# Distance Education for Rural Agricultural Workers in Indonesia

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ABSTRACT :

Agricultural extension workers should have several competencies in order to carry out their duties properly. One of the essential competencies that they must possess is the professional competency that is directly related to their duties in carrying out extension activities. Such competency can be acquired through studying at Universitas Terbuka (UT). With its distance learning system, agricultural extension workers can study at UT without leaving their duties. This research was intended to formulate strategies for developing the professional competencies in extension education at UT. By using an explanatory research design, a census method was conducted to the entire population of 111 agricultural extension workers who recently graduated from UT in four different locations, namely Serang, Karawang, Cirebon, and Tanggamus. A survey technique was implemented. Data was analyzed using descriptive and regression analyses. The findings indicated that agricultural extension workers who had graduated from UT had a moderate level in professional competencies. Several strategies that can be formulated to improve their professional competencies were improving their level of knowledge and skills related to their duties in planning, doing, and evaluating extension activities. These can become a focus for future improving the learning quality at UT, mainly in the interaction with modules, coverage of course materials, interactions in the study group, and in the learning facilities.

## 1. INTRODUCTION :

The success of agricultural development can not be separated from the role of extension workers in performing their duties in agricultural extension activities. To be able to perform their duties properly, extension workers need to possess certain competencies. The development of these competencies need to be adjusted to the conditions and challenges of extension today, developments in science and technology (IPTEK), and the presence of globalization. There is now the Law No. 16 of 2006 on the System of Agricultural Extension, Livestock, Fisheries and Forestry, which supports the achievement of specific competencies for extension workers. This is covered there in Chapter IV

Article 21 paragraphs 1 and 3. The presence of these laws is expected to provide strategic meaning as a legal umbrella for extension worker to increase their competence. Under these conditions, then any extension workers must prepare themselves to learn continuously and sustainable in order to become and remain a professional.

Facts in the field indicated that the level of competence of extension workers is still relatively low. It was supported by a research of Suryaman (2001), which indicated that the level of competence and performance of extension workers in the province of West Nusa Tenggara, East Nusa Tenggara, East Java and West Java is still low. Puspadi (2002) also reported the level of competence of the agricultural extension

workers in the three provinces of Lampung, East Java and West Nusa Tenggara, is moderate. Results of other studies conducted by Marius (2007) in East Nusa Tenggara, and by Gatut (2008) in West Java also indicated that the competence of extension workers is still considered low. Their low competence is also related to the fact that despite efforts to increase their competence, particularly through education and training, the achieved results are still inadequate (Deptan, 2005). These conditions indicate the need for efforts to increase the competence of extension workers.

Referring to the Law No. 20 of 2003 on National Education System (Sisdiknas) and Law No.14 of 2005 on Teachers and Lecturers, one important competence that needs to be owned by extension workers as an educator or teacher is professional competence. The one who have such competence are expected to produce good performance in accordance with the demands of his job as an extension worker. This is because the competency is a fundamental characteristic that determines the performance of their work (Spencer & Spencer, 1985). Therefore, information or research on the competence of extension workers is important.

The competence of extension workers can be increased through learning process, one of them is through the Indonesian Open University (UT) on the Study Programme of Agricultural Extension and Communication. The programme aims to accommodate the needs of agricultural extension workers who want to develop themselves but their work in remote villages hampers their capacity to attend regular courses face-to-face. With the characteristics of UT as an open and long distance education, extension workers who study at UT, will be able to follow a quality education without leaving their duties and obligations as an extension workers. They can improve their competence through the courses that support the expected competence. To meet these educational objectives, the Study Programme of Agricultural Extension and Communication has developed educational curriculum that can support the learning process.

Until now the number of extension workers listed as an active student of UT, is 2042 people who came from 37-UT UPBJJ area across Indonesia. This amount is relatively increased at each new registration period . While, the number of agricultural extension workers who have completed their studies at UT is approximately 1300 people who spread all over Indonesia. Compared with the total number of graduate extension workers in Indonesia, those are 11.368 people (BPSDM Deptan, 2009), we can say that UT has a significant contribution in improving the competence of agricultural extension workers.

