



## **Evaluating Training Effectiveness using the Malaysian Sample: Tracing the Mediation Effect of Training Motivation using SEM-AMOS**

**Siti Fardaniah Abdul Aziz\***

School of Psychology and Human Development, Faculty of Social Sciences and Humanities, National University of Malaysia, Universiti Kebangsaan Malaysia, Malaysia. \*Email: [daniah@ukm.edu.my](mailto:daniah@ukm.edu.my)

### **ABSTRACT**

A large number of researches indicated that training motivation as the mediator on the relationship between independent variables and training effectiveness. Interestingly, various factors were indicated to stimulate training motivation and effectiveness; however the interaction between these variables has received little attention. Hence, the aim of this study was to determine the interaction between variables related to training effectiveness, especially the mediation effect of training motivation. Using samples of participants attended compulsory training to obtain certificate for practice organized by the Malaysian National Institute of Occupational Safety and Health in 2015; findings indicated that training motivation only mediated the relationship between training-characteristic support and training effectiveness with a large effect. However, there is a chain-linkage relationship between these variables; findings were supported by previous research. Hence, findings can be used for planning intervention to improve training effectiveness and organizational performance in the global economy context.

**Keywords:** Comprehensive Training Motivation, Training Effectiveness, Employee Training, Malaysia

**JEL Classifications:** J24, M53, M54

### **1. INTRODUCTION**

Training program is a mechanism that provides employees with updated knowledge, skills and value that essential for organizational performance; hence, it is crucial to ensure that this effort is effective. Since human resource is appreciated as the most important capital in organization, the function of training and development becomes more important (Cascio, 2015). Commonly, training is the ultimate decision to improve organizational performance via human resources; in which, training was given to modernize the use of technology in organization, to cater with the changing in globalization, and to achieve the organizational goals especially the economic business goal (Daft, 2014). In fact, the quality of human resources will determine the quality of an organization (Weiner et al., 2013). Hence, training was given to improve the quality of human resources from time to time; this is why it is most important to make sure the effectiveness of training (Noe, 2012; Kirkpatrick and Kirkpatrick, 2010). Hence, previous

researchers have tried to find factors that can improve training effectiveness; in which, various factors were found to affect training effectiveness (Cannon-Bowers et al., 1995; Aziz, 2013).

Further, previous researchers have been investigating independent variables related to training effectiveness; however, the interaction between these variables has received little attention. Previous researchers including Cannon-Bowers et al. (1995), Aziz (2013), and Ghaneemah and Gian (2015) found that several independent variables are related to training effectiveness; these factors can be categorized into personal-, training-, and organizational-characteristic support. Meanwhile, a large number of researchers including Bauer et al. (2016) had proven that training motivation is the antecedent that usually plays role as a mediator on the relationship between independent variables and training effectiveness. Ironically, the determination of interaction between these independent variables did not receive as much as attention of investigating various factors related to training effectiveness.

Hence, Aziz (2013) suggested that future research to investigate the interaction between these variables to determine which factor should be focussed on in providing intervention to improve training effectiveness. Therefore, the aim of this paper is to determine the interaction between variables related to training effectiveness, especially the mediation effect of training motivation. With the verification of interaction among independent variables related to training effectiveness, researchers and practitioners can determine the most important factor to focus on as well as reducing similar factor in determining the list to improve training effectiveness.

## 2. FACTORS RELATED TO TRAINING EFFECTIVENESS

According to Kirkpatrick (1959; 1996), training effectiveness can be measured based on trainees' reaction towards the achievement of training objectives. Interestingly, training motivation was proven as the antecedent that mediated the relationship between independent variables and training effectiveness (Bauer et al., 2016). Meanwhile, the independent variables related to training effectiveness can be categorized into personal-, training-, and organizational-characteristic support (Cannon-Bowers et al., 1995; Aziz, 2013).

According to the four levels of training evaluation by Kirkpatrick (1959; 1996), training should be evaluated using four levels including reaction, learning, behavioural changes, and results. Kirkpatrick's model is an outstanding model to evaluate training effectiveness because it was referred by numerous practitioners and researchers (Griffin, 2010, Aziz, 2015). However, most of researchers prefer to use the reaction evaluation in the model to determine the starting phase of effectiveness (Giangreco et al., 2008). In fact, this is the evaluation of training that applied by majority of manufacturing companies in the Malaysian context (Chong, 2005). Meanwhile, Kirkpatrick and Kirkpatrick (2010) argue that reaction towards training can be evaluated using the perception of trainees towards the achievement of training objective.

