

# Factors that Affects the Agriculture Extension Officers' Skills on Cyber Extension-Based Agriculture Extension

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## Abstract

In the cyber extension implementation, it was found that agriculture extension officers still have limited skills, namely in knowledge, attitude and skills in practice. Agriculture extension officers, who were expected to be capable in extending information about agriculture growth and motivating society to act right under the demand of information technology development, were not capable to fulfill the standard competition. This study was trying to cover that area and in the same time to study extension officers' skills. The aim of this research was to know extension officers' skills on cyber extension-based agriculture extension and factors that affected extension officers' skills on cyber extension-based agriculture extension. This research was held in Tulungagung Regency, East Java, by taking samples of 105 agriculture extension officers using the simple random sampling technique. Data then was analyzed with path analysis. Form the analysis result that was based on Bloom's psychomotoric Aspect distribution, it found that the psychomotoric skill of Tulungagung Regency's agriculture extension officers was on perception level but there was some extension officers that reached origination level. Whereas, the result of path analysis concluded that factors that affected the extension officers on cyber extension-based agriculture extensions in Tulungagung Regency were the extension officers' knowledge and attitude on cyber extension.

**Keywords** : cyber extension, extension officer, training, knowledge, attitude dan skills.

## 1. Introduction

Information dan communication technology development that increases drastically affects the speed of human needs for information, whether it is as an organization or individual. This technology referred to the usage of electronic hardwares (computer) and communication network so that technology have a potential contribution to activities that has a benefit in economy, social, and environment.

Internet was one of the information technology that develops phenomenally, whether it was from the amount side of the host computer or from the user side. With internet, it was possible for nearly everyone in the world to communicate fastly and easily. With the revolution of information it should be used on extension as a media to distribute information to village community and extension, and to support village region development.

Cyber extension is the development of agriculture development's communication and information network that is effectively programmed. A cyber extension can be focused to the entire development of agricultural business, starting from production, management, marketing, and the other building activities of a village so the information that farmer needs was always available all the time. The concept of cyber extension is a model of communication that had been sensed for its needs to increase farmer's productivity (Sumardjo, Lukman Baga & Mulyandari, Retno, 2010).

Inside the utilization of cyber extension, agriculture society still has limited abilities, whether on knowledge, attitude, and skills to be practiced. The agent of agricultural extension (extension officer) that was expected to be capable to distribute information about the building of agriculture sector and motivating society to act right under the demands of information technology development and the needs of agricultural society, turned out they did not fulfill the standard competition that people who worked as an extension officers should understand. Of course this needs education process and trainings to increase the capacity in doing cyber extension-based agricultural extension.

Relatively, a bit of extension studies talked about the utility of information and communication technology. This also applied to studies that talked about extension officers' skills. The aim of this research was to know extension officers' skills on cyber extension-based agricultural extension and factors that affect the extension officers' skills on cyber extension-based agricultural extension.

## 2. Theory

Extension is someone's involvement to do a conscious information communication with the aim to help each other by giving opinions, to make a right decision (Van den Ban & Hawkins, 1996). According to the Agricultural Departement (2009) agricultural extension is an informal education system for a farmer and his/her

family to change their attitude and behavior for better farming, better business, better living, better community, and better environment. Whereas, based on the Republic Indonesian Statute Number 16 Year 2006 about the Agricultural, Fishery, and Forestry Extension System said that the next agricultural, fishery, and forestry extension that is called as an extension is a learning process for the main subject along with the businessman to make them want and can help and organize themselves in accessing market's information, technology, modality, and other resources, as an effort to increase productivity, business efficiency, income, and prosperity, along with improving the awareness inside the conservation of the living environment's function. From the few definitions of extension shown above extension is defined as an activity which is done to do a behavior movement process, starting from knowledge, attitude, until someone's ability. With the movement on the way, that will increase the production in the end, it is expected that this will affect to the increasing of production, income, or profit, along with the improvement of the family or society's prosperity.

