

Commercialization and Farmer Literacy's role on Agriculture Extension Services in Malaysia

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Commercialization has played a significant role in the agriculture industry of Malaysia as increased literacy of the farmers and the access to developmental services in their fields aid in the production of the crops that are rich in nutrients and provide better standards of living. Moreover, the increasing demand and incorporation of technology in the farming practices has necessitated that farmer gain access to technical and educational services to improve their propensity. Literacy and commercialization play a vital role in the dissemination of information and lead to adoption of extension services. Extension services assist the farmers through educational processes and work through the improvement in the farming procedures and practices. Adoption of extension services lead to improved farm outputs like increased efficiency and income and thus the factors influencing the adoption of extension services needs to be addressed. Thus, the main objective of the study was to evaluate the role played by commercialization and farm literacy in the adoption of extension services. The study was based on a quantitative methodology and survey technique was used. A convenient sample of 316 farmers was collected from Malaysia. The method of structural equation modelling was used for estimation of variable estimation. The technique of confirmatory factor analysis was used for estimation of model validity. The results indicate that the commercialization and farm literacy significantly influence the adoption of extension services. Also, social influence and information quality were found to mediate the associations positively as well.

Keywords: Social influence, commercialization, educational services, technical services, extension services.

1. INTRODUCTION

Commercialization is a practice that brings novel items into the market as per the innovative technology and advanced techniques used in producing goods. In various situations, it has been reported that commercialization has played a significant role in the agriculture industry of Malaysia because of the increased educational services provided to the farmers about enhancing the quality of crops in their fields and producing the crops that are rich in nutrients and provide better standards of living to them as well as the demand of consumers is also fulfilled. In addition, the farmers can also increase their income with such practices.

A higher level of literacy in farmers can have countless benefits in the context of Malaysia. The country has increased weather impacts, and due to change in climate and the soil fertility is affected in such a way so the farmers can be advised through various programs to utilize some new techniques and to maintain their income level. The knowledge provided to framers can also help increase the commercialization in the agriculture department of Malaysia as the new products would be introduced in the market, and farmers can play a major role in getting rewards by bringing some innovations (Chetthamrongchaia, Foonsirib, & Jermsttiparsertc, 2019).

The traditional methods of farming have been considered low standards. Customers are also not satisfied with the products of agriculture that are grown through the traditional methods as such grains and crops are considered lacking in natural nutrients. The land is also not efficient enough for the next

time to produce similar crops and taste as before. In such circumstances, farmers are advised to utilize new standards and increase the production of agricultural products. They are provided with agriculture extension services and guided with the help of different seminars to attain help for the future (Rosmiza, CR, Mazdi, & Jabil, 2014).

The farmer literacy is considered a major concern in agriculture department as the knowledge of commercialization can play a significant role in crop productivity and the business of agriculture sector can be enhanced with effective knowledge and interest of farmers in crop yield. The problem statement for this respective study is to establish the relationship between farmer extension services and the use of innovative procedures in agriculture department of Malaysia. The delivery of efficient crops to the consumers with professional extension services provided to farmers has a considerable positive impact at global level as the commercialization is being adopted by a lot of farmers in various other countries (Sheng Tey, Brindal, Li, Gill et al., 2018).

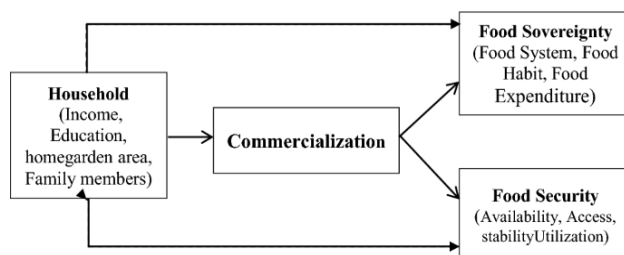
The need of this study is to improve the farmer's literacy rate in agriculture department and to encourage them for utilization of commercialization in their farming practices to attain better income with financial stability in their lifestyle. The study fills up the gaps in educative parameters and campaigns organized in Malaysia to enhance agriculture extension services. Farmers can get enough knowledge to introduce new products in market with efficient productivity for grabbing the attraction of

consumers to provide economic stability to agriculture as well as economic stability to government of Malaysia.

