

MASTER

Designing an integrated evaluation tool for training and development programs at Vanderlande

Dewanti Priyananda, D.

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MASTER THESIS REPORT

Designing an Integrated Evaluation Tool for Training and Development Programs at Vanderlande

by Dahlia Dewanti Priyananda

BSc Industrial Engineering – Bandung Institute of Technology
Student Identity Number 0923829

In partial fulfilment of the requirements for the degree of
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In Operations Management and Logistics

Supervisors:

Dr. ir. P.A.M. Kleingeld, TU/e, HPM

Dr. S. Rispens, TU/e, HPM

Drs. D.J. Verheijden, (Manager) Vanderlande Academy

TUE. School of Industrial Engineering.
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ABSTRACT

Training and development programs has been regular activities that are provided by organizations to facilitate the improvement of knowledge and skills of their employees. With the investment of time and cost that the organizations have put into conducting the training and development programs, it becomes crucial for organizations to be able to evaluate the effectiveness of the programs. Currently, there are various types of interventions that have been developed to deliver the materials of training and development programs. This master thesis project presents the process and results of five-and-a-half-month graduation project at Vanderlande Industries, Veghel, The Netherlands.

The main objective of this master thesis project was to design a parsimonious integrated training and development programs evaluation tool that can fulfill the following requirement from Vanderlande, which are:

1. It should be valid and reliable
2. It should be applicable across different types of training and development interventions.
3. It should have an overall score that is based on weighted mean scores of factors related to the training and development programs, taking into account the possibility that the weights may vary across different types of interventions.

The development of integrated evaluation tool included the literature study, interview to training and development experts at Vanderlande, and Confirmatory Factor analysis of the current training evaluation tool used by Vanderlande. The new design of evaluation tool was then tested by a pilot study. All the research questions were successfully answered based on the result of the pilot study. Recommendations for the implementation of the evaluation tool were proposed to improve the effectiveness of the evaluation of training and development programs at Vanderlande.

PREFACE

This Master Thesis marks the completion of the master thesis program that I have been going through for the past two years. I would like to thank the people who had given me the support I need to complete this Master Thesis.

First of All, I would like to thank my university supervisor, Ad Kleingeld, who had been very supportive during this master thesis project. I am very grateful for his excellent guidance and feedback during the project. I would also thank Sonja Rispen for the insights and feedback during the crucial stages of the project. Furthermore, I would like to thank all members of Vanderlande Academy for all the support and help during the project. Special thanks to Dirk-Jan Verheijden and Els Hettinga for the feedback, insights, and for giving me the opportunity to complete my master thesis project at Vanderlande.

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My thanks also go to my fellow students and friends Zaskya Mansur, Oleksandra Dynn timer, Gabriela Gutierrez, and Amalia Hasnida, for the fun and struggling time we've been through together. Special thanks to Arbella Delianti and Hani who helped me in dealing with the training evaluation data. And many thanks to Nanda Erian, for everything.

Last but not least, thank you to my parents and my brother for the endless support and unconditional love.

Dahlia Dewanti Priyananda

Eindhoven, 2016

MANAGEMENT SUMMARY

Research Background

Vanderlande aims to evaluate and keep track of the quality of all training and development programs that are conducted for its employees. Vanderlande currently already has a training evaluation tool developed by Radhakrishnan (2015) based on classroom training. After the operation of this evaluation tool for several months, VA found two problems based on the result of the evaluation tool. The first one is a relatively smaller problem related to the emergence of trainees who did not complete filling in the evaluation. Vanderlande suspected that this may relate to the number of questions that were considered to be too large and the presence of similar questions that are asked couple of times in the evaluation. Therefore, Vanderlande wanted to have an analysis of possibilities of reduction in number of questions. The second, more serious problem related to the non-applicability of the current evaluation tool for some types of different training and development interventions. Therefore, Vanderlande would like to develop an evaluation tool that is applicable for various types of interventions used at Vanderlande.

Research Objectives

The main objective of this master thesis project is to design a parsimonious training and development programs evaluation tool that can fulfill the following requirement from Vanderlande, which are:

1. It should be valid and reliable
2. It should be applicable across different types of training and development interventions.
3. It should have an overall score that is based on weighted mean scores of factors related to the training and development programs, taking into account the possibility that the weights may vary across different types of interventions.

To achieve the objective, this master thesis project is driven by 6 research questions:

1. Which training and development interventions are available and used at Vanderlande?
2. What types of intervention methods are usually used together in a training or development program?
3. How does Vanderlande currently evaluate learning and transfer of training across training and development programs?
4. Taking into account the general and special characteristics of training and development interventions, which characteristics are the key factors that may affect the learning and transfer of training & development performance at Vanderlande?
5. What is the most parsimonious integrated training and development evaluation tool that can be developed at Vanderlande, taking into account the criteria for reliability, validity, and completeness?
6. Based on the collected data from the pilot study, which factors affect the learning and transfer of training that happens due to training and development program at Vanderlande?

Data Analysis and Results

Research Question 1

Based on interview sessions with the Managers of Vanderlande Academy and Talent Development, it was found that currently there are six types of training and development interventions used at Vanderlande :

1. Classroom Training
2. E-learning
3. Coaching
4. Peer Group Counseling
5. Outdoor Program
6. Business Case

Research Question 2

This research question was answered based on interview sessions with the Managers of Vanderlande Academy and Talent Development. There are 7 types of classification in using the interventions for training and development programs at Vanderlande. The first two are the use of only Classroom training or E-learning intervention in the programs. The other five types consist of integration of at least two interventions in a program as shown in Table M1.

Table M1. Integration of Interventions

No	Name of Training/Development Program	Intervention(s) used in the program
1	Blended Learning	Classroom Training and E-learning.
2	Pit-Stop	Classroom Training and Business Case
3	Authentic Leadership	Classroom Training, Peer Group Counseling, Outdoor Program
4	Leadership I	Classroom Training, Coaching, Peer Group Counseling
5	Personal Leadership	Classroom Training, Coaching, Peer Group Counseling, Outdoor Program

Research Question 3

Vanderlande currently did not directly evaluate the learning and transfer of training across its training and development program. The evaluation tool that Vanderlande uses at this moment (Radhakrishnan, 2015) measures the factors that potentially can affect learning and transfer of training. This research extended the evaluation tool by adding the elements of perceived learning and transfer of training measurement to the newly designed evaluation tool.

Research Question 4

The answer of this research question was based on the literature study and interview with five training and development experts at Vanderlande. Table M2 shows the key characteristics (factors) that may affect learning and transfer of training at Vanderlande. The factors shown in the table are divided based on the general factors, special factors for each intervention and the transfer of training factors. These factors then become the base for designing the integrated evaluation tool.

Table M2. Key Characteristics Affecting Learning and Transfer of Training

General Factors	Classroom Training	E-learning
<ul style="list-style-type: none"> • Motivation to Learn • Learning goal orientation • Perceived utility • Cognitive Ability • Voluntary Participation • Content relevance • Clear goals • Behavioral Modeling • Feedback & Practice 	<ul style="list-style-type: none"> • Motivation to transfer • Trainer communication & support • Interesting lecturing method • Transfer effort • Fellow Trainee communication & support 	<ul style="list-style-type: none"> • Trainee Technology attitude • Content quality & organization • Quality of user interface • Quality of Technical system • Trainee control
Coaching	Outdoor program & Business Case	Work environment
<ul style="list-style-type: none"> • Experience & competence of the Coach • Trust in Coach • Coach Commitment 	<ul style="list-style-type: none"> • Fidelity • Reflection/feedback after the program • Transfer Design 	<ul style="list-style-type: none"> • Transfer climate • Opportunity to perform • Supervisor support • Peer Support

Research Question 5

The initial design of the integrated evaluation tool was developed based on the factors stated in Chapter 3.6. The variables that construct the factors were based on validated scales from past research such as LTSI (2000) and Grohmann & Kauffeld (2013), and also based on Confirmatory Factor Analysis of the current evaluation tool. A pilot study was then carried out to get the data for testing the validity and reliability of the initial design. Based on the data gathered, there were different factor analysis done to the sets of factors. CFA was done to the sets of factors that had more than 200 responses: General Factors, Classroom Training Factors, and Transfer of Training Factors. Partial Exploratory Factor Analysis was done to the sets of factors that had about 20 responses: E-learning Intervention Factors and Business Case Factors. Factor analysis was not done for Coaching Intervention Factors, Outdoor Program Intervention Factors, and Peer Group Counseling Intervention Factors due to limited number of data.

This project resulted in two types of evaluation survey. The first one is the evaluation survey to be answered by participants right after the training programs. This evaluation survey consists of General Factors, special factors related to the interventions, and three other general questions about trainee's overall judgements regarding the program. The most parsimonious integrated training and development evaluation tool that can be developed at Vanderlande, taking into account the criteria for reliability, validity, and completeness consists of different number of variables for different types of training or development program. The number of variables for the first type of evaluation tool can be seen in Table M3. The second evaluation survey is the evaluation survey to be answered by participants after allowing some time for transfer of training to happen. This evaluation survey consists of thirteen variables related to the Transfer of Training Factors.

Table M3. Number of Variables in Final Structure

No	Name of Training/Development Program	No. of Variables
1	Classroom Training	21
2	E-Learning	19
3	Blended Learning (Classroom Training and E-learning)	29
4	Pit-Stop (Classroom Training and Business Case)	28
5	Authentic Leadership (Classroom Training, Peer Group Counseling, Outdoor Program)	34
6	Leadership I (Classroom Training, Coaching, Peer Group Counseling)	41
7	Personal Leadership (Classroom Training, Coaching, Peer Group Counseling, Outdoor Program)	46

Research Question 6

Research Question 6 was answered by measuring the predictive validity of the factors towards output Learning and Opportunity and Implementation of Transfer. The predictive validity was measured by multiple regression and additional mediation analysis due to the emergence of mediator factor Motivation to Transfer. The multiple regression analysis was done to the dataset of Classroom Training Program, Blended Learning Program, and Pit-Stop that had sufficient data to produce significant relation between factors and desired output. Table M4 shows the summary of predictive effects between factors and the training or development program. In the table, factors that were found to have effects on Rate are defined as "R", factors that were found to have effects on learning are defined as "L", and factors that were found to have effects on Opportunity and Implementation of Transfer of Training through mediation of Motivation to Transfer are defined as "TM". Motivation to Transfer was defined as the mediator of the other factors to Opportunity and Implementation of Transfer of Training (T). Number beside the factors' name describe the number of variables that construct the respective factor.