Extension as an education or learning process is meant that information spread activity and the explanation given can stimulate the behavior movement process goes on that can be done through learning process. Behavior movement can be done through various ways like persuasion, intensive giving/gifts, or even through forcing activities, both by creating physical environment condition or social economy or even through rules and threads. Behavior movement that is done not through education, then the behavior that appears through learning process actually goes on slower but the movement is relatively everlasting. Movements like that will recently fade if it has an alternative or something that can replace it, which has new superiorities that is believed has a better benefit. Different with the behavior movement that is done because of persuasion, gifts, or forcefulness, behavior movement can be done relatively in a short time but it can fade quickly, if the factors stopped or it cannot be used to preserve the activity (Mardikanto, 2010).

Extension as an education process, in academic concept can be knowledgeable, but in activity process it should be detailed further, because the education that was meant here is not going vertical with the know-it-all characteristic, but it is adult's education which is going horizontal and participative lateral (Mead, 1959). In this link extension officer's success is not measured based on how much the lesson he/she told, but it is the matter of how far the dialogic-together learning process could improve the awareness (attitude), knowledge, and new skills which could change the target group's attitude and more prosperity life for each individual, family, and society.

Statute No.16 Year 2006 maintains that extension is done by public servants, public servants that's given tasks, responsibilities, authority, and rights fully by the officials that have the power to be competent to do agricultural extensions; Private Extension Officers, an extension officer that came from the corporate world and/or organizations that have a competiton in extension sector; and Self-Supporting Extension Officers, the main agent that succeed in his business and other society people with their own awareness to be and able to be an extension officer. Suhardiyono (1992) explains that agricultural extension officers have some roles that can be played step-by-step, and that is : (1) extension officers as the farmer's guide. An extension officer is a farmer's guide and teacher in nonformal education. An extension officer should know the local agricultural business system, sympathized against the farmer's life and decision making of the farmer both by theory or practice. Extension officers should be able to give a demonstration practice about a manner or method of plant's cultivation, helping farmers how to use an agricultural production medium and tools correctly, giving guides to the farmer about the credit fund source that can be used to develop their agricultural business and following developments against farmer's needs that came from concerned instances ; (2) extension officers as farmer's organizer and dynamist. In doing agricultural extension, extension officers are impossible to do visits to each farmers, so farmers must be invited to make agricultural groups and develop it into an economy and social institute that has a role to develop the local society. In making and developing the groups the extension officers play as an organizer and dynamist; (3) extension officer as a technician. An extension officer must have a good technical knowledge and skill, because one day he/she will be asked by the farmers to give suggestions or demonstration of a technical agricultural business; and (4) extension officers as a connector bridge between research institutes and farmers. Extension officers have a task to give research institute's findings to the farmers. In opposite, farmers have the duty to report the practice implementation's results of the research institute's invention results that was found by that own institute to the extension officer who teaches them as a connector bridge. Next of all extension officer extends the technology's implementation results that was extended by the farmer to the concerned research institute as a further reference.

Extension program *cyber extension* is an interconnection internet path utilization that is used as an information and technology dissemination media in order to iron out information and technology restrictiveness. *Cyber extension* utilization in farming development needs mastery in information technology. This technology mastery is very vital for agricultural extension officers as one reformer agent that tries to influence or aim decision-making process in determining commodity and technology that farmer will apply in doing farming business. To support that program, extension officers are demanded to have IT and communication competence in producing qualified agricultural extension service.

### 3. Research Method

#### 3.1. Data Source

Data that was used in this research was primary data. In this research the amount of used samples was 115 extension officers that was taken with the simple random sampling technique from the population with 197 people inside that was done on 2012, including training factors, extension officers' knowledge about cyber extension (cognitive aspect), extension officers' attitude against cyber extension (affective aspect) and extension officers' skills on cyber extension (psychomotoric aspect)

#### 3.2. Identification of the Research's Variables

Variables that was used in this research consists of 4 (four) aspects: training variable, cognitive, affective, and psychomotoric aspect. Whereas indicator variables that can be defined as most observed variables listed below:

- a. Indicator from the training variable (exogenous/independent latent variable) :a chance to join a training, to do a comparative study, and to join a workshop.
- b. Indicator from the cognitive aspect variable (extension officers' knowledge about cyber ekstension) exogenous/independent latent variable : Knowledge, Comprehension,. Application dan Analysis
- c. Indicator from the affective aspect variable (extension officers' attitude against cyber extension) variabel laten eksogen/independen : Receiving, Responding, Valuing, Organizing dan Characterization by value
- d. Indicator from the psychomotoric aspect variable (extension officers' skills on cyber ekstension) endogenous/dependent latent variable : Perception, Set, Guided response, Mechanism, Complex overt response, Adaptation dan Origination

#### 3.3. Hypothesis

Inside this research hypothesis was asked simultaneously estimated and partial training variable, cognitive aspect, and affective aspect contributes significantly against the psychomotoric aspect variable.