Assorted studies have revealed that farming information as per knowledge to provide effective education to farmers was not considered at a high note in past. The consequences and the need of agriculture extension services were not known in the past as the literacy rate of farmers was quite low in ancient times. The estimates have shown that due to such low-level literacy rate of farmers about 45% of cultivated areas in the country were not fertilized and various crop fields were wasted due to lack of knowledge in farmers to increase the productivity. In accordance with all these aspects, the current study is initiated to fulfill the gaps of previous study and to establish the significance of agriculture extension services with reference to commercialization of crops. The current research also provides awareness to farmers to enlighten the new techniques that could be utilized for introducing high quality crops in market.

As per the information provided in justification rationale of the current study, the objectives can be proposed as well. The farmer input information must be increased in Malaysia to support farmers in large scale farming practices and to develop the agriculture sector with the help of commercialization (Utami, Indrianto, & Pratama, 2019). Specific objectives for the current study are:

- To explore the perception of farmers towards agriculture extension services
- To enhance the commercialization at a global level to gather consumer attention
- To propose different educative programs in Malaysia for providing enough information to farmers regarding commercialization



According to recent studies, it has been reported that about 77% of farmers of Malaysia have been literate with better quality knowledge and education. In different agriculture departments of Malaysia, farmers need to provide guidance to tackle the different agriculture perspectives. The scope of current study is to highlight the need of farming techniques to encourage commercialization and increase the farmer literacy rate in the country for better outcomes. The study fills up gaps in lack of information and awareness in farmers to promote their small scale business to a large scale (Adnan, Nordin, & bin Abu Bakar, 2017).

Main significance of current study is based on increased agriculture productivity if the commercialization would be promoted in the respective department of Malaysia. Some

factors of influence in agriculture with respect to farmer literacy rate can be boosted with effective reasoning. The trade practices will be increased and the economic as well as financial stability would be encouraged in Malaysia. Farmers would be able to earn better farm level income and improve their lifestyle with progressive business in agriculture. Cultivation mechanisms will be developed, and crops would be enriched with a considerable impact on economic growth.

The current study is organized in a sequence of providing information in the form of literature review followed by methodology utilized by researchers to conduct study under the selected topic. The next part is based on results and findings that researchers have gathered during the study. In the end discussion and conclusion are stated to further explain the topic in detail.

2. LITERATURE REVIEW

2.1. Theory of Social Influence

The theory is proposed by social scientist Kelman, who states that the individual's attitudes, beliefs, and actions are influenced referred to the internalization, identification, and compliance. Kelman adds that social influence shape the behavior of the people. Compliance occurs when people accept the influence that comes socially and adopt according to that influence which is induced with the intentions of gain and rewards, and to avoid the disapproval or punishment. Satisfaction is usually achieved because of the social influence in compliance. Identification happens when social influence molds the behavior to maintain relation with some specific social group or another person. Internalization occurs when the social influence effects the actions and attitude once people have perceived the influencing behavior is rewarding (Friedkin, 1998). The social influence is said to be unintentional and even intentional at times that affects the attitude and actions of the people. Social influence occurs via peripheral processing, therefore the person or the group under the social influence is usually unaware of the fact that their actions and behavior is being socially influenced (Friedkin, 1998; Rashotte, 2007). The idea of social influence is pivotal while studying and understanding social psychology and inter-group processing and inter-group relations. It is a widespread practice among the human beings in the daily life, and a fundamental part of relations within a group and across social groups. While practically observing social influence has different forms obedience, socialization, peer pressure, leadership, persuasion, minority influence and many other aspects fall in the category of social influence (FULK, 1990). Social roles that are played by all members of the society come in the category of implicit expectations which also come under the social influence. However, the action of obedience falls in the category of explicit expectations.