Now the problem is no comprehensive information is available on the level of professional competence of extension workers after completing his education at UT; how is the level of competence aspects such as knowledge, affective, and psychomotor; what factors influence the professional competence of extension workers; Are the professional competencies of extension workers in accordance with their need to do their duties ?

Related to these problems, this research has focused on gathering information about the following ; (1) to analyze the level of professional competence of extension workers graduated from UT in carrying out extension activities ; (2) to analyze the dominant factors affecting professional competence of extension workers ; and (3) to formulate an effective strategy for the development of professional competence of extension workers through studying at UT.

Competence is the ability to think and act that underlies and reflects a form of behavior and performance of a person in activities in the field of work (Spencer & Spencer, 1983 ; Mangkuprawira, 2004). The competence level of extension workers includes the level of knowledge, attitude, and skill is the result of the learning process (Bandura, 1986), and this is influenced by individual characteristics and their environment. In this paper, professional competence refers to the ability of agricultural extension workers in conducting extension activities. Specifically these are planning, implementing, and evaluating extension activities. Figure 1
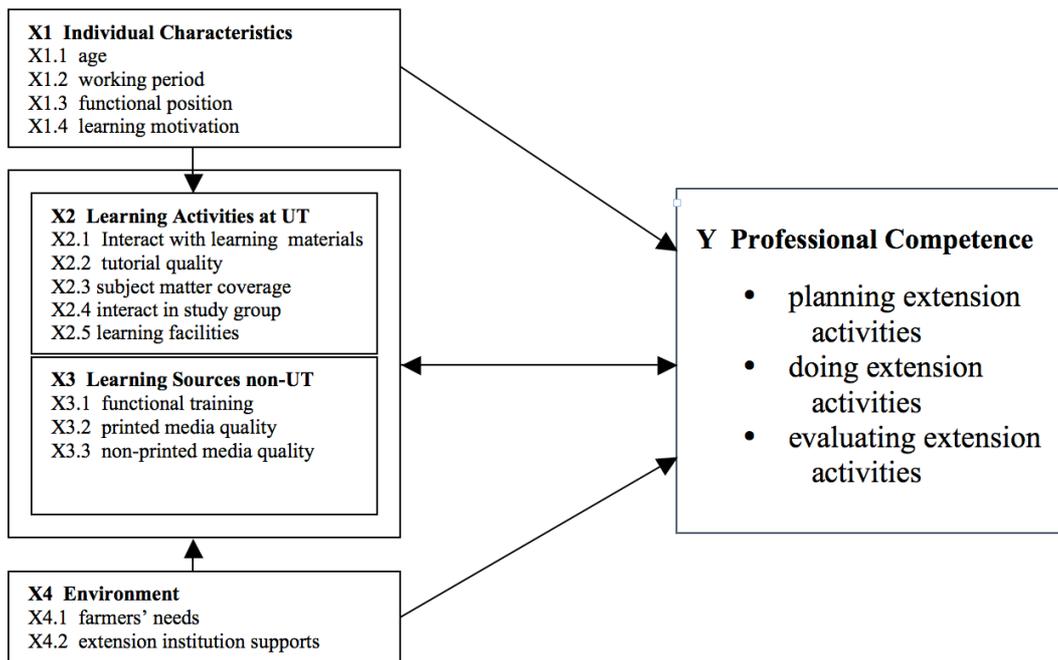
Figure 1 : The flow of thought in formulating the strategy for developing the professional competence of agricultural extension workers at UT

shows the flow of thought in formulating the strategy for developing the professional competence of the agricultural extension workers through studying at UT.

## 2. METHODS :

The design of this research is explanatory research that attempts to explain the phenomenon of professional competence of extension workers graduated from UT in the area of Serang, Karawang, Cirebon, and Tanggamus.

The population in this study consisted of all the extension workers that have graduated from UT in the area of Serang, Karawang, Cirebon, and Tanggamus. Respondents drawn from the entire population using the census method. Of the 112 respondents, 1 (one) was removed of the relevant data because although he was an extension worker graduated from UT, but he did not carry out extension activities

to farmers, instead he was a statistical officer at extension office (BIPP) Serang, so the total number of respondents was reduced to 111 people.

