



A Revisit of Holton's HRD Evaluation and Research Model (2005) for Learning Transfer

Kulthida Mongkolsirikiet* and Chiraprapha Akaraborworn

School of Human Resource Development, National Institute of Development Administration

No. 118 Moo 3, Serithai Road, Klong-Chan, Bangkok, Bangkok 10240, Thailand

*Corresponding author E-Mail address: porkulthida@gmail.com

Received: 24 October 2018; Accepted: 21 December 2018

Abstract

The main purpose of this study was to revisit the Holton's HRD Evaluation and Research Model (Holton III, 2005) for Learning Transfer in order to develop an instrument to measure the factors affecting the learning transfer of Thai employees. The study included the exclusive literature review of Edward Holton's HRD Evaluation Model (Holton III, 2005) and the process of developing a new instrument of Learning Transfer. The research process was composed of two phases: **Phase I: Scale Development**, involving drafting an English version of a 72-item-scale from related literature review, conducting back translation, and testing content validity with HR experts by using Index of Item-Objective Congruence (IOC), and **Phase II: Scale Validation**, including and analyzing all of the items with Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) with 679 front-line employees from three large sized Thai commercial banks. The Exploratory Factor Analysis (EFA) results yielded six emerging constructs of the 71-item-scale, namely traits, employee commitment, motivation to improve work through learning, lack of opportunity to apply, supportive environment, and transfer design. The Confirmatory Factor Analysis (CFA) results confirmed the six-construct-model validation with a good fit. The results provided a strong support for the structure of 15 factors; 7 factors in the Specific Training domain and 8 factors in the General Training domain. The results of this study yield a new and comprehensive learning transfer measurement scale based on the emerged model that would contribute to not only academics, but also to Thai HRD practitioners and Thai banking sector to systemically diagnose. It also detects and solves problems of training effectiveness. Future studies should validate and test the model and the instrument with Structural Equation Modeling (SEM) in order to see the causal links among the latent variable.

Keywords: Learning Transfer, Instrument Development, Holton's HRD Evaluation and Research Model

Introduction

Despite the fact that learning transfer has long been studied by researchers since the 19th century, the complexity of multivariate learning transfer system remains unclear to global researchers with several conflicting and inconsistent findings of factors affecting it (Blume, Ford, & Baldwin, 2010; Hutchins, Nimon, Bates, & Holton, 2013). The learning transfer remains an 'unsettled' issue not only among the researchers, but also among Human Resource Development practitioners as evident from the fact that the subject has continually been in the spotlight at annual ASTD conferences from 2012-2014 (ASTD, 2014). Approximately \$100 billion of the US organization budget was allocated to training investment expenditures each year (Paradise, 2007) with the hope that staff were not only better equipped with new knowledge and skills, but also transferred what they had learnt to their work. However, Saks (2002) posited that 40% of the trainees failed to apply what they had learnt immediately after the training. In Thailand, the Department of Skill Development (DSD) required organizations with over 100 employees to provide training to at least 50% of the workforce and incentivized the organizations with up to 200% tax deduction grant as stated in Skill Development Promotion Act B.E. 2545 (A.D. 2002) (Smiti, 2009). However, the learning effectiveness was never declared.

Many of Thai HRD academics (Vathanalee, 2003; Kasemsri, 2004; Yamnill and McLean, 2005; Jungsiriwattana, 2006; Bumroongtham, 2008), had conducted research regarding the learning transfer



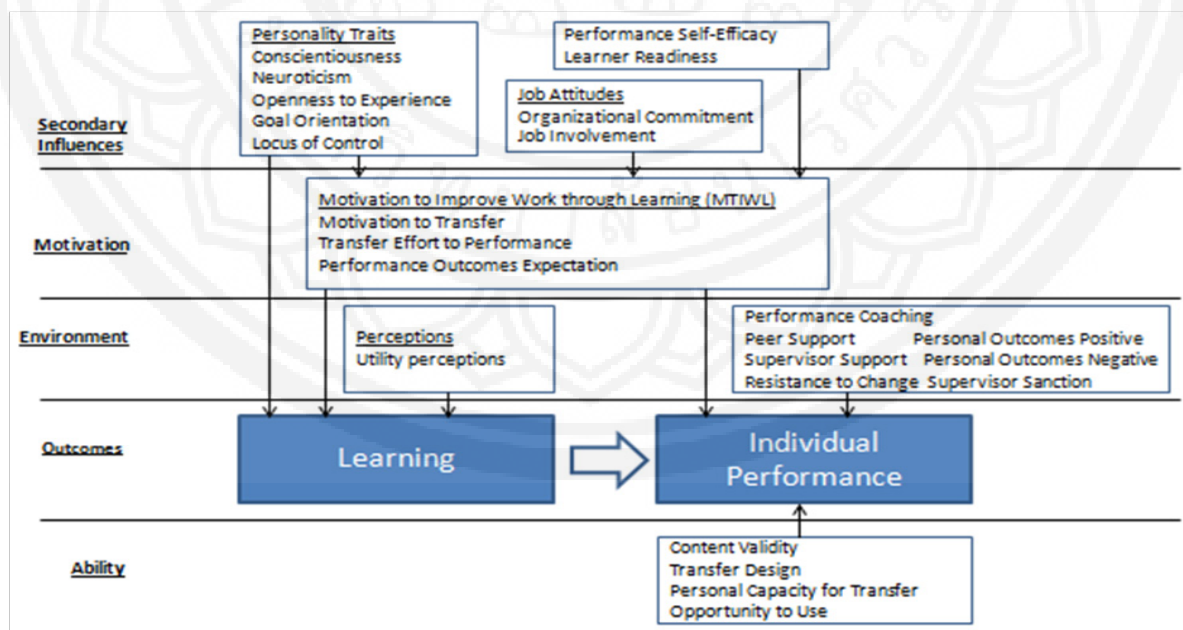
effectiveness and searched for the best fit models and tools available for organizations in Thailand. The problem is that although there was a number of learning transfer models developed by the researchers and practitioners, most of them were developed with western perspective which may not necessarily fit to Thai organizational culture context as suggested by Holton, Bates and Ruona (2000) that “the HRD concept and the characteristic of organizations in each country (including Thailand) might differ” (p. 325) (Yamnull and McLean, 2005).

Among the training evaluation tools, Holton’s HRD Evaluation and Research Model (Holton III, 1996) and Learning Transfer System Inventory (LTSI), developed by Holton III, Bates, & Ruona (2000) as a training diagnostic tool, have most frequently been cited as well-validated model, in terms of construct validity, criterion validity, and cross-cultural validity (Yamnull & McLean, 2005; Bates, Holton III, Seyler, & Carvalho, 2000; Ruona, Leimbach, Holton III, & Bates, 2002). Yamnull & McLean (2005) validated LTSI version 2 by replicating Holton et al.’s study (2000) with Thai samples as a kick-off tackle to the learning transfer problem in Thailand so that Thailand at least had a tool to diagnose the problem. Their study reported the discrepancy found included cultural and language differences as follows: “the ambiguity of some items in the original, making the translation of some words difficult” (p. 340), “eleven items were dropped because of weak factor loadings” (p. 330) and factors with low reliability. Yamnull and McLean (2005) concluded in their study that “the transfer system and the translated LTSI are of potential validity in Thailand, however, this instrument has some weaknesses, such as a disproportionate number of items across factors and low internal consistency reliability in some factors” (p. 340). Thus, Yamnull and McLean (2005) suggested this instrument require revision and additional research.