#### 3.4. Analysis Method

To test the hypothesis inside this research descriptive analysis and path analysis was used, thereas calculation process was used with The SYSLIN Procedure Two Stage Least Squares Estimation software. Below is the model that was used in this research (Picture 1) :

### 4. Result and Discussion

#### 4.1. Research result description

##### 4.1.1. Training

The modern competence of agricultural extension's resources, was not compatible with cyber-extension based extension's needs. The limited competent resources, with knowledge, mental or social attitude and skills was not enough supporting to achieve the vision and mission of an extension institute. Competence here was the fusion of knowledge, attitude, skills, and individual characters that is needed to achieve a success (for finishing a job).

Training was a process to complete extension officers with special skill or activity that helped extension officers to correct how they do their job or proffesion. The main goal of training was to complete their ability in working or performance, so they can do their tasks just like as shown in description and/or job specification that will be done effectively and efficiently. Training was one of the way to increase competent that could be measured using certain standards. This competent includes intention, attitude and result aspect (Marwansyah, 2010).

Table 4.1.1 showed that extension officers had a chance to join a training for the biggest rank 40.38, and chances to join a workshop had the smallest rank for 16.89. Whereas relatively only a bit extension officers that never had a chance to join a training, workshop, and comparative study. Training creates an environment where extension officers can learn knowledge, abilities, and specific expertise that was linked to his/her profession. This training was done to help extension officers do their present jobs better.

So, it can be said that basically training was a process to give help to extension officers to expertise a special skill or to fix his/her lacks in doing jobs. Activities were focused on increasing working capabilities to fulfill the needs of effective way to work. Training was the key of success in implementating strategy to make competitive profit. So, it was very required to have the ability to manage traning wisely, so the done method could transfer required skills that will finally directly affect the knowledge, attitude, and the skills of the extension officers.

This data points out that competent institute had a relatively big commitment to increase the abilities of cyber extension-based extension officers through researches. It was expected that in the future it could be increased again by doing comparative studies and giving bigger chance to join a workshop.

##### 4.1.2. Cognitive Aspect

In this research, cognitive Aspect that was used came from Bloom and modified by Mardaus and differed in four stages: knowledge, comprehension, aplication dan analysis. Cognitive Aspect was a process of knowledge that the development was based on perception, introspection, and memory (Dictionary of Education, 1973 and Sukardi, 2009)..

Cognitive skill was something fundamental and advises someone's attitude. With this skill, someone was viewed as an individual that actively builds their own knowledge. According to Myers (1996). "cognition refers to all the mental activities associated with thinking, knowing, and remembering." Other definition said that cognition was a common concept that includes all kinds of recognition, including observing, seeing, paying attention, giving, suppose, imagine, estimating, presuming, and appraising (Chaplin, 2002).

Table 4.1.2. showed that respondents had the highest percentage for 70.86% on application level and 61.52% on analysis level as the lowest. This describes that the cognitive skill of extension officers of Tulungagung Regency was on the application level, but there were some extension officers that was on the analysis level.

If we paid attention that some extension officers were on the analysis level that would be a benefit towards the development of cyber extension-based agricultural extension. This reality matched with what really happened that trainings of extension officers which talked about cyber extension that was held by the Food Security and Agricultural Extension Department Tulungagung Regency was done by the extension officers' group alone who acts as a tutor or even an informant. It was expected that these groups would always interact with other extension officers so they could act as a motivator. In other words other extension officers could study from their environment and increase their mental development to adapt their selves with the environment (adaptation). This matched Piaget's premise (Piaget, 1971). that says each development of cognitive phase was the betterment of the previous development phase so each individual will pass connected and invariant qualitative changes, it will remain the same; it will not jump or go backwards. These qualitative changes happened because of the biological pressures to adapt him/her with the environment and the organizing of thinking structure. Cognition was a system that will be always organized and adapted, it enables an individual adapts with his/her environment.