The data were collected through a survey using a questionnaire. The questionnaire was developed based on the indicators of professional competence for extension workers in planning, implementing, and evaluating the extension activities. The reliability of the questionnaire ranged from 0.6 to 0.9. Questionnaire items that have a reliability value below 0.6 were revised until the item succeeded to measure the professional competency. The questionnaire consisted of closed and open questions. Quantitative data were analyzed using descriptive statistics, while qualitative information was used to complement and triangulate the existing quantitative data. The data were processed using SPSS version 15.0, and analyzed in accordance with the purpose of this research, using descriptive statistics and also statistical regression analysis.

## 3. RESULTS AND DISCUSSION :

The discussion in this paper is sorted in accordance with the purposes of this study, those are the level of professional competence of extension workers, the dominant factors affecting professional competence, and strategies for developing the professional competence of extension workers at UT.

### 3.1 The Level of Professional Competence of the Extension Workers

The professional competence of the extension workers graduated from UT include their capabilities in planning, implementing, and evaluating extension activities. The level of competence of the extension workers and the competence aspects (knowledge, affective, and psychomotor) are presented in Table 1, whereas the average score of their competence is presented in Table 2.

The level of competence of the extension workers graduated from UT was moderate (Figure 2), indicating the capability of the extension workers in planning, implementing, and evaluating extension activities is not yet optimal. This condition indicates that there should be further efforts to increase the professional competence of the extension workers graduated from UT which are focused on improving the capability of the extension workers in planning, implementing, and evaluating extension activities.

The level of the professional competence of the extension workers graduated from UT has been classified as moderate with the average score 66, shown by their affective and psychomotor, but their knowledge level is low. This shows that extension workers graduated from UT were less understanding about the concepts related to the duties of their profession as extension workers, especially with regard to their duties in planning, implementing, and evaluating extension activities. However, the extension workers have sufficient beliefs and actions related to the task and profession as an extension workers.

Given the level of knowledge of extension workers is still relatively low, then the efforts to increase their professional competence can be focused on increasing knowledge of planning, implementing, and evaluating extension activities. Similarly, their affective and psychomotor levels which were still relatively moderate, need to be increased in order to increase their competence.
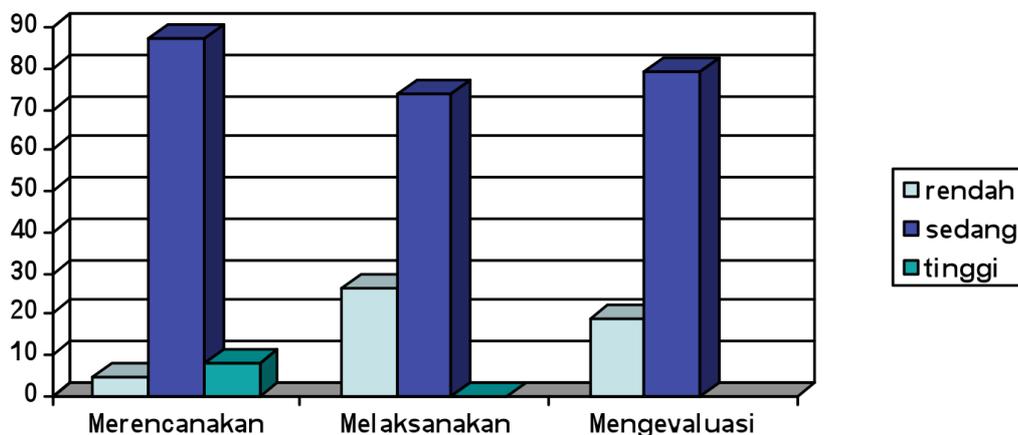