Interestingly, previous research finds that training motivation is the most important factor that mediated the relationship between various independent variables and training effectiveness (Aziz, 2013). This is supported by an integrative theory of training motivation by Colquitt et al. (2000) and a large number of empirical research including those conducted by Noe and Schmitt (1986), Fecteau et al. (1995), Chiaburu and Tekleab (2005), and Bauer et al. (2016). Colquitt et al. (2000) found that training motivation mediated the relationship between organizational climate and training effectiveness; and that between personal factors and training effectiveness. Additionally, Cannon-Bowers et al. (1995) and Aziz (2013) found training motivation mediated the relationship between several factors and training effectiveness; these factors can be grouped into personal-, training-, and organizational-characteristic support. In fact, some researchers including Pilati and Borges-Andrade (2008), Tracey et al. (2001), and Aziz et al. (2015) found that training motivation can have a large effect on training effectiveness. Interestingly, Aziz

(2013) redefined training motivation into comprehensive training motivation because there were various types of training motivation as discussed by previous research. This demonstrated that it is crucial to stimulate training motivation because it can predict the status of training effectiveness.

Further, previous researchers have been investigating factors related to training effectiveness including personal-, training-, and organizational-characteristic support (Cannon-Bowers et al., 1995). Using an integrative literature review suggested by Torraco (2005), some researchers provide the details of sub-factors that had effect on training motivation and effectiveness. Personal-characteristic support includes intrinsic orientation, extrinsic orientation, organizational commitment, self-efficacy to learn, appropriate personality, job satisfaction, job involvement, and appropriate demographics (Aziz et al., 2011). Training-characteristic support includes the relevance of training, familiarity of training content, training reputation, option of voluntary attendance, and appropriate training design (Aziz et al., 2011). Organizational-characteristic support includes social support, cultural support, job support, and management support (Aziz, 2011). Hence, using these conceptual and operational definitions, Aziz (2013) found that comprehensive training motivation mediated the relationship between some independent variables and training effectiveness among academic staff in a public university.

Furthermore, previous research had also investigated the interaction between training effectiveness, training motivation, and personal-, training-, and organizational-characteristic support; however, only few research, such as Fecteau et al. (1995), Hansen (2001), and Aziz (2013) included these variables within a single study. Fecteau et al. (1995) and Hansen (2001) found that some of independent variables had significant effect on training effectiveness with training motivation as mediator; however, the interaction between those variables was not reported. Interestingly, Aziz (2013) reported that those independent variables had significant direct effect on training effectiveness; her findings is supported by previous researchers that indicated significant relationship between these variables including those indicated by Noe and Schmitt (1986), Fecteau et al. (1995), Tracey et al. (2001), Colquitt et al. (2000), Aziz et al. (2015), and Bauer et al. (2016). However, Aziz (2013) found that training motivation only mediated the relationship between training-characteristic support and comprehensive training motivation within a single study; hence, she suggested future researcher to explain the mysterious of insignificant effect that other independent variables had on training effectiveness when multiple variables were included within a single study.

According to Werner and DeSimone (2012), and Noe (2012), organizations carry out their training needs analysis using three major components including the organizational-analysis, task and individual-analysis. Meanwhile, Aziz (2002) found that most organizations in Malaysia have been practising the training needs analysis before sending their employees for training. Hence, it can be seen that organizational-characteristic will determined the type of employee (personal-characteristic) and training-characteristic through organizational-analysis; meanwhile,

personal-characteristic will determined the type of training (training-characteristic) through individual-analysis. Finally, training-characteristic will determined the training effectiveness through task analysis. Hence, it can be seen that variables related to training effectiveness can interact with each other in a chain-linkage relationship.

Taken together, a conceptual framework was developed to determine the interaction between training effectiveness and independent variables; this is depicted in Figure 1. The framework suggests that comprehensive training motivation mediated the relationship between personal-, training-, and organizational-characteristic support and training effectiveness (reaction). Meanwhile, personal-characteristic support mediated the relationship between organizational-characteristic support and training-characteristic support, comprehensive training motivation, and reaction. In addition, training-characteristic support mediated the relationship between personal-characteristic support and comprehensive training motivation, and reaction; and that between organizational-characteristic support and comprehensive training motivation, and reaction. All mediations are in partial mediation effect.