As an addition, the weights for each factor is also mentioned in Table M4. This weight only applied to the factors of the evaluation survey that needs to be answered right after the training or development program. The detail results of multiple regression and process for determining the weights can be seen in chapter 4.3.

Table M4. Summary of Predictive Validity and Weights

No	Factors	Hard Skill Classroom Training		Soft Skill Classroom Training		Blended Learning		Pit-Stop Program	
		Predictive Validity	Weight	Predictive Validity	Weight	Predictive Validity	Weight	Predictive Validity	Weight
General Factors									
1	Motivation & Relevance (4)	R, L, TM	37%	R, TM	41%	R, L, TM	41%	TM	31%
2	Clear Goals (2)	R, TM	13%	TM	14%		5%	TM	7%
3	Learning (2)	TM	19%	TM	18%	TM	14%	TM	15%
Classroom Intervention Factors									
4	Trainer Knowledge & Experience (2)	R, L, TM	15%	R, L	11%	R	6%	R	8%
5	Support, Feedback & Practice (4)	R, TM	16%		16%		5%	L	8%
6	Motivation to Transfer (4)	Mediator to T		Mediator to T		Mediator to T		Mediator to T	
E-Learning Intervention Factors									
7	Content Quality (3)					TM	19%		
8	Technical System Quality (2)						5%		
9	Trainee's Control (3)						5%		
Business Case Intervention factors									
10	Fidelity of Design (5)							TM	26%
11	Feedback & Practice (2)								5%
Transfer of Training Factors									
12	Transfer Resource Availability (2)	TM		TM				TM	
13	Supervisor Support (5)	TM		TM		TM		TM	
14	Colleague Support (2)	TM		TM		TM		TM	

Recommendations for Practical Implementation of New Evaluation Tool

Key recommendations for the implementation of new evaluation tool are:

1. Send personalized invitation and follow up e-mail that addressed to a specific participant to increase the response rate
2. Develop a report that can generate the required data such as:
 - 1) The average score of each variables
 - 2) The average score of each factors, including the factors of outputs: Rating, Learning
 - 3) The weighted overall rating based on weighted score of the factors
 - 4) The average scores of no 1, 2, and 3 of all training programs that uses the same interventions with the program that is being evaluated
 - 5) Remarks on which factors scores fall below average of all programs or below the minimum score that is determined by Vanderlande

The illustration for this report can be seen in Appendix 4

Beside the above key recommendations, there are also some detail practical recommendations:

1. In the implementation, there are two different times that are required to fill in the survey. The first one, is right after the training program and the second one is some time after the training or development program to allow the transfer of training to happen.
2. Placing several questions in one page, with separation of pages for the variable of General Factors and each type of Intervention factors.
3. Vanderlande should be able to use the different set of variables templates depending on the interventions used in a training or development program that has been found in this research.
4. Utilize the result of Training and Development Evaluation to get more insights on the implementation and outcomes of training and development program. With the result, Vanderlande can see which factors should be improved and who is the parties to discuss the improvement with (i.e. the managers, the trainers, or the organizer of the program)
5. Pay attention to the aspects of motivation to learn and relevancy of training and development program content to the participants' required competency.

Possible Improvements for Future Research

With some limitations of this research, there are some recommendations for future research:

1. Gather more data for analyzing the structure of Coaching Intervention Factors, Outdoor Program Intervention Factors, and Peer Group Counseling Intervention Factors. Analysis of the predictive validity of the other programs that had not been analyzed in this research due to data limitation should also be analyzed.
2. When more data is available, do the analysis for defining the most important factors to be put in an evaluation tool when the program consists of many interventions
3. Measure the learning and transfer of training performance based on objective assessment by the participants' supervisor/manager or subordinate that works alongside the participants daily.

GLOSSARY

Term	Definitions
<i>Commitment</i>	The extent to which an individual feels the psychological and emotional attachment to a task(occupation), relationship, goal, or organization (Landy & Conte, 2013)
<i>Competency</i>	Skill, ability, or personal characteristics that are possessed by an individual that are required to achieve the desired outcomes (Landy & Conte, 2013)
<i>Fidelity</i>	The extent to which the content of the training (i.e. material, practice) is similar to the real condition of the job (Landy & Conte, 2013)
<i>Learning</i>	The extent to which an individual gains the knowledge and skills provided in the training program (Noe, 1986)
<i>Mediation</i>	The intervention of a third variable/factor between two other related factors (Hair et. al., 2010)
<i>Motivation to Learn</i>	Desire of the trainees to gain the knowledge and skills that are presented in the training program (Noe, 1986)
<i>Motivation to Transfer</i>	Desire of the trainees to implement the knowledge and skills they gained from the training program in the job (Noe, 1986)
<i>Opportunity to Perform</i>	The extent to which trainees are provided with the resources which enable them to implement the knowledge gained from training on the job (Holton, Bates, & Ruona, 2000).
<i>Peer Support</i>	The extent to which trainee’s peers encourage and provide support to implement the knowledge and skills from training on the job (Holton et al., 2000).
<i>Reliability</i>	The extent to which a set of variables able to measure what it is expected to measure consistently.
<i>Self-efficacy</i>	The extent to which an individual belief in the ability to reach a goal or perform a task (Landy & Conte, 2013)
<i>Supervisor Support</i>	The extent to which trainee’s manager/supervisor encourage and provide support to implement the knowledge and skills from training on the job (Holton et al., 2000).
<i>Talent Development</i>	Strategically aligned program in which organizations plan, select, and implement development strategies for their employees to supply the organization with current and future talent (Garavan, Carbery, & Rock, 2012)
<i>Technical System Quality</i>	Trainee’s believe in the reliability, ease of use, and response time of the web-based learning system. (Chiu, Chiu, & Chang, 2007)
<i>Transfer Design</i>	The extent to which the training program are designed to provide the trainees the ability to transfer the knowledge to the job with the use of training instruction that match the requirements of the job (Holton et al., 2000).
<i>Transfer of Training</i>	The extent to which trainees implement the skills and knowledge that they have gained from training or development programs are called the transfer of training (Goldstein & Ford, 2002).
<i>Trainee’s Control</i>	The control that trainees’ have regarding the pace, sequence, or content of web-based training (Karim & Behrend, 2013)
<i>Training</i>	Acquisition of skills, concepts, or behavior that marks the improvement of performance (Goldstein & Ford, 2002)

<i>Trust</i>	The extent of an individual's belief in how a person acts based on previous cooperation with that person (Ferrin, Dirks, & Shah, 2006)
<i>Validity</i>	The extent to which a set of measures represents the concept that is being studied correctly (Hair et. al., 2010)

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CHAPTER 1

INTRODUCTION

With the increase of competitiveness in the global economy era, it is getting more important for organizations to excel in terms of the knowledge and skills of their employees (Aguinis & Kraiger, 2009). Training and development programs have been regularly done by organizations to facilitate the improvement of knowledge and skills of their employees. With the investment of time and cost that the organizations have put into conducting the training and development programs, it becomes crucial to know the effectiveness of the programs and how the programs affect their employees. The programs will become beneficial for employees and organization when employees are actually able to learn and gain knowledge and skills from the program, and are able to implement those knowledge and skills into on-the-job behavior and improve their working performance. The extent of implementation of knowledge into actual jobs and maintaining it can also be called as transfer of training (Baldwin & Ford, 1988).

With the fast development of technology in the past years and continuous research on training and development methods, currently various types of training and development interventions exist and have advanced beyond the traditional methods of training such as classroom teaching interventions. Research investigating outcomes of some types of training and development interventions showed that different media that are used to deliver knowledge may have different effects on the outcomes of training and development (Piccoli, Ahmad, & Ives, 2001; Arthur Jr. et al., 2003).

This master thesis report will present a thorough explanation of the project related to the evaluation of training and development programs at Vanderlande Industries B. V (Vanderlande). The main objective of the thesis assignment is to design an evaluation tool that can measure the effectiveness of training and development programs at Vanderlande, taking into account the different methods used to enhance participants' knowledge and skills.

1.1 General information about the company

1.1.1 Vanderlande Industries

Vanderlande is a company that engages in the logistic business by providing automated material handling systems and the accompanying services to maintain, optimize, and enhance those systems. The company was established in 1949 in The Netherlands and is currently executing projects in over 100 countries. Vanderlande provides goods handling in airport baggage handling systems, distribution centers, and parcel sortation facilities. The company manages the material handling system from local sorting depots to airports and large facilities, in the Netherlands and all around the world. To be able to provide complete service to the clients from initial analysis to total life-cycle support, Vanderlande is equipped with the core competencies in all relevant disciplines, from system design and engineering to project management and customer services. (Vanderlande, 2015)

The company's mission is to optimize its customers' business processes and competitive positions by working closely to improve the logistics and operations performance of the customers throughout the entire system life cycle (Vanderlande, 2016). To carry out the mission,

Vanderlande has more than 3.900 employees worldwide who are deployed to the businesses on all locations of Vanderlande projects (Vanderlande, 2015). Over one-third of the employees work in the Netherlands, while the rest are located around the world. Vanderlande has been rapidly expanding its organization and one of the core values that Vanderlande holds is to continuously learn, develop, and innovate. In relation to the core values and internationalization that is happening at Vanderlande, various types of training and development programs for employees are provided to enable employees to enhance their skills and knowledge to contribute more to the accomplishment of the company's goals. Vanderlande has set up its branches to be able to work closer to customers across Europe, North and South America, and Asia (Vanderlande, 2015). With regard to this expansion, the relevant skills and knowledge that are required are developed within local teams with the help of the more experienced office branches in Netherlands, Germany, the United Kingdom, and Spain (Vanderlande, 2015).

1.1.2 Vanderlande Academy and Talent Development

Vanderlande Academy (VA) was founded in 2008 as a response to the increase of demand for education within Vanderlande (Vanderlande Academy, 2016). VA provides courses to all national and international employees. VA provides training on general competency, software applications, technical, and service trainings. Training programs are provided by in-house trainers and also external organizers. The core activities of VA include developing courses for Vanderlande's internal learning process, organizing all training courses, managing the administration of courses and employees who participate in the courses, setting up the training programs for Vanderlande's subsidiaries worldwide, managing the competence registration, managing the education of certified trainers, and managing collaboration with schools and universities.

