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### Effects of Agricultural Extension Workers' Perceptions of Off-the-Job Training and On-the-Job Training to the Development of Their Skills

<sup>1</sup>Mohammad Jiaul Hoque and <sup>2</sup>koichi Usami

<sup>1</sup>The United Graduate School of Agricultural Sciences, Tottori University, Tottori-shi 680-8553, Japan

<sup>2</sup>Faculty of Agriculture, Yamaguchi University, Yamaguchi-shi 753-8515, Japan

**Abstract:** This study was conducted to identify the contributing perceptions of Agricultural Extension Workers (AEWs) regarding off-the-job training and on-the-job training (OJT) for developing their extension skills. Data on AEWs' skill levels on selected four extension skill areas, their perceptions of Off-JT and OJT were collected from 90 AEWs using structured questionnaires. AEWs' skill levels on four extension skill areas ranged from 36 to 86. AEWs' perceptions of Off-JT did not significantly differ between AEWs with less than average skill levels and AEWs with higher than average skill levels. However, AEWs' perceptions of OJT significantly differed between the two groups of AEWs. Perception of practical steps of OJT was important contributing factor to AEWs' skill on work planning. Besides, perceptions of merits of OJT were important contributing factors to AEWs' skills on working with group, organizing demonstration, assessing farmers' problems, and work planning.

**Key words:** Perception, Agricultural Extension Worker, Off-the-Job Training, On-the-Job Training Extension Skill

#### INTRODUCTION

The Department of Agricultural Extension (DAE) is the largest Government organization in Bangladesh and provides unified agricultural extension services to farmers throughout the country. The DAE encourages and supports planning and implementation of all agricultural extension activities at the grass-root level and works in partnership with Government organizations, non-government organizations, and private sectors. To provide high quality extension services, the DAE employs 12,640 Agricultural Extension Workers (AEWs) at the field level [9]. According to the DAE guidelines [8], each AEW has to provide extension services to around 1,200 farm households in his/her assigned service area. Since the extension coverage of each AEW is very large, the success or failure of his/her extension services largely depends on his/her extension skill levels in the following areas: 1) Working with group, 2) Organizing and running a demonstration, 3) Assessing farmers' problems, and 4) Work planning [7].

Training aims to change trainees' performance through improved knowledge, skills, and attitude. Training Wing of the DAE is responsible for providing Off-the-Job Training (Off-JT) to AEWs to develop their

extension skill levels. For this objective, the DAE has invested huge resources for Off-JTs provided by the development partners- Government organizations, international organizations and non-government organizations over the years [2]. Despite this huge investment, only 13.93% of the AEWs were found credible as communicator of technical advice to the farmers [13]. Nevertheless, 35% of farm information loss has been found to take place in the transit between AEWs and farmers [4]. According to Ahmed [1], due to lack of extension skills AEWs were not able to provide satisfactory extension services to the farmers. Lack of AEWs' extension skills resulted in less adoption of improved rice variety by the farmers [12]. Consequently the average rice production in Bangladesh was only 1.83t/ha [5]. Karim & Mahboob [14] reported that neither the simple number of in-service training in the total service period nor the simple duration of in-service training in the total service period could improve the job performance of the Agricultural Extension Officers in Bangladesh. In the context of the shortage of training fund, a large number of costless training programs have been planned by the DAE. On-the-Job Training (OJT) is one of the such training programs [15]. Nowadays, all the AEWs are encouraged to develop their extension skills through OJT along with attending Off-JT. Although the DAE has introduced OJT in the recent

**Corresponding Author:** Mohammad Jiaul Hoque, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh – 2202, Bangladesh, Tel: (88091) 55695 Ext. 2480, Fax: (88091) 55810

time, there are no specific structures and instructions of OJT that could help the AEWs to practice it effectively.

The main objective for investing resources in training is to eliminate performance deficiencies [6]. To achieve this objective, the training organizations must be concerned about the effectiveness of the training program [3,10]. According to the Davies' model, the effectiveness of agricultural extension training exclusively depends on the trainees' perceptions regarding trainings conducted for developing their skill levels. Numerous studies have cited problems with the Off-JT in Bangladesh. However, in spite of having immense importance of trainees' perceptions of trainings there are no published study on examining the perceptions of AEWs regarding Off-JT and OJT. Thus, such an effort to identify the contributing perceptions of AEWs regarding Off-JT and OJT would facilitate in decision making for training planner as well as policy makers to revise the current training program for AEWs to develop their extension skills. Therefore, the objective of this study was to identify the contributing perceptions of AEWs regarding Off-JT and OJT for their skill levels.

