

The Influences Transfer of Training on Relationship between Knowledge Characteristic of Work Design Model and Outcomes

Hawjeng Chiou, Yi-Hsuan Lee and Sutrisno Hadi Purnomo

Abstract—The purpose of this study is to examine the relationships among transfer of training, knowledge characteristic of work design and work outcomes. Transfer of training is not only served as the predictor, but also the moderator to the prediction of knowledge characteristics towards outcome variables. Subjects are 252 teachers and administrative staff coming from various school levels. Results indicate that among the five-characteristics of knowledge, the variable specialization is positively correlated to outcome variables. Nevertheless, transfer of training can positively predict outcomes. More importantly, transfer of training as a moderator can influence the relationship of specialization for satisfaction to organization, but not for satisfaction to performance and job performance. These results suggest that in order to achieve satisfaction and performance, human resource practice agency should design training that gives trainees the ability to enhance knowledge and skill.

Index Terms—transfer of training, knowledge characteristic, work design, satisfaction, performance

I. INTRODUCTION

Nowadays, work design continues to be of great practical significance to organizations as they try to attain outcomes such as efficiency and satisfaction. It has been said that the nature of work has a substantial impact on an employee's performance and attitude (Morgeson, 2005). Successful work-design initiatives must overcome many obstacles in order to have their intended impact and influences on multiple outcomes such as expected to increase positive behavioral (e.g., job performance) and attitudinal (e.g., job satisfaction) outcomes (Humphrey et.al, 2007). It is also said that increasing positive behavioral and attitudinal will be achieved if the motivational characteristic are perform. The basic principle of the motivational approach is that jobs will be enriched (i.e., made more motivating and satisfying) if high levels of these characteristics are present (Morgeson & Humphrey, 2006). Campion and McClelland (1993) subdivided motivational characteristic into those work characteristics that reflect the task and knowledge requirements of work namely, task and knowledge characteristic. Similarly, Morgeson and Humphrey (2006) also identified five knowledge characteristics such as skill variety, information processing, job complexity, specialization, and, problem solving. In sum, these work characteristics are expected to impact a variety of work

outcomes.

Previous study from Morgeson and Humphrey (2006) found evidences that knowledge characteristics correlate significantly to both training and compensation requirements. Results also showed that the knowledge characteristics are significantly more strongly related to training requirements than compensation requirement. This is due to the fact that only changes to the knowledge-based aspects of work are likely to increase the number and level of knowledge, skills, and abilities required (Campion & Berger, 1990). Accordingly, training is needed to acquire better knowledge, which subsequently increased the number and level of knowledge, skills, and abilities required. After learning and retaining the training content, trainees could transfer the knowledge and/or skills accrued to the work context with the intention of improving their job performance over time (Noe et al., 2006). The degree to which trainees effectively apply the knowledge, skills, and attitudes gained in the training context to the job is called transfer of training (Baldwin & Ford, 1988). Researchers have also demonstrated that training efforts are unlikely to result in positive changes in job performance unless the newly trained competencies are transferred to the work environment (Baldwin & Ford, 1988; Montesino, 2002).

In light of such issues, this study aims to examine the hypothesis that transfer of training moderates the relationship between knowledge characteristics and outcomes. We believe that the higher the degree of transfer of training, the stronger the positive impact of knowledge characteristics will be on performance and satisfaction. Therefore, the present study first examine the relationships between the knowledge characteristics and outcomes towards satisfaction and performance. Furthermore, the relationship between transfer of training and outcomes towards satisfaction and performance will be examined. Finally, this study aims to investigate whether transfer of training is a moderator of the relationship between knowledge characteristic and outcomes. This study might contribute to work design research, because it provides a more complex view of work design and suggests that future research should investigate the factors to determine whether these abilities moderate the relationship between work characteristics and various outcome measures.