Talent Development is a part of the Human Resource Department at Vanderlande (Vanderlande, 2016). The Talent Development programs aim to stimulate and facilitate employees' personal development which relate to the accomplishment of organizational goals. Compared to VA's education and training programs which focus on specific content, including hard and soft skills, Talent Development programs have broader and more holistic development goals, for example development to be a better leader and the development of personal capabilities to make a career step. There are several main ambitions of Talent Development including designing and executing the development programs for different target groups locally and globally and facilitating the development of solid international succession planning to acquire insights into talents, key positions, and key players. Other ambitions are ensuring that the right people are placed at the right places, and facilitating the operation of the development program for Vanderlande employees.

1.2 Problem statement

Vanderlande aims to evaluate and keep track of the quality of all training and development programs that are conducted for its employees. Currently, the tool that is used by Vanderlande to evaluate its training and development programs is a tool that was developed by Radakrishnan (2015). This tool was developed based on classroom trainings for soft skill and hard skill generally. The evaluation tool is presented in a form of an online questionnaire in which trainees have to fill in ratings for 28 questions related to trainee characteristics, training design characteristics, trainer characteristics, and also three other general questions about trainee's overall judgements regarding the training program. The complete content of the current

evaluation tool can be seen in Chapter 3.4. The information that is gained from the trainees about the implementation of training and development programs was intended to be used by Vanderlande to analyze and improve the programs that are provided by both internal and external parties.

After the operation of this evaluation tool for several months, VA found two problems based on the result of the evaluation tool. The first one is a relatively smaller problem related to the emergence of trainees who did not complete filling in the evaluation. Vanderlande had the impression that there are a lot of trainees that did not complete the evaluation tool after filling in few numbers. From the data of training evaluation during February to early May 2016, it turned out that only about 4% of the employee did not continue completing the evaluation after answering a few numbers of questions. Vanderlande suspected that this may relate to the number of questions that were considered to be too large and the presence of similar questions that are asked couple of times in the evaluation. Therefore, Vanderlande wanted to have an analysis of possibilities of reduction in number of questions.

The second, more serious problem related to the non-applicability of the current evaluation tool for some types of different training and development interventions. As the current evaluation tool was designed on the basis of a traditional classroom environment, not all questions in the evaluation tool were considered applicable for all types of training and development interventions. For example, in the self-study training program, questions related to communication with other participants are not applicable. This may also be the reason why the trainees do not complete the questionnaire, and/or questioning the applicability of the questions. In the current implementation of the tool, every question needs to be answered to continue to the next question. When the participants thus still answer a question even if it is not applicable to the program, the result of the evaluation tool may be inaccurate and not representing the real situation of the training. Another issue that was brought up by Vanderlande was that in the current evaluation tool, the overall rating of the training and development programs were measured subjectively from only one general self-reported rating that the trainees provide with no relation to the rating of other factors mentioned in the questionnaire. Rather than having this self-reported overall rating, Vanderlande would like to investigate an alternative way to estimate the quality of programs with the use of weighted score of relevant factors of the training and development program.

1.3 Objectives and Research Questions

1.3.1 Objectives of the master thesis project

Based on the problems mentioned in 1.2, the main objective of this master thesis project is to design a parsimonious training and development programs evaluation tool that can fulfill the following requirement from Vanderlande, which are:

1. It should be valid and reliable
2. It should be applicable across different types of training and development interventions.
3. It should have an overall score that is based on weighted mean scores of factors related to the training and development programs, taking into account the possibility that the weights may vary across different types of interventions.

1.3.2 Research Questions

To achieve the objective, this master thesis project is driven by 6 research questions:

1. **Which training and development interventions are available and used at Vanderlande?**
2. **What types of intervention methods are usually used together in a training or development program?**

The above two questions were required to understand the actual implementation of various training and development interventions at Vanderlande. In each training and development program, it is possible to use more than one type of training intervention. Therefore, it was also important to know what kind of training interventions are used together to design the integrated evaluation tool.

3. **How does Vanderlande currently evaluate learning and transfer of training across training and development programs?**

In evaluating training and development programs, there are four levels of evaluation criteria that can be achieved, which are reaction, learning, behavior, and results (Kirkpatrick, 1996). The aim of this question was to understand how extensively Vanderlande evaluates its training and development at the moment (i.e. which of the four levels are included in the evaluation). From this information, improvement could be made by extending the level of criteria included in the evaluation tool, so that it would give a deeper understanding about the situation during the training programs and its aftereffect.

4. **Taking into account the general and special characteristics of training and development interventions, which characteristics are the key factors that may affect the learning and transfer of training & development performance at Vanderlande?**

As learning and transfer of training are important outcomes that should be achieved by the training and development programs, it was essential to know the factors that may affect the achievement of those outcomes. The characteristics would then be included as factors that are measured in the evaluation tool, so that insights on the actual implementation of the programs could be drawn from the participants' response towards those factors.

5. **What is the most parsimonious integrated training and development evaluation tool that can be developed at Vanderlande, taking into account the criteria for reliability, validity, and completeness?**

In designing the new evaluation tool, some requirements were needed to be fulfilled, such as that the evaluation tool had to be valid, reliable, and complete in the sense that it included not only general factors of training, but also special factors that related to different types of training and development interventions. These factors were to be identified via a literature study. However, if all potentially relevant factors were included in the survey, it would in all likelihood result in too many questions for trainees to answer. Therefore, when the key factors of training and development interventions that may affect the learning and transfer of training performance had been found, it would be beneficial if the evaluation tool fulfilled Vanderlande's requirement to be a parsimonious evaluation tool without compromising the special criteria of different interventions.

6. Based on the collected data from the pilot study, which factors affect the learning and transfer of training that happens due to training and development program at Vanderlande?

As part of this project, after the new evaluation tool was designed a pilot study was held to test the reliability and validity of the tool as explained in Chapter 4. The result of this analysis determined the final recommendation for the design of the integrated training and development evaluation tool for Vanderlande, including which factors and variables to include in the tool and whether a weighted factor system could be used as part of the evaluation tool.

1.4 Research scope

This research explored and analyzed the factors that are related to the training and development interventions available and used at Vanderlande. Interventions types that were not used in carrying out training and development programs at Vanderlande at this moment, and were not expected to be used in the foreseeable future were not included in this research.

At Vanderlande, the training programs available at this moment consist of 53 types of soft-skill programs, more than 80 types of hard-skill programs, 31 types of health & safety programs, and dozens of other miscellaneous training programs (Vanderlande Academy, 2016). This research included all types of training and development programs that were carried out during the first half of 2016, and will be classified based on the type of interventions used in the program.

1.5 Outline of the report

This chapter contained the introduction of the project at Vanderlande including the problem definition and the research questions that guided the research. Summary findings from a literature study by Priyananda (2016) that was done as the base of this research is presented in Chapter 2. Chapter 3 will explain the methodology used to design the evaluation tool and the process to get the design. This Chapter also includes the result of the interview process and analysis of the structure of the current evaluation tool. Chapter 4 explains the method for the implementation and evaluation of the new design in a pilot study. This chapter also includes the results of the pilot study and the statistical analysis of the data gathered on each intervention. Chapter 5 presents the summary findings and recommendations for practical implementation of the new design of evaluation tool. Limitations and suggestions for future research are also described in this Chapter. The outline of this report is shown in Figure 1.

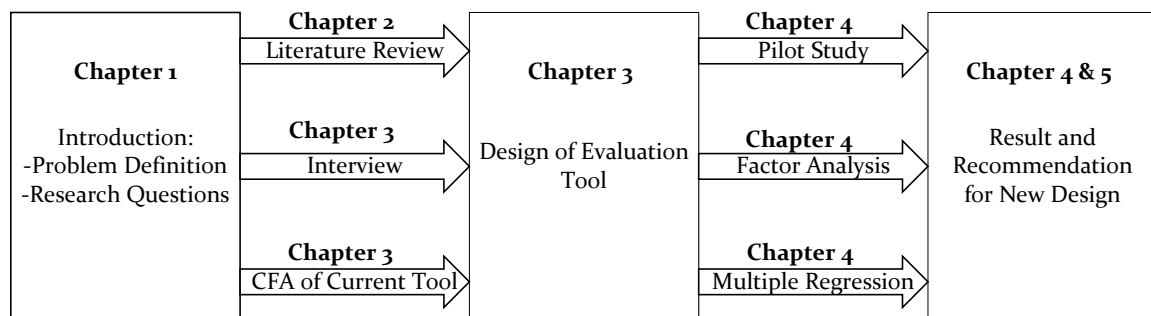


Figure 1 Outline of Master Thesis Report

CHAPTER 2

SUMMARY OF LITERATURE REVIEW

This chapter includes the main findings of the literature review related to the research problems as the basis of this master thesis project. This chapter includes a general overview of training and development, the definition of different types of training and development interventions, a general explanation of evaluation for training and development programs, and the characteristics that were found to be affecting learning and transfer of training.

2.1 Training and development programs

Training and development are two types of program that are used to facilitate the teaching process for required knowledge and skills. Participation in training is expected to improve the work performance of the participants (Goldstein & Ford, 2002). Beside training, organizations also provide development programs for their employees. Talent development is a strategically aligned program in which organizations plan, select, and implement development strategies for their employees to supply the organization with current and future talent (Garavan, Carbery, & Rock, 2012). The talent here can be seen as a limited number of employees who have unique competencies in the leadership and management aspects (Garavan et al, 2012).

While both training and development programs are done with the aim to improve skills and knowledge, there are some similarities and differences between them. The differences lie in the duration and content of the programs. Training typically is a short-term focused program for trainees to gain the skills and knowledge of the tasks that are required at the present by trainees to be able to succeed in their current position (Fitzgerald, 1992). In contrast, development has a long-term focus where trainees participate in activities to gain skills and knowledge that can be implemented for contributions in their organization, in the present or the future (Fitzgerald, 1992). In terms of content, the focus of training program can be on hard or soft skill aspects that are needed for the employees' current jobs (Laker & Powell, 2011). On the other hand, development programs, as they are done to prepare the employees for future higher level positions which frequently require management skills such as leadership and communication ability, development programs have a strong focus on the improvement of soft-skill aspects for their trainees. Though there are differences, training and development are also similar in terms of the methods and approaches they use in formal delivery of materials. For example, both training and development use classroom intervention as one of the ways to deliver the materials to the participants.

2.2 Training and development interventions

In implementing training and development programs, there are several types of methods, here called interventions, that can be used to deliver the material to participants. For training, the interventions can be divided into on-site training programs which include having trainees being placed into a particular job to learn from more experienced workers, and off-site training programs that are done outside the real work environment. Table 1 shows the types and explanation of training interventions and their characteristics.