#### 4.1.3. Affective Aspect

A human characteristic includes the way of thinking, action, and feelings. Thinking was related to cognitive Aspect, action was related with the psychomotoric Aspect, and feelings was related with the affective Aspect (Andersen, 1981 and Bloom, 1976). Those Aspects were human characteristics as the result of learning inside the education aspect. Affective Aspect includes behaviour disposition such as feelings, interest, attitude, emotion, or value. A person who did not have an interest to certain activities would be hard to achieve success on optimal learning. Someone who was interested inside a certain learning activity would be expected to reach the optimal result. So, every teacher or tutor have to arouse the interest of all students to reach the given competence. And what is more, emotional coalesce was needed to build the spirit of togetherness, nationalism, social oriented, etc. For that all, in arranging teaching program, education unit must pay attention to the affective aspect (Popham, 1996).

Table 4.1.3. showed that respondents have the highest rank on valuing level. This showed that affective abilities of extension officers of Tulungagung Regency was on the value level, but there were some extension officers that was on the characterization by value level. With this level extension officers showed the internalization and commitment degree, plus conviction of internet utilization on agricultural extension Tulungagung Regency. Still on certain groups, extension officers already had an attitude that made the internet as a fulfilment of needs for agricultural information and technology, plus using it as a communication media as a rutinity and lifestyle.

From the explanation above it can be said that extension officers had a positive attitude against internet technology, high interest and even making it as a lifestyle.

#### 4.1.4. Psychomotoric Aspect

Psychomotoric Aspect was related with learning results that was achieved through manipulation skill that includes muscle and physic power, this Aspect was more orientated to movement and emphasizing on physical reaction and hand know-hows, where skills showed someone's level of skill in doing tasks (Andersen, 1981 and Schachter & Singer, 1962).

Table 4.1.4. showed that respondents had the highest rank Guided Respond level. This points out the psychomotoric skills of Tulungagung Regency's extension officers was on the Guided Respond level but there were some extension officers that was on the origination level. In other words, Tulungagung Regency's extension officers had a high variability on their psychomotoric level.

#### 4.2. Hypothesis testing

The analytical result of The SYSLIN Procedure Two-Stage Least Squares Estimation calculation showed that the value of Adj R Square = 0.98848 (Table 4.2.1). That number showed how big was the affect that could be explained by a model as big as 98.85 percent, whereas 1.15 percent was caused by other variabls outside this model. From the calculation of table 4.2.1. it showed that the value of P-value was smaller 0.0001, and it means that there was a significant relation between training variable, cognitive aspect, and affective aspect against the psychomotoric aspect.

The partial results of the regression (Table 4.2.2) pointed out that training variables was not

significantly different against the psychomotoric aspect variable, whereas cognitive aspect variable and affective aspect variable showed a very real significant against the psychomotoric aspect variable. The simultaneous and partial testing (Table 4.2.1 and 4.2.2) could be converted into an equation below:

$$\text{Psychomotoric Aspect} = 0.177 \text{ cognitive aspect} + 0.403 \text{ affective aspect}$$

The parameter coefficient 0.177 and 0.403 showed that each increasing of every mark of cognitive aspect and affective aspect would contribute an increasing for 0.177 and 0.403. The equation above showed that the low or high of the psychometric aspect could be explained by the cognitive aspect variable for 17.7% and affective aspect variable for 40.3%.

From this equation it is clear that psychomotoric aspect was very affected by the cognitive and affective aspect variable. Whereas the parameter coefficient pointed out that affective aspect variable had a more dominant effect than the cognitive aspect variable. So, it can be said that extension officers' skills about cyber extension was very influenced by the extension officers' knowledge about cyber extension and their attitude against cyber extension, where the affection of extension officers' attitude cyber extension was more dominant than the extension officers' knowledge about cyber extension.