II. RESEARCH FRAMEWORK

A. Knowledge characteristic

Knowledge characteristics reflect the kinds of knowledge, skill, and ability demands that are placed on an individual as a

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function of what is done on the job (Campion & McClelland, 1993). Morgeson and Humphrey (2006) recently identified five work dimensions in the knowledge characteristic. First, job complexity is the extent to which a job is multifaceted and difficult to perform (Humphrey et al., 2007). Job complexity reflects to employee's belief that the work being done is intrinsically interesting and challenging because it is characterized by high levels of variety, significance, identity, feedback, and autonomy (Hackman & Oldham, 1980). Humphrey et al. (2007) highlighted that high job complexity promotes satisfaction but is also likely to hurt efficiency and promote perceptions of work overload.

Second, information processing is the extent to which a job necessitates an incumbent to focus on and manage information (Humphrey et al., 2007). Past research has suggested that jobs differ in their level of monitoring and processing of information (Wall & Jackson, 1995; Wall, et al., 1995). Higher levels of information processing are expected to change the requirements for jobs, as employees require high levels of knowledge in high information processing jobs in order complete their work (Morgeson & Humphrey, 2006).

Third, problem solving is the extent to which a job requires the production of unique solutions or ideas (Humphrey et al., 2007). Mumford et al. (2004) sought to develop creative problem-solving skills by training people in the use of strategies contributing to effective process execution. In their study, they found training in the application of effective strategies led to improved performance on measures of relevant creative problem-solving skills.

Fourth, Skill variety. Skill variety reflects the extent to which a job requires an individual to use a variety of different skills to complete the work (Hackman & Oldham, 1980). High level of skill variety is expected to support and encourage higher levels of motivation and creativity than are relatively simple, routine jobs (Hackman & Oldham, 1980).

Finally, specialization is the extent to which a job involves the performance of tasks requiring specific knowledge and skill (Humphrey et al., 2007). Skill and task variety reflect the breadth of behaviors and skills involved in a job, whereas specialization represents the depth of knowledge and skills necessary. Although there is only limited research surrounding specialization (e.g., Champion, 1988; Edwards et al., 2000), recent research has suggested that increasing specialization may resolve the tradeoff in work design between satisfaction and efficiency (Morgeson & Champion, 2002).

Humphrey et al. (2007) stated that they are only able to examine the relationship for information processing and job complexity with a number of outcomes. There are not enough studies examining specialization or problem solving to include these characteristics in their meta-analytic review. However, these five work characteristics are expected to impact a variety of work outcomes. Past research has suggested that increasing knowledge requirements makes work more intrinsically motivating and promotes positive attitudinal outcomes (ie. satisfaction, involvement). On the other hand, knowledge characteristic also expected as work characteristics that would increase performance. For example, specialization has been shown to increase job efficiency (Morgeson & Champion, 2002) and therefore performance. Morgeson and Humphrey (2006) found that knowledge

characteristics would be positively related to job satisfaction and performance. We examine the hypothesis:

Hypothesis 1: Knowledge characteristics are positively related to job satisfaction.

Hypothesis 2: Knowledge characteristics are positively related to job performance

B. Transfer of Training

Transfer of training is defined as the degree to which individuals effectively apply the skills and knowledge gained from a training program to a job situation (Baldwin and Ford, 1988). This suggests that transfer of training first requires a trainee to learn new job-related competencies (Velada & Caetano, 2007). By learning, they are referring to a relatively permanent change in knowledge, skills and behaviors of trainees (Weiss, 1990). After learning and retaining the training content, trainees should transfer the knowledge and/or skills accrued to the work context with the intention of improving job performance over time (Noe et al., 2006).

Transfer of training is a core issue with respect to linking individual change to the requirements of the organizational system. Therefore, if we believe that training truly makes a difference in organizational and individual performance, we must understand how to support transfer of training in organizations (Yamhill & Mc Clean, 2001). However, a significant purpose of training and development is to improve performance (Swanson, 1995). Learning is a little value to organizations unless it is transferred in some way to performance (Holton, et al., 1997). Kuchinke (1995) also argued that learning is a means, not a primary organizational outcome. Learning is an internal behavior, whereas performance is usually a more external one. Therefore, training outputs should emphasize performance, not just learning. (Yamhill & Mc Clean, 2001).