### 3. METHODS

A survey was applied among those attended compulsory training to obtain certificate for practice as organized by the Malaysian National Institute of Occupational Safety and Health (NIOSH) in 2015. Using census method, 309 respondents that attended 21 training programs were involved in the research; this is equivalent to 94% of return rate. However, only 287 were selected due to outliers. Data for personal-, training-, and organizational-characteristic support were collected at the beginning of training; data for training motivation and reaction towards the achievement of training objectives (training effectiveness) were collected at the completion of training. Instrument to measure trainees' reaction was adapted from Kirkpatrick and Kirkpatrick (2010); sample question was "The training program successfully achieved the defined objective". However, other instruments used for the survey were adapted from Aziz (2013); the instrument had been tested for reliability, content validity and confirmatory factor analysis by her. Sample question for personal-characteristic support was "I find that my values and my organization's values are very similar," for training-characteristic support was "This training program will help me improve performance in my current job," for organizational-characteristic support was "Top management expects continuing technical excellence and competence," and for comprehensive training motivation was "I try to learn as much as I can from this training program." Data were analysed using SPSS and AMOS.

Figure 2 and Table 1 shows the measurement model using SEM-AMOS. Using formula suggested by Hair et al. (2006), the instrument had acceptable construct validity; including its convergent, nomological, and discriminant validity. The average variance extracted (AVE) for each construct was higher than 0.5 indicating convergent validity. The squared correlation among constructs was lesser than their AVE indicating discriminant

Figure 1: Conceptual framework

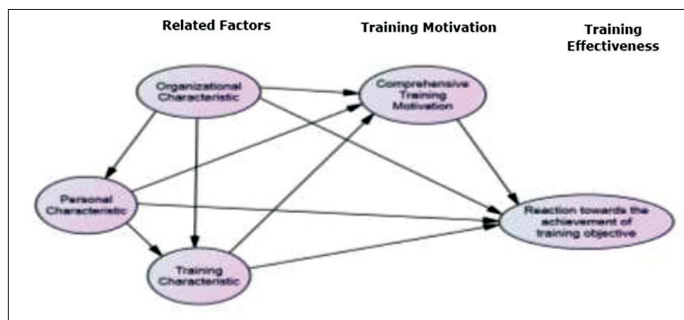


Table 1: AVE, CR, correlation, and squared correlation among constructs

AVE	CR	Variable	PCS	TCS	OCS	CTM	R
0.57	0.83	PCS	-	0.58	0.35	0.21	0.21
0.61	0.86	TCS	0.76	-	0.55	0.28	0.32
0.66	0.88	OCS	0.59	0.74	-	0.25	0.61
0.67	0.89	CTM	0.46	0.53	0.50	-	0.05
0.63	0.83	R	0.46	0.57	0.78	0.23	-

Values below the diagonal are correlations as produced by SEM. Values above the diagonal are squared correlation. All correlations are significant at 0.0001 level of significance. PCS: Personal-characteristic support, TCS: Training-characteristic support, OCS: Organizational-characteristic support, CTM: Comprehensive training motivation, R: Reaction, AVE: Average variance extracted, CR: Constructs reliability

validity. The correlation between construct was significant indicating nomological validity. The constructs reliability were also higher than 0.7. The model also fits the data;  $\chi^2(125) = 271.578$  with  $P = 0.000$ ,  $\chi^2/df = 1.913$ ,  $GFI = 0.911$ ,  $CFI = 0.961$ ,  $TLI = 0.953$ , and  $RMSEA = 0.056$ .

### 4. FINDINGS AND DISCUSSION

Findings indicated that comprehensive training motivation only mediated the relationship between training-characteristic support and training effectiveness (reaction) with partial mediation effect. However, there was interaction between these variables; in which, these variable interact as a chain-linkage relationship. This explains the mysterious of insignificant effect that personal- and organizational-characteristic support had on training effectiveness when multiple variables were included within a single study. Findings are consistent with the conceptual framework and previous literature and research.

