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The Improvement of Agricultural Extension Competence Based on the Social Media Utilization and Role of Extension Institutions

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Abstract - The purpose of this research was to analyze the improvement of agricultural extension competence based on the social media utilization and role of extension institutions. This research used explanatory method with the census method. Total population of 90 civil servants and THL-TBPP instructors were all collected from respondents in Riau Islands Province. Data were collected from June to October, 2019. These data were also supported with in-depth interviews and observations to sharpen the quantitative analysis data. The data were analyzed using descriptive method and PLS (Partial Least Squares) analysis test. The intensity of social media utilization generally was still in the medium category containing the most visited social media, namely Whatsapp (high), Facebook and Youtube (medium), as well as Instagram (low). The role of extension institutions was still generally in low category, specifically extension agent training and organizing, learning media providers, as well as extension service infrastructure providers. The extension competence was relatively low, especially the ability to have critical thinking and problem solving skills. Innovative creative abilities, communication skills, and collaboration were in the low to medium category. Based on this study, social media utilization influences the extension competence and role of extension institutions.

Keywords - Social Media Utilization, Extension Institution Role, Extension Competence.

I. INTRODUCTION

Human resource development in the global era should be oriented to the qualified human resource creation based on the 21st century demand. Sharon and Kay (2010) introduced four populars of the 21st century demands (4Cs), namely critical thinking, communication, collaboration, and creative-innovative thinking. According to Tilaar (2002), there are four main characteristics of the world community life in the 21st century as the beginning era of globalization, namely world without borders, science and technology advances, human right and obligation awareness, and mega competition society. Therefore, agricultural human resources development, especially human resource extension is required based on the 21st century demands. Incapable extension service to adapt these challenges will be abandoned by its clients (farmers).

Information and communication technology development (ICT) is nowdays growing faster as the emergence of radio, television, and specifically social media. These media provide the convenience of extension to access informations needed as changes occur in the community. Current rapid growing ICT is social media. Based on the results of Hootsuite's and Wearesosial research (2019), social media users in Indonesia reached 150 million or 56% of the total population.

Rapid development of social media has the potential used as learning resource and agricultural information media to solve the farmer problems occur in the field. Muslihat *et al*. (2015) explained that the competent extension based on the community assessment depends on the media consumption factor. The more often extension services use media, the more knowledge they have, and the bigger opportunity to answer the farmer problems. Some people can share ideas, work together, and collaborate to create creations, sights, argument, as well as finding people who can be good friends or partner and build a community through social media (Nasrullah 2017).

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Extenston institution is an important factor in the extension system to obtain the effective role of extension can develop the extension competence properly. Based on Indonesian policy no.16/2006 about the agricultural, fisheries, and forestry extension system, the roles and functions of extension institution at the regency/city level are:(1) Drafting extension policies and programmes in regency/city based on the provincial and national extension policies and programmes, (2) Conducting extensione service and mechanism development, governance and extension methods, (3) Collecting, processing, packaging, and dissemining the extension materials for main and business actors, (4) Developing the cooperation, partnerships, institutional management, employment, facilities and infrastructure, as well as finance, (5) Cultivating and facilitating the institutional and forum activities for main and business actors, and (6) Implementing the increased capacity of civil servants, self-reliance, and self-help through ongoing learning process.

The main challenge of current extension service is the limitation of extension personnel in agriculture. The number of agricultural extension services in Indonesia, especially in Riau Islands Province is still not ideal based on the Indonesian policy No. 19/2013 on farmer protection and empowerment. Article 46 (4) mentions that the provision of extension as intended in article (2) should at least provide one extension service responsible for one village. The number of extension service in Riau Islands Province as civil servants (PNS) is 29 people, while field-assistance personnel (THL-TB) of agricultural extension service are 61 people. This means that the total of agricultural extension is only 90 people (*Pusluhtan* September, 2019). However, the number of villages that require agricultural extension is 416 villages (Riau Islands in number 2019). The limitation of extension service number in seven regency/city of Riau Islands Province causes the extension service hold several villages in one district.