Table 1 Training Interventions

Training Interventions		Characteristics
On-site training programs		
1	Apprenticeship	Training program that usually consists of a formal training process and implementing the learned skill into the work alongside more experienced employees who the trainees can learn from (Chatzimouratidis, Theotokas, & Lagoudis, 2011)
2	Job Rotation	This program includes learning the skills and knowledge by moving to various departments in the company or doing various jobs in a department (Landy & Conte, 2013).
Off-site training programs		
3	Traditional classroom lectures	This is the traditional method of training where trainees get lectures from the trainer in the classroom (Landy & Conte, 2013).
4	Multimedia-based training Consists of:	
	a) Programmed Instruction	Self-paced training program that gives trainees instruction via written or computer-based materials (Landy & Conte, 2013).
	b) Simulators	The learning process uses a system that adapts the important characteristic of the relevant work in real life (Landy & Conte, 2013).
	c) Computer-based training	This training method uses computers to transfer the knowledge and skills for the jobs to trainees (Brown & Ford, 2002 in Landy & Conte, 2013). Landy & Conte (2013) stated that this type of training method can be done when trainees are present in one location or can be done in the term of distance learning. Computer based training includes the organizations' intranets, multimedia learning environment, and e-learning (including Virtual learning environment and Massive On-line Open Course (MOOC).
5	Blended learning	The use of various types of interventions (i.e. a combination of intervention 1-4) during the whole process of one training (Singh, 2003)

For development programs, the interventions that can be used are listed in Table 2.

Table 2 Development Interventions

Development Intervention		Explanation
1	Formal Education	This type of approach includes on site and off site lecture programs that are designed specifically for the employee, and can be carried out by an internal or external organizer (Noe, Employee Training and Development, 2010). This on-site and off-site program methods are similar to the training program method explained in Table 1.
2	Assessment	This refers to the activities where information regarding relevant skills or behavior of employees is collected from themselves and also from their peers, manager, and/or subordinates, as a basis for feedback (Noe, Employee Training and Development, 2010). This method can be included in employee development program as a tool to identify employees who have potential in managerial aspect or to measure the strength and weaknesses of current managers (Noe, Employee Training and Development, 2010)

Development Intervention		Explanation
3	Interpersonal Relationship (Mentoring & Coaching)	This approach includes mentoring and coaching. In mentoring, mentors are usually more senior or experienced employees who will help the trainees who are less experienced in the relevant areas (Noe, Employee Training and Development, 2010), while coaching process can be managed by a trained internal or external coach, but also can be done in term of peer coaching (Berg & Karlsen, 2012). Mentoring is often associated with broader development for career progress while coaching is often done regarding a specific aspect of employees' jobs (Clutterbuck, 2008)
4	Outdoor Management Development	For this development approach, activities are conducted in outdoor environment and demand some kind of physical effort from the trainees (Jones & Oswick, 2007)
5	Business Games	This type of development activity is usually done for management skills development to simulate the nature of competitiveness in the business world (Noe, Employee Training and Development, 2010).

2.3 Training evaluation

The design of training evaluation in this master thesis project was based on Kirkpatrick's level of criteria framework. This framework has been used in many research about training since its publication in 1959 (Goldstein & Ford, 2002). The criteria levels consist of reaction, learning, behavior, and results. Evaluation of reaction is related to the extent to which the trainee likes the training (Kirkpatrick, 1996). Learning evaluation examines the level of knowledge and skills that were attained by trainees from the training process (Kirkpatrick, 1996). Evaluation of behavior measures the changes that happen to trainee's on-the-job behavior which are related to training content. Result evaluation assesses the outcomes of training in terms of tangible measures such as production quantity, quality, or cost (Kirkpatrick, 1996). Philips (2012) expanded Kirkpatrick's model by adding the fifth level for evaluation of Return on investment, which examines the financial benefits of training programs. A taxonomy that was made by Alliger et al. (1997) explained the 4 criteria of training evaluation by Kirkpatrick (explained in 1.3) and their respective evaluation framework as shown in Table 3.

Table 3 Training Evaluation Criteria Taxonomies

Kirkpatrick's Taxonomy	Augmented framework
Level 1: Reactions	Reactions Affective reactions Utility Judgements
Level 2: Learning	Learning Immediate knowledge Knowledge retention Behavior/Skill demonstration
Level 3: Behavior	Transfer
Level 4: Results	Results

2.4 Transfer of training

Organizations provide training and development programs for their employees with the aim to improve their skills and knowledge, and to enable them to implement the skill and knowledge to their on-the-job behavior. The extent to which trainees implement the skills and knowledge

that they have gained from training or development programs are called the transfer of training (Goldstein & Ford, 2002). The extent of learning that occurs from participating in the training program was considered as an important predictor of training transfer (Kraiger, Ford, & Salas, 1993).

A leading model for transfer of training by Alvarez, Salas, and Garofano (2004), called the Integrated Model of Training Evaluation and Effectiveness (IMTEE), was based on integration of literature about transfer of training from 1993-2002. In Figure 2, it can be seen that the model has four levels, beginning with needs analysis at the top level, which contributes to the next level, which consists of the overall targets of evaluation: training content & design, the changes in learners, and organizational payoffs (Alvarez et al., 2004). The next level of the model shows the measurements that are used for evaluation: trainees' reactions are used as measurement of training content and design, changes in learners are evaluated by measuring post-training self-efficacy, cognitive learning, and training performance, while organizational payoffs can be measured with transfer performance and results (Alvarez et al., 2004). These two middle levels are defined as the combination of models by Kraiger (2002), Kirkpatrick (1976), Holton (1996), and Tannenbaum et al. (1993) (Alvarez et al., 2004). The bottom level of IMTEE model shows the characteristics that affect training effectiveness, consisting of individual characteristics, training characteristics, and organizational characteristics.

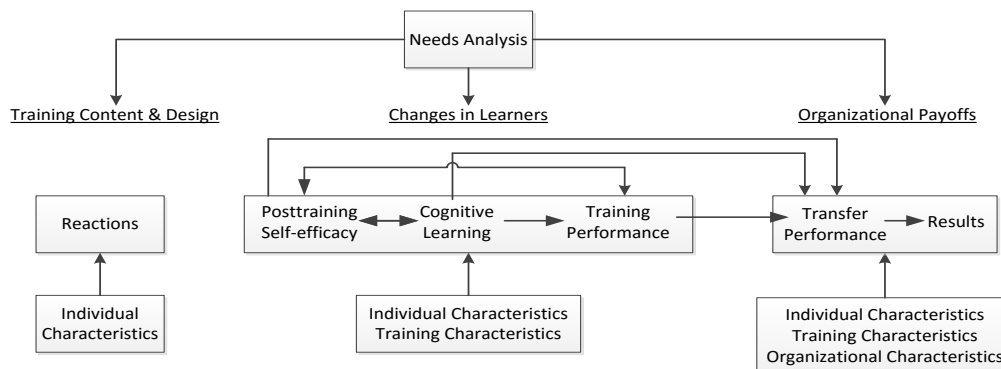


Figure 2 IMTEE Model (Alvarez et al., 2004)

2.5 Factors related to effectiveness of training & development programs

In past research, various factors have been found to affect the transfer of training in general and for different types of training and development interventions. Based on Alvarez et al. (2004) training effectiveness is affected by trainees' individual characteristics, training characteristics, and organizational characteristics. Another type of characteristic that was found to have an effect on training effectiveness is the trainer's characteristic. The framework of all factors that were found to affect the training and development effectiveness can be seen in Figure 3. In the literature review, this framework was made on the basis of a compilation of factors that affect the effectiveness of training and development program in general, and also on the learning and behavior levels. The main sources were Barron, Dawson, and Yendol-Hoppey (2008), Berg & Karlsen (2012), Blume, Ford, Baldwin, & Huang (2010), Britton & Anderson (2010), Burke & Hutchins (2007), Ely et al. (2010), Landy & Conte (2013), Lau & McLean (2013), Lim, Lee, & Nam (2007), Noe (2010), Park & Wentling (2007), Parker, Hall, & Kram (2008), Piccoli et. al (2001), Salas & Burke (2002), Shan et al. (2014), Sitzmann et. al. (2006), Yousef et al. (2014), Yousef et. al. (2015), and previous related master thesis project by Elbers (2010) and Radhakrishnan (2015).

In the framework, the general characteristics that affect transfer of training are shown in the top boxes, followed by the distinct characteristics of each type of interventions below them. The framework in Figure 3 was the basis of the characteristics to be explored in the master thesis project. Factors that are related to the general description of effectiveness (i.e. where it is unclear to which level this effectiveness refer) are defined as "E", factors that are related to learning level are defined as "L", and factors that are related to behavior level are defined as "B". As for the factors that were found from empirical or meta-analysis studies, the code "EMA" was added, as well as "EO" for expert opinion and "WO" for self-assessment by Priyananda (2016). Example of a way to interpret Figure 3 is as follows: For evaluating classroom training, it is important to take into account characteristics in general factors that affect transfer of training and also to add extra characteristics of trainer & fellow trainee communication & support, motivation to transfer, transfer effort, and interesting lecture method. In contrast, for peer coaching intervention, besides including the general factors, it is also important to look at the characteristic of fellow trainee communication & support and trust in the coach. From the framework, it can be seen that each type of intervention has different characteristics that affect its effectiveness. Thus, it is important to take into account these differences in designing the evaluation tools rather than having same questions for all types of training and development interventions.