## MATERIALS AND METHODS

The target population for this study consisted of all 236 AEWs in Kishorganj district. Out of 13 *upazilas* (sub-district) in this district 4 *upazilas*, namely Hossainpur, Pakundia, Kotiadi, and Kishorganj, were purposively selected for this study. The data were collected from 90 AEWs (due to 11 AEWs on personal leave) out of the total number of 111 AEWs in the selected 4 *upazilas* by using structured questionnaire. The necessary survey was conducted by face-to-face interviews with the respondents during April to May 2006. The questionnaire consisted of three parts. The first part included the AEWs' demographic information such as age, service tenure, and educational level. The second part was on measuring AEWs' skill levels. Skill levels of an AEW were evaluated by 3 *Upazila* Agricultural Officers (UAO) who supervised his/her daily activities, 3 skillful AEWs senior to him/her, and 3 farmers from the area in his/her charge. UAOs and senior AEWs always remain close contact with AEWs. Each UAO and AEW were directly asked to evaluate the skill levels of all AEWs in the assigned *upazila* from 0 point to 100 point using the following criteria: AEWs who can provide proper extension services to farmers will be given 100 point and who cannot provide satisfactory extension service at all will be given 0 point. Meanwhile, farmers are not aware of all AEWs

in a *upazila*, and so three farmers in a block were asked to evaluate the AEW assigned to their block in accordance to the basic criteria: encouraging farmers to talk to about their problem; learning from farmers; building the confidence of farmers; discussing ideas and sharing options openly with farmers; assisting farmers to undertake their own planning; and providing solution to the farmers' problems. Thus, though an AEW can be evaluated by 9 persons separately, the level of an extension skill for analysis was calculated as an average of all scores of the three types of evaluators. The final part of the questionnaire consisted of twenty statements as perceptions regarding Off-JT and OJT. Perceptions were measured by a four-point Likert scale; for each statement there were 4 response categories, namely "strongly agree", "agree", "disagree", and "strongly disagree" and the scoring was done by assessing 4,3,2, and 1 points respectively.

A pilot-test with 12 AEWs was conducted in the study area before fielding the study and accordingly minor changes were made in the questionnaire. Questionnaire reliability was measured (based on the pilot-test) by calculating Cronbach's Alpha. Reliability coefficient of .88 for the questionnaire was achieved. Descriptive statistics such as frequencies, percents, means and standard deviations were used to analyze the data. T-tests and analysis of variance (ANOVA) were used to determine whether there were significant differences among AEWs with regard to their perceptions of Off-JT and OJT. Furthermore, focusing on the quantitative relations, multiple linear regression analysis was done to identify the contributing perceptions of AEWs regarding Off-JT and OJT for their extension skill levels.

## RESULTS

**Characteristics of agricultural extension workers (AEWs):** A higher proportion of the respondents were between 41 and 50 years of age (59%) with an average of 46.30 years. The respondents had on average 23 years of service tenure as an AEW. There was no respondent whose service tenure was less than 10 years. Forty four percent of the respondents had a Higher Secondary Certificate (HSC) degree while 36% had a Secondary School Certificate (SSC) degree with Agricultural Diploma as an associate degree. Only 12% of the respondents had a Bachelor of Science degree with Agricultural Diploma as an associate degree.

**Agricultural extension skill levels of AEWs:** As shown in Table 1, the score of four extension skills

Table 1: AEWs' extension skill levels in the study area (range of score: 0-100)

Skills	Observed Range (score)	Mean	Std. dev.
1. Working with group	46 - 84	67	8.93
2. Organizing and running a demonstration	43 - 83	66	7.85
3. Assessing farmers' problem	43 - 86	64	8.81
4. Work planning	36 - 83	60	9.19

Table 2: Comparisons of extension skill levels of AEWs' group-1 and AEWs' group-2

Skills	AEWs' group-1 <sup>a</sup> Mean	AEWs' group-2 <sup>b</sup> Mean	t-statistic
1. Working with group	59.83	73.95	-12.306***
2. Organizing and running a demonstration	60.87	71.23	-8.312***
3. Assessing farmers' problem	56.83	70.48	-11.649***
4. Work planning	53.74	65.84	-8.366***

<sup>a</sup> AEWs group which the score is less than average; <sup>b</sup> AEWs' group of which the score is higher than average; \*\*\* t-statistics significant at 0.01 level of probability

ranged from 36 to 86 (range of mean = 60 to 67), indicating large differences in their skill levels among AEWs. Mean value of extension skill levels of AEWs' with higher than average skill levels (AEWs' group-1) was very much higher than that of AEWs' with less than average skill levels (AEWs' group-2) and the difference was statistically significant at 1% significance level (Table 2).