Figure 2 : The level of professional competence of the extension workers

Table 1 : Distribution of Professional Competence Level and its Aspects (n = 111)

| professional competence | score | competence aspects | | | | | | total | |
|---|---|---|---|---|---|---|---|---|---|
| | | knowledge | | affective | | psychomotor | | | |
| | | n | % | n | % | n | % | n | % |
| planning | 0-50 | 90 | 81.1 | 1 | .9 | 22 | 19.8 | 5 | 4.5 |
| | 51-75 | 20 | 18.0 | 51 | 45.9 | 70 | 63.1 | 97 | 87.4 |
| | 76-100 | 1 | .9 | 59 | 53.2 | 19 | 17.1 | 9 | 8.1 |
| implementing | 0-50 | 111 | 100 | 2 | 1.8 | 31 | 27.9 | 29 | 26.1 |
| | 51-75 | 0 | 0 | 61 | 55.0 | 66 | 59.5 | 82 | 73.9 |
| | 76-100 | 0 | 0 | 48 | 43.2 | 14 | 12.6 | 0 | 0 |
| evaluating | 0-50 | 107 | 96.4 | 6 | 5.4 | 27 | 24.3 | 21 | 18.9 |
| | 51-75 | 4 | 3.6 | 70 | 63.1 | 61 | 55.0 | 88 | 79.3 |
| | 76-100 | 0 | 0 | 35 | 31.5 | 23 | 20.7 | 2 | 1.8 |
| overall competence | 0-50 | 59 | 53.2 | 1 | .9 | 28 | 25.2 | 4 | 3.6 |
| | 51-75 | 49 | 44.1 | 61 | 55.0 | 66 | 59.5 | 99 | 89.2 |
| | 76-100 | 3 | 2.7 | 49 | 44.1 | 17 | 15.3 | 8 | 7.2 |

Table 2 : Distribution of the Average Score in Professional Competence

| professional competence | | competence aspects | | | | | | total | |
|---|---|---|---|---|---|---|---|---|---|
| | | knowledge | | affective | | psychomotor | | | |
| | | m | s.d. | m | s.d. | m | s.d. | m | s.d. |
| planning | | 52 | 6 | 78 | 13 | 62 | 16 | 67 | 12 |
| implementing | | 26 | 4 | 78 | 15 | 61 | 16 | 58 | 12 |
| evaluating | | 33 | 7 | 73 | 16 | 62 | 20 | 59 | 14 |
| overall competence | | 54 | 8 | 75 | 13 | 60 | 16 | 66 | 12 |

## 3.2 Competence in Planning Extension Activities

Their competence level in planning extension activities was overall moderate (Table 1). This is not optimal, due to their lacking capability in identifying potential areas, agroecosystem, farmer needs, and working plans. There should be more efforts to increase the competence of the extension workers in planning extension activities which focused on improving the capability of the extension workers in identifying potential areas, agroecosystem, farmer needs, and working plans.

In general, the level of competence of extension workers in planning extension activities (Table 1) which were classified as being moderate, can be seen from their psychomotor aspect, but their knowledge is low, whereas their affective aspect was high. This means that although the extension workers have a positive attitude, yet have a low understanding in planning extension activities. To that end, efforts to increase the competence of extension workers in planning extension activities can be focused on increasing their knowledge aspects.

## 3.3 Competence in implementing extension activities

The Competence of extension workers in carrying out extension activities is related to their ability to develop self-reliance of farmers in their farming activities. In Table 1, it can be seen that the level of competence of the extension workers in developing the self-reliance of farmers was moderate, due to the ability of extension workers to grow farmer groups was still not optimal. This condition indicates that there should be efforts to increase the competence of extension workers in developing farmers self-reliance which focused on improving the ability of extension workers to grow farmer groups.

The competence of extension workers in developing farmers self-reliance (Table 1) which were classified as middle, was visible from their affective and psychomotor aspects, however, their knowledge level is low. This means that the extension workers have a good understanding in terms of developing self-reliance of farmers, namely in the growing farmer groups. However extension workers have beliefs and actions quite well in developing self-reliance of farmers, for example, involved the relevant parties in growing farmer groups. In this regard, the efforts to increase the competence of extension workers in developing self-reliance can be focused on increasing their knowledge aspect.

## 3.4 Competence in evaluating extension activities

In Table 1, it can be seen that the level of competence of extension workers in evaluating extension activities was classified as moderate, due to their ability in planning extension activities, collecting data and analyze the results, and formulating the reports of extension activities, is still not optimal. This condition indicates that there should be efforts to increase the competence of extension workers in evaluating extension activities focused on improving their ability in preparing a plan of evaluation activities, collecting data and analyze the results, and formulating the evaluation reports.