2.2. Farmer's Literacy and Agriculture Extension Service

Farmer's literacy is one of the prime factors considered towards the crop productivity. A well informed and educated farmer has a professional attitude towards the crop efficiency and believe is using the new scientific

techniques to enhance the crop yield. However, the farmers with little or no education regarding their profession believe in the old conventional methods of farming. Studies have shown the regions of world with high rate of farmer literacy are accelerating in the crop production and crop affectivity. Farmers with enough information regarding the use of chemicals and ratio of use of chemicals including pesticides, insecticides, fungicides, and fertilizers can also prevent the crop from any hazard more effectively. Farmer's literacy is also important in considering the agriculture extension service that also aims to guide farmers regarding the effective farming techniques (Aggarwal, Gupta, & Singh, 2014). Farmers who already have a good command on the knowledge tend to accept the guidance and suggestions more readily by the agents of the extension service. The aim of agriculture extension service is to introduce new scientific farming techniques and findings of farming research to the farmers. Therefore agriculture extension service also plays a significant role in enhancing the farmer's literacy as it aims to educate farmers in all aspects to deal with the environmental shock, increase productivity and use new efficient technological methods to enhance the practice of farming (Mashroofa & Senevirathne, 2014).

2.3. Mediating Effect of Social Influence in relation between Farmer's Literacy and Extension Service

Social influence is an important aspect of the daily life of all human beings. Either knowing or being unaware all human beings are under social influence. Farmer's behavior is also greatly shaped by different social groups that influence them. One of the most crucial factors is the inter group influence. Farmer's behavior is significantly affected by other farmers, as studies have shown that the farmers of one region follow the same farming techniques. Therefore, the role of agriculture extension is also mediated by the social influence. It is considered as a task of considerable magnitude for the agents of agriculture extension to convince the farmers with little or no education regarding farming towards the new scientific findings and technological farming techniques (David & Samuel, 2014). As the entire group of the farmers is under the social influence of each other. However it has also been studied that a few members of group if have knowledge and believe in the guidance of the agriculture extension service the other farmers under the social influence to also achieve the reward of greater productivity are easily convinced towards the new farming practices (Alam, Hoque, Khalifa, Siraj et al., 2009; Duinen, Filatova, Geurts, & Veen, 2015). Therefore, social influence plays a mediating role in relation between farmer's literacy and agriculture extension service.

2.4. Mediating role of Information Quality in relation between Farmer's Literacy and Agriculture Extension service

The aim of agriculture extension service is to guide the farmers regarding new farming methodology, new machines, and other scientific methods to improve the farming. Information quality in this regard plays a

mediating role (Gudalov & Treshchenkov, 2020). As the perception of the information and knowledge received by the farmers also effects the behavior of the farmers towards extension services. The quality of information conveyed to the farmers by the agents of the agriculture extension service is especially important. Information and Communication Technology has also eased this task for the agents of the agriculture extension to provide enough guidance and help to the farmers at any time they need (Gelb & Bonati, 1998). Moreover, the quality of information provided to the farmers is also a crucial factor in shaping the literacy of the farmers that in turn shapes the perception of the farmers towards the information provided. It is mandatory to provide the quality information to the farmers to enhance the farmer's literacy which has a positive influence and perception of the farmers towards agriculture extension service that affect the crop productivity and crop efficiency.

2.5. Commercialization and Agriculture Extension Service

Many farmers who have small areas for farming, grow plants and herbs but do not sell them to markets or consider them for commercialization. They grow them to meet the needs of their families and do not even have the idea regarding the worth of plants they are growing (Ab Yajid, 2020). However, the effort of agents of agriculture extension service can help them assist regarding the worth of their crops and plants which can be beneficial for the farmers as well as the state as it will contribute to give the economic boost. Commercialization of crops will enhance the positive behavior of the farmers towards agriculture extension services (Mahaliyanaarachchi & Bandara, 2006). They will be motivated to consider the suggestions of the agents and also introduce the use of new techniques in the farming practices (Gebremedhin, Hoekstra, & Tegegne, 2006). By bringing the farming products in the market and applying the new farming techniques along with suggestion of the agents will result in the prosperity of the farming efficiency leading to enhanced productivity.

2.6. Mediating Role of Social Influence in relation between Commercialization and Agriculture Extension Service

It is the very part of human nature that humans are under profound influence of other humans that can be from the same social group or from other groups. However, they undergo the social influence looking for some reward or bonus. So is the case of farmers, they are under profound influence of each other and follow what they see other doing. Commercialization of the crops or plants grown by the farmers is influenced by the behavior in their social group. However observing another group of farmers participating in the commercialization of their crops and gaining some reward can greatly influence the farmers towards the idea of commercialization (Binswanger & Braun, 1991). Therefore, in relation where the agents of agriculture service extension work enough to educate the farmers regarding the benefits of commercialization social influence is of immense importance. Social influence can lead to both positive and negative outcomes (Petzelka,

Korsching, & Malia, 1996). However, in relation between commercialization and agriculture extension service social influence plays a mediating role in shaping the behavior and attitude of the farmers towards new farming practices.