The weakness of extension personnel is certainly either limited to quantity or quality. Studies conducted by Nuryanto (2008) in West Java Province, Anwas (2009) in Karawang and Garut Regency, Bahua and Limonu (2016) in Gorontalo Province showed that extension competence assessment is still in low category. Other studies conducted by Pramono (2017) in Garut, and Sustanti *et al*. (2018) in Singkawang also revealed that the competence level of agricultural extension is also in low category. Thereby, the low competence level of agricultural extension needs to be solved.

This study aimed to analyze the intensity level of social media utilization, role of extension institution, and level of extension competence, as well as analyzing factors affecting the competence of agricultural extension in Riau Islands Province.

II. METHODS

This study used quantitative approaches with explanatory research method that analyzes the relationship between one or another variable, or how a variable affects other variables. Variables in this study comprised independent and dependent variable. Independent variables were the social media (X_1), i.e *Facebook*, *WhatsApp*, *YouTube*, and *Instagram*, and the role of extension institution (X_2), i.e the implementation of extension training and organizing, availability for media learning and infrastructure, as well as extension facilities. Dependent variable was the extension competence (Y) containing critical thinking, creative-innovative, and problem-solving capabilities, as well as communication skill and collaborative build-up capabilities. This study was conducted in Riau Islands Province on June-October, 2019. The study sample was determined by the census method from 90 people, comprising civil servants and THL-TB agricultural extension. Data were collected using questionnaire, interviews, and documentation. Descriptive statistical analysis was used to describe the spread of respondents on each variable. Measurements in the study used 1-4 Likert scale. Data were processed with *SPSS* program, containing significant different analysis was analyzed using T-Test and influence analysis was done using Partial least Square (PLS) with *SmartPLS 3.0* software.

A. Social Media Utilization

Ragam media Sosial yang dimanfatkan dalam meningkatkan kompetensi penyuluh yaitu facebook, whatsapp, youtube, dan instagram. Sebaran indikator peran kelembagaan penyuluhan tersaji pada Tabel 1. Social media variance utilized to increase the competence level of extension personnel were *facebook*, *whatsapp*, *youtube*, and *instagram*. The role indicator of extension institution is presented on Table 1.

Table 1 Social media utilization distribution in Riau Islands Province, 2019

Social Media Utilization	Category	Percentage (%)	AS
Facebook ($X_{1.1}$)	Very low	17	55 (Medium)
	Low	40	
	Medium	36	
	High	7	
Whatsapp ($X_{1.2}$)	Very low	0	76 (High)
	Low	24	
	Medium	28	
	High	48	
Youtube ($X_{1.3}$)	Very low	23	55 (Medium)
	Low	31	
	Medium	39	
	High	7	
Instagram ($X_{1.4}$)	Very low	71	26 (Low)
	Low	18	
	Medium	9	
	High	2	

Note: AS (Average Score) : 0–25 = Very low, 26–50 = Low, 51–75 = Medium, 76–100 = High

Facebook utilization intensity was indicated by medium score average with 55 (Table 1). It can be interpreted that *facebook* interests the extension personnel as agricultural learning media resources. The actual contents related to agricultural extension technique is mostly obtained from community group of *facebook* as caught its users with the question *What's on Your mind*, therefore *facebook* is used as a place to think and discuss. The extension personnel utilize *facebook* to obtain agricultural technique based on the specific locations, technology, and problem review, as well as experience sharing and agricultural extension communication medium.

The utilization intensity of *whatsApp* was indicated by high average score with 76 (Table 1). It can be interpreted that *whatsapp* interests the extension personnel as agricultural learning media resources. Extension personnel often receive agricultural information for the first time through *whatsapp* both from the government and public. Information from the government related to agriculture can be quickly accessed by the extension personnel and mainly discussed on *whatsapp* extension group extension both at regency and provincial level. In addition, *whatsapp* facilitates the extension personnel about agricultural technology innovation, research on agricultural problem, experience sharing, and communication media. Information, eithr e-books or agricultural information materials can be easily accessed via *whatsapp*. Extension personnel once receive and send the information file easily via *whatsapp* rather email.

Youtube utilization intensity was indicated by the medium average score with 55 (Table 1). It can be interpreted that *youtube* interests the extension personnel as agricultural information and learning media. Actual content related to agriculture can be easily accessed by the extension personnel through subscribing the *youtube* channel content according to the extension personnel needs. *Youtube* also provides hundreds to thousands of videos with wide range of topics integrated in learning process. *Youtube* will also be vast free video library for learners that will encourage them to become independent learners. Extension personnel will also directly share the video to the other extensions or farmer through *whatsapp*, after obtaining the agricultural information from *YouTube* that is interesting and suitable.