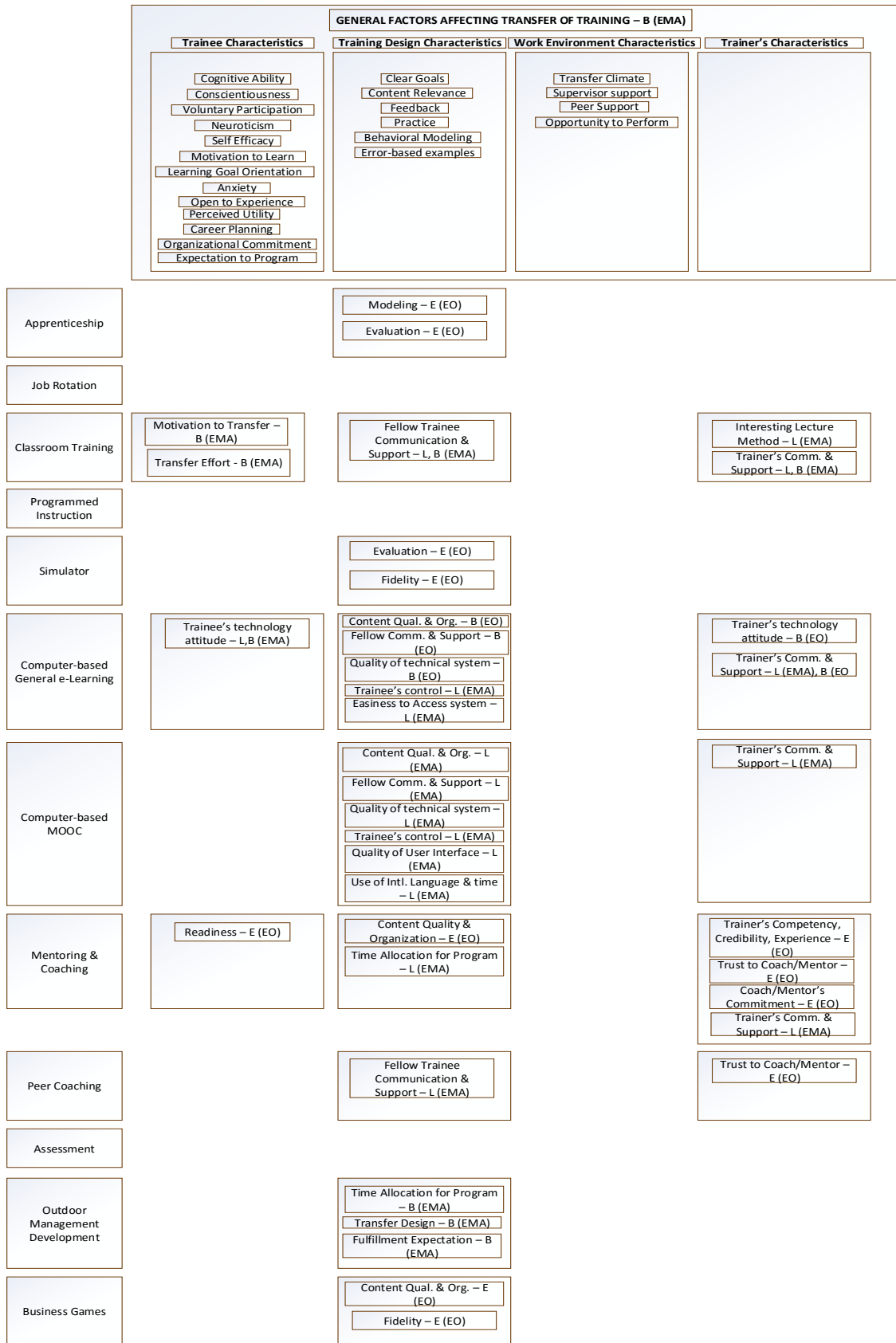


Figure 3 Integrated factors affecting training effectiveness

CHAPTER 3

EVALUATION TOOL DESIGN

This chapter aims to explain the methods that were used to design the new evaluation tool and the initial design of the new evaluation tool. The chapter starts with the explanation of the research structure which then continues to the detail description of that structure in relation with the design process of the new evaluation tool. The implementation of the design process is then described and followed by the result.

3.1 Research Structure

This research was structured based on the problem solving cycle by Van Aken, Berends, and Van der Bij (2012). This structure was chosen due to the compatibility between the objective of this research and the focus of problem solving cycle, which is on the fulfillment of emerging requirements related to business problems of an organization (Van Aken et al., 2012). The problem solving cycle consists of problem definition, analysis and diagnosis, solution design, intervention, and learning/evaluation as depicted in Figure 4.

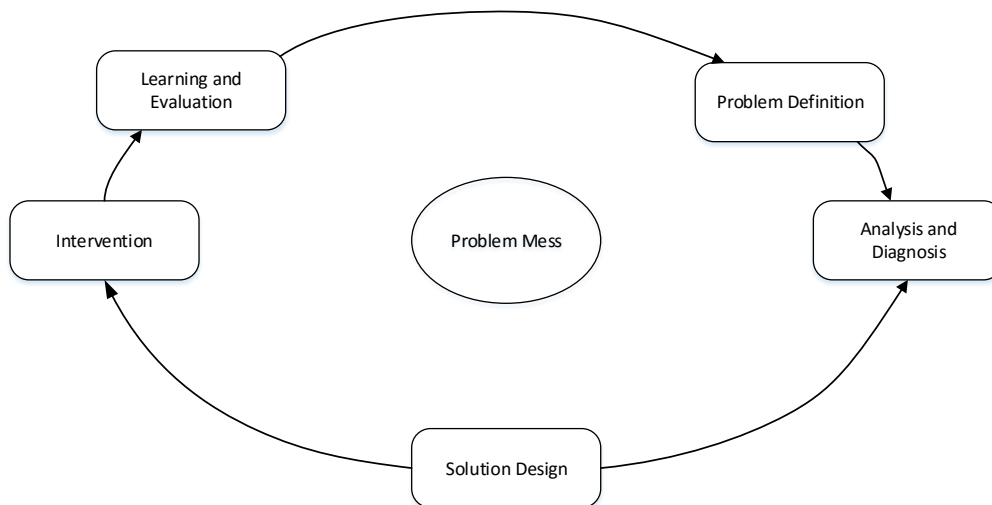


Figure 4 Problem solving cycle (Van Aken et. al.,2012)

Following the problem solving cycle, there were quantitative and qualitative methods were used during this research to answer the research questions. To answer research questions 1, 2, 3, and 4, Problem Definition, Analysis and Diagnosis and Solution Design were carried out. The details of these steps are explained in this Chapter 3. Research questions 5 and 6 were answered by implementing steps the Intervention and Evaluation, which will be explained in Chapter 4.

3.2 Research Methods for Evaluation Tool Design

3.2.1 Problem Definition

This research started with the identification and formulation of clear business problems related to training and development evaluation at Vanderlande. The research questions for the research were also defined at this stage. A literature review was done based on previous training and development evaluation studies and documents from Vanderlande. Information from the manager of Vanderlande Academy (VA) and Training Development (TD) was also used in this

stage. The information that was gathered was put into documents of literature study and research proposal by Priyananda (2016).

3.2.2 Analysis and Diagnosis

After defining the main problems and research questions, the next step was to analyze the problem and its context. For this step, series of interview series was conducted and Vanderlande's training and development documentations were examined.

To get started, interviews with the manager of VA and TD were done in order to answer research questions 1, 2, and 3 below:

1. *Which training and development interventions are available and used at Vanderlande?*
2. *What types of intervention methods are usually used together in a training or development program?*
3. *How does Vanderlande currently evaluate learning and transfer of training across training and development programs?*

With the information that was extracted from the interviews, the researcher proceeded to answer research question 4: *Taking into account the general and special characteristics of training and development interventions, which characteristics are the key factors that may affect the learning and transfer of training & development performance at Vanderlande?* The answer to this research question was defined based on literature review by Priyananda (2016) and sets of interviews with the training and development experts at Vanderlande.

As explained in the summary of the literature review in Chapter 2, there are general and distinct characteristics (factors) that can affect the effectiveness of training and development programs, be it in terms of general effectiveness, or more specifically at the learning level and the behavior level. However, based on Goldstein & Ford (2002), the criteria's relevancy and reliability are important aspects to be considered in defining criteria for training evaluation. Based on Kasunic (2005), conducting in-depth interview with experts on the related subject prior to designing a survey instrument is valuable to do as the interviewee can help the researcher to define the relevant survey questions and give feedback to the researcher about the survey items. The experts can also help to categorize the items and select the highest priority items in the survey (Kasunic, 2005). Therefore, sets of interviews with the managers and training and development experts at Vanderlande were conducted to define which factors on each intervention were relevant to be explored in this research. The experts that were interviewed were the employees who work at the VA and Human Resources department, and were directly involved in the managing and implementation of training and development programs at Vanderlande. The interviews were conducted with 5 respondents: the VA Manager, the TD manager, two learning consultants from VA, and one Human Resources Manager with previous experience as TD Manager. Besides the interviews, documents related to the training and development interventions at Vanderlande were also analyzed.

The interviews were done as a face-to-face interview with each of the respondents. The way to deliver the questions was based on semi-structured interview method. Using open-ended type of question is likely the most popular in the interview used in research studies due to its nature that allows the respondents to express their point of view and experience fully (Turner, 2010). Semi-structured interview method could be used to understand relationships between variables (Saunders, Lewis, & Thornhill, 2009). The latter was aligned with the objective of this interview

process, which was to know which characteristics are related to learning and transfer of training of various training and development interventions at Vanderlande. In the interview, the researcher used an interview guideline, including the questions that were intended to be asked. Respondents were asked the same key questions, but quite flexible in the sense that when the respondents did not understand the question, the researcher could explain the question further to the respondent, and further questions apart from the pre-determined questions but still relevant to the research were also asked when needed. During the interview, participants were asked about the characteristics of trainee, trainer, training design, and work environment at Vanderlande that could affect the learning and transfer of training process based on their own opinion and also their opinion about the characteristics that were found from the literature. Participants were also asked about which characteristics they would recommend to include in the new design for evaluation tool.

3.3 Interview Result

Two different interview sessions were held at Vanderlande. The first one was interview sessions to the Managers of Vanderlande Academy and Talent Development to answer the research questions 1, 2, and 3. After that, the second interview sessions were held with 5 participants mentioned in 3.2.2. The literature review, combined with the result of this interview was used to find the answer of Research question 4. This section will explain the result of the interviews in detail.

1. Which training and development interventions are available and used at Vanderlande?

The interview session with the Managers of Vanderlande Academy and Talent Development revealed that six types of training and development interventions were used. Table 4 shows the information about those training interventions.

Table 4 Training & Development Interventions at Vanderlande

No	Intervention	Explanation
1	Classroom Training	This is the most common type of intervention which is used in almost all training and development program at Vanderlande. The only program that does not involve this intervention is the pure E-learning training program. Classroom training is used for both hard and soft-skill programs.
2	E-learning (Web-based Training)	This type of training involves the use of computer and internet network for delivering the material. This is usually a program where the trainees learn by themselves without the physical presence of trainer and other trainees.
3	Coaching	This is a part of development program in which Vanderlande assigns a coach to the participants of the program. The coach can be an external professional coach or an internal employee with a higher level position at Vanderlande who has been trained to be a coach.
4	Peer Group Counseling	In this type of development intervention, participants are instructed to learn and support or help each other as a group. There are also trainers who accompany the groups and support the group by giving counseling and feedback to the group members.