LTSI consisted of two domains: Specific Training Domain measuring trainees’ experience in the specific training session, while General Training Domain measuring the trainees’ experience in other general training sessions. The LTSI version 1 (Holton III et al., 1997) consisted of nine constructs with a 63-item instrument. The revision was then made in LTSI version 2 to correspond to the HRD Evaluation and Research Model (Holton III, 1996) and new factors were added and tested yielding 68 items measuring 16 factors; 11 factors in Specific Training and 5 factors in General Training Domain (Holton III et al., 2000). Yet, after the emergence of new evidence from a number of research (Noe, 2000; Colquitt, LePine, & Noe, 2000; Naquin & Holton III, 2002; Morgan & Casper, 2000; Tan, Hall, & Boyce, 2003; Ruona et al., 2002) relating to the learning transfer system, Holton III (2005) modified the model by combining 8 new factors to the existing 16 factors; altogether 24 factors, whereby 7 dispositional factors were added to the General Training Domain and 1 environmental factor was added to the Specific Training Domain respectively as shown in Table 1. Interestingly, there has been no research modifying and validating the scale based on the updated version of Holton III’s (2005) (R. Bates, personal communication via email, November 18, 2015). The objective of this research is to revisit Holton’s HRD Evaluation and Research Model (Holton III, 2005) and develop a new and more comprehensive learning transfer instrument based on Holton III’s revised model that better equipped Thai context. The research question is “what factors hypothesized in Holton’s Evaluation Model (2005) are identified when conducting an EFA and CFA on the hypothesized model in order to develop the new learning transfer measurement scale for a Thai population in banking sector?”

**Table 1** Comparison of Factors in Holton Model of Year 1996 and 2005

Dimension	Factors in Holton 1996 Model	Factors in Holton 2005 Model	Training Domain
Secondary Influences	N/A	1. Conscientiousness (C)	General Training
		2. Neuroticism (N)	General Training
		3. Openness to Experience (OTE)	General Training
		4. Goal Orientation (GO)	General Training
		5. Locus of Control (LOC)	General Training
	N/A	6. Organization Commitment (OC)	General Training
		7. Job Involvement (JI)	General Training
Motivation	1. Performance Self-Efficacy	8. Performance Self-Efficacy (PSE)	General Training
	2. Learner Readiness	9. Learner Readiness (LR)	Specific Training
	3. Motivation to Transfer	10. Motivation to Transfer (MT)	Specific Training
	4. Transfer Effort to Performance	11. Transfer Effort to Performance (TEP)	General Training
	5. Performance Outcome Expectation	12. Performance Outcome Expectation (POE)	General Training
Environment	N/A	13. Utility Perceptions (UP)	Specific Training
	6. Feedback	14. Performance Coaching (PC)	General Training
	7. Peer Support	15. Peer Support (PS)	Specific Training
	8. Supervisor Support	16. Supervisor Support (SS)	Specific Training
	9. Resistance to Change	17. Resistance to Change (RC)	General Training
	10. Personal Outcomes Positive	18. Personal Outcomes Positive (POP)	Specific Training
	11. Personal Outcomes Negative	19. Personal Outcomes Negative (PON)	Specific Training
Ability	12. Supervisor Opposition	20. Supervisor Opposition (SO)	Specific Training
	13. Content Validity	21. Content Validity (CV)	Specific Training
	14. Transfer Design	22. Transfer Design (TD)	Specific Training
	15. Personal Capacity to Transfer	23. Personal Capacity to Transfer (PCT)	Specific Training
	16. Opportunity to Use	24. Opportunity to Use (OUT)	Specific Training

**Figure 1** Holton's HRD Evaluation and Research Model (Adapted from Holton III, 2005)



Literature Review

In this section, related literatures are reviewed in order to understand the elements involving the learning transfer system, particularly those additional factors described in Holton's HRD Evaluation and Research Model (Holton III, 2005).

Holton's HRD Evaluation and Research Model

Holton III (1996) viewed that Kirkpatrick's four-level evaluation (Kirkpatrick, 1959) to be "flawed as an evaluation model" (p. 5) and "shortcoming of empirical research". He had proposed an HRD Evaluation Research and Measurement Model, a multivariate conceptual evaluation model and Learning Transfer System Inventory (LTSI) scale (Holton III et al., 2000). The LTSI scale consisted of two domains: Specific Training Domain and General Training Domain. The LTSI version 1 (Holton III et al., 1997), was based on Rouiller and Goldstein's transfer climate (Rouiller & Goldstein, 1993), consisted of nine constructs with a 63-item instrument. The revision was then made in LTSI version 2 to correspond to the HRD Evaluation and Research Model (Holton III, 1996) and new factors were added and tested yielding 68 items measuring sixteen constructs; 11 factors in Specific Training and 5 factors in General Training Domain (Holton III et al., 2000). An additional 21 items were added to create version 3 of the LTSI, an 89-item instrument. Bates, Holton III, & Hatala (2012) validated and refined LTSI version 4 scale items by deleting the cross-loaded and inter-item correlations, causing the number of scale items reduced from 68 to 48 items and confirmed the factorial structure of 11 factors in Specific Training and 5 factors in General Training Domain. His work was viewed as the most completed model with fully different factors affecting learning transfers (Kirwan & Birchall, 2006). Yamnill & McLean (2005) viewed LTSI as "a well-validated and reasonably comprehensive set of scales to measure factors in a transfer system". However, Noe (2000) suggested that Holton should consider integrating dispositional factors into his model as there was evidence that such factor, for example, the Big Five personality characteristics, job involvement, job attitudes had an impact on motivation, training outcomes and performance.

In response to Noe (2000); Holton III (2005) modified his model and named it the "Revised HRD Evaluation and Research Model". The revised model remained at five dimensions, namely Secondary Influences, Motivation, Environment, Outcomes and Ability. However, compared to the model in 1996, the variables in some constructs were different. In Secondary Influences dimension, individual characteristics were clearly depicted as conscientiousness, neuroticism, openness to experience, goal orientation and locus of control; job attitudes were specified as organizational commitment and job involvement; intervention readiness was replaced by performance self-efficacy and learner readiness. In Motivation dimension, motivation to improve work through learning (Naquin & Holton III, 2003) was introduced. In terms of Environment, perceptions of training was specifically identified as utility perceptions; transfer climate was broken down into feedback, peer support, supervisor support, openness to change, personal outcomes positive, personal outcomes negative and supervisor sanctions. The Outcomes remained the same, while transfer design in Ability/Enabling Elements dimension was classified as content validity, transfer design, personal capacity to transfer and opportunity to use.

Research on Secondary Influences

Holton III (2005) included in his revised model three of the Big Five personality traits with strong research support, namely conscientiousness, neuroticism and openness to experience as having impact to motivation to learn and training outcomes. From the studies of Holton III (2005); Yamkovenko & Holton (2010), conscientiousness was found to affect motivation to learn, intention to transfer and training outcomes. Neuroticism



was found in a few studies to negatively associate with learning scores and work performance (Martocchio & Webster, 1992; Webster & Martocchio, 1993), negatively and strongly impact motivation to learn, post-training self-efficacy (Colquitt et al., 2000) and motivation to transfer and transfer outcome (Machin & Fogarty, 2004). Openness to experience was found to correlate with training proficiency and positively correlated to transfer (Herold, Davis, Fedor, & Parsons, 2002; Naquin & Holton III, 2002) and influenced motivation to learn and training outcomes (Holton III, 2005). It was reported that 48 percent of intent to transfer could be explained by conscientiousness, motivation to transfer and learner readiness with conscientiousness being the only significant variable (Yamkovenko & Holton, 2010). According to Dweck's motivation theory, goal orientation was a dispositional trait that correlated to ability (Dweck, 1989). Research showed that while learning goal orientation was associated with more positive outcomes (Gegenfurtner & Hagenauer, 2013; Laine & Gegenfurtner, 2013), performance goal orientation was associated to negative outcomes (Button, Mathieu, & Zajac, 1996). Noe (1986) viewed that people with internal locus of control believed in their ability to control environment or situations facing them and viewed challenges and failure as opportunity to learn. The person, who was highly involved with his job, was likely to be highly motivated to learn and to improve his work skills (Colquitt et al., 2000). Tolentino (2013) discovered that while affective commitment scale significantly and positively correlated to job performance, normative commitment scale weakly and negatively correlated to job performance. Learner readiness was posited to relate to motivation to learn (Hicks & Klimoski, 1987; Baldwin, Magjuka, & Loher, 1991). When the trainees were forced to attend the training and did not feel that the training added any value, they tended to be less motivated and less likely to learn (Hicks & Klimoski, 1987; Tannenbaum et al., 1991).