Instagram utilization intensity was indicated by low average score with 26 (Table 1). It can be interpreted that *instagram* is less recognized by the extension personnel as agricultural learning media source and information. This happens in terms of access requirement, as the user must have an account first. Therefore, the extension personnel number that had *instagram* account was limited. In addition, the agricultural information on *instagram* was still a little with mostly presented as pictures and videos, thus less

desired by the agricultural extension personnel at the study site.

B. The Role of Extension Institution

The role of extension institution in inducing the extension competence comprised holding the extension personnel training, extension organization, learning media provider, as well as facility and infrastructure provider. Indicator distribution of extension institution role is presented on Table 2.

Table 2 Extension institution role distribution in Riau Islands Province, 2019

Extension institution role	Category	Percentage (%)	AS
Extension personnel training ($X_{2.1}$)	Very low	28	36 (Low)
	Low	41	
	Medium	31	
	High	0	
Extension organization ($X_{2.2}$)	Very low	37	30 (Low)
	Low	60	
	Medium	3	
	High	0	
Learning media ($X_{2.3}$)	Very low	34	28 (Low)
	Low	66	
	Medium	0	
	High	0	
Infrastructures ($X_{2.4}$)	Very low	36	28 (Low)
	Low	64	
	Medium	0	
	High	0	

Note: AS (Average Score) : 0–25 = Very low, 26–50 = Low, 51–75 = Medium, 76–100 = High

The extension institutional role in the implementation of extension training was categorized as low with 36 (Table 2). The extension training conducted was less relevant to farmer demands and needs as only oriented to the central institution programs. The training was also less suitable on the demands of changes, namely the utilization of social media as learning extension media. Education and training should be supported with the curriculum to fulfill the extension and farmer needs, then easily applicable. The extension institutions has not held the extension training in a long time, either internally or recommended to related agencies. In Bintan regency, for example, there are new extension personnel and certainly need to be given some trainings related to extension services. Budget limitation also becomes one of the obstacles of holding an extension training, thus not all extension personnel are included, besides the distribution is still less equal.

The extension institution role in extension organization was categorized as low score with 30 (Table 2). This happens as the lack of the number of extension personnel presented at the regency and district level with unclear authority arrangement, besides the absence of non-governmental and private extension personnel mapping to overcome the shortage of civil servants and THL-TB.

The role of extension institution as learning media provider categorized as low score with 28 (Table 2). This happens as the information available to support the extension activities is very low and incomplete. The results showed that the extension personnel assessed the extension institution as learning media provider in the regency and district to be very low. Learning media provider can be specially designed, such as leaflets, brochures, posters, tabloids, magazines, books, videos, VCD, DVD or utilized in the learning process for capability improvement, such as agricultural technology trials. This was in line with van den Ban and Hawkins (2005), who suggested that the ability of extension agent to influence farmers was increased, partly due to the development of communication and information technology, besides social sciences utilization.

The role of the extension institution as infrastructure and facility provider was categorized as low score with 28 (Table 2). The interview indicated the extension personnel

considered the low infrastructure and facility availability. Extension institution either in the regency or district did not provide laptop/computer, while WiFi was slowly connected with limited transportation vehicles and LCD projectors was used in turns with other personnel. These findings were in line with Anantanyu (2009) and Sudarko (2012) who revealed that increased extension institution support and other institutions can be performed with good approach based on the society characteristic target (information suitability, method accuracy, various extension techniques, media utilization), extension availability programmes, ease of access, facility support, and program implementation. The relevant approach to improve the extension institution in Riau Islands Province is through increased support of related institutions, namely Agricultural Technology Institute (BPTP), local governments, farmer groups and agribusiness companies.

C. Extension Compentence

Extension competence located in the study site was generally on the low category. Five aspects of compentence are: Critical thinking, creative-innovative, problem solving, communication, collaborative skill, categorized as low average score. The distribution percentage of extension competence based on the indicator is presented on Table 3.