2.7. Mediating Role of Information Quality in relation between Commercialization and Agriculture Extension Service

In the 21st century where information and communication have overpowered all walks of human life and have made it far easier. Communicating information across the globe has become a matter second. Application of information and communication technology in the field of agriculture can help achieve farmer's goals of productivity. Educating farmers regarding the benefits of commercializing their crops and conveying quality information towards farmers can help gain their trust towards the agriculture service extension. Guiding farmers regarding the ongoing trends in the market regarding prices can help them take a better and bold decision regarding commercialization. This can be achieved by communicating the right information with farmers and also the benefits of commercialization (Kennedy & Cogill, 1988). Because communicating the right information with farmers can accelerate the approximation of their perception regarding commercialization and can also boost their trust in the agents of agriculture extension (Alemu & Negash, 2015). Therefore, communication of right information can enhance the productive farming as it enhances the trend the agriculture service extension in the farmers.

The following hypothesis can be generated for this study:

H1: Farmer's Literacy effects the agriculture extension service.

H2: Social Influence plays a mediating role in relation between farmer's literacy and agriculture extension service.

H3: Information Quality plays a mediating role in relation between farmer's literacy and agriculture extension service.

H4: Commercialization effects the agriculture extension service.

H5: Social Influence plays a mediating role in relation between commercialization and agriculture extension service.

H6: Information Quality plays a mediating role in relation between commercialization and agriculture extension service.

3. METHOD

This research paper used the questionnaire based survey methodology that is most commonly followed in primary data research (Dubey, Gunasekaran, Childe, Papadopoulos et al., 2019). The researcher has used Confirmatory Factor Analysis (CFA) to evaluate the convergent and discriminant validity of the instrument in the first stage of analysis and Structural Equation Modelling (SEM) has been adopted in the second stage for analyzing the validity of the hypotheses of this research.

3.1 Research Design

The research design in the present study is guided by the research onion presented by Saunders, Lewis, Thornhill, and Bristow (2015). The process of research in a study is based on several philosophies and underlying paradigms that can lead to a path of appropriate decision-making in accordance with the area and scope of research. The research philosophy defines the values, assumptions, and beliefs of a researcher (Antwi & Hamza, 2015). Traditionally, four main research paradigms or philosophies exist i.e., interpretivism, positivism, pragmatism, and realism. In the present study, positivism is used to form the basis of the philosophical paradigm as it allows a researcher to objectively collect and analyze data. Research approach can be found to be broadly classified as either deductive or inductive (Grinchenko & Shchapova, 2020). In the present study, a deductive approach will be aimed as the researcher needs to use empirical techniques of elicitation of patterns from the theories and opinions collected from the respondents (Rahi, 2017). Furthermore, in the current study, a cross-sectional time horizon strategy is used. In a cross-sectional study, the data from the participants is collected in a single time. The longitudinal studies need more time to be conducted as they are required to be repeated across time whereas the cross-sectional research studies are based on a single time data collection and are most suitable in cases where the researcher has a limited time for data collection and analysis and does not involve time series data analysis.

3.2 Population and Sampling

The population can be defined as the overall group of subjects from which the sample for a study is to be drawn (Sekaran & Bougie, 2016). The sample can be extracted efficiently only if the population is well defined. A sample is the smaller subset of the overall population from which the data is collected, and it can represent the characteristics and point of view of the overall population. The population of the current study is the farmers in Malaysia. There are two types of sampling techniques: probability and non-probability. In the present study, the researcher used non-probability sampling method. More precisely, the purposive sampling technique is utilized in the current study. The researcher selected such farmers that are experienced in use of agricultural extension services.