#### AEWs' perceptions of Off-JT and their skill levels:

The data in Table 3 represents the comparison of perceptions of AEWs' group-1 and AEWs' group-2 regarding Off-JT. Considering all of the four extension skills, AEWs' group-1 and AEWs' group-2 did not differ in terms of awareness of the perceptions related to the objectives, merits and demerits of Off-JT. Thus, it could be concluded that the absence of statistically significant differences in the perceptions of Off-JT between the two groups of AEWs indicate that perceptions of Off-JT have not been a contributing factor to AEWs' skill levels.

#### AEWs' perceptions of OJT and their skill levels:

Table 4 summarizes comparison of perceptions of AEWs' group-1 and AEWs' group-2 regarding OJT. In terms of AEWs' skill development in the areas of four extension skills, the mean ratings by AEWs' group-1 for three of the statements related to the practical steps of OJT namely, "OJT involves an orderly period of instruction ( $x_1$ )", "AEWs try to do the task by himself and bring the finished task to the instructor ( $x_2$ )", and "AEWs perform the task virtually independently only seeking help in difficulties ( $x_3$ )" ranged from 3.17 to 3.33, indicating being favorable perceptions. The mean ratings by AEWs' group-2 for the above three statements ranged from 3.53 to 3.67, indicating being strongly favorable perceptions. Statistical test resulted in the significant differences between the AEWs' group-1 and AEWs' group-2 in their perceptions of practical steps of OJT.

On the other hand, the mean ratings by AEWs' group-1 for the other seven statements related to the merits of OJT namely, "OJT minimizes the happening of same mistake during servicing the farmers ( $x_4$ )", "OJT ensures skills on managing daily activities by own efforts ( $x_5$ )", "OJT ensures to improve extension workers' knowledge and skills continually ( $x_6$ )", "OJT creates a true workplace learning environment ( $x_7$ )", "OJT is more effective than formal training as it needs less time for skill formation ( $x_8$ )", and "Changing service delivery place is helpful to form new skills ( $x_9$ )", and "OJT enables AEWs to prepare local extension programs successfully ( $x_{10}$ )" ranged from 2.02 to 3.33, indicating being unfavorable to favorable perceptions. While, the mean ratings by AEWs' group-2 for seven of the practical steps related statements range from 2.80 to 3.75, indicating being strongly favorable perceptions. The statistical test resulted in significant differences between the AEWs' group-1 and AEWs' group-2 in their perceptions of merits of OJT. Thus, perceptions of OJT have been a contributing factor to AEWs' skill levels.

#### Contributing perceptions of AEWs regarding OJT for developing their skill levels:

Results of multiple linear regression analyses are presented in Table 5 indicates that out of the ten statements related to the perceptions of OJT only five statements were statistically significant for AEWs' skill levels. As a matter of fact, the F tests of the multiple linear regression analysis were highly significant with adjusted  $R^2$  of 0.29 ~ 0.39 being low for four extension skills. AEWs' perception of "Changing service delivery place is helpful to form new skills" most importantly

Table 3: Mean score of perceptions of Off-JT by skills and skill levels

Perceptions	Working with group		Organizing and running demonstration		Assessing farmers' problems		Work planning	
	G1 <sup>a</sup> N=46	G2 <sup>b</sup> N=44	G1 N=45	G2 N=45	G1 N=48	G2 N=42	G1 N=43	G2 N=47
Training enables AEWs to undertake their upcoming extension programs (X <sub>1</sub> )	3.91	3.91	3.96	3.87	3.94	3.88	3.93	3.89
	(0.07) <sup>d</sup>		(1.48)		(0.94)		(0.60)	
Training is essential to teach AEWs farmers' need-based agricultural practices (X <sub>2</sub> )	3.87	3.95	3.93	3.89	3.90	3.93	3.88	3.94
	(-1.13)		(0.59)		(-0.43)		(-0.70)	
Training provides AEWs with supporting technical knowledge and skills (X <sub>3</sub> )	3.83	3.80	3.89	3.73	3.83	3.79	3.81	3.81
	(0.32)		(1.67)		(0.50)		(0.06)	
Training enables AEWs to develop skills on communication and extension methods (X <sub>4</sub> )	3.57	3.68	3.58	3.67	3.60	3.64	3.58	3.66
	(-0.93)		(-0.71)		(-0.31)		(-0.62)	
Off-JT is appropriate for skill formation (X <sub>5</sub> )	2.59	2.41	2.60	2.40	2.58	2.40	2.65	2.36
	(0.93)		(1.05)		(0.94)		(1.53)	
Planning training program should consider AEWs' opportunities to participation (X <sub>6</sub> )	2.54	2.50	2.56	2.49	2.56	2.48	2.53	2.51
	(0.22)		(0.34)		(0.45)		(0.13)	
Training programs facilitate necessary training materials (X <sub>7</sub> )	3.17	3.07	3.27	2.98	3.13	3.12	3.07	3.17
	(0.61)		(1.69)		(0.03)		(-0.58)	
Training programs always ensure suitable training place (X <sub>8</sub> )	2.54	2.59	2.58	2.56	2.46	2.69	2.56	2.57
	(-0.25)		(0.12)		(-1.21)		(-0.08)	
Training duration is always appropriate for acquiring skills on each training task (X <sub>9</sub> )	2.46	2.30	2.53	2.22	2.42	2.33	2.33	2.43
	(0.88)		(1.72)		(0.45)		(-0.54)	
Formal training never makes opportunity of learning by doing (X <sub>10</sub> )	2.54	2.18	2.58	2.16	2.50	2.21	2.51	2.23
	(1.55)		(1.82)		(1.22)		(1.19)	