Holton (1996) provided a conceptual evaluation model of training focused on individual performance. This model proposes three primary outcomes of training intervention: learning, individual performance, and organizational results. These outcomes are defined, respectively, as achievement of the learning outcome desired in an HRD intervention, change in individual performance as a result of learning being applied on the job, and results at the organizational level as a consequence of change in individual performance. Regarding with job satisfaction, Faerman and ban (1993) have found moderate to strong relationship between training participants satisfaction with the training and changes their work related behavior. Based on the discussion, we examine the hypothesis:

Hypothesis 3: Transfer of training is positively related to job satisfaction.

Hypothesis 4: Transfer of training is positively related to job performance

In this study, we expect that transfer of training influence relationship between knowledge characteristic and outcomes. Influences' transfer of training toward relationship between

knowledge characteristic and outcomes as mentioned above is namely moderation effect. There is limited study to investigate moderating effect relationship between knowledge characteristic and outcomes. For instance, Fried and Ferris (1987) suggested that growth need strength (GNS) as the preference or need individuals have for stimulating and challenging work moderated the relationship between knowledge characteristic and performance. Tieg et al. (1992); Rentsch and Steel (1998) found no moderating effect of competence or need for achievement, suggesting that growth need do not act as moderators. However, study to investigate moderating effect mechanism in this relationship would be very important to do continuously.

In their early work of work design model, Hackman and Oldham (1980) proposed three factors (i.e. growth need strength, context satisfaction, knowledge and skill) as moderators of both the job characteristics-critical psychological states relationships and the critical psychological states-work outcomes relationships. With regard to the third specified moderator, knowledge and skills, none of the available studies have examined its moderating effect on the relationships between the core job dimensions and any of the examined outcomes (Fried & Ferris, 1987). If the skill and knowledge from training are applied successfully in their daily work, it's ensure that it have positive impact to outcomes. We expect that higher the skill and knowledge were applied in the work would be increase satisfaction and performance. Therefore, we examine the hypothesis:

Hypothesis 5: Higher degree transfer of training increases relationship between knowledge characteristic and job satisfaction.

Hypothesis 6: Higher degree transfer of training increases relationship between knowledge characteristic and job performance.

Based on the discussion above, we proposed the research hypotheses in figure 1.

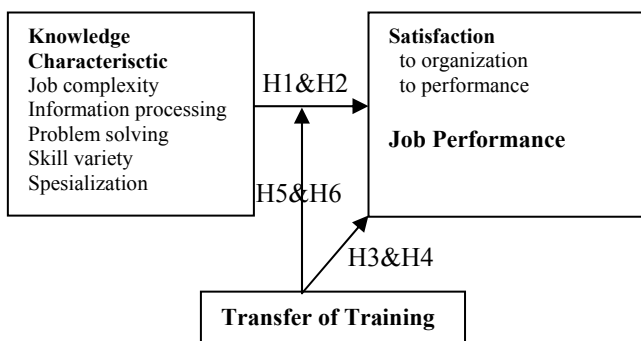


Figure 1. Research hypotheses of the present study

III. METHODS

A. Participants

A total of 252 school teachers and administration staffs (61.5% are male) from elementary schools, junior high schools, senior high schools and universities in Indonesia

participated in this study. Demography of respondents are as such: Ages ranged between 20-30 years old was 25.8%; 30-40 years old 35.7%; 40-50 years old 31.3% and over 50 years old 7.1%. As for the level of education, the majority of the participants had already received a bachelor degree (66.3%), and a smaller percentage having received only a vocational degree (16.3%).