Research on Motivation to Improve Work through Learning

Naquin and Holton III (2002) argued that "motivation to learn or motivation to train is inadequate to encompass the requirements for improved employee productivity" (p. 356). The authors viewed that the objective of organization training was productivity from performance improvement. Thus, motivation to improve work through learning (MTIWL), which was a function of motivation to train and motivation to transfer combined leading to improved productivity, was proposed. MTIWL was defined as "the motivation to improve work outcomes by engaging in training or learning activities and using what is learned to perform job functions differently" (p. 359). Naquin and Holton III (2002) reported that among other relevant variables in their study MTIWL could predict learning transfer the most.

Research on Trainee's Reactions

A few recent literature articles demonstrated that trainee's reactions were correlated to learning (Morgan & Casper, 2000). Alliger, Tannenbaum, Bennett, Traver, & Shotland (1997) found that reactions were moderately correlated with learning and transfer. The utility reactions, in particular, have received strong support from the literature as having a positive influence to transfer (Alliger et al., 1997; Lim & Morris, 2006). Morgan & Casper (2000) studied participant reactions to training and the results showed that "the utility factor strongly related to satisfaction with instructor ($r = 0.73$)" (p. 313). The authors posited that the trainee reactions were "useful criteria to examine in evaluation of training programs" (p. 314) and could be a potential source to contribute as a part of a comprehensive training effectiveness evaluation.



Research on Transfer Climate

Transfer climate has been classified similarly into three elements: supervisor and co-workers, reinforcement and feedback and organizational constraints (Blume et al., 2010). Montesino (2002) added the transfer climate time element (before, during and after training) to facilitate the learning transfer. To enhance the learning transfer, the organizations climate, particularly supervisor support (Blume et al., 2010) and peer support (Chiaburu & Marinova, 2005), must be conducive to facilitate it (Kirwan and Birchall, 2006). Blume et al. (2010) posited that “transfer climate had the highest relative relationship with transfer, followed closely by support” (p. 28). Supervisor support, as compared to peer support, was found to exert stronger correlation to the learning transfer (Holton III, Chen, & Naquin, 2003).

Method and Findings

In order to develop a new instrument, generally there are two phases: Phase I scale development and Phase II scale validation.

Phase I: Scale Development

The new instrument was developed from six measurement scales based on literature review corresponding to the Revised HRD Evaluation Research and Model proposed by Holton III (2005): (1) Learning Transfer System Inventory (LTSI) version 4, the latest version, (Bates et al., 2012) was used as a base for developing this new instrument. While the other five measurements are combined, (2) The Big Five Inventory (John, Naumann, & Sato, 2008), (3) the Learning Goal Orientation Scale (Button et al., 1996), (4) the Locus of Control Scale (Levenson, 1973), (5) Job Involvement and Normative Commitment Scale (Meyer & Allen, 2004), and (6) Reactions Measurement Scale (Tan et al., 2003). Altogether 72-item-questionnaire was developed as a first draft to be tested.

Since the first draft of the questionnaire was developed in English, the researcher needed to have it back-translated into Thai language. The questionnaire was sent to the certified Thai-English translator. After the translation into Thai version, the researchers conducted a content validity test by sending this questionnaire to five HR experts; three of whom working as HR or HRD executives in the three banks, and two being the HRD university professors, to review and approve the questionnaire. The HR experts were chosen as they were accountable for the training effectiveness and return on training investment (ROI) in the organizations and they were supposed to be the Subject Matter Experts in the subject. At this state of testing the reliability and validity of the instrument, Index of Item-Objective Congruence (IOC) was adopted (Rovinelli and Hambleton, 1977). With the IOC test, there are 31 of 72 items passed the cutoff criterion at 0.6. Forty one items were revised and re-adjusted to ensure that they measured the corresponding objectives. The revised version of this questionnaire had 72 items.

The questionnaire was composed of two training domains: General Training Domain and Specific Training Domain. The General Training domain consisted of 12 factors and the Specific Training domain consisted of another 12 factors; altogether 24 factors. Each factor consisted of three items, thus there are 72 items in total. In the questionnaire, items 1-36 measure the specific training experience, while items 37-72 measure the general training experience. A five-point Likert-type scale was used to determine the respondent's viewpoint, ranging from “Strongly Disagree” (1) to “Strongly Agree” (5) for consistency across all items in the consolidated questionnaire. Apart from checking the content validity of the scale item with IOC, a pilot study of



30 samples from the target population of a bank using random sampling method was conducted to ensure the quality of the measurement scale, 100% response rate was achieved. The reliability of the instrument was reported as follows: The Corrected Item–Total Correlation (CITC) ranged from 0.3 to 1.0, with an exception of two items scored less than 0.2, and Cronbach’s alpha ranged from .356 to 1.0. Thus, the questionnaire was finalized and distributed in both hard copy and on–line in order to test the scale validation.

Phase II: Scale Validation

The scale validation was performed by using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). SPSS Statistics version 24 was used to conduct the statistical analysis. As eight new factors were added in Holton’s Revised HRD Evaluation (Holton III, 2005), Exploratory Factor Analysis (EFA) was used to identify the structure of the relationship among the variables using factor analysis and factor loading. The goal of EFA is to identify factors based on data and to maximize the amount of variance explained. When the structure of the relationship among variables was identified and formed into factors, they would then be confirmed using Confirmatory Factor Analysis (CFA). CFA was then used to evaluate the priori hypotheses whether or not these factors were correlated, and which items/measures loaded onto and reflected which factors (Vanichbuncha, 2013). The criteria used to assess the model fit was tabled below (Hooper, Coughlan, & Mullen, 2008)

Table 2 CFA Criteria for Model Fit

Absolute Fit Indices	Level of Fit: Good	Level of Fit: Satisfactory
CMIN/df	$0 \leq \text{CMIN/df} \leq 3$	$3 \leq \text{CMIN/df} \leq 5$
RMR	$0 \leq \text{RMR} \leq 0.05$	$0.05 \leq \text{RMR} \leq 0.10$
GFI	$0.95 \leq \text{GFI} \leq 1.00$	$0.9 \leq \text{GFI} \leq 0.95$
AGFI	$0.95 \leq \text{AGFI} \leq 1.00$	$0.9 \leq \text{AGFI} \leq 0.95$
NFI	$0.95 \leq \text{NFI} \leq 1.00$	$0.9 \leq \text{NFI} \leq 0.95$
RFI	$0.95 \leq \text{RFI} \leq 1.00$	$0.9 \leq \text{RFI} \leq 0.95$
IFI	$0.95 \leq \text{IFI} \leq 1.00$	$0.9 \leq \text{IFI} \leq 0.95$
TLI	$0.95 \leq \text{TLI} \leq 1.00$	$0.9 \leq \text{TLI} \leq 0.95$
CFI	$0.95 \leq \text{CFI} \leq 1.00$	$0.9 \leq \text{CFI} \leq 0.95$
RMSEA	$0 \leq \text{RMSEA} \leq 0.05$	$0.05 < \text{RMSEA} \leq 0.08$

Target population for this study was front–line staff from the three major retail banks in Thailand. The total population was approximately 22,876 (Bank of Thailand, n.d.). The sample size identified by rule of thumb (Swanson & Holton III, 2005) was 720. The researcher collected 790 questionnaires but after data screening, 679 samples (86%) were valid and can be used for analysis. The participants were employees of the three large–sized commercial banks in Thailand, consisting of 529 female (78%) and 150 male (22%). The largest age group of the participants was between 26–35 years old (58%), 557 participants (82%) took sales role, and 122 participants (18%) took service–oriented role. After conducting the reliability test with the Thai translated measurement scale, it found that the values of Cronbach’s alpha ranged from .591 to .849 while the cut–off score should be higher than 0.5. Thus, all the factors were kept for further exploratory factor analysis (EFA).