<sup>a</sup> AEWs group which the score is less than average; <sup>b</sup> AEWs' group of which the score is higher than average; <sup>c</sup> Means were calculated on the basis of a five point Likert-scale 1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree; <sup>d</sup> Values in the parenthesis are t value.

contributed to the skill levels on working with group, organizing and running a demonstration, assessing farmers' problems, and work planning. This indicates that, except AEWs' skill on work planning, all of the extension skills would develop through practicing OJT at different service delivery places. AEWs can develop their skill levels through solving more problems faced at the time of providing extension services at different service places. AEWs' perception of "OJT system creates a true workplace learning environment" was the most important contributing perception for AEWs' skill levels on assessing farmers' problems and work planning. This is because working at real working place

would affect the development of AEWs' skill levels on identifying problems, and work planning. AEWs' perception of "OJT ensures skill on managing daily activities by own efforts" was the important contributing perception for AEWs' skill levels on working with group, organizing and running a demonstration, and assessing farmers' problems. This clearly indicates that developing skill levels on working with group, maintaining demonstration, and identifying problems require more AEWs' individual efforts to level up their skill levels. AEWs' perception of "OJT system enables AEWs to prepare local extension programs successfully" was an important contributing perception for AEWs' skill levels on organizing and

Table 4: Mean score of perceptions of OJT by skills and skill levels

Perceptions	Working with group		Organizing and running a demonstration		Assessing farmers' problems		Work planning	
	G1 <sup>a</sup>	G2 <sup>b</sup>	G1	G2	G1	G2	G1	G2
	N=46	N=44	N=45	N=45	N=48	N=42	N=43	N=47
OJT involves an orderly period of instruction (x <sub>1</sub> )	Mean <sup>c</sup> 3.17 (3.79***) <sup>d</sup>	3.66	3.29 (-1.80)	3.53	3.23 (-2.95***)	3.62	3.28 (-1.86)	3.53
The AEWs try to do the task by himself and bring the finished task to the instructor (x <sub>2</sub> )	3.28 (2.91***)	3.66	3.36 (-1.67)	3.58	3.29 (-2.89***)	3.67	3.33 (-2.04**)	3.60
The AEWs perform the task independently only seeking help in difficulties (x <sub>3</sub> )	3.17 (2.89***)	3.64	3.22 (-2.18**)	3.58	3.25 (-1.96)	3.57	3.23 (-1.95)	3.55
OJT minimizes the happening of same mistake during servicing the farmers (x <sub>4</sub> )	3.17 (3.83***)	3.75	3.27 (-2.40**)	3.64	3.31 (-1.92)	3.62	3.33 (-1.55)	3.57
OJT ensures skills on managing daily activities by own efforts (x <sub>5</sub> )	3.04 (2.56**)	3.50	2.69 (-3.61***)	3.58	3.06 (-2.44**)	3.50	3.07 (-2.09**)	3.45
OJT ensures to improve extension workers' knowledge and skills continually (x <sub>6</sub> )	2.96 (3.85***)	3.66	3 (-3.22***)	3.60	3 (-3.47***)	3.64	3.02 (-2.80***)	3.55
OJT creates a true workplace learning environment (x <sub>7</sub> )	3.11 (2.66***)	3.57	3.22 (-1.25)	3.44	3.15 (-2.30**)	3.55	3.12 (-2.38**)	3.53
OJT is more effective than formal training as it needs less time for skill formation (x <sub>8</sub> )	3.13 (2.46**)	3.52	3.09 (-2.97***)	3.56	3.13 (-2.66***)	3.55	3.07 (-3.09***)	3.55
Changing service delivery place is helpful to form new skills (x <sub>9</sub> )	2.02 (6.28***)	3.16	2.36 (-2.10***)	2.80	2.13 (-5.05***)	3.10	2.16 (-3.96***)	2.96
OJT enables AEWs to prepare local extension programs successfully (x <sub>10</sub> )	2.52 (2.25**)	2.95	2.47 (-2.81***)	3	2.52 (-2.37**)	2.98	2.58 (-1.72)	2.89