A person's skills could be categorized into three Aspects, which was cognitive, affective dan psychomotoric. These Aspects explicitly could not be separated from one to each other. Cognitive Aspect was related to thinking capabilities, affective Aspect includes behaviour disposition, such as feelings, interest, value, and emotions (Bloom, 1976 and Andersen, 1981). And those Aspects were human characteristics as a learning result in education sector. Inside this research the success level of extension officers' skills about cyber extension was very influenced by the condition of extension officers' attitude against cyber extension. Extension officers who had an interest to learn and positive attitude against cyber extension would be pleased to learn it, so they can achieve their optimal abilities. So, in order to achieve the optimal learning result, we must pay attention to extension officers' attitude. This matched Popham's premise (Popham, 1996), affective Aspect determines someone's success level in studying. Someone who did not have an interest on certain lesson would be hard to achieve an optimal success on learning, and on the contrary. So every teacher must have to arouse its' students' interest to achieve the given competent. Besides that, emotional coalesce was needed to build the spirit of togetherness, unity, nationalism, social personality, etc. For all teaching program design, education units should pay attention to the affective Aspect.

## 5. Conclusion

Based on the explanation above it can be concluded that the skill level of Tulungagung Regency was on the perception level whereas factors that influenced the extension officers' skills in cyber extension-based agricultural extension in Tulungagung Regency was knowledge and the extension officers' attitude on cyber extension.

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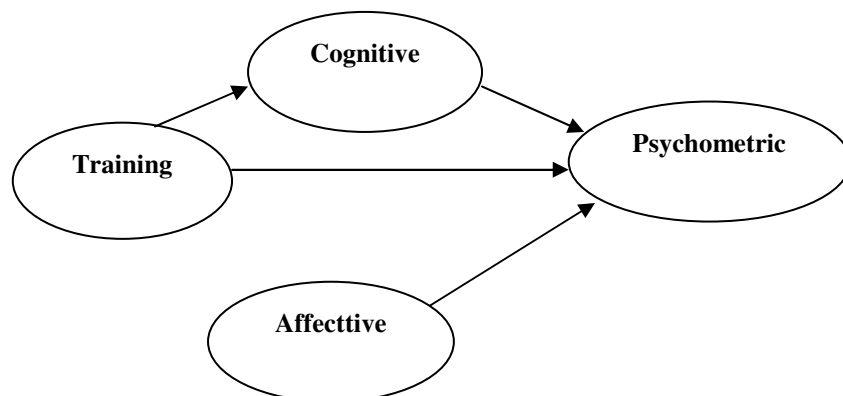


Figure 1. Path analysis model factors that affect extension officers' skills on cyber extension-based agricultural extension in Tulungagung Regency.

Table. 4.1.1. Distribution of the Respondents Amount based on the Training

Indicator	Percentage
Chance to join a training	83.05
Chance to do a comparative study	67.81
Chance to join a workshop	50.67
Total	201.53
Average	<b>67.18</b>

Table. 4.1.2. Respondents' Answers Distribution on Cognitive Level

Cognitive Aspect	Percentage
Knowledge	69.87
Comprehension	62.63
<b>Application</b>	<b>70.86</b>
Analysis	61.52

Table. 4.1.3. Respondents' Answers Distribution on Affective Level

Affective Aspect	Percentage
Receiving	77.14
Responding	82.19
<b>Valuing</b>	<b>83.04</b>
Organizing	77.24
Characterization by value	74.48

Tabel. 4.1.4. Respondents' Distribution based on Psychomotoric Level

Cognitive aspect	Percentage
Perception	70.48
Set	69.91
<b>Guided Respond</b>	<b>80.77</b>
Mechanism	70.48
Complex overt Response	62.29
Adaptation	67.62
Origination	65.71

Table 4.2.1. Simultaneous Results of the Regression Analysis

Model	Sum of Squares	df	Mean Squares	F	Pr > F
Regression	64012.11	3	21337.37	3003.55	<.0001
Residual	724.6140	102	7.104059		
Total	65586.00	105			

R Square = 0.98881  
 Adj R Square = 0.98848

Table 4.2.2. Partial Results of Regression Analysis

<b>Variabel</b>	<b>DF</b>	<b>Coefficiens Parameter Estimate</b>	<b>Standard Error</b>	<b>t Value</b>	<b>Pr &gt;  t </b>
Training	1	0.198133	0.129776	1.53	0.1299
Cognitive	1	0.176944	0.037846	4.68	<.0001
Affective	1	0.402983	0.096097	4.19	<.0001

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