B. Measures

Work Design Questionnaire (WDQ). The measures of work characteristics used in this study are taken from Morgeson and Humphrey's (2006) previous work on WDQ. All items were measured using a five-point Likert-type scale with anchors from "strongly disagree" to "strongly agree". Items for measuring the knowledge characteristics were selected for the purpose of this current study. There are five sub-dimensions in the knowledge characteristics including "job complexity" (e.g. the tasks on the job are simple and uncomplicated), "information processing" (e.g. the job requires me to monitor a great deal of information), "problem solving" (e.g. the job involves solving problems that have no obvious correct answer), "skill variety" (e.g. the job requires a variety of skills), and "specialization" (e.g. the job is highly specialized in terms of purpose, tasks, or activities). The reliability of internal consistency ranged from 0.82 to 0.92.

Transfer of training. Items for measuring transfer of training were adapted from Tesluk et al. (1995). Where in three items (e.g. using new knowledge and skills to improve performance) are included in the scale, while having an internal consistency reliability of 0.78.

Job satisfaction. Item created by Campion (1988) for measuring job satisfaction was used in this study. The sub-dimensions, obtained from Williams and Andersons (1991), included satisfaction towards organization (e.g. I am very satisfied with my current employment by a company or organization), satisfaction towards performance (e.g. I am very satisfied with my personal performance) and job performance (e.g. I always fulfill responsibilities specified in my job description). The internal consistency reliability ranged from 0.72 to 0.85.

The dimensionalities of the measures were assessed through confirmatory factor analysis (CFA) using AMOS 7.0. A significant chi-square was reported ($\chi^2 = 253.19$, $p < 0.05$, $df = 210$). The ration of χ^2 to df was 2.14 which was less than 3, indicating an acceptable model fit. Other indicators also shows good fitness indices in the measurement model wherein Goodness Fit Index (GFI)=0.91, Adjusted Goodness Fit Index (AGFI)=0.88, Comparative Fit Index (CFI)=0.95 and Root-mean-Square Error of Approximation (RMSEA)=0.048. In sum, results of CFA reveals acceptable model fit to the observed data (Hu & Bentler 1999; Hair et al. 2006). Further examinations are going to process in the result section.

IV. RESULTS

A. Descriptive statistic and Correlation among construct

Table 1 presents the means, standard deviations, reliabilities and bivariate correlations among the study variables. For the sub-dimensions of knowledge

characteristic, specialization significantly correlate with outcomes, correlation coefficients ranged from .21 to .42 ($p < .01$). Skill variety is significantly correlated with satisfaction to organization ($r = .21$, $p < .01$) and job performance ($r = .25$, $p < .01$). Meanwhile, job complexity, information processing and problem solving significantly correlated only with job performance. On the other hand, transfer of training was positively correlated each of the three work-outcomes, with correlation coefficients ranged from .28 to .54 ($p < .01$). Positive correlation coefficients were found between transfer of training with information processing ($r = .29$, $p < .01$), skill variety ($r = .28$, $p < .01$) and specialization ($r = .43$, $p < .01$).

Table 1: Means, standard deviations, reliabilities and correlation coefficients among variables (*the end of manuscript*)

B. Hypothesis Testing

Table 2 summarizes the results of hierarchical regression analyses of research hypotheses. The independent variables were knowledge characteristic and dependent variables were different dimensions of work outcomes. In addition, the hierarchical regression analysis was used for testing the moderation effects of transfer of training to the aforementioned relationship.

In the hierarchical regression analysis, independent variables were entered in several steps. The control variables (gender, education and tenure) were entered in the first step, then followed by the relevant independent measures. Results revealed that education (years of education completed) has significant influence towards satisfaction to organization ($\beta = -.19$, $p < .01$). In the second step, knowledge characteristic were entered as the predictors of satisfaction to organization. Among the five-knowledge characteristic, only specialization were positively related to satisfaction to organization ($\beta = 0.27$, $p < .01$). In the third step, transfer of training was added into the regression model as a predictor. A significant beta coefficient was reported ($\beta = 0.26$, $p < .01$).