Figure 3 shows the structural model which also fit the data that consistent with the measurement model;  $\chi^2(125) = 271.578$  with  $P = 0.000$ ,  $\chi^2/df = 1.913$ ,  $GFI = 0.911$ ,  $CFI = 0.961$ ,  $TLI = 0.953$ , and  $RMSEA = 0.056$ . In addition, Table 1 shows that all variables are significantly correlated with each other. Meanwhile, Aziz (2013, p. 4) explains that Cohen (1988) had determined that the effect size is considered small for 0.10 to 0.29, medium for 0.30 to 0.49, and large for 0.50 and above. Hence, Table 2 shows that some independent variables had large effect on endogenous variables including comprehensive training motivation on training effectiveness ( $\beta = 0.690$ ), personal-characteristic support on training-characteristic support ( $\beta = 0.500$ ), and organizational-characteristic support on personal-characteristic support ( $\beta = 0.591$ ). Additionally, all exogenous variables explained



Figure 2: Measurement model

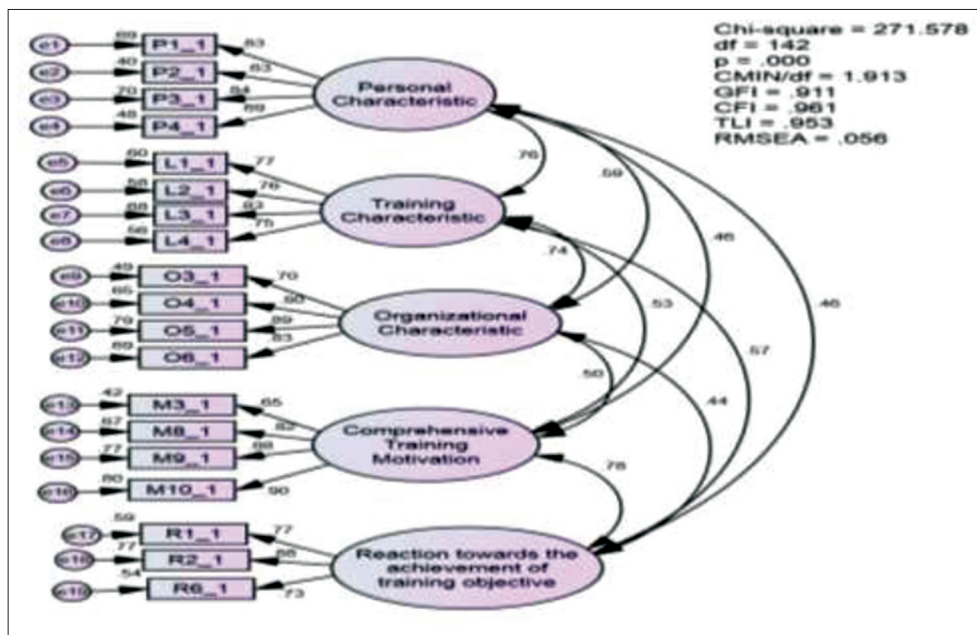
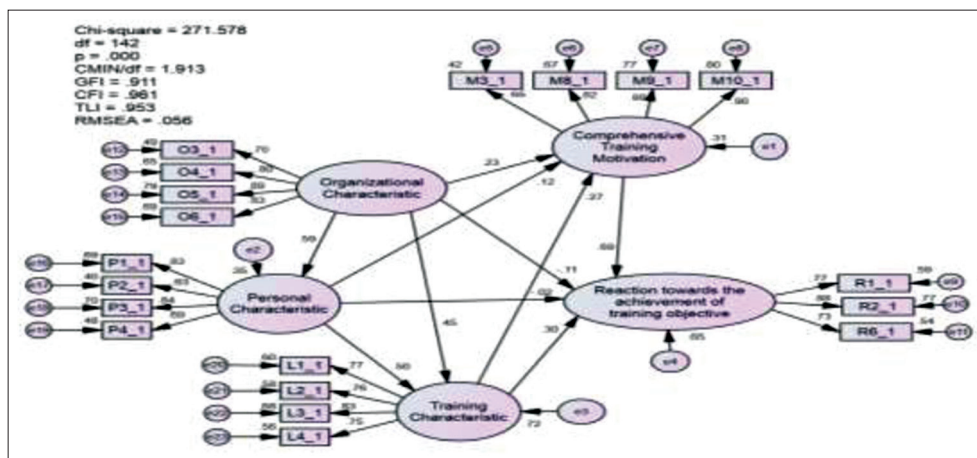


Figure 3: Structural model



65% variance in training effectiveness (reaction), 31% variance in comprehensive training motivation, 72% variance in training-characteristic support, and 35% variance in personal-characteristic support.