3.3 Pilot Test and Data Collection

With the aim of evaluating the conceptual model developed in this research and to evaluate the hypotheses, the researcher has designed a survey instrument to measure the constructs of this study. First, a pilot study was conducted based on a draft of the survey questionnaire. Pilot test was conducted to ensure validity of the content of the questionnaire. In this stage, six professionals were requested to check and provide inputs regarding the validity of the questionnaire. Three of these professionals belonged to academia, one was an IT specialist and the rest two were agricultural industry specialists. The feedbacks from this panel helped the rephrasing of the questions, rearranging the item sequences and improvements in

clarity and readability. The questionnaires were sent out to five hundred respondents purposively selected by the researcher. The emails were followed by reminders to make sure that the maximum response rate is achieved (Singh & El-Kassar, 2019). A total of 327 questionnaires were received back after the waiting period. After removing redundant, incomplete, and irrelevant responses, 314 responses were finalized to be included in the research.

3.4 Measures

The constructs that comprised the research model have been measured using items that have been identified through literature. The data has been calculated using a five-point Likert scale that ranges from strong at 5 to weak at 1. A total of sixteen items is included in this study.

- Commercialization is the first independent variable in this study. It is measured using 3 items adopted by the study of [Abdoellah, Schneider, Nugraha, Suparman et al. \(2020\)](#).
- Farm literacy is the second independent variable in this study. It is measured using 3 items adopted from a number of past studies ([Nyasimi, Kimeli, Sayula, Radeny et al., 2017](#); [Sanga, Kalungwizi, & Msuya, 2013](#))
- Information quality and Social Influence are used as a mediation variable and are measured using three items each. The items are extracted from several recent studies ([Kante, 2021](#); [Kante, Chepken, & Oboko, 2018](#); [Kante, Oboko, & Chepken, 2019](#)).
- Agricultural extension services are the dependent variable in this study. Items for this variable are adopted and reworded from a previous research work by [Muh. Hatta, Amri, Muhammad, Ma'mun et al. \(2017\)](#).

3.5 Non-Response Bias

10 non-respondents were contacted to check for the non-response bias issues ([Sheikh & Mattingly, 1981](#)) and they were inquired about the reason for opting to not participate. Lack of information about the various constructs came forward as the most highlighted reason. The non-response bias was, however, considered irrelevant due to the fact that Chi-Square testing ([McHugh, 2013](#)) on demographics

of early and late respondents showed that there was no significant difference among the two groups.

3.6 Data Analysis

The stage of data analysis can be defined as the process of conversion of raw data into meaningful and useful information. Demographic, descriptive, and other preliminary tests like fit statistics were used to ensure model fitness. Furthermore, CFA and SEM are used for analysis in this study.

4. RESULTS

4.1. Descriptive statistics

The values in [table 1](#) are depicting the descriptive summary of the study variables. The table indicates that the final sample included 316 respondents. The descriptive summary informs of the mean response orientation, normality, and outliers present in the sample. The number of respondents against each construct is similar i.e., 316. Thus, showing that there are no missing values present in the data. The average value for all constructs is between 3.4-3.9, showing that the respondents at large agreed with the statements of the questionnaire. The next facet to evaluate is the presence of outliers, which can be studied based on the minimum and maximum values against each of the variables in the [table 1](#). The minimum and maximum values for all constructs are similar i.e., 1 and 5 and match with the endpoints of the Likert scale used for response evaluation. Thus, this indicates that the data is free from outliers. The last facet evaluated through the descriptive analysis is the normality of the constructs. Normality is an essential characteristic and is a prerequisite of SEM and therefore needs to be ensured. The normality of the data is evaluated based on the results of the skewness test. The acceptable range for the skewness test is 1- to+1 and the values of all five variables remain in this threshold. Thus, indicating that the given data is normally distributed and valid. The results in [table 1](#) prove that the data is valid i.e., it is normal and free from outliers and missing values therefore eligible to go for further testing.