No	Intervention	Explanation
5	Outdoor Program	Outdoor program is part of development interventions. In this intervention, participants engage in a program that is conducted in an outdoor environment with the content related to the topic of the development program they follow (e.g. rafting program for teamwork training).
6	Business Case	Participants of Business Case are given examples of problem case related to the topic of the development program that can happen in a company. The participants are then asked to analyze and find solutions to the problem.

2. *What types of intervention methods are usually used together in a training or development program?*

Based on the six interventions mentioned in the answer of research question 1, there are seven types of classification in using the interventions for training and development programs at Vanderlande. The first two are the use of only Classroom training or E-learning intervention in the programs. During the first half of 2016, there were more than 100 classroom training programs were held with more than 400 participants, and ten e-learning programs with about 30 participants. The other five types consist of integration of at least two interventions in a program as shown in Table 5. The table shows the name of the programs and the interventions used during the implementation of those programs.

Table 5 Integration of Interventions

No	Name of Training/Development Program	Intervention(s) used in the program and number of programs and participants during the first half of 2016
1	Blended Learning	Classroom Training and E-learning. There were four programs with about forty participants.
2	Pit-Stop	Classroom Training and Business Case There were three programs with about sixty participants.
3	Authentic Leadership	Classroom Training, Peer Group Counseling, Outdoor Program There was one program with fifteen participants.
4	Leadership I	Classroom Training, Coaching, Peer Group Counseling There was one program with fourteen participants.
5	Personal Leadership	Classroom Training, Coaching, Peer Group Counseling, Outdoor Program There was one program with twelve participants.

3. *How does Vanderlande currently evaluate learning and transfer of training across training and development programs?*

Vanderlande currently did not directly evaluate the learning and transfer of training across its training and development program. The evaluation tool that Vanderlande uses at this moment (Radhakrishnan, 2015) measures the factors that potentially can affect learning and transfer of training. This research extended the evaluation tool by adding the elements of perceived learning and transfer of training measurement to the newly designed evaluation tool. This addition of new elements was important to verify whether the factors included in the new design of evaluation tool indeed predicted learning or transfer of training at Vanderlande.

4. *Taking into account the general and special characteristics of training and development interventions, which characteristics are the key factors that may affect the learning and transfer of training & development performance at Vanderlande?*

Interview with experts in Training and Development program at Vanderlande were done with five interviewees in the form of face-to-face interview in the period between 15-24 June 2016. The purpose was to get insights on which of the characteristics mentioned in the literature review were relevant as the characteristics that may affect the learning and transfer of training at Vanderlande, and whether there were also other relevant characteristics that were not mentioned in the literature review.

In this interview process, the interviewees were asked about their own opinions of the characters that can affect learning and transfer of training, and also their opinions on the characters that were found in the literature study. Opinion about the special characters were only asked to the interviewees who had managed the respective programs. During the interview, almost all general and special characters shown in Figure 3 were mentioned by at least one interviewee as the factor that may affect the learning and transfer of training. The personal opinion of the interviewees that were not shown in Figure 3 were also mentioned such as the reflection and feedback after outdoor program and business case. To narrow down the choices to define which factors to put in the new evaluation tool, the interviewees were also asked which characteristics between all the characteristics that had been mentioned were thought to be the key characteristics that may affect learning and transfer of training at Vanderlande and recommended to be put in the evaluation tool. Table 6 describes the characteristics of training and development programs that were recommended to be put in the evaluation tool by at least 1 interviewee and/or were thought to affect learning or transfer of training at least by two interviewees (i.e. The special characteristics of interventions that are used in development programs were only asked to HR manager and TD manager). This set of characters became the guide to structure the new evaluation tool. In the final initial structure of new evaluation tool, not all of these characteristics were included due to practicality reasons that will be explained in 3.5.

Table 6 Key Characteristics Affecting Learning and Transfer of Training

General Factors	Classroom Training	E-learning
<ul style="list-style-type: none"> • Motivation to Learn • Learning goal orientation • Perceived utility • Cognitive Ability • Voluntary Participation • Content relevance • Clear goals • Behavioral Modeling • Feedback & Practice 	<ul style="list-style-type: none"> • Motivation to transfer • Trainer communication & support • Interesting lecturing method • Transfer effort • Fellow Trainee communication & support 	<ul style="list-style-type: none"> • Trainee Technology attitude • Content quality & organization • Quality of user interface • Quality of Technical system • Trainee control
Coaching	Outdoor program & Business Case	Work environment
<ul style="list-style-type: none"> • Experience & competence of the Coach • Trust in Coach • Coach Commitment 	<ul style="list-style-type: none"> • Fidelity • Reflection/feedback after the program • Transfer Design 	<ul style="list-style-type: none"> • Transfer climate • Opportunity to perform • Supervisor support • Peer Support

3.4 Research Methods for Structuring the New Evaluation Tool

This part was based on the solution design step. The solution design step was the first step to answer research question 5: *What is the most parsimonious integrated training and development evaluation tool that is possible to be developed at Vanderlande?*. In this step, the design of the evaluation tool was determined, including the choice of the set of variables related to the relevant factors that had been found as the answer of research question 4, and the structure of the variables in the evaluation tool. This step included studying literatures related to the relevant characteristics to obtain validated scales for all factors and also allocating the characteristics to either of general factors or the specialized factors of each intervention.

The current evaluation tool that Vanderlande uses was based on research by Radhakrishnan (2015), in which its validity had been determined by Exploratory Factor Analysis (EFA) on relatively small sample. As it also includes general characteristics that may be explored in this project, a confirmatory factor analysis (CFA) was done with larger sample of 509 data that were gathered from the employees who filled in the evaluation tool in February until early May 2016 to verify whether the structure of the questions in each characteristic is still applicable to be used in the new design of the evaluation tool. This analysis was also done in order to find the most parsimonious valid set of variables that can construct a factor. The result of this CFA was subsequently used when the factors were defined to be part of the new design of the evaluation tool. The theory used in the statistical analysis was based on Hair et al (2010) and some other sources mentioned in the following explanations. Table 7 explains the measurements that were done during CFA.

Table 7 Measurements for CFA

Terms	Explanation
<i>Absolute Fit Indices</i>	Direct measure of how well the model that was specified by the researcher reproduces the observed data
<ul style="list-style-type: none"> • Normed Chi-square (χ^2) 	The ratio of χ^2 to the degrees of freedom of a model. The ratio of $\chi^2:df$ on the order of 3:1 or less are associated with better fitting model.
<ul style="list-style-type: none"> • Root Mean Square Error of Approximation (RMSEA) 	Lower RMSEA value shows better model-fit. The cutoff value for RMSEA is 0.05 or 0.08 or lower
<i>Incremental Fit Indices</i>	Assess how well the estimated model fits relative to some alternative baseline model.
<ul style="list-style-type: none"> • Comparative Fit Index (CFI) 	The value of CFI ranges from 0 to 1, the closer the value to 1, the better-fit the model. CFI values of more than 0.90 or 0.95 are typically associated with good-fit model.
<i>Parsimony Fit Indices</i>	This set of indices show which model is the best based on its fit relative to its complexity.
<ul style="list-style-type: none"> • Parsimony Normed Fit Index (PNFI) 	PNFI is an adjusted Normed Fit Index (NFI) The value of PNFI ranges from 0 to 1, the closer the value to 1, the better-fit the model
Construct validity	The extent to which the measured variables actually represent the theoretical latent construct those variables are designed to measure.
Convergent validity	The extent to which the measured variables of a construct share a high proportion of variance in common. The measure of convergent validity can be seen from the value of factor loadings, average variance extracted, and construct reliability.

Terms	Explanation
<ul style="list-style-type: none"> • <i>Factor loadings</i> 	All factor loadings should be statistically significant and standardized loading estimates should be 0.5 or higher, and ideally 0.7 or higher. In CFA, variables with low loadings become candidates for deletion.
<ul style="list-style-type: none"> • <i>Average variance extracted (AVE)</i> 	The average percentage of variation among the variables of a construct. It is a measurement of convergence among a set of variables that represent a latent construct. AVE measurement is required for each latent construct. AVE should be 0.5 or higher to suggest adequate convergent validity.
<ul style="list-style-type: none"> • <i>Construct reliability</i> 	The measurement of reliability and internal consistency of the measured variables that represent a latent construct. CR value of 0.7 or higher suggests good reliability.
Discriminant validity	The extent to which a construct is really distinct from the other constructs in terms of how much it correlates to the other constructs and how distinct its measured variables represent only this single construct.
Maximum Shared Squared Variance (MSV)	Indicates how well a factor is explained by variables of other factors. (Hariri & Roberts, 2015) The value of MSV is measured for each construct. The value can be measured by squaring the biggest value of correlation between a construct with other constructs.
Average Squared Variance (ASV)	Indicates how much, on average, a factor is explained by the variables of other factors. (Hariri & Roberts, 2015) The value can be measured by calculating the average value of the square of correlations between a construct with other constructs.
Modification Indices (MI)	When a relation between variables, factors, or error terms in a model shows modification indices value of 4.0 or greater, it suggests that the fit of the model could be improved by making a modification to the corresponding relation.

The relationship of factors (latent constructs) and their variables are shown in the form of path diagram. In path diagram, latent constructs are shown as ellipses, and the measured variables are represented by rectangles. Each measured variable has an error term which depicts the extent to which the latent factor does not explain the measured variable. This error term is shown as a rectangle in the path diagram. The relationship between latent constructs and between latent constructs and their measured variables are shown with the arrows. An example of path diagram is shown in Appendix A1.1.

Beside CFA, Exploratory Factor Analysis (EFA) was also done in some parts to give a clearer understanding of the model's structure. The EFA was done with Principal Component Analysis due to the research focus on finding the minimum number of factors required to represent the maximum portion of total variance shown in the original set of variables. Along with that, Oblique rotation was chosen because it is considered as more accurate for social or human behavior study due to its nature that allows correlation between variables was chosen (Osborne & Costello, 2009). As part of oblique rotation, Promax rotation was used in the analysis as it has been shown to be effective in statistical studies and popular in practice (Finch, 2013). To check the reliability of the scale, reliability coefficient Cronbach's alpha is the most widely used measure. The lower limit of acceptable Cronbach's alpha is 0.70, or 0.60 in exploratory research.