On the other hand, Table 3 shows that all exogenous variables had significant direct effect on endogenous variable. This explains that each exogenous variable can significantly predict endogenous variable. Meanwhile, Table 4 shows the result of mediation test; according to Hair et al. (2006. p. 870), mediation effect exist if the total effects of exogenous on endogenous variable is greater than 0.08. Hence, findings indicated that comprehensive training motivation only mediated the relationship between training-characteristic support and training effectiveness; this is consistent with findings by Aziz (2013) that was done to determine the mediation effect of training motivation within a single study.

In addition, the effect of organizational-characteristic support on training effectiveness was mediated by personal-characteristic

Table 2: Regression weights, SE, CR, and significant level between constructs in the structural model

Hypothesized path	Standardized regression weights estimates	SE	CR	P value
PCS←OCS	0.591	0.085	8.268	***
TCS←OCS	0.448	0.074	6.584	***
TCS←PCS	0.500	0.062	7.437	***
CTM←OCS	0.228	0.106	2.356	0.018
CTM←PCS	0.118	0.097	1.129	0.259
CTM←TCS	0.268	0.135	1.998	0.046
R←CTM	0.690	0.070	9.454	***
R←TCS	0.297	0.112	2.558	0.011
R←OCS	-0.110	0.086	-1.341	0.180
R←PCS	-0.017	0.078	-0.193	0.847

\*\*\*Significant at 0.0001. PC: Personal-characteristic support, TCS: Training-characteristic support, OCS: Organizational-characteristic support, CTM: Comprehensive training motivation, R: Reaction, SE: Standard error, CR: Critical ratio

support, training-characteristic support, and comprehensive training motivation. Meanwhile, the effect of personal-characteristic support on training effectiveness was mediated

by training-characteristic support and comprehensive training motivation. This is consistent with findings by Colquitt et al. (2000), Switzer et al. (2005), and Aziz et al. (2015) that found the significant mediation effect of training motivation on the relationship between personal-characteristic support and training effectiveness. Additionally, Fecteau et al. (1995), Cannon-Bowers et al. (1995), and Chiaburu et al. (2010) found the significant mediation effect of training motivation on the relationship between organizational-characteristic support and training effectiveness. Meanwhile, Tracey et al. (2001), Aziz (2013), and Bauer et al. (2016) found the significant mediation effect of training motivation on the relationship between training-characteristic support and training effectiveness. This explains the mysterious of insignificant effect that personal- and organizational-characteristic support had on training effectiveness when multiple variables were included within a single study. Findings also indicated that personal- and organizational-characteristic support had significant effect on training effectiveness without the present of comprehensive training motivation; however, the effect becomes insignificant with the present of comprehensive training motivation. However, these independent variables still affect training effectiveness through a chain-linkage relationship.

## 5. RECOMMENDATION

Findings impact the human resource development field of study by determining the interaction of independent variables related to training effectiveness as a chain-linkage. This implies that training effectiveness can be improved by stimulating training motivation through excellent training-characteristic support, followed by selecting the right personal-characteristic that were ready for training, and nurturing organizational-characteristic that

support training effectiveness. Interestingly, findings demonstrated that each variables related to training effectiveness is important to improve training effectiveness; hence, future researchers and practitioners should not take for granted in providing organizational-, personal-, and training-characteristic that support training motivation and effectiveness.

Findings indicated that there is a chain-linkage relationship between independent variables and training effectiveness. This demonstrated that organizational-characteristic support will affect the personal-characteristic support, and then the personal-characteristic support will affect the training-characteristic support. This is followed by the effect of training-characteristic support on comprehensive training motivation; finally, the comprehensive training motivation will affect the training effectiveness. This implies that to improve training effectiveness, the trainees' training motivation should be stimulated by providing excellent training-characteristic; however, the training-characteristic should be designed to suit with the personal-characteristic. Interestingly, the organizational-characteristic is also important because it will determine the personal-characteristic of employee that sent for training. Hence, each independent variable plays roles in determining training effectiveness; in which, each variable is the precursor for training effectiveness that exist in a chain-linkage relationship. In addition, most of these independent variables had a large effect in predicting the precursor of training effectiveness, and the training effectiveness itself. For example, comprehensive training motivation had a large effect on training effectiveness; hence, it can be used to predict training effectiveness.