In this study, EFA was adopted to explore Holton’s Revised HRD Evaluation (Holton III, 2005) as there was evidence from the literature (Holton III, 2005) suggesting that eight new factors be added into the model.



Although the Learning Transfer System Inventory measurement scale (Bates et al., 2012), had been validated by EFA and CFA in a number of research from many countries (Holton III et al., 2000; Kirwan & Birchall, 2006; Holton III, Bates, Bookter, & Yamkovenko, 2007; Bhatti & Kaur, 2010; Yamkovenko & Holton, 2010; Bates et al., 2012; Hutchins et al., 2013), 24 scale items corresponding to the eight modified factors were integrated into LTSI version 4 (Bates et al., 2012) and tested.

The Specific Training Domain

The 12-original-factor in the Specific Training Domain was Learner Readiness (LR), Motivation to Transfer (MT), Utility Perceptions (UP), Peer Support (PS), Supervisor Support (SS), Personal Outcomes Positive (POP), Personal Outcomes Negative (PON), Supervisor Opposition (SO), Content Validity (CV), Transfer Design (TD), Personal Capacity to Transfer (PCT), Opportunity to use (OUT). The EFA results showed that the number of factors in the Specific Training Domain was reduced from 12 to 7 factors as depicted in Table 3; total explained by variance 62.52% and KMO & Bartlett .906. The seven emerging factors in the specific training domain consisted of 1) Transfer Design with factor loading ranging from 0.688 to 0.796, 2) Supportive Environment with factor loading ranging from 0.492 to 0.798, 3) Motivation with factor loading ranging from 0.432 to 0.758, 4) Lack of Opportunity to Apply with factor loading ranging from 0.436 to 0.846, 5) Supervisor Opposition with factor loading ranging from 0.747 to 0.806, 6) Personal Outcomes Negative with factor loading ranging from 0.651 to 0.916, and 7) Personal Outcomes Positive with factor loading ranging from 0.594 to 0.870.

Table 3 KMO and Bartlett's Test of the Specific Training Domain

KMO Measure of Sampling Adequacy		.906
Bartlett's Test of Sphericity	Approx. Chi-Square	13006.652
	df	630
	Sig.	.000

The General Training Domain

The 12-original-factor in the General Training Domain was Conscientiousness (C), Neuroticism (N), Openness to New Experience (OTE), Goal Orientation (GO), Locus of Control (LOC), Organization Commitment (OC), Job Involvement (JI), Personal Self-Efficacy (PSE), Transfer Effort to Performance (TEP), Performance Coaching (PC) and Resistance to Change (RC). The EFA results showed that the number of factors in the training general domain was reduced from 12 to 8 factors as shown in Table 4; total explained variance 62.294% and KMO & Bartlett is .905. The eight emerging factors in the general training domain consisted of Transfer Effort to Performance with factor loading ranging from 0.448 to 0.771, 2) Conscientiousness with factor loading ranging from 0.455 to 0.742, 3) Employee Commitment with factor loading ranging from 0.453 to 0.768, 4) Resistance to Change with factor loading ranging from 0.713 to 0.848, 5) Openness to New Experience with factor loading ranging from 0.442 to 0.762, 6) Neuroticism with factor loading ranging from 0.750 to 0.852, 7) Locus of Control with factor loading ranging from 0.596 to 0.729, and 8) Performance Coaching with factor loading ranging from 0.482 to 0.601.

**Table 4** KMO and Bartlett's Test of the General Training Domain

KMO Measure of Sampling Adequacy		.905
Bartlett's Test of Sphericity	Approx. Chi-Square	11444.669
	Df	630
	Sig.	.000

However, the content of each item was reviewed, item number 48 (PSE v1) was not aligned with the objective measured in that factor. Thus, it was deleted; leaving 71 items, 15 factors, to be further tested by CFA. In summary, the EFA results revealed that the factors in specific training domain were reduced from 12 to 7 factors and that those in general training domain were reduced from 12 to 8 factors; altogether 15 factors. The items loading in each construct in both specific training domain and general training domain demonstrated value greater than 0.4 and were retained for further CFA analysis except for variable item number 48. As a result, 71 items were retained.

Table 5 Emerged Factors from EFA

Domain of Training	Emergед Factor	Item	Former Factor
Specific	1. Transfer Design (TD)	CV1, CV2, CV3, TD1, TD2, TD3, OUT3	- Content Validity (CV) - Transfer Design (TD) - Opportunity to Use3 (OUT v3)
	2. Supportive Environment (SE)	PS1, PS2, PS3, SS1, SS2, SS3, OUT2	- Peer Support (PS) - Supervisor Support (SS) - Opportunity to Use2 (OUT v2)
	3. Motivation (MT)	LR1, LR2, LR3, MT1, MT2, MT3, OUT1	- Learner Readiness (LR) - Motivation to Transfer (MT) - Opportunity to Use1 (OUT v1)
	4. Lack of Opportunity to Apply (OA)	UP1, UP2, UP3, PCT1, PCT2, PCT3	- Utility Perceptions (UP) - Personal Capacity to Transfer (PCT)
	5. Supervisor Opposition (SO)	SO1, SO2, SO3	- Supervisor Opposition (SO)
	6. Personal Outcomes Negative (PON)	PON1, PON2, PON3	- Personal Outcomes Negative (PON)
	7. Personal Outcomes Positive (POP)	POP1, POP2, POP3	- Personal Outcomes Positive (POP)
General	1. Transfer Effort to Performance (TEP)	PSE2, PSE3, TEP1, TEP2, TEP3, POE1, POE2, POE3	- Performance Self-Efficacy (PSE) - Transfer Effort to Performance (TEP) - Performance Outcome Expectation (POE)
	2. Conscientiousness (C)	C1, C2, C3, JI3	- Conscientiousness (C) - Job Involvement 3 (JI v3)
	3. Employee Commitment (EC)	OC1, OC2, OC3, JI1, JI2	- Organization Commitment (OC) - Job Involvement 1, 2 (JI v1,2)
	4. Resistance to Change (RC)	RC1, RC2, RC3	- Resistance to Change (RC)
	5. Openness to Experience (OTE)	OTE1, OTE2, OTE3, GO1, GO2, GO3	- Openness to Experience (OTE) - Goal Orientation (GO)
	6. Neuroticism (N)	N1, N2, N2	- Neuroticism (N)
	7. Locus of Control (LOC)	LOC1, LOC2, LOC3	- Locus of Control (LOC)
	8. Performance Coaching (PC)	PC1, PC2, PC3, PSE1	- Performance Coaching (PC) - Performance Self-Efficacy (PSE)

CFA analysis required the researcher to hypothesize, in advance, the number of factors, whether or not these factors were correlated, and which items/measures loaded onto and reflected which factors (Vanichbuncha, 2013). The model to perform CFA in this study emerged from the EFA results of the factors from the Revised HRD Evaluation and Research Model (Holton III, 2005), as depicted in figure 2, consisting of 6 constructs: (1) traits, (2) employee commitment, (3) motivation to improve work through learning, (4) lack of opportunity to use, (5) supportive environment, (6) transfer design. Noticeably, in Holton's revised model (Holton III, 2005), in the part of learning and individual performance, there were 7 constructs in the model, however, as EFA was performed, a construct of 2 factors namely, Learner Readiness and Performance Self-Efficacy variable 2 and 3 was merged with Motivation and Transfer Effort to Performance, whereas Performance Self-Efficacy variable 1 was merged with Performance Coaching; leaving the 6 constructs in the EFA emerged model to be tested with the CFA.