For testing the moderating effects of transfer of training on the relationship between knowledge characteristic and work outcomes, we then entered interaction in the step 4. As shown in the Table 3, only interaction between specialization and transfer of training significantly predicted towards satisfaction to organization ($\beta = -1.87$, $p < .01$). While, in step 4, a positive moderating effect ($F\text{-change} = .02$, $p < .05$) of transfer of training to the aforementioned relationship was reported.

Table 2: Hierarchical regression analysis results for satisfaction to organization

The results for predictions regarding the second dependent variable, satisfaction towards performance, are shown in Table 2. The results of step 1 showed that control variables have no significant influence. Among the five variables of knowledge characteristics only specialization was found to significantly predict satisfaction towards performance ($\beta = 0.22$, $p < .01$) in step 2 of hierarchical regression analysis. In step 3, we focused on transfer of training. The result revealed transfer of training ($\beta = 0.25$, $p < .01$) significantly predicted

satisfaction towards performance. Test of the moderation effect in step 4 have no significant influence on the relationship between the dependent and independent variables.

Table 3. Hierarchical regression analysis results for satisfaction to performance

For the job performance as a dependent variable, results are shown in Table 4. Results revealed that education has a significant influence on job performance ($\beta = 0.18$, $p < .01$). Furthermore, specialization significantly predicted satisfaction towards job performance ($\beta = 0.36$, $p < .01$). In step 3, we focused on transfer of training. The results revealed that transfer of training significantly predicted satisfaction towards job performance ($\beta = 0.40$, $p < .01$). In the final step, the interaction term was no significant influence on the dependent variable.

Table 4. Hierarchical regression analysis results for job performance

With regard to verified of hypothesis 1 in which knowledge characteristic will be positively related to (a) satisfaction to organization and (b) satisfaction to performance and hypothesis 2 was knowledge characteristic will be positively related to job performance. The findings showed that among five-characteristics only specialization positively related to work outcomes. Hence, hypothesis 1 and 2 were partially supported. Test of hypothesis 3 was transfer of training will be positively related to (a) satisfaction to organization and (b) satisfaction to performance and hypothesis 4 was transfer of training will be positively related to job performance. The result showed that transfer of training positively predicted to three-work outcomes. Therefore, hypothesis 3 and 4 were supported. Finally, hypothesis 5 and 6 examine the moderation effect of transfer of training. Hypothesis 5 was higher degree transfer of training will increase the relationship between knowledge characteristic and (a) satisfaction to organization and (b) satisfaction to performance and hypothesis 6 was higher degree transfer of training will increase relationship between knowledge characteristic and performance. The findings showed that only specialization have moderation effect towards satisfaction to organization. On the other hand, specialization has no moderation effect to both satisfaction to performance and job performance. Accordingly, hypothesis 5 and 6 were partially supported.

C. Simple Slope Analysis

The simple slope analysis (Aiken & West, 1991) as a post hoc test of the moderation effect of transfer of training on the relationship between the independent variables (knowledge characteristics) and dependent variable (work outcomes) were illustrated by figure 2. The relationship between specialization and satisfaction for high and low levels of transfer of training (defined as +1 and -1 standard deviations from the mean, respectively) is illustrated in Figure 2.