Table 1: Descriptive Summary

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness
COM	316	1.00	5.00	3.4905	.36696	-.741
FL	316	1.00	5.00	3.8386	.44700	-.826
SI	316	1.00	5.00	3.5791	.47098	-.697
IQ	316	1.00	5.00	3.5158	.21056	-.758
ES	316	1.00	5.00	3.9873	.80390	-.505
Valid N (listwise)	316					

4.2. Sample adequacy

The adequacy or the suitability of the data is measured through the application of the KMO and Bartlett test. KMO is a statistical test that is applied to evaluate the suitability of the sample prior to subjecting to factor analysis. KMO evaluates the proportion of variance among the factors. The lower the proportion of variance in the model, the more the model will be suitable for analysis. The range of the KMO statistic falls between 0-

1, where higher values are indicative that the factor analysis will entail suitable results. However, if the results are on the lower end of the spectrum i.e., less than or near to 0.5 it indicates that the factor analysis won't provide with favorable results ([Vogt & Johnson, 2011](#)). The Bartlett's test of sphericity is applied for the comparison of the correlation matrix with the factor matrix to evaluate if an identity matrix is formulated. The results in the [table 2](#) are depicting that KMO has a higher

value and is close to one i.e., 0.742 and indicates that the dataset is suitable for further analysis. Moreover, the Bartlett test is significant as well and therefore highlights

that there is no redundancy present in the dataset. Thus, the factor analysis will be suitable for the present data and other statistical tests can be proceeded with.

Table 2: Sample Adequacy

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.742
Bartlett's Test of Sphericity	Approx. Chi-Square	1113.898
	df	10
	Sig.	.000

4.3. Reliability analysis

The reliability of the scales was evaluated through the Cronbach Alpha. The reliability informs of the internal consistency of the construct scales. The acceptable value for the measure is 0.7 (Christmann & Van Aelst, 2006; Connelly, 2011). The table 3 indicates of the number of items and Cronbach Alpha values against each construct. Commercialization, farm literacy, social influence, and information quality are all evaluated based on three item scales and have Cronbach Alpha values if 0.891, 0.781, 0.902, 0.812 and extension services is measured through four items and has α value of 0.859. As all the values are greater than 0.7, the scales are deemed dependable.

Table 3: Reliability analysis

Variable	Cronbach's Alpha	N of Items
COM	.891	3
FL	.781	3
SI	.902	3
IQ	.812	3
ES	.859	4

4.4. Component matrix

The next test applied on the data is the component matrix. The table values indicate that the loadings of all items are greater than 0.5. Thus, indicating that all items contributed to the overall variance of the construct. Moreover, none of the items have loaded against one another i.e., cross loading, therefore all items are significant.

Table 4: Factor loadings

	Rotated Component Matrix				
	Component				
	1	2	3	4	5
COM1	.596				
COM2	.740				
COM3	.830				
FL1		.859			
FL2		.842			
FL3		.849			
SI1			.820		
SI2			.860		
SI3			.862		
IQ1				.837	
IQ2				.840	
IQ3				.863	
ES1					.895
ES2					.824
ES3					.853
ES4					.864

4.5. Convergent and discriminant validity

The next step in the analysis is to study the validity of the constructs. The validity of the scales is measured through the construct validity. The construct validity is based on

the convergent and discriminant validity. The convergent validity evaluates the internal consistency of the scales and is based on the values of CR and AVE. The values of composite reliability for each of the variables are greater than 0.7 which is in accordance with defined measures and AVE is greater than 0.5. These values are in accordance with the defined thresholds by Fornell and Larcker (1981). Also, the discriminant validity is theoretically based on the evidence that measures of two constructs should not be highly related to one another. The table 5 indicates that the correlations of constructs with one another are low and that with one another are significantly high. Thus, the discriminant validity is established as well. Thus, the construct validity is established for the model.

Table 5: Construct validity

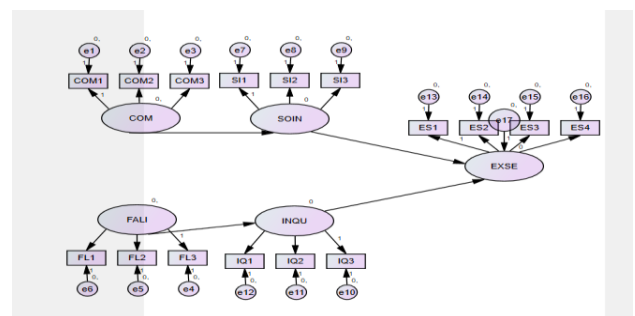
	CR	AVE	MSV	COM	FL	SI	IQ	ES
COM	0.910	0.717	0.327	0.847				
FL	0.915	0.730	0.327	0.501	0.855			
SI	0.886	0.663	0.348	0.572	0.572	0.814		
IQ	0.926	0.760	0.376	0.366	0.378	0.372	0.872	
ES	0.920	0.794	0.376	0.531	0.472	0.590	0.613	0.891