Table 3 Extension competence distribution in Riau Islands Province, 2019

Extension Competence	Category	Percentage (%)	AS
Critical thinking ($Y_{1.1}$)	Very low	34	35 (Low)
	Low	34	
	Medium	26	
	High	6	
Creative-innovative ($Y_{1.2}$)	Very low	27	47 (Low)
	Low	43	
	Medium	30	
	High	0	
Problem solving ($Y_{1.3}$)	Very low	31	37 (Low)
	Low	40	
	Medium	28	
	High	1	
Communication ($Y_{1.4}$)	Very low	37	44 (Low)
	Low	26	
	Medium	33	
	High	4	
Collaboration ($Y_{1.5}$)	Very low	29	47 (Low)
	Low	43	
	Medium	24	
	High	4	
Extension competence	Very low	38	42 (Low)
	Low	43	
	Medium	19	
	High	0	

Note: AS (Average Score) : 0–25 = Very low, 26–50 = Low, 51–75 = Medium, 76–100 = High

The extension competence level was assessed and data accuracy was tested. The test was performed on some farmers who came from the extension site or relevant client for extension program. The rate of extension competence score according to the extension assessment was 42, while from the farmer assessment was 40. These two score results were categorized as low score. The result of t-test showed insignificant different (sig. 0,55), which means that the extension competence score based on the extension service assessment was greater than the farmer assessment, although indicating insignificant difference.

D. *The Improvement of Agricultural Extension Competence Based on The Social Media Utilization*

The evaluation model assessment in this study used the measurement model (outer model) and structural model (inner model) with *smartPLS 3.0* software. The outer model was performed to determine the indicator correlation with variables. The indicator was declared valid when the loading factor was > 0,70. The counterreliability test was also performed by observing the compote reliability and cronbach alpha value. Construct was declared reliable whether the reliability composit and cronbach alpha value was > 0,70. The outer model test results can be seen on Table 4.

Table 4 Outer model assessment result with PLS algorithm procedure in Riau Islands

Variables	Composite Reliability	Alpha Cronbach	Loading factor	Cross Loading
Social Media Utilization (X_1)	0,916	0,862	$X_{1.4}$< 0,70	The value of latent
Extension Institution role (X_2)	0,905	0,871	> 0,70	variable *crossloading*
Extension Competence (Y)	0,950	0,934	> 0,70	was higher than other latent variables

There was an indicator having a loading factor of < 0,70, indicating that the indicator model was dropped from the model as the indicator was invalid. Indicators issued from the latent variable of social media utilization were Instagram ($X_{1.4}$). Reanalysis was performed after dropped to obtain the value of testing parameters, i.e composite reliability, alpha cronbach, loading factor, and cross loading, which were greater than the criteria value that must be met on each parameter.

The inner model was performed to describe the estimation power between latent and bootstrapping process. This model assessment can be conductd by means of determining the relationship between the construct of line coefficient and t-statistic. Significant effect occured as t-statistic was > 1.96 (t-table) to 5% alpha. The coefficient value, t-statistic, and significant independent variables affecting dependent variable can be seen on Table 5.

Table 5 Coefficient value, t-statistic, and significant independent variables that affect dependent variable, Riau Islands 2019

Independent Variables	Path Coefficients	t-statistik	p-value	Dependent Variable
Social media utilization (X_1)	0.727	13.199	0.000	Extension Competence (Y_1)
Extension Institution role (X_2)	0.229	3.951	0.000	(R^2=0.776)

Structural assessment was also performed to determine the value of R-square as goodness-fit model test. The impact variable model of social media utilization and extension institution role provided R-square value with 77.6%, indicating a strong model was determined (Ghozali 2015), while 22.% was described as other variables outside of the study. PLS influence result on the social media utilization and extension institution role extension against the extension personnel competence can be seen on Figure 1.

E. *Extension Competence Improvent through Social Media Utilization*

Large coefficient of social media utilization with 0,727 and t-statistic with 13,199 were found on Table 5. Social media utilization variable had t-statistic value of > t-table (1.96) on 0,000 significant level. This means there is a positive influence between media utilization (X_1) on extension competence (Y) or interpreted as better social media utilization increases the extension competence. The line coefficient value of each indicator social media utilization on Table 1 were *facebook* (0,884), *whatsapp* (0,849), and *youtube* (0,922) with t-statistical value of 33,723, 25,975, and 72,760 respectively. These three indicators had t-statistic value was > t-table (1,96) on 0,000 significant level. This means that *facebook*, *whatsapp*, and *youtube* had significant positive impact on the extension competences. In other words, these three social media can be used as learning media to share ideas, collaboration, creativity, discussion, and communication. The social media utilization intensity of *facebook* and *youtube* still needs to be improved, thus the extension competence can be increased.

