0.807	0.583
TAN	0.599	0.621	0.765	0.452

From table 1, it could be recognized that all the factors are reliable (Henseler et al., 2016). This characteristic is measured by some indicators on a construct, indicating that the associated indicators have statistical significance (Hair et al., 2017; Hair Jr et al., 2016; Henseler et al., 2016; Nunnally and Bernstein, 1994).

B. Path Model Test

The structural model was examined to test hypotheses. Paths are interpreted as standardized beta weights in a regression analysis. The relationship testing results are based on bootstrapping (with 5000 subsamples) to test the statistical significance of each path coefficient using t-tests.
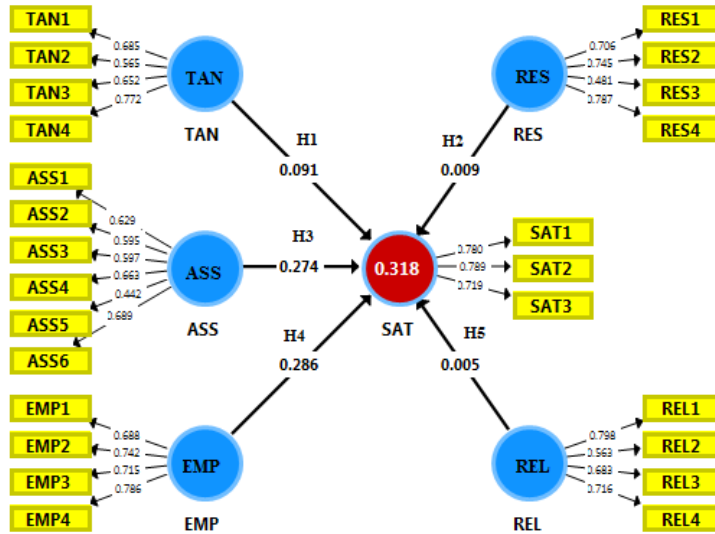

Figure 1. Empirical model

The result of the empirical model in figure 1 showed that the model was compatible with data research. The service quality in agricultural extension training was affected by five factors, about 31.8%.

Table 2. T-Test Results

Hypothesis	Beta	SE	T-value	P	Decision
ASS -> SAT	0.274	0.053	5.199	0.000	Supported
EMP -> SAT	0.286	0.055	5.235	0.000	Supported
REL -> SAT	0.005	0.057	0.087	0.931	Unsupported
RES -> SAT	0.009	0.063	0.142	0.887	Unsupported
TAN -> SAT	0.091	0.059	1.540	0.124	Unsupported

Beta (r): SE = SQRT (1-r2)/ (n-2); CR= (1-r)/SE; P-value =TDIST (CR, n-2, 2).

In the T-Test analysis in table 2, the two variables associated with the service quality of agricultural extension training (p<0.05) and REL, RES, and TAN were not correlated with service quality in agricultural extension training (p>0.05). The most important factor for the SAT was the EMP aspect with the Beta equals 0.286.

T-Test results also showed that the model was compatible with data research in table 2. In bootstrapping, resampling methods were used to compute the significance of PLS coefficients. The output of significance levels can be retrieved from the bootstrapping option. Table 2 shows the results of hypotheses testing; all the t values above 1.96 are significant at the 0.05 level. Two hypotheses were supported, and three were unsupported as table 2.

V. CONCLUSION AND IMPLICATIONS

A.   Conclusion

The main contribution of the paper is to confirm the influence of agricultural extension training to transfer technical advances to production efficiency, the income of rice farmers in Vietnam, and to build quantitative models to evaluate quality. agricultural extension training service in agriculture. The research results show that there exist two factors that have a positive impact on the service quality of agricultural extension training: assurance (ASS) and empathy (EMP). Therefore, to improve the service quality of agricultural extension training, we propose several policy suggestions to focus on as follows.

B.   Implications

First, improve the assurance (ASS): There are only items in the assurance (ASS) of agricultural extension training. So we give implication as follows: Comparison of the performance of the demonstration field at the end of the season was well performed (ASS6), five other items are unsupported because their items have Outer loadings greater than 0.4. (ASS6) Collation, comparison of productivity, cost, and efficiency of the demonstration field with farmer field at the end of the season was well implemented. The feature of "One-to-five-year" reduction technology is the reduction of seed, fertilizer, and drug inputs but no yield reduction. Therefore, it is necessary to compare the cost, productivity, and efficiency between the demonstration field and the farmer's customary farming field in a clear way for farmers to understand and apply. The clearer the chart, the easier it is for farmers to be satisfied with the quality of the training.

Second, increase empathy (EMP): There are four items in empathy (EMP) of agricultural extension training, EMP1 item is unsupported because its item has Outer loadings greater than 0.4. So we give implication as follows. The group of lecturers close and intimate with farmers (EMP2), Lecturers sympathizes with learning difficulties of farmers (EMP3), Lecturers always recognize the needs of farmers (EMP4). (EMP2) The group of lecturers close and intimate with farmers. Farmers in the training courses are farmers, they have been away from schools for a long time. Therefore, the teaching group needs to show close, intimate with students so that they can boldly exchange, discuss, and share practical experiences with teachers to make the classroom lively and effective. (EMP3, EMP4) Lecturers sympathize with their learning difficulties and are always aware of their needs. These factors belong to the teacher's sympathy for the farmers. Since learners are farmers, most of them are old, so they have learning difficulties such as slow acquisition, inadequate writing, unreasonable presentation, or apprehension, due to being dominated by life ... for, Therefore, lecturers need to sympathize with farmers and pay attention to identify farmers' needs to create a lively atmosphere in the training class.

The main contributions of the paper

The paper confirms the impact of the agricultural and technological advanced agricultural extension programs "three reductions and three increases", "one and five reductions" for technical efficiency and economic-income efficiency in rice production of farmers in Vietnam. It develops a service quality scale for agricultural extension training based on SERVQUAL and uses the relationship model of quality and satisfaction to assess the quality of service in agriculture. This method is fast, low cost, and very convenient to evaluate the quality of extension training. The new academic contribution of the paper is to confirm the theory of the impact of technological innovation in agriculture transferred through agricultural extension training in rice production conditions in Vietnam and to build quantitative models. assessing the important factors of service quality in agricultural extension training, which is less researched based on applying SERVQUAL and relationship model of service quality and satisfaction. Besides, the dissertation has added the evaluation factor, perceived economic efficiency, environmental efficiency of new technical and technological advances to the regression model of service quality relationship and satisfaction to increase the relevance of the model.

C.   Limitations and directions for next researches

Next papers are proposed to continue researching and applying Seroquel in the fields of agricultural services and constructing some scales to complement the quality relationship model and satisfied in the agricultural

service sector more appropriate.

VI.   REFERENCES

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