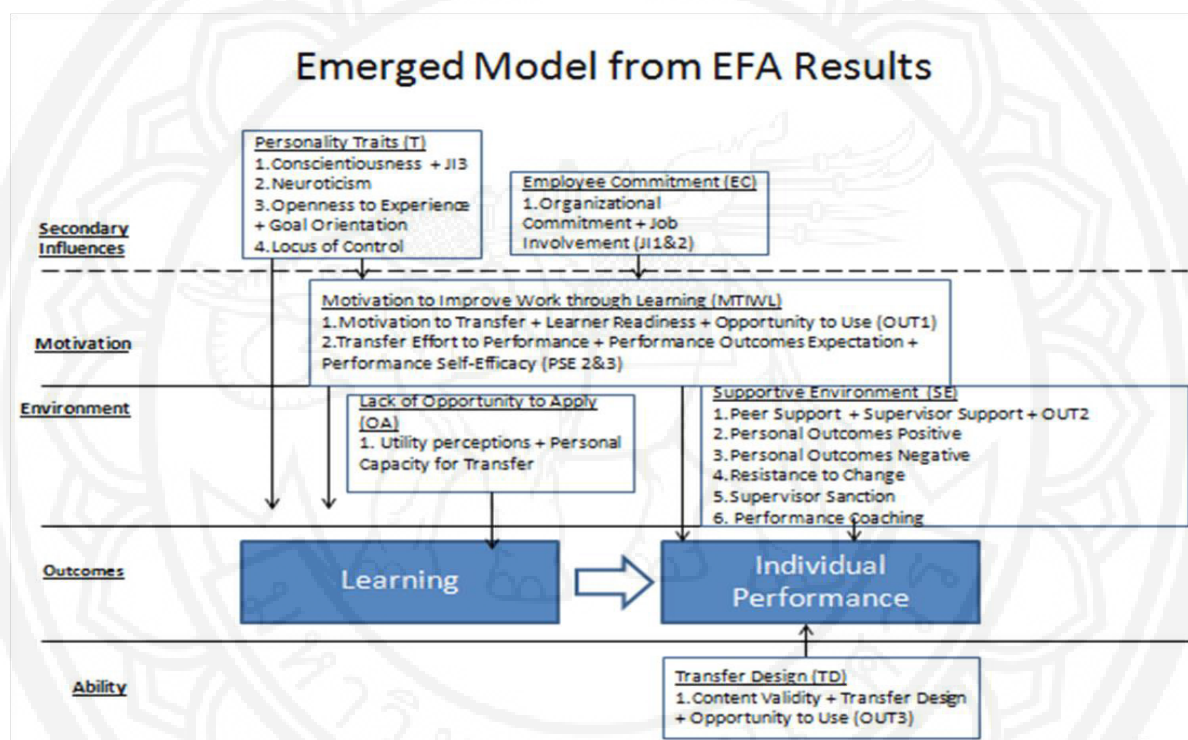


Figure 2 Emergent Constructs from EFA

CFA Results

The CFA Results confirmed the six constructs emerged from the EFA as illustrated in Table 6. The six constructs consisted of (1) traits, (2) employee commitment, (3) motivation to improve work through learning, (4) lack of opportunity to apply, (5) supportive environment, and (6) transfer design.

As depicted in figure 2, (1) Traits construct consisted of 4 factors which were Conscientiousness (C), Neuroticism (N), Openness to Experience (OTE) and Locus of Control (LOC). The results of correlation showed Traits as a coefficient correlation ranging from .115 to .704 at significant level 0.01. The factor loading ranged from .072 to .818 with locus of control being the weakest, followed by neuroticism (.238), openness to new experience (.671) and the strongest being conscientiousness (.818). The CFA results confirmed Traits measurement model satisfactorily fit with the empirical data. (2) Employee Commitment (EC) was the EFA



merged of Organization Commitment (OC) and Job Involvement (JI) factors. The correlation between latent variables in employee commitment (EC) ranged from .49 to .77. The factor loading ranged from .49 to .77 with job involvement being the weakest, and the strongest being organization commitment. The statistics values of Employee Commitment (EC) construct revealed a good fit between the data and the model. (3) Motivation to Improve Work through Learning (MTIWL) construct was the EFA merged from six factors: Learner readiness, motivation to transfer and opportunity to use (variable 1), personal self-efficacy (variable 2 and 3), transfer effort to performance and personal outcome expectation, perceived transfer opportunity. The correlation of the latent variables in MTIWL construct ranged from .57 to .82. The factor loading ranged from .72 to .85 with transfer effort to performance being the strongest, followed by motivation to transfer. The statistics values of Motivation to Improve Work through Learning (MTIWL) construct revealed an acceptable fit. (4) Lack of Opportunity to Apply (OA) construct derived from two factors; Utility Perceptions (UT) and Personal Capacity to Transfer (PCT). The correlation of the latent variables ranged from .36 to .91. The Lack of Opportunity to Apply (OA) construct revealed a good fit. (5) Environment construct were derived from 6 factors: Supportive Environment (SE), Resistance to Change (RC), Performance Coaching (PC), Personal Outcomes Negative (PON), Personal Outcomes Positive (POP) and Supervisor Opposition (SO). In terms of correlation, the outcome showed a range between -.147 to .699. The factor loading ranged from -.195 to .841 with personal outcomes negative being the weakest, followed by supervisor opposition (.137), resistance to change (.178), personal outcomes positive (.549), performance coaching (.729) and the strongest being supportive environment (.841). The statistics values of Environment (E) construct revealed an acceptable fit. 6) Transfer Design construct was derived from an EFA merged outcome of three factors which were Content Validity (CV), Transfer Design (TD) and Opportunity to Use (OUT). The correlation ranged from .62 to .88, while the factor loading ranged from .656 to .805 with transfer design being the strongest, followed by content validity. The statistics values of Transfer Design (TD) construct revealed a good fit.

Table 6 Confirmatory Factor Analysis Results of the Six Emerged Constructs

Absolute Fit Indices	Traits	Employee Commitment	Motivation	Lack of Opportunity to Apply	Environment	Transfer Design
CMIN/df	3.037	0.404	3.133	2.491	3.091	3.089
RMR	0.061	0.006	0.024	0.023	0.058	0.012
GFI	0.924	0.999	0.953	0.992	0.925	0.988
AGFI	0.924	0.996	0.931	0.973	0.901	0.963
NFI	0.921	0.999	0.948	0.991	0.904	0.990
RFI	0.901	0.996	0.933	0.978	0.904	0.978
IFI	0.946	1.002	0.964	0.995	0.944	0.994
TLI	0.932	1.006	0.953	0.987	0.933	0.985
CFI	0.945	1.000	0.964	0.995	0.944	0.994
RMSEA	0.055	0.000	0.056	0.047	0.056	0.056
Level of Fit	Satisfactory	Good	Satisfactory	Good	Satisfactory	Satisfactory

Conclusion

The main purpose of this study was to revisit the Holton's HRD Evaluation and Research Model for Learning Transfer (Holton III, 2005) in order to develop a new and comprehensive instrument to measure the factors affecting the learning transfer of Thai front-line employees in banking sector. In this study, 24 new scale items were developed to correspond to the eight new factors introduced in Holton (Holton III, 2005), combined with the existing 48 items of LTSI version 4, resulting in the 72-item-measurement scale. The 72-item-modified scale was then back-translated and tested the reliability and validity by Index of Item Objective Congruence (IOC). The EFA of the modified scale was conducted to explore factor loading and correlations among the observable variables so as to reduce and combine the relating factors and the findings revealed that the 7-factor structure in Specific Training and the 8-factor structure in General Training Domain respectively; altogether 15 factors as shown in Table 5. One item was deleted from the scale, leaving the 71-item-measurement scale. The CFA results revealed a good fit between the data and the models as shown in Table 6. Thus, the 71-item-scale to measure the factors affecting the learning transfer was developed and validated. Furthermore, Holton's HRD Evaluation Research and Model (Holton III, 2005) was revisited. As illustrated in Table 7, the comparison of the factors of Holton's model of year 1996, year 2005, and the emerged and confirmed model in this study were evident. Holton (Holton III, 2005) added 7 new dispositional factors and 1 new environmental factor to the model. This study verified and validated a 15-factor-structure; 7 in the Specific Training and 8 in the General Training Domain, affecting the learning transfer, as opposed to the 24 factors; 12 in the Specific Training and 12 in the General Training Domain, described in Holton's revised model (Holton III, 2005).