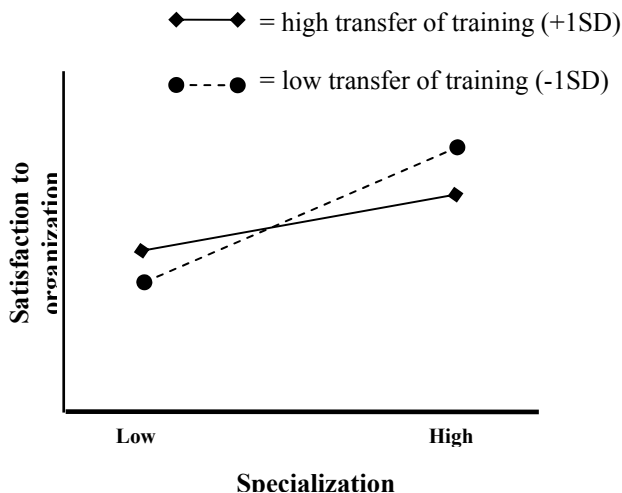


Figure 2. simple slope analysis of the moderation effect

The relationship between specialization and satisfaction to organization is positive for individuals with high transfer of training and individuals with low transfer of training. However, the individuals with low transfer of training need higher specialization than individual with high transfer of training. This interaction further reinforces the importance of transfer of training in determining how individuals interpret and attribute their satisfaction to the organization.

V. DISCUSSION AND CONCLUSION

This study demonstrated that the knowledge characteristics were positively related to the different aspects of work outcomes. Among the five sub-dimensions of knowledge characteristics, only specialization shows significant impact on work outcomes. On the other hand, job complexity, information, problem solving and skill variety cannot predict a variety of work outcomes. All four characteristics demonstrated strong relationships with job performance, while skill varieties were strongly related to satisfaction towards organization. Possibly due to the backgrounds or beliefs of participants used in this study, a result showing only specialization as being significantly related to work outcomes was found. The participants of this study were comprised of teachers from various institutions. This type of job possibly requires more specialization represented through the depth of knowledge and skills necessary to complete job requirements. Campion (1988) and Edwards et al. (2000) declared that although there is only limited research surrounding specialization, recent research has suggested that increasing specialization may resolve the tradeoff in work design between satisfaction and efficiency (Morgeson & Campion, 2002).

Consistent with the hypothesis, transfer of training was positively related to both of satisfaction and job performance. This empirical study gives evidence that the hypothesis was supported. Noe et al. (2006) concluded that after learning and retaining the training content, trainees should transfer the knowledge and/or skills accrued to the work context with the intention of improving job performance over time. Faerman

and ban (1993) have found moderate to strong relationship between training participants initial satisfaction with the training and changes their work related behavior. Therefore, training of transfer have an important role to organization to improve job satisfaction and performance.

Humphrey et al. (2007) stated that there are not enough studies examining specialization to include in their meta-analytic review. However, research on specialization has documented only specialization's positive effects and has neglected the investigation of possible negative effects. In fact, published studies have explicitly stated or implicitly assumed that specialization is an adaptive trait such that high levels of specialization are more desirable than low levels of specialization. Results of this study challenge this assumption. Specifically, specialization is more associated with the criterion for individuals with low levels of transfer of training than the criterion for individuals with high levels of transfer of training.

VI. LIMITATION AND FURTHER RESEARCH

Several limitations of this study should be noted. First, the transfer of training was measured by self-report questionnaire rather than observations on actual behaviors. This may have influenced the pattern of results. Nevertheless, in addition to the above-mentioned argument for using self-report performance ratings, utilizing specific items and anonymous and confidential surveys might have enhanced the accuracy of the self-report data. The previous research has used similar self-report measures of training transfer (Tesluk et al., 1995; Chiaburu & Tekleab, 2005; Velada et al., 2007), showing evidence that trainees can accurately self-report their levels of training transfer. However, for future research, we do suggest the use of additional measures collected from several sources (e.g. supervisors, peers and subordinates) in order to reinforce the trainees ratings or, when possible, the use of direct and objective measures of the trainee's on-the-job performance.

Because we collected data from only one kind was educational organization, these results may not generalize to other organizations or industries. This may be relevant for the findings regarding the independent variables that only specialization was supported. Inconsistent with previous study from Humphrey et al. (2007) that job complexity, information processing and skill variety were related to work outcomes. It is maybe because of single kind of organization, different with Morgeson et al. (2006); Humphrey et al. (2007) which use various kind of organization. Consequently, future research should examine the generalization of our results in different organizational contexts.