The competence of extension workers in evaluating extension activities (Table 1) which were classified as moderate, can be seen from their affective and psychomotor aspects. However, their knowledge level is low. This means that they do not have a good understanding on evaluating the extension activities, namely in terms of planning; collecting data and analyzing the results, and formulating the evaluation report on extension activities. However their belief and action was good enough in evaluating extension activities. Therefore, efforts to increase the competence of extension workers in evaluating extension activities can be focused on increasing their knowledge aspects.

Interview with extension workers indicated that although they has sufficient experience in extension activities, but they felt that their knowledge was still less and should be improved according to the condition of the current extension. Similarly, although they have a positive attitude towards their duties as a counselor, but they were still encountering problems or difficulties when carrying out the extension activities.

From the above explanation, it can be concluded that efforts to increase the professional competence of extension workers can be focused on improving their knowledge and skills in planning, implementing, and evaluating the various extension activities.

## 3.5 The dominant factors influencing the professional competence

Professional competence of extension workers is influenced by several factors, among which are ; (1) individual characteristics which include (a) age, (b) working period, (c) functional position, and (d) learning motivation ; (2) learning activities at UT, including (a) interaction with learning materials, (b) coverage of subjects, (c) interaction in study groups, (d) tutorial activities, and (e) learning facilities; (3) learning sources non-UT which include (a) functional training, (b) print media, and (c) non-print media ; and (4) environmental factors that include (a) farmer needs, and (b) institutional support. These factors are correlated with the workers professional

competence. The results of the Pearson correlation analysis to examine the correlations among the individual characteristics, learning activities at UT, non-UT learning resources, and environment on the professional competence of the extension workers are presented in Table 3.

Table 3 shows that the motivation to learn, interaction with learning materials, interaction in study groups, training, and farmers need, are correlated with a positive impact on the professional competence of the extension workers. This means that increasing motivation to learn, interaction with learning materials, interaction in study groups, training, and farmers needs will improve the professional competence of extension workers graduated from UT.

Interaction with instructional materials can enhance the professional competence of extension workers because the interactions may further enhance understanding of the material contained in teaching materials that can enhance learning achievement. Through interaction in study groups, extension workers can interact directly and discuss the study materials that are considered difficult, so that it can enhance the understanding of learning. Through training, extension workers gain knowledge and skills about the material relating to their duties as extension workers. While the demanding needs of farmers creates challenges for extension workers to be able to meet these needs so that they will attempt to improve the competence related to the needs of farmers.

Table 3 : Correlation Coefficient of the Individual Characteristics, Learning Activities at UT, Non-UT Learning Resources, and Environment on Professional Competence

| variable | competence aspects | | | total |
|---|---|---|---|---|
| | planning | implementing | evaluating | |
| X1  Individual Characteristics | | | | |
| X1.1  age | -.235** | -.042 | -.356** | -.084 |
| X1.2  working period | -.233** | -.064 | -.23** | -.019 |
| X1.3  functional position | .149 | .158 | .057 | .139 |
| X1.4 learning motivation | .243** | .274** | .466** | .281** |
| X2  Learning Activities at UT | | | | |
| X2.1  interact with learning materials | .351** | .144 | .153 | .325** |
| X2.2  tutorial quality | .132 | .154* | .264** | .151 |
| X2.3  subject matter coverage | .211** | .078 | .194* | .128 |
| X2.4  interact in study group | .288** | .127 | .308** | .308** |
| X2.5  learning facilities | .128 | .053 | -.043 | .048 |
| X3 Learning Sources non-UT | | | | |
| X3.1  functional training | .083 | .040 | .218** | .216** |
| X3.2  printed media quality | .067 | .001 | -.028 | .045 |
| X3.3  non-printed media quality | .041 | .047 | -.135 | .108 |
| X4  Environment | | | | |
| X4.1  farmers' needs | .020 | .078 | .231** | .232** |
| X4.2  extension institution support | .080 | -.001 | .231** | .065 |

Note : * significant at α .05, ** significant at α .01

Age and working period showed negative but significant correlation with the capability of the extension workers in planning and evaluating extension activities. This indicates that the increasing age and working period will reduce their ability in planning and evaluating extension activities.