Thus, this study completed its purposes of revisiting Holton's model (Holton III, 2005) and developing the 71-item-scale measuring the factors affecting the learning transfer.

Table 7 Comparison of the Factors in Holton III (1996); Holton III (2005) and the Emerged and Confirmed Model

Dimension	Factors in Holton Model (1996)	Factors in Holton Model (2005)	The Emerged Model	Training Domain
Secondary Influences	N/A	Personality Traits	Personality Traits	
		1. Conscientiousness	1. Conscientiousness & Job	General Training
		2. Neuroticism	Involvement v3	General Training
		3. Openness to Experience	2. Neuroticism	General Training
		4. Goal Orientation	3. Openness to Experience &	General Training
	N/A	5. Locus of Control	Goal Orientation	General Training
			4. Locus of Control	
		Job Attitudes	Employee Commitment	
		6. Organization Commitment (OC)	5. Organizational Commitment & Job	General Training
		7. Job Involvement (JI)	Involvement v1, v2	General Training
	1. Performance Self- Efficacy	8. Performance Self-Efficacy (PSE)	N.A.	General Training
	2. Learner Readiness	9. Learner Readiness (LR)		Specific Training



Table 7 (Cont.)

Dimension	Factors in Holton Model (1996)	Factors in Holton Model (2005)	The Emerged Model	Training Domain
Motivation		Motivation to Improve Work through Learning	Motivation to Improve Work through Learning	
	3. Motivation to Transfer	10. Motivation to Transfer (MT)	6. Motivation to Transfer, Learner Readiness & Opportunity to Use v1	Specific Training
	4. Transfer Effort to Performance	11. Transfer Effort to Performance (TEP)	7. Transfer Effort to Performance, Performance Outcomes Expectation & Performance Self-Efficacy v2, v3	General Training
	5. Performance Outcome Expectation	12. Performance Outcome Expectation (POE)		General Training
Environment	N/A	Perceptions	Lack of Opportunity to Apply	
		13. Utility Perceptions (UP)	8. Utility Perceptions & Personal Capacity for Transfer	Specific Training
	6. Feedback	14. Performance Coaching (PC)	Supportive Environment	
	7. Peer Support	15. Peer Support (PS)	9. Performance Coaching	General Training
	8. Supervisor Support	16. Supervisor Support (SS)	10. Peer Support, Supervisor Support & Opportunity to Use v2	Specific Training
	9. Resistance to Change	17. Resistance to Change (RC)	11. Resistance to Change	Specific Training
	10. Personal Outcomes Positive	18. Personal Outcomes Positive (POP)	12. Personal Outcomes Positive	General Training
	11. Personal Outcomes Negative	19. Personal Outcomes Negative (PON)	13. Personal Outcomes Negative	Specific Training
	12. Supervisor Opposition	20. Supervisor Opposition (SO)	14. Supervisor Sanction	Specific Training
	13. Content Validity	21. Content Validity (CV)	Transfer Design	
	14. Transfer Design	22. Transfer Design (TD)	15. Content Validity, Transfer Design & Opportunity to Use v3	Specific Training
	15. Personal Capacity to Transfer	23. Personal Capacity to Transfer (PCT)		Specific Training
	16. Opportunity to use	24. Opportunity to use (OUT)		Specific Training

Discussion

This study has succeeded in validating the revised model and developing a new and extensive learning transfer measurement scale which includes the additional factors to help Thai organizations to detect the factors affecting the learning transfer more comprehensively. In the past, based on the literature, the learning transfer studies conducted in Thai context was limited to the factors identified by the Learning Transfer System Inventory (LTSI) which does not include the dispositional factors such as traits, employee commitment, and utility perceptions. This new tool, developed from the revised HRD Evaluation and Research model (Holton III, 2005), has potential to measure and explore the additional factors of each individual, cited by the literature as having significant impact on the learning transfer. According to Naquin & Holton III (2002), the disposition traits of conscientiousness, positive affectivity, agreeableness and extraversion were antecedents of Motivation to Improve Work through Learning (MTIWL). Extraversion and positive affectivity positively and directly related to MTIWL,



while conscientiousness and agreeableness indirectly related through work commitment. Further, Yamkovenko and Holton (2010) explored the relationship between the Five Factor model of personality, goal orientation, self-efficacy and intent to transfer using SEM. It was reported that 48 per cent of intent to transfer could be explained by conscientiousness, motivation to transfer and learner readiness with conscientiousness being the only significant variable. In terms of learning environment, Utility Perceptions should also be considered, when designing and conducting the training session as Blume et al. (2010) found that utility reactions had a direct correlation with the learning transfer. A number of studies have also cited that learning design strongly correlates to learning and transfer (Lau & McLean, 2013).

Unfortunately, most research conducted in Thai context is limited to the LTSI measurement scale and thus, is unable to explore other factors that are possible to have affected the learning transfer. Moreover, the results of the learning transfer studies conducted in Thai context using LTSI also show discrepancies from those conducted in the US. Those variances could come from the cultural and translation aspects as Yamnill and McLean (2005) posited that “several items in the original LTSI were also low in reliability...it is unclear whether the concepts themselves are unreliable or whether the items contain enough ambiguity that they do not produce higher reliability” (p. 339) and proposed that “this instrument needs revision and additional research” (p. 340). They also viewed that the language and back translation could be potential problems. Jungsiriwattana (2006) and Bumroongtham (2008) found that the Thai samples did not see that supervisor sanctions affected the learning transfer. Instead, they strongly agreed that learning design did have an impact on the transfer. On the other hand, Boonkiat (2003) posited that supervisor support, organizational support and peer support were the main factors affecting learning transfer respectively, while lack of understanding and lack of cooperation from the supervisor was the factor inhibiting it. Interestingly, Kasemsri (2004) found that locus of control and self-efficacy emerged as the factors affecting learning transfer and rewards were found to be the factor least affected.

In conclusion, this study has shed a new light on both the literature and in practice that the individual's dispositional attributes, their job attitudes and utility perceptions along with the learning environment could impact the learning transfer. The organizations should be mindful when investing in the employee development program. Dispositional attributes of the employees should be taken into account. Learning and working environment should also be conducive to facilitate the employees to transfer. The new and more comprehensive learning transfer measurement tool developed in this study could assist the organizations to diagnose the complex system of the learning transfer and enable them to learn of their learning transfer environment. Being able to identify the factors that impede the learning transfer by this measurement instrument could help the organizations to remedy them effectively and timely and could also enhance the Return on Investment (ROI) of the training.

Implication, Limitation and Recommendations for Future Research

The study would be beneficial to both realms of researchers and practitioners and bridging the gaps between the two realms. In terms of the researchers, this study re-ignites the calls for further exploration and remedy for the factors affecting the learning transfer complex system. Without knowing what factors facilitate, or impede the learning transfer, the countries and organizations may waste a lump sum of research and training investment and overtime new knowledge would be declined. Despite the facts that this issue has long been debated in the literature since 19th century, it is still not fixed. Top management teams in Thai Organizations are in desperate need to see the proof of learning effectiveness and return on their training investment. The HRD executives in



the organizations would like to have a comprehensive and effective tool to help them detect, fix and prove to the top management the learning effectiveness that produces tangible results. This research has developed a validated learning transfer measurement scale that could diagnose the factors affecting the learning effectiveness which would be beneficial to both Thai and international researchers and HRD executives.