4.6. Model fit indices

The fitness of the model was evaluated through the confirmatory factor analysis. Once the model fitness and validity has been confirmed only then the next phase of the analysis can be performed. One of the primary rationales behind the assessment of the constructs through the CFA is to evaluate the validity of the model, of individual factors and the nested model, and the loadings of the items involved in the construct. The table 6 shows that the values were within the threshold ranges. Thus, the model is deemed fit.

Table 6: CFA

Indicators	Threshold range	Current values
CMIN/DF	Less or equal 3	1.009
GFI	Equal or greater .80	.765
CFI	Equal or greater .90	.866
IFI	Equal or greater .90	.666
RMSEA	Less or equal .08	.082



4.7. Structural equation modelling

For evaluation of the hypothesized relationships presented in the theoretical framework in [figure 4](#), the method of structural equation modelling has been used. The conceptual model and fitness of the model were verified in the previous section and in this section the structural model and relationships have been evaluated through the application of SEM. The direct and indirect variables and their associations are studied.

The [table 7](#) demonstrates the results of the variable relationships proposed in the second section of the paper. The direct impact of commercialization on agricultural extension services is significant and positive. The estimate of the association is 0.6, thus showing that a unit increase in commercialization will result in 0.6 units in the extension services. Thus, the hypothesis is accepted. The second hypothesized direct association is between farm literacy and extension services. The results show that a unit increase in farm literacy will increase extension services by 0.34 units. The association is positive and significant, and the hypothesis is accepted. The table indicates that information quality and social influence have a direct and positive association with extension services as well. Social influence and information quality were introduced as mediators between commercialization, farm literacy and extension services. The table values show that the social influence was a significant mediator for farmers. The table indicates that the presence of social influence mediated the association between commercialization and extension services positively. Similarly, social influence acts as a significant and positive mediator between farm literacy and extension services. Thus, showing that the transmission of social influence is influential on the commercialization of the farm and leads to the farmers seeking extension services. Comparable results are generated for the mediation of information quality. The presence of information quality improves the commercialization and farm literacy, which leads to the increased adoption of the extension services by the farmers. Thus, all six of the hypotheses are accepted.

Table 7: SEM estimates

	Estimate	S.E.	P	Status
COM → ES	.608	.061	***	Significant
FL → ES	.347	.103	***	Significant
IQ → ES	.677	.109	***	Significant
SI → ES	.360	.052	***	Significant
Indirect effect				
COM → SI → ES	.108	.051	***	Significant
FL → SI → ES	.047	.003	***	Significant
COM → IQ → ES	.127	.029	***	Significant
FL → IQ → ES	.120	.043	***	Significant

5. DISCUSSION

The agricultural extension services are one of the particularly key factors for improving the agricultural sectors in various parts of the world. The core function of the agricultural extension services is to promote the adoption of agricultural technology by the rural farmers. Such services improve the knowledge as well as education of the farmers thus encouraging them to implement new

techniques for improving the efficacy of the farmers as well as crop productivity. Many research studies have been conducted in the past to determine the impact of different variables on the extension services. For this research study, the impact of commercialization on the agricultural extension services is determined taking social influence as the mediating variable. The impact of farmer's literacy on the agricultural extension services is also determined in this study by taking informative quality as the mediating variable.

The results obtained from this research study showed that commercialization has significant impact on the agricultural extension services. However, the impact of social influence is also found to be positive on the agricultural extension services. According to [Achamyelh, Shumeta, Tesfaye, and Hailemariam \(2020\)](#), many rural farmers, are not well-aware of their capabilities and they grow different herbs as well as different plants but do not consider to earn profits from them. The implementation of agricultural extension services helps in providing awareness as well as knowledge for adopting different techniques to gain profits. The social influence however, play a significant role in this case ([Bandyopadhyay, Atehnkeng, Ortega-Beltran, Akande et al., 2019](#)). The increased communication between the farmers and organizations helps in making our separate ways to promote a better and effective method to gain more profits. Commercialization of extension services helps in improving the overall production as well as profitability of the agricultural sectors in different parts of the world especially in the rural areas of different developing countries ([Buehren, Goldstein, Molina, & Vaillant, 2019](#)).