<sup>a</sup>AEWs group which the score is less than average; <sup>b</sup>AEWs' group of which the score is higher than average; <sup>c</sup>Means were calculated on the basis of a five point Likert-scale 1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree; <sup>d</sup>Values in the parenthesis are t value; \*\*t-statistics significant at 0.05 level of probability; \*\*\*t-statistics significant at 0.01 level of probability.

running a demonstration. The findings show that AEWs' perception of "Extension workers try to do the task by himself and bring the finished task to the instructor" was the important contributing perception for AEWs' skill levels on work planning. This indicates that providing instructions by officers or senior colleagues could develop AEWs' planning skill.

### CONCLUSIONS

Overall, there were large differences among AEWs in their skill levels. The difference in the perceptions of AEWs regarding Off-JT was not statistically significant. However, statistically significant differences in the perceptions of AEWs regarding OJT

were found. This clearly indicates that, perceptions of Off-JT would not significantly affect the difference of skill levels between the AEWs' group-1 and AEWs' group-2. On the other hand, perceptions of OJT would significantly affect the difference of skill levels between the two AEWs' groups. Out of the ten statements related to the perceptions of OJT only five statements were statistically significant to AEWs' skill levels and could explain 29% ( $R^2 = 0.29$ ) to 39% ( $R^2 = 0.39$ ) of the total variations in the AEWs' skill levels. AEWs' perception of practical steps of OJT such as "Extension workers try to do the task by himself and bring the finished task to the instructor" was an important contributing perception for AEWs' work planning skill. AEWs' perception of merits of OJT such as "Changing service delivery place is helpful to form



Table 5: Result of regression analysis on contributing AEWs' perceptions of OJT for developing their skill levels

OJT Perceptions	Working with group Coefficient	Organizing and running a demonstration Coefficient	Assessing farmers' problems Coefficient	Work planning Coefficient
OJT involves an orderly period of instruction (x1)	0.05	-0.86	0.53	0.72
The AEWs try to do the task by himself and bring the finished task to the instructor (x2)	0.64	1.05	1.61	2.87**
The AEWs perform the task independently only seeking help in difficulties (x3)	0.97	1.42	0.88	0.44
OJT minimizes the happening of same mistake during servicing the farmers (x4)	0.26	-0.09	0.12	-0.25
OJT ensures skills on managing daily activities by own efforts (x5)	2.11**	2.19**	2.28**	1.70
OJT ensures to improve extension workers' knowledge and skills continually (x6)	1.59	1.63	1.22	-0.25
OJT creates a true workplace learning environment (x7)	1.19	0.50	2.67**	2.76**
OJT is more effective than formal training as it needs less time for skill formation (x8)	1.27	1.03	1.06	1.63
Changing service delivery place is helpful to form new skills (x9)	2.96***	1.49**	2.67***	1.99**
OJT enables AEWs to prepare local Extension programs successfully (x10)	1.56	1.54**	0.86	1.85
Adjusted R <sup>2</sup>	0.39	0.30	0.39	0.29
Sample Size	89	89	89	89

\*\*t-statistics significant at 0.05 level of probability;

\*\*\*t-statistics significant at 0.01 level of probability

new skills” and “Ojt system creates a true workplace learning environment” were the most common contributing perceptions for AEWs’ skill levels. The study showed that AEWs’ perception of “OJT ensures skill on managing daily activities by own efforts ” and “OJT system enables AEWs to prepare local extension programs successfully” were the important contributing perceptions for AEWs’ skill levels on working with group, organizing and running a demonstration, and assessing farmers’ problems. Based on the findings of this study, it could be concluded that, differences of AEWs’ extension skill levels are mostly depend on their perceptions of OJT rather than perceptions of Off-JT. Besides, practice of OJT at different service places with an opportunity to work at the real workplace could be helpful to develop most of the extension skills of AEWs. Providing instruction at the time of facing problems could improve AEWs’ perceptions of OJT that would affect the development of AEWs’ planning

skills. Thus, the DAE should review the existing trainings along with developing a better training system in accordance to the readiness of AEWs’ perceptions of Off-JT and OJT.

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