After correlation analysis, the factors that have a real relationship were analyzed using multiple regression to see the impact of individual characteristics, learning activities at UT, non-UT learning resources, and environmental factors on professional competence. Results of regression analysis between the individual characteristics, the learning activities at UT, non-UT learning resources, and environment on the professional competence of extension workers are presented on Table 4.

Table 3 : Regression Coefficient between the Individual Characteristics, Learning Activities at UT, Learning Sources non-UT, and Environment on Professional Competence

| variable | competence aspects | | | | | | total | |
| | planning | | implementing | | evaluating | | | |
| | coef | p | coef | p | coef | p | coef | p |
|---|---|---|---|---|---|---|---|---|
| **X1  Individual Characteristics** | | | | | | | | |
| X1.1  age | -.03 | .77 | | | -.11 | .23 | | |
| X1.2  working period | -.15 | .07 | | | -.11 | .21 | | |
| X1.3  functional position | | | | | | | .24** | .00 |
| X1.4  learning motivation | .08 | .27 | .25 | .00 | .31 | .00 | .22** | .01 |
| **X2  Learning Activities at UT** | | | | | | | | |
| X2.1  interact with learning materials | .20 | .00 | | | | | .18** | .01 |
| X2.2  tutorial quality | | | .07 | .30 | .06 | .33 | | |
| X2.3  subject matter coverage | .09 | .35 | | | .01 | .88 | | |
| X2.4  interact in study group | .13 | .08 | | | .16 | .16 | .30** | .00 |
| X2.5  learning facilities | | | | | | | | |
| **X3 Learning Sources non-UT** | | | | | | | | |
| X3.1  functional training | | | | | -.01 | .88 | | |
| X3.2  printed media quality | | | | | | | -.18 | .12 |
| X3.3  non-printed media quality | | | | | | | .13 | .18 |
| **X4  Environment** | | | | | | | | |
| X4.1  farmers' needs | | | | | .09 | .21 | | |
| X4.2  extension institution support | | | | | .07 | .32 | | |

Note : * significant at α  .05,  ** significant at α  .01

Based on the regression coefficients in Table 4 regression model can be written as follows:
Y1.2 = 0.57 + 0.24 + 0.22 X1.3 X2.1 X1.4 + 0.17 + 0.30 X2.4 - X3.2 0.18 + 0.2 + 0.13 X3.3

where Y1.2 = Professional Competence, X1.3 = functional position, X1.4 = learning motivation, X2.1 = interact with teaching materials, X2.4 = interact in study groups, X3.2 = print media, and X3.3 = non-print media

The regression equation indicated that the professional competence of extension workers influenced by functional position, the motivation to learn, interact with learning materials, interactions in study groups, print media, and non-print media, and was also influenced by other factors outside the model. Error coefficient for 0197 indicated that approximately 19.7 percent of the model was influenced by other factors that have not been included in the model.

Factors which showed a significant positive influence on their professional competence were functional position, learning motivation, interaction with the teaching materials, and interaction in the study groups. This means the higher the functional position, level of motivation, level of interaction with teaching materials, and level of interaction in study groups, can enhance the professional competence of extension workers of UT alumni. The higher the level of interaction with teaching materials will increase understanding about the matter of teaching materials that impact on increasing competence. Likewise, the higher the level of interaction in study groups, will be more intensive discussion of the matter of teaching materials that impact on increasing competence.

Table 4 showed that functional factors, motivation to learn, interact with instructional materials, and interactions in study groups highly significant on the level of professional competence of extension workers. It was significant that these factors were the main elements that contribute to improving the professional competence of extension workers of UT alumni or in other words high and low levels of professional competence of extension workers of UT alumni influenced by how much influence these factors. Interaction in the study group showed the largest contribution to the professional competence of extension workers or in other words the interaction in study groups was a factor that indicated an effective influence on the professional competence of extension workers of UT alumni. Thus, improving their professional competence can be focused on improving the interaction in study groups.