There are a few limitations in this research. First, in terms of the generalization, the results of this study may not be generalized to other industries and other countries as the samples are the front-line employees of the three large-sized Thai commercial banks. Second, in terms of the common method bias, the current study was designed as self-reported, collected the data from the same group of samples for one time using Likert scale and the question items consisting of a mix of both positive and negative which may confuse respondents. Thus, the results could be prone to errors and biases.

Future studies should validate and test the model and the instrument with Structural Equation Modeling (SEM) in order to see the causal links among the latent variables and explore the factors affecting the learning transfer in Thai banking context and other industries' contexts. Furthermore, Holton III (2005) recommended the model to be validated in steps: on a single level e.g. validating learning and all intervening variables affecting learning and then moving onto multi-levels analysis at the next phase.

References

- Alliger, G. M., Tannenbaum, S. I., Bennett, W., Jr., Traver, H., & Shotland, A. (1997). A Meta-Analysis of the Relations among Training Criteria. *Personnel Psychology*, 50(2), 341-358. <http://dx.doi.org/10.1111/j.1744-6570.1997.tb00911.x>
- ASTD. (2014). Content Community Global Perspectives: The Premier Conference for Training and Development Professionals. In *ASTD 2014 International Conference & Exposition, May 4-7, 2014*. Washington DC, USA: ASTD. Retrieved from <http://webcasts.astd.org/uploads/assets/264/document/HowtoLeadaDelegationtoICE2014.pdf>
- Baldwin, T. T., Magjuka, R. J., & Loher, B. T. (1991). The Perils of Participation: Effects of Choice of Training on Trainee Motivation and Learning. *Personnel Psychology*, 44(1), 51-65. DOI: 10.1111/j.1744-6570.1991.tb00690.x
- Bank of Thailand. (n.d.). *Financial Status of Thai Commercial Banks Report*. Retrieved from <http://www2.bot.or.th/statistics/ReportPage.aspx?reportID=679&language=th>
- Bates, R., Holton III, E. F., & Hatala, J. P. (2012). A Revised Learning Transfer System Inventory: Factorial Replication and Validation. *Human Resource Development International*, 15(5), 549-569, DOI: 10.1080/13678868.2012.726872
- Bates, R. A., Holton III, E. F., Seyler, D. L., & Carvalho, M. A. (2000). The Role of Interpersonal Factors in the Application of Computer-Based Training in an Industrial Setting. *Human Resource Development International*, 3(1), 19-42. <https://doi.org/10.1080/136788600361920>



Bhatti, M. A., & Kaur, S. (2010). The Role of Individual and Training Design Factors on Training Transfer. *Journal of European Industrial Training*, 34(7), 656–672. <https://doi.org/10.1108/03090591011070770>

Blume, B. D., Ford, J. K., Baldwin, T. T., & Huang, J. L. (2010). Transfer of Training: A Meta-Analytic Review. *Journal of Management*, 36(4), 1065–1105. <https://doi.org/10.1177/0149206309352880>

Boonkiat, S. (2003). *Work Environment Factors Affecting the Transfer of Training: A Case Study of Telecommunication Company in Thailand*. (Unpublished Master's thesis). National Institute of Development Administration, Bangkok, Thailand.

Bumroongtham, P. (2008). *The Study of Factors Affecting Learning Transfer from Training Course: A Case Study of Operation Employees at National Institute of Development Administration*. (Unpublished Master's thesis). National Institute of Development Administration, Bangkok, Thailand.

Button, S. B., Mathieu, J. E., & Zajac, D. M. (1996). Goal Orientation in Organizational Research: A Conceptual and Empirical Foundation. *Organizational Behavior and Human Decision Processes*, 67(1), 26–48. <https://doi.org/10.1006/obhd.1996.0063>

Chiaburu, D. S., & Marinova, S. V. (2005). What Predicts Skill Transfer? An Exploratory Study of Goal Orientation, Training Self-Efficacy and Organizational Supports. *International Journal of Training and Development*, 9(2), 110–23. <https://doi.org/10.1111/j.1468-2419.2005.00225.x>

Colquitt, J. A., LePine, J. A., & Noe, R. A. (2000). Toward an Integrative Theory of Training Motivation: A Meta-Analytic Path Analysis of 20 Years of Research. *Journal of Applied Psychology*, 85(5), 678–707.

Dweck, C. S. (1989). Motivation. In A. Lesgold, & R. Glaser (Eds.), *Foundations for a Psychology of Education* (pp. 87–136). Hillsdale, NJ: Erlbaum.

Gegenfurtner, A., & Hagenauer, G. (2013). Achievement Goals and Achievement Goal Orientations in Education. *International Journal of Educational Research*, 61(1), 1–4. DOI: 10.1016/j.ijer.2013.08.001

Herold, D. M., Davis, W. D., Fedor, D. B., & Parsons, C. K. (2002). Dispositional Influences on Transfer of Learning in Multistage Training Programs. *Personnel Psychology*, 55(4), 851–869. DOI: 10.1111/j.1744-6570.2002.tb00132.x

Hicks, W. D., & Klimoski, R. J. (1987). Entry into Training Programs and its Effects on Training Outcomes: A Field Experiment. *Academy of Management Journal*, 30(3), 542–552. DOI: 10.2307/256013

Holton III, E. F. (1996). The Flawed Four-Level Evaluation Model. *Human Resource Development Quarterly*, 7(1), 5–21. <https://doi.org/10.1002/hrdq.3920070103>

Holton III, E. F. (2005). Holton's Evaluation Model: New Evidence and Construct Elaborations. *Advances in Developing Human Resources*, 7(1), 37–54. DOI: 10.1177/1523422304272080



Holton III, E. F., Bates, R. A., & Ruona, W. E. A. (2000). Development of a Generalized Learning Transfer System Inventory. *Human Resource Development Quarterly*, 11(4), 333–360. DOI: 10.1002/1532-1096(200024)11:4<333::AID-HRDQ2>3.0.CO;2-P

Holton III, E. F., Chen, H-C., & Naquin, S. S. (2003). An Examination of Learning Transfer System Characteristics across Organizational Settings. *Human Resource Development Quarterly*, 14(4), 459–482. <https://doi.org/10.1002/hrdq.1079>

Holton III, E. F., Bates, R. A., Bookter, A. I., & Yamkovenko, V. B. (2007). Convergent and Divergent Validity of the Learning Transfer System Inventory. *Human Resource Development Quarterly*, 18(3), 385–419. DOI: 10.1002/hrdq.1210

Holton III, E. F., Bates, R. A., Seyler, D. L., & Carvalho, M. B. (1997). Toward Construct Validation of a Transfer Climate Instrument. *Human Resource Development Quarterly*, 8(2), 95–113. <http://dx.doi.org/10.1002/hrdq.3920080203>

Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural Equation Modelling: Guidelines for Determining Model Fit. *The Electronic Journal of Business Research Methods*, 6(1), 53–60.

Hutchins, H. M., Nimon, K., Bates, R., & Holton, E. (2013). Can the LTSI Predict Transfer Performance? Testing Intent to Transfer as a Proximal Transfer of Training Outcome. *International Journal of Selection and Assessment*, 21(3), 251–263. <https://doi.org/10.1111/ijsa.12035>

John, O. P., Naumann, L. P., & Soto, C. J. (2008). Paradigm Shift to the Integrative Big Five Trait Taxonomy: History, Measurement, and Conceptual Issues. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of Personality: Theory and Research* (3rd ed.) (pp. 114–158). New York, NY: Guilford Press.