In such case, the farmer's literacy also plays a significant role on the agricultural extension services. According to [Fox \(2019\)](#), it has been observed that the educated farmers were more likely to adopt to the continuous changings in techniques and they implement such techniques for obtaining better and effective results whereas, the non-educated farmers still follow the old methods of crop production and do not implement the new techniques in order to increase their productivity. However, the quality of information provided in this case is found to play a significant role in this regard. It helps in improving the knowledge of the farmers and improving their methods for producing crops. According to [Hamamouche, Kuper, Amichi, Lejars et al. \(2018\)](#), the rural farmers are more likely to go for the new technologies when they are provided with proper information. As education is the key to success, in this case it is also proved to be right. Different public as well as private organizations support different agricultural extension services to spread awareness about the significance of implementing new technologies for improving the productivity of the crops in order to gain more profit ([Leahy, 2018](#)). Thus, this research study supports the significant relationship between commercialization and agricultural extension services considering the significant mediating role of social influence. It also supports the significant relationship between farmer's literacy and agricultural extension

services considering the significant mediating role of informative quality.

6. CONCLUSION

The agricultural extension services are one of the most essential factors for improving the overall agricultural profit. The aim of agriculture extension service is to introduce new scientific farming techniques and findings of farming research to the farmers. The awareness of the farmers as well as better education, are found to have a particularly important influence in this case. The main aim of this research study was to determine the impact of commercialization as well as farmer's literacy rate on the agricultural extension services. For this study, the mediating roles of social influence as well as informative quality were also observed. The results obtained from this research study showed that the social influence play a significant role on the extension services and the commercialization is improved by spreading the word of mouth through personal or by digital means. This increases the awareness among the rural farmers as well and encourages them to take essential steps to improve the productivity rate to gain more profit. Similarly the impact of farmer's literacy is highly impacted by the informative quality i.e. if a better information is provided to the farmers, it helps in improving the overall productivity of the farmers leading to positive outcomes (Okediran, Ganiyu, & Badmus, 2018). However, the agricultural extension services help in improving the literacy rate for a more effective working environment for the farmers. This results in the overall profit for the farmers thus improving their incomes as well as economic growth of the country. Such services are mostly encouraged in the developing countries as well.

7. LIMITATIONS AND FUTURE RESEARCH INDICATIONS

Almost no such study was conducted in the past that covered the impact of literacy of farmers as well as the commercialization on the extension services under one profile. This research study will help in promoting the connection between these variables as well as their impact on the agricultural extension services so that it could be elaborated very well in the future studies to be conducted. This will not only improve the literature review, but it will also help in providing different practical applications as well.

Even though the data for this research study was only collected from Malaysia, it still showed the required results very effectively. This influences many scholars to conduct cross-sectional studies in the future leading to more positive outcomes as well. Such studies should be conducted more often so that better literature review can be obtained.

Many various variables are found to have a substantial impact on the agricultural extension services. However, for this research study only few such variables are considered. Thus, for future studies, many other variables should also be considered to determine the impact of different variables on it. This leads to positive impact on the

promotion of the agricultural extension services especially in different developing as well as developed countries around the world leading to a better and effective agricultural environment.

8. IMPLICATIONS

The current study helped in determining the impact of farmers' literacy as well as commercialization on the agricultural extension services. This encouraged different private as well as public sectors and NGOs to introduce different educational systems for the farmers in the rural areas of Malaysia. New regulations were formed which encouraged the farmers to gain more education and to promote the digital word of mouth for this purpose. Innovative technologies have been introduced by the government in the rural areas. This helped the farmers to have a better understanding of their capability and they started to see the change in them thus working harder to gain more profits. Even different policies are also developed by the government of Malaysia to promote the implementation of agricultural extension services as they help in providing better system as well as service for promoting the use of new agricultural technologies. This leads to the promotion of different techniques to be used by the farmers of the rural areas to gain more profits thus having a better and healthy environment.

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