Further, Aziz (2011) have outlined some guidelines to nurture the right organizational-characteristic that support training motivation and effectiveness including to provide social support, followed by cultural, job, and management support in organization. Meanwhile, Aziz et al. (2011) have outlined some guidelines to select the right candidate for training based on their personal-characteristic including to select those with high intrinsic orientation followed by high extrinsic orientation, organizational commitment, self-efficacy to learn, appropriate personality such as a low level of anxiety and introversion, and high job satisfaction and involvement. In addition, Aziz and Ahmad (2011) have outlined some guidelines to prepare the right training-characteristic including by making sure that any training given to employees are (1) willingly to be attended by employees; (2) have a good reputation especially employees' perception on training providers, content, and its quality; (3) is designed systematically using the consideration of blended learning; (4) is relevant to job-related need, such as can be used to increase job performance; (5) is relevant to personal-related

**Table 3: Direct effect on endogenous variable**

Endogenous variable	Regression	Exogenous variable	Standardized direct effect
R	←	OCS	0.440***
CTM	←	OCS	0.243***
TCS	←	OCS	0.744***
PCS	←	OCS	0.589***
R	←	PCS	0.456***
CTM	←	PCS	0.456***
TCS	←	PCS	0.768***
R	←	TCS	0.562***
CTM	←	TCS	0.526***
R	←	CTM	0.783***

\*\*\*Significant at 0.0001. PCS: Personal-characteristic support, TCS: Training-characteristic support, OCS: Organizational-characteristic support, CTM: Comprehensive training motivation, R: Reaction

**Table 4: Testing the mediation effect**

Dependent variable	Regression	Independent variable	Mediator	Total effect	Mediation effect (>0.08)
R	←	OCS	PCS, TC, CTM	$-0.11+(0.59 \times 0.5 \times 0.27 \times 0.69)+(0.45 \times 0.27 \times 0.69)+(0.23 \times 0.69)=0.1875$	Yes
R	←	OCS	TC, CTM	$-0.11+(0.45 \times 0.27 \times 0.69)+(23 \times 0.69)=0.1325$	Yes
R	←	OCS	CTM	$-0.11+(0.23 \times 0.69)=0.0487$	No
R	←	PCS	TC, CTM	$-0.02+(0.5 \times 0.27 \times 0.69)+(0.12 \times 0.69)=0.15595$	Yes
R	←	PCS	CTM	$-0.02+(0.12 \times 0.69)=0.0628$	No
R	←	TCS	CTM	$0.3+(0.27 \times 0.69)=0.4863$	Yes

PCS: Personal-characteristic support, TCS: Training-characteristic support, OCS: Organizational-characteristic support, CTM: Comprehensive training motivation, R: Reaction

needs, such as can be used as part of competency development; and (6) is relevant to career development, such as can be used as a part of the job promotion process.

Taken together, each independent variable related to training effectiveness interacts with each other in a chain-linkage relationship; hence, each factor should be taken into consideration in the intervention process of improving training effectiveness. In fact, comprehensive training motivation had a large effect on training effectiveness and can be used to predict training effectiveness since the process of training evaluation is costly, timely, and confidential.

## 6. CONCLUSION

The aim of this study was to determine the interaction between variables related to training effectiveness because previous research have not discussed the mysterious of insignificant effect of independent variables related to training effectiveness when multiple variables were included within a single study. To this end, a survey was conducted among participants that attended compulsory training to obtain certificate for practice as organized by the Malaysian NIOSH in 2015. Findings indicated that comprehensive training motivation only mediated the relationship between training-characteristic support and training effectiveness. However, each independent variable related to training effectiveness interacts with each other in a chain-linkage relationship; hence, each factor should be taken into consideration in the intervention process of improving training effectiveness. Findings were supported by previous research and suggesting future researcher and practitioner to predict training effectiveness using training motivation. Findings also demonstrated that each training-, personal-, and organizational-characteristic support should be provided to stimulate training motivation and effectiveness. Hence, with these findings, practitioners and researchers can improve training effectiveness to increase the organizational competitiveness in the global economic context.

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