Jungsiriwattana, T. (2006). *Factors Afftecting Trainng Transfer at Thai Airways*. (Unpublished Master's thesis). National Institute of Development Administration, Bangkok, Thailand.

Kasemsri, W. (2004). *The Analysis of Motivation Factors of the Learning Transfer from Training Course in Operational Level Employees: A Case Study of Somboon Group Co., Ltd.* (Unpublished Master's thesis). National Institute of Development Administration, Bangkok, Thailand.

Kirkpatrick, D. L. (1959). Techniques for Evaluation Training Programs. *Journal of the American Society of Training Directors*, 13, 21–26.

Kirwan, C., & Birchall, D. (2006). Transfer of Learning from Management Development Programmes: Testing the Holton Model. *International Journal of Training and Development*, 10(4), 252–268. <http://dx.doi.org/10.1111/j.1468-2419.2006.00259.x>



- Laine, E., & Gegenfurtner, A. (2013). Stability or Change? Effects of Training Length and Time Lag on Achievement Goal Orientations and Transfer of Training. *International Journal of Educational Research*, 61, 71–79. <https://doi.org/10.1016/j.ijer.2013.03.014>
- Lau, P. Y. Y., & McLean, G. N. (2013). Factors Influencing Perceived Learning Transfer of an Outdoor Management Development Programme in Malaysia. *Human Resource Development International*, 16(2), 186–204. DOI: 10.1080/13678868.2012.756157
- Levenson, H. (1973). Multidimensional Locus of Control in Psychiatric Patients. *Journal of Consulting and Clinical Psychology*, 41(3), 397–404. <http://dx.doi.org/10.1037/h0035357>
- Lim, D. H., & Morris, M. L. (2006). Influence of Trainee Characteristics, Instructional Satisfaction, and Organizational Climate on Perceived Learning and Training Transfer. *Human Resource Development Quarterly*, 17(1), 85–115. <https://doi.org/10.1002/hrdq.1162>
- Machin, M. A., & Fogarty, G. J. (2004). Assessing the Antecedents of Transfer Intentions in a Training Context. *International Journal of Training & Development*, 8(3), 222–236. <https://doi.org/10.1111/j.1360-3736.2004.00210.x>
- Martocchio, J. J., & Webster, J. (1992). Effects of Feedback and Cognitive Playfulness on Performance in Microcomputer Software Training. *Personnel Psychology*, 45(3), 553–578. <https://doi.org/10.1111/j.1744-6570.1992.tb00860.x>
- Meyer, J. P., & Allen, N. J. (2004). *TCM Employee Commitment Survey Academic Users Guide 2004*. Ontario, Canada: Department of Psychology, University of Western Ontario.
- Montesino, M. U. (2002). Strategic Alignment of Training, Transfer-Enhancing Behaviors, and Training Usage: A Posttraining Study. *Human Resource Development Quarterly*, 13(1), 89–108. DOI: 10.1002/hrdq.1015
- Morgan, R. B., & Casper, W. J. (2000). Examining the Factor Structure of Participant Reactions to Training: A Multidimensional Approach. *Human Resource Development Quarterly*, 11(3), 301–317. [https://doi.org/10.1002/1532-1096\(200023\)11:3<301::AID-HRDQ7>3.0.CO;2-P](https://doi.org/10.1002/1532-1096(200023)11:3<301::AID-HRDQ7>3.0.CO;2-P)
- Naquin, S. S., & Holton III, E. F. (2002). The Effects of Personality, Affectivity and Work Commitment on Motivation to Improve Work through Learning. *Human Resource Development Quarterly*, 13(4), 357–376. <https://doi.org/10.1002/hrdq.1038>
- Naquin, S. S., & Holton III, E. F. (2003). Motivation to Improve Work through Learning in Human Resource Development. *Human Resource Development International*, 6(3), 355–370. <https://doi.org/10.1080/13678860210154431>
- Noe, R. A. (1986). Trainees' Attributes and Attitudes: Neglected Influences on Training Effectiveness. *The Academy of Management Review*, 11(4), 736–749. DOI: 10.2307/258393



- Noe, R. A. (2000). Invited Reaction: Development of a Generalized Learning Transfer System Inventory. *Human Resource Development Quarterly*, 11(4), 361–365. [https://doi.org/10.1002/1532-1096\(200024\)11:4<361::AID-HRDQ3>3.0.CO;2-F](https://doi.org/10.1002/1532-1096(200024)11:4<361::AID-HRDQ3>3.0.CO;2-F)
- Paradise, A. (2007). *State of the Industry Report*. Alexandria, VA: American Society of Training and Development.
- Rouiller, J. Z., & Goldstein, I. L. (1993). The Relationship between Organizational Transfer Climate and Positive Transfer of Training. *Human Resource Development Quarterly*, 4(4), 377–390. <https://doi.org/10.1002/hrdq.3920040408>
- Rovinelli, R. J., & Hambleton, R. K. (1977). On the Use of Content Specialists in the Assessment of Criterion-Referenced Test Item Validity. *Tijdschrift voor Onderwijsresearch*, 2(2), 49–60.
- Ruona, W. E. A., Leimbach, M., Holton III, E. F., & Bates, R. (2002). The Relationship between Learner Utility Reactions and Predicted Learning Transfer Trainees. *International Journal of Training and Development*, 6(4), 218–228. <https://doi.org/10.1111/1468-2419.00160>
- Saks, A. M. (2002). So is a Good Transfer of Training Estimate? A Reply to Fitzpatrick. *The Industrial-Organizational Psychologist*, 39, 29–30.
- Smiti, P. (2009). *THAILAND's Perspective on Skills Training in the Workplace*. Retrieved from http://www.ilo.org/wcmsp5/groups/public/@asia/@ro-bangkok/documents/meetingdocument/wcms_120566.pdf
- Swanson, R. A., & Holton III, E. F. (2005). *Research in Organizations: Foundations and Methods of Inquiry*. San Francisco, California: Berrett-Koehler Publishers.
- Tan, J. A., Hall, R. J., & Boyce, C. (2003). The Role of Employee Reactions in Predicting Training Effectiveness. *Human Resource Development Quarterly*, 14(4), 397–411. <https://doi.org/10.1002/hrdq.1076>
- Tannenbaum, S. I., Mathieu, J. E., Salas, E., & Cannon-Bowers, J. A. (1991). Meeting Trainees' Expectations: The Influence of Training Fulfillment on the Development of Commitment, Self-Efficacy, and Motivation. *Journal of Applied Psychology*, 76(6), 759–769. <http://dx.doi.org/10.1037/0021-9010.76.6.759>
- Tolentino, R. C. (2013). Organizational Commitment and Job Performance of the Academic and Administrative Personnel. *International Journal of Information Technology and Business Management*, 15(1), 51–59.
- Vanichbuncha, K. (2013). *Analyze Structural Equation Modeling with AMOS*. Bangkok: Threelada.
- Vathanalee, S. (2003). *Developing the Measurement, Motivation Factors of the Learning Transfer from Training Courses in Operational Level Employees: A Case of Somboon Group Co., Ltd.* (Unpublished Master's thesis). National Institute of Development Administration, Bangkok, Thailand.



Webster, J., & Martocchio, J. J. (1993). Turning Work into Play: Implications for Microcomputer Software Training. *Journal of Management*, 19(1), 127-146. DOI: 10.1016/0149-2063(93)90049-S

Yamkovenko, B., & Holton, E. (2010). Toward a Theoretical Model of Dispositional Influences on Transfer of Learning: A Test of a Structural Model. *Human Resource Development Quarterly*, 21(4), 381-410. <https://doi.org/10.1002/hrdq.20054>

Yamhill, S., & McLean, G. N. (2005). Factors Affecting Transfer of Training in Thailand. *Human Resource Development Quarterly*, 16(3), 323-344. <https://doi.org/10.1002/hrdq.1142>