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Table 1. Means, standard deviations, reliabilities and correlation coefficients matrix (N=252)

Variable	M	SD	1	2	3	4	5	6	7	8	9
1. Job Complexity	3.39	.65	(0.83)								
2. Information Processing	4.17	.57	-.18**	(0.72)							
3. Problem Solving	3.47	.67	.52**	-.11	(0.89)						
4. Skill Variety	3.83	.72	-.01	.24**	.04	(0.81)					
5. Specialization	4.07	.52	-.03	.31**	-.05	.41**	(0.70)				
6. Transfer of Training	4.08	.50	-.03	.29**	-.09	.28**	.43**	(0.78)			
7. Satisfaction to organization	3.77	.59	.02	.06	-.07	.21**	.34**	.38**	(0.80)		
8. Satisfaction to performance	3.76	.69	-.04	.02	-.00	.09	.21**	.28**	.36**	(0.73)	
9. Job performance	4.06	.41	.14*	.28**	.16**	.25**	.42**	.54**	.34**	.35**	(0.72)

Note : Values in parentheses represent internal consistency reliabilities (Cronbach's α) obtained in this study

** $p < 0.01$ * $p < 0.05$

Table 2: Hierarchical regression analysis results for satisfaction to organization

Independent Variables	Satisfaction to organization							
	Step 1		Step 2		Step 3		Step 4	
	β	t	β	t	β	t	β	t
1. Education	-.19	-3.04**	-.20	-3.23**	-.21	-3.48**	-.23	3.77**
2. Specialization (Sp)			.27	3.94**	.18	2.54*	1.29	2.84**
3. Transfer of training (Tt)					.26	4.02**	1.88	2.93**
4. Sp×Tt							-1.87	-2.44*
R ²	0.04		0.15		0.20		0.25	
ΔR^2	0.03		0.12		0.17		0.20	
F change	3.32		6.30		16.17		2.82	
Sign F change	0.02		0.00		0.00		0.02*	

Note ** $p < 0.01$ * $p < 0.05$

Table 3. Hierarchical regression analysis results for satisfaction to performance

Independent Variables	satisfaction to performance							
	Step 1		Step 2		Step 3		Step 4	
	β	t	β	t	β	t	β	t
1. Education	-.038	-.59 ^{ns}	-.030	-.46 ^{ns}	-.040	-.62 ^{ns}	-.05	-.83 ^{ns}
2. Specialization (Sp)			.22	3.19**	.137	1.91*	.75	1.55 ^{ns}
3. Transfer of training (Tt)					.252	3.70**	.09	.135 ^{ns}
4. Sp×Tt							-1.04	-1.28 ^{ns}
R ²	0.03		0.08		0.13		0.14	
ΔR^2	0.02		0.05		0.10		0.09	
F change	2.66		2.67		13.68		0.40	
Sign F change	0.05		0.02		0.00		0.85	

Note ** $p < 0.01$ * $p < 0.05$

Table 4. Hierarchical regression analysis results for job performance

Independent Variables	Job performance							
	Step 1		Step 2		Step 3		Step 4	
	β	t	β	t	β	t	β	t
1. Education	.18	2.91**	.14	2.34*	.12	2.28*	.13	2.38*
2. Specialization (Sp)			.36	5.66**	.22	3.60**	.39	.96 ^{ns}
3. Transfer of training (Tt)					.40	7.00**	-.08	-.14 ^{ns}
4. Sp×Tt							-.26	-.39 ^{ns}
R ²	0.06		0.25		0.38		0.39	
ΔR^2	0.04		0.23		0.35		0.36	
F change	4.78		12.72		49.02		1.24	
Sign F change	0.00		0.00		0.00		0.29	

Note ** p< 0.01 * p<0.05