The final pilot design of new evaluation tool was also discussed with company supervisor before being sent to survey participants. The final answer for research question 5 includes the result from step Intervention and Evaluation.

3.5 Confirmatory Factor Analysis (CFA) of Current Evaluation Tool

The analysis of the current evaluation tool was done as part of the solution design step of the project. Data was gathered from the 530 training participants who filled in the evaluation tool questionnaire between February and Early May 2016. Of these, 509 respondents presented complete data and were used for further analysis.

This CFA was done to see whether the valid structure of the current evaluation tool was still the same after being used in actual training evaluations for some months. During the pilot analysis of the current evaluation tool, Radhakrishnan (2015) determined the structure of the questionnaire through exploratory factor analysis (EFA), but due to the limited amount of data, the exploratory factor analysis had to be divided into three parts, which were the pre-training phase, the actual training phase, and post training phase. Based on Hair Jr. et al. (2010), the general rule for sample size required for a Factor Analysis is at least five times the number of variables to be analyzed. In the current evaluation tool, there are 28 variables to be analyzed in the CFA. Therefore 509 cases were considered enough to run analysis for all the variables together. The initial structure and the structure after CFA was done is shown in Table 8.

Table 8 CFA Result of Current Data

Initial Structure (following Radhakrishnan, 2015)	Remarks	Structure Based on CFA
<u>Training Expectations ($\alpha = 0.812$)</u> 1. From the start of the training program, I was aware of the goals I am supposed to achieve via this training program. 2. I knew what to expect from this training (e.g. content, type) before it began. 3. The expected outcomes of this training were clear at the start of the training program.	Stay as initial structure	<u>Training Expectations ($\alpha = 0.812$)</u> 1. From the start of the training program, I was aware of the goals I am supposed to achieve via this training program. 2. I knew what to expect from this training (e.g. content, type) before it began. 3. The expected outcomes of this training were clear at the start of the training program.
<u>Relevance of the training program ($\alpha = 0.791$)</u> 4. This training program fits well to my job requirements. 5. This training program will enhance my career development. 6. The training program helped me identify how to build on my current knowledge and skills.	Item no. 4 was removed, and the other items were integrated into "Relevance to Work"	<u>Relevance to Work ($\alpha = 0.939$)</u> 4. This training program will enhance my career development. 5. The training program helped me identify how to build on my current knowledge and skills. 6. I am happy to try out the skills that I have learnt at the training program.
<u>Performance Self-Efficacy ($\alpha = 0.884$)</u> 7. I am happy to try out the skills that I have learnt at the training program.	Item no. 8 and 10 were removed, and the other items were integrated into	7. I am confident in my ability to use the new skills at work. 8. After the training program, I can't wait to get back to work and try out what I have learnt.

Initial Structure (following Radhakrishnan, 2015)	Remarks	Structure Based on CFA
<p>8. I am curious to see the outcomes when I employ my learnt skills at work.</p> <p>9. I am confident in my ability to use the new skills at work.</p> <p>10. At work, I feel very confident using what I have learnt in this training program even in the face of difficult situations.</p> <p>11. After the training program, I can't wait to get back to work and try out what I have learnt.</p>	<p>“Relevance to Work”</p>	<p>9. The training will influence my performance on the job.</p> <p>10. The training meets my job related development goals.</p> <p>11. My training performance will have a direct impact on my results at my job.</p> <p>12. This training program will increase my personal productivity.</p> <p>13. I believe that this training program will help me do my current job better.</p>
<p><u>Fulfilment expectations ($\alpha = 0.843$)</u></p> <p>12. The training will influence my performance on the job.</p> <p>13. The training meets my job related development goals.</p> <p>14. The content of the training program fits to my training needs.</p>	<p>Item no. 14 was removed, and the other items were integrated into “Relevance to Work”</p>	
<p><u>Impact on work performance ($\alpha = 0.888$)</u></p> <p>15. My training performance will have a direct impact on my results at my job.</p> <p>16. This training program will increase my personal productivity.</p> <p>17. I believe that this training program will help me do my current job better.</p>	<p>All items were integrated into “Relevance to Work”</p>	
<p><u>Practice and Feedback ($\alpha = 0.836$)</u></p> <p>18. During the training, I got feedback from the trainer about the way I was applying the new knowledge and skills.</p> <p>19. After the training, the trainer made clear that I did or did not meet the formulated requirements.</p> <p>20. There were sufficient exercises during the training to properly understand how I must apply the learned knowledge and skills into practice.</p> <p>21. During the training, I received feedback from other participants about the way I was applying the new knowledge and skills.</p> <p>22. During the training, I got enough instructions from the trainer about how to apply the new knowledge and skills of the training.</p>	<p>Items no. 19 and 22 were removed.</p>	<p><u>Practice and Feedback ($\alpha = 0.783$)</u></p> <p>14. During the training, I got feedback from the trainer about the way I was applying the new knowledge and skills.</p> <p>15. There were sufficient exercises during the training to properly understand how I must apply the learned knowledge and skills into practice.</p> <p>16. During the training, I received feedback from other participants about the way I was applying the new knowledge and skills.</p>

Initial Structure (following Radhakrishnan, 2015)	Remarks	Structure Based on CFA
<u>Goal Clarity ($\alpha = 0.797$)</u> 23. I had specific, clear training goals to aim for during this training program. 24. I knew which of the goals I want to accomplish were the most important.	Stay as initial structure	<u>Goal Clarity ($\alpha = 0.797$)</u> 17. I had specific, clear training goals to aim for during this training program. 18. I knew which of the goals I want to accomplish were the most important.
<u>Trainer support ($\alpha = 0.897$)</u> 25. The trainer had sufficient experience about the topics covered during the training. 26. The trainer had sufficient knowledge about the topics covered during the training.	Stay as initial structure	<u>Trainer support ($\alpha = 0.897$)</u> 19. The trainer had sufficient experience about the topics covered during the training. 20. The trainer had sufficient knowledge about the topics covered during the training.
<u>Up-to-date content ($\alpha = 0.839$)</u> 27. The content of the training program was up to date. 28. The trainer used up-to-date equipment/ training materials	Stay as initial structure	<u>Up-to-date content ($\alpha = 0.839$)</u> 21. The content of the training program was up to date. 22. The trainer used up-to-date equipment/ training materials.

During the process, six variables were removed from the initial structure and four factors were integrated into one factor. The changes were made through several Models to increase the Model-fit and validity of the construct. Table 9 shows the summary explanation of the changes made to the structure during the CFA. The measurements mentioned in the explanation were based on the result from SPSS and SPSS AMOS.

Table 9 Changes Made During CFA

Changes in Structure	Explanation
1) Deletion of “At work, I feel very confident using what I have learnt in this training program even in the face of difficult situations.”	Value of standardized loading estimates lower than 0.7, and its error term had high Modification Indices (MI) with the error term of variable “I am confident in my ability to use the new skills at work.” (MI value: 106.67). As mentioned in Table 7, value of MI above 4 shows that the fit value of the model can be improved by modifying the respective relation. As including covariance between the error terms were considered as a threat to construct validity (Hair et. al, 2010), then it was chosen to delete one of the factors related to the correlated error terms that has factor loading lower than 0.7.
2) Deletion of “This training program fits well to my job requirements.”	Value of standardized loading estimates lower than 0.7.
3) Deletion of “After the training, the trainer made clear that I did or did not meet the formulated requirements.”	Value of standardized loading estimates lower than 0.7.
4) Deletion of “During the training, I got enough instructions from the trainer about how to apply the new knowledge and skills of the training.”	Had high Modification Indices (MI) with construct Trainer Support.
5) Deletion of “The content of the training program fits to my training needs.”	Value of standardized loading estimates lower than 0.7.

Changes in Structure	Explanation
6) Integration of factors Content Relevance, Fulfilment Expectation, Performance self-efficacy, and Impact on Work Performance	The validity and reliability test shows that there were high correlations between these 4 factors. Therefore, Exploratory Factor Analysis (EFA) of the variables of these factors was conducted. The KMO Measure of Sampling adequacy shows the value of 0.958 which is above the minimum value of 0.5 and the Bartlett test of sphericity shows the value of 0.000. This means that the variables have significant correlation so that it is appropriate to apply EFA to the data. The EFA result showed that the variables of these 4 factors actually belonged to one factor.
7) Deletion of "I am curious to see the outcomes when I employ my learnt skills at work."	Had high Modification Indices (MI) with variable "I am confident in my ability to use the new skills at work." and had a value of standardized estimates lower than 0.7.

The path diagram of initial structure of the current evaluation tool and the structure after CFA can be seen in in Appendix 1 and the comparison of model-fit and the validity between the initial and new structure can be seen in Table 10. The result shows that the structure after CFA had better fit and validity compared to the initial structure. The detail information of Validity measurement can be found in Appendix 1. The validity measurement shows that the initial structure was not valid, while the final structure fulfills all requirements to be valid. Even though the improvement in fit value shows only small changes, but the final structure could provide more parsimonious sets of variables while also make the model valid and reliable. Therefore, the new structure was used as one of the references for designing the new evaluation tool.

Table 10 Fit Measurement of Current Evaluation Tool

Scale	Description	Initial Structure	Structure after CFA
CMIN/DF	Normed Chi-square Good fit: ~ 1 ; Acceptable fit: 1-3	3.054	2.778
RMSEA	≤ 0.01 excellent, ≤ 0.05 good, ≤ 0.08 mediocre fit	0.064	0.059
CFI	The closer to 1, the better fit CFI $> .90$ or 0.95: good fit	0.928	0.948
PNFI	The closer to 1, the better fit	0.746	0.774

3.6 Defining the New Evaluation Tool Structure

The solution design step was done to define the structure of the new evaluation tool. To decide on which variables were included in the evaluation tool, there were three criteria that the researcher took into account. The first one was that the factors related to the variables were included as the characteristics that affect learning and transfer of training by literature and/or the interviewees. The second one was whether the variables are objectively related to the training/development programs and are aspects that can be improved during the training program. The evaluation tool should not measure the personal ability or behavior of the trainees that they already had since before the training, but rather focused on the actual situation during the training, so that the variables will be able to be analyzed to improve the training and development programs at Vanderlande. The third one is the result from the Confirmatory Factor Analysis (CFA) of the current evaluation tool. If the characteristics were part of the factors in the current evaluation tool that was used by Vanderlande, then the variables that were chosen were based on the CFA. Another thing that was taken into account was the opinion about the variables from the Experts that were interviewed before, and the opinion of the researcher. Their opinion was used when choosing variables for some of the factors, or also to add relevant

variables to some factors. The variables that were used were based on validated scales from previous studies related to training and development. The next part will explain the chosen factors to be put in the new evaluation tool and the variables that constructed the factors.