F. Extension Competence Improvement through Extension Institution Role

Table 5 shows the magnitude of coefficient line on the extension institution role with 0,229 and t-statistic with 3,388. Extension institution role variable had t-statistic > t-table (1,96) on 0,000 significant level. This can be interpreted that higher the extension institution role will increase the extension competence. Figure 1 shows the line coefficient value of each indicator of extension institution role, namely the implementation of extension training (0,773), extension organization (0,886), media learning provider (0,867), as well as facilities and infrastructures provider (0,829) with t-statistic value of 20,443, 26,166, 15,972, and 12,016 respectively. These four indicators had t-statistic value > t-table (1,96) on 0,000 significant level. This means that four indicators of extension institution role had significant positive impact on the extension competence. These facts indicate that the extension institution role needs to be improved to potentially increase the extension competence.

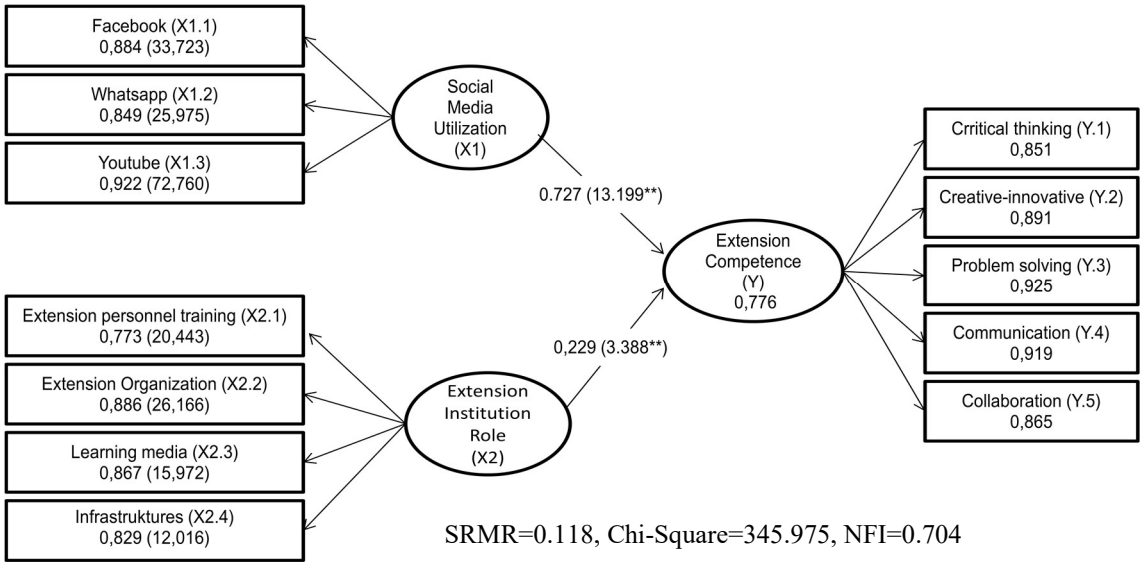

Figure 1 PLS result on the improvement of agricultural extension competence based on the social media utilization and extension institution role, Riau Islands 2019

III. CONCLUSION

The extension intensity in the Riau Islands Province based on the social media utilization to improve the extension competence was overall observed in the medium category, specifically *facebook* and *youtube* (medium), *whatsapp* (high), and *instagram* (low). The role of extension institution to improve the extension competence was still on the low category, particularly in the case of extension training, extension organization, learning media provider, as well as facilities and infrastructures provider. The extension competence was relatively low, especially on the critical thinking, problem solving, creative-innovative, communication, and collaboration skill. The extension competences are influenced by the utilization of social media and extension institution role. The intensity of social media utilization was performed through *facebook*, *whatsApp*, and *youtube*. The extension institution role can be performed through the implementation of extension training, extension organization, learning media provider, as well as facilities and infrastructures provider.

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