Results of multiple regression analysis of the dominant factors that influence the professional competence showed that the dominant factor that positively affects the professional competence of extension workers was the interaction in study groups.

## 3.6 Strategy for developing the Professional Competence of the extension workers through distance education

One purpose of this study was to formulate the development strategy of professional competence through distance education at UT so that they will be able to show better performance.

In general, the results of this study indicated that the level of professional competence of extension workers of UT alumni was still not maximal, which was caused by their ineffective ability in planning, implementing, and evaluating extension activities. In detail, the level of the professional competence of the extension workers which were classified as being moderate can be seen on the affective and psychomotor aspects, but their level of knowledge was low. The level of social competence of the extension workers which were classified as being moderate, can be seen in their affective aspect and his actions but their aspect of knowledge was low.

Under these conditions, it was needed efforts to increase the professional competence of extension workers to provide services that satisfy the farmers. Those efforts can be done through several strategies that were based on the results of the analysis as shown on Figure 1. The improvement of professional competence was influenced by the level of motivation to learn, interact with teaching material, interactions in study groups, and functional positions, but the interaction with teaching materials showed the contribution of the most dominant. Concerning the significant effect and the dominant influence on professional competence of extension workers, the improvement of professional competence of extension workers were focused on improving interaction in study groups. In term of the competence aspects, the main strategy taken was improving their

knowledge and skills, which was associated with the task of extension, those were planning, implementing, and evaluating the extension activities.

Thus, the results of this study found that the recommended strategy for developing the professional competence of the extension workers through studying at UT can be done through several stages. These stages involve (1) strengthening the individual characteristics focusing primarily on increasing their motivation to study, and (2) improving UT learning quality in order to effectively improve the professional competence of the extension workers. These efforts should focus on improving their interactions with the teaching materials and improving their interactions in the study groups.

## 4. CONCLUSIONS :

The level of the professional competence of the extension workers graduated from UT were concluded to be moderate. However the farmers assessed the competence of the extension workers as low and were not satisfied with them. Their competence aspects was rated as relatively low, particularly in their knowledge aspect.

The professional competence was influenced by the level of motivation to learn, interaction with learning material, interaction in study groups, and functional positions. Among those factors, the interactions in the study group showed the dominant contribution.

Strategies developed to improve the professional competence of the extension workers of UT alumni should be focused on improving their interactions in study groups. In terms of their competence aspects, a key strategy should be improving their knowledge and skills aspects, especially in planning, implementing, and evaluating extension activities.

Professional competence of extension workers of UT alumni need to be increased in order to provide better services to farmers. Effective strategies to improve the professional competence of the UT alumni should include developing the UT learning

activities. In more detail, the advice given to stakeholders for implementing the strategies should include ;

• For an individual extension worker

Given that the professional competence of the extension workers of UT alumni is still not optimal, then they should improve their capability focusing on improving their awareness of the need to improve their professional competencies.

• For UT as an institution of education

Given that the level of the professional competence of the extension workers of UT alumni is not optimal, it is necessary to increase their competence focusing on improving the learning quality at UT, especially in terms of (a) the interactions with the learning materials. Given the interactions with learning materials are still lacking, then UT needs to better motivate students to improve their interactions with the learning materials so that attainment of learning results are improved, (b) interactions in study groups. Given that the participation in the study groups is useful in helping students to achieve success, then UT needs to better motivate students to be able to increase their intensity of interactions in the study groups.

• For the Department of Agriculture

Given that the level of the professional competence of the extension workers of UT alumni is still not optimal, then in order to perform their duties properly in accordance with the farmer needs, extension workers need to increase their professional competence through education that is designed in accordance with the duties of extension workers and farmers' needs.

• For the Institute for Research

Given the early stage of this new research, to obtain more comprehensive information, further research needs to be done. This should include (a) assessing the competence of the extension workers on a larger scale, (b) assessing the learning activities in greater scale related to their interaction with instructional materials and their interactions in the study groups, and (c)

assessing the perceptions of stakeholders about the professional competence of the extension workers on a larger scale and in more detail.

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