Table 11 Validated Scale for Evaluation Tool Design

Scale	Literature reference	Remarks
General Factors		
• Motivation to Learn (3 items)	Noe & Schmidt (1986) in Tharenou (2001) $\alpha=0.81$	The new design of evaluation tool focused on the characteristics that are able to be changed during and after the training. Therefore, the trainee characteristics were not included in the initial design of new evaluation tool, except motivation to learn and motivation to transfer (for classroom training), as those characteristics were considered important by majority of the interviewees, recommended to be part of the evaluation tool, had validated variables that are related to the training programs rather than purely the trainee's personality and were not similar to other characteristics.
• Content relevance (2 items)	Giangreco et al (2009) in Radhakrishnan (2015)	Based on CFA Result $\alpha=0.939$ (Relevance to Work)
• Clear goals (2 items)	Lee et al (1991)	Based on CFA Result $\alpha=0.737$
Classroom Training		
• Trainer knowledge & Experience (2 items)	Giangreco et al (2009) in Radhakrishnan (2015)	Based on CFA Result $\alpha=0.897$ (Trainer Communication & Support)
• Fellow Trainee communication & support (3 items)	Paechter (2010) and LTSI (2000) - CFA $\alpha = 0.783$ (Practice & Feedback)	
• Feedback & Practice (3 items)	LTSI (2000)	Due to different requirements of each intervention (e.g. the e-learning program is a program where the trainees do individual learning without a trainer), the Feedback & Practice scale was moved from the general factors to become part of the particular training interventions factor. Based on CFA Result $\alpha=0.783$
• Motivation to transfer (5 items)	LTSI (2000)	Based on CFA Result $\alpha=0.939$ (Relevance to Work)
Additional remarks regarding Classroom Training Factors:		
<ul style="list-style-type: none"> • Variables related to Interesting Lecture Method had been tested in the research by Radhakrishnan (2015) and was found to be a cross-loading variable. Therefore, this characteristic was excluded from the new design. • Variables related to Transfer Effort were similar to variables of Motivation to Transfer. Therefore, this characteristic was excluded. 		
E-Learning		
• Content quality (2 items)	Giangreco et al (2009) in Radhakrishnan (2015)	The variables were also based on CFA Result $\alpha=0.839$ (Up-to-date Content)
• Quality of Technical system (3 items)	Chiu (2007) $\alpha=0.9$	The validated scale also included a variable related to Quality of user interface
• Trainee control (3 items)	Paechter (2010)	

Scale	Literature reference	Remarks
Coaching		
• Experience & competence of the Coach (2 items)	Giangreco et al (2009) in Radhakrishnan (2015)	Based on CFA Result $\alpha=0.897$
• Trust in Coach (3 items)	Gan & Chong (2013) $\alpha=0.92$	Trust in coach and Coach commitment were not mentioned as the factors recommended to be put in the evaluation tool, but both HR Manager and TD Manager stated that Trust in coach and Coach commitment were important for mentoring & coaching programs. Therefore, the researcher decided to include these factors in the pilot study to see whether these actually affect learning and transfer of training at Vanderlande.
• Coach Commitment (3 items)	Gan & Chong (2013) $\alpha=0.904$	
• Feedback & Practice (4 items)	LTSI (2000)	The variables were adjusted by taking into account the opinion of the Talent Development Manager.
Peer Group Counseling		
• Trust to Peer (3 items)	Gan & Chong (2013) $\alpha=0.92$	
• Feedback & Practice (5 items)	LTSI (2000)	
Outdoor Program		
• Transfer Design (3 items)	LTSI (2000) $\alpha=0.85$	
• Feedback & Practice (2 items)	LTSI (2000)	
Business Case		
• Transfer Design (3 items)	LTSI (2000) $\alpha=0.85$	
• Feedback & Practice (2 items)	LTSI (2000)	
• Fidelity (2 items)	LTSI (2000) $\alpha=0.84$	
Transfer of Training		
• Opportunity to perform (3 items)	LTSI (2000) $\alpha=0.70$	
• Supervisor support (5 items)	LTSI (2000) $\alpha=0.91$	The factor Transfer Climate had a very similar scale to Supervisor Support and Peer Support, and thus was excluded from the new design.
• Peer Support (3 items)	LTSI (2000) $\alpha=0.83$	
Outcome Constructs		
Learning (2 items)	Grohmann & Kauffeld (2013) $\alpha=0.91$	
Transfer of Training (2 items)	Grohmann & Kauffeld (2013) $\alpha=0.90$ Xiao (1996) in Zumrah (2014)	

CHAPTER 4

IMPLEMENTATION AND RESULT OF PILOT STUDY

The pilot study was done to answer research question 5: What is the most parsimonious integrated training and development evaluation tool that is possible to be developed at Vanderlande, taking into account the criteria for reliability, validity, and completeness? And also to answer research question 6: Based on the collected data from the pilot study, which factors affect the learning and transfer of training that happens due to training and development program at Vanderlande? This chapter will explain the methods used to find the answer of those research questions and the data result and analysis from the pilot study.

4.1 Research Methods to Implement and Evaluate Pilot Study

4.1.1 Intervention

To answer question 5 and 6, intervention step of the problem solving cycle was done by executing a pilot study to check the evaluation tool. With respect to the time dimension, there were three types of criteria in training evaluation based on Goldstein & Ford (2002): immediate criteria for which measures are available during the training program, proximal criteria for which measures can be obtained shortly after the training ends, and distal criteria for which measures can only be obtained after providing some considerable time after training to allow transfer of training. Due to time restrictions in this project, a longitudinal study to test the evaluation tool in each of those three time dimensions was not possible. Therefore, a cross-sectional study was used to carry out the pilot study, with data on all measures collected in the same questionnaire.

4.1.1.1 Participants selection

The pilot survey for the current project was not only measuring the perceived learning and transfer of training, but also the characteristics that are thought to affect the transfer of training. Therefore, it was also important that the training and development period of the target was not straying too far from the time when the target participants took part in the programs, but also allowing some time for transfer of training to happen. Therefore, to compromise between the participant's memory of condition during the actual implementation of the program and to allow some time for the on-the-job implementation to happen, the researcher targeted participants of training and development programs that had finished in the first half of 2016. The invitation to join the study was first sent to participants on July 11th, 2016 and participation was opened for 3 weeks.

4.1.1.2 Operationalization of the pilot survey

During the first six months of 2016, seven types of training programs had been conducted with different sets of interventions used to deliver the material. The total number of questions that the participants needed to answer depended on the interventions used in the program they followed.

The participants of the pilot study were asked to fill in ratings for variable items that were related to the training and development interventions that they followed previously and to their work environment. Furthermore, they were also asked to rate their perceived learning and transfer of training performance after the programs ended. Matell & Jacoby (1971) stated that optimal reliability is obtained with a 7-point scale, and therefore the rating scale used in the pilot study was in the form of 7-point scale ranging from Strongly Disagree to Strongly Agree.

The pilot survey was implemented in an online system and the participants received the link to the online survey in the personalized invitations that were sent by e-mail. Each of the seven types of training and development program had its own link to the online survey. The variables included in the survey were based on the variables mentioned in 3.5 with the addition of 3 general questions mandatory at Vanderlande:

1. Would you recommend this training program to your colleagues?
2. How would you rate this training program considering all its aspects? (Rating from 1-10)
3. Suggestions/ Further Remarks?

4.1.2 Evaluation

The final step was the evaluation step to answer research questions 5 and 6. In this step, the data that are gathered from the pilot survey were analyzed statistically to define its validity and reliability using multivariate analysis. Books by Hair Jr, et al. (2010) was the basis theory of the statistical method in this research. In evaluating the data, first of all, the obtained data were examined to exclude the missing data and outliers from the overall data set, and also to prevent the violations of assumptions underlying the statistical technique. Then, confirmatory factor analysis (CFA) and/or Exploratory Factor Analysis (EFA) was done to check whether the structure among variables that was used matched the basic theory that was used to design the questionnaire. The reliability of the scales was checked from the value of Cronbach's Alpha (α) for each factor. Measurements that were used in CFA was as explained in 3.2.2.

Furthermore, to answer research question 6, predictive validity was examined to test which factors were the predictors of learning and/or transfer of training performance at Vanderlande. For this part, correlation analysis and multiple regression analysis were done to analyze the relationship of training & development intervention characteristics with learning and transfer of training performance. Trainee characteristics, training design characteristics, and trainer characteristics were included in the analysis related to learning performance, and work environment characteristics were included in the analysis related to transfer of training performance. The regression coefficients represent the type of relationship (negative or positive) and the strength of the relationship with the learning and transfer of training performance. Based on the regression coefficient, the researcher also did an analysis to define the weight of each factor to construct the overall rate of the training or development program.

4.2 Data Result and Analysis

There were 298 employees participated in the pilot survey. During this period, personal reminders were sent weekly via e-mail to participants who had not completed filling in the pilot

survey. From the gathered data, 259 responses were deemed to be complete and used further in the analysis. The detail number of data used in the analysis is shown in Table 14.

Table 12 Number of Complete Data from Pilot Study

Training subject	Number of complete surveys	Percentage of the total invited participants
Based on Whole Training/Development Program		
Classroom Training	182	41%
E-learning	6	19%
Blended Classroom and E-Learning	25	63%
Personal Leadership (Classroom, Coaching, Peer group counseling, Outdoor training)	7	58%
Leadership I (Classroom, Coaching, Peer group counseling)	6	43%
Authentic leadership (Classroom, Peer group counseling, Outdoor training)	5	33%
Pit-Stop (Classroom, Business Case)	28	44%
Total	259	42%
Based on Questionnaire Section		
General Factors	259	
Classroom Intervention Factors	253	
E-Learning Intervention Factors	31	
Coaching Intervention Factors	13	
Peer Group Counseling Intervention Factors	18	
Outdoor Program Intervention Factors	12	
Business Case Intervention Factors	28	
Transfer of Training Factors	259	

For further analysis, the overall responses were divided into some parts as shown in Table 14. The first division was based on the questionnaire sections to define the final structure of the recommended evaluation tool. The second one was based on the whole training program types for measuring the effect of characteristics to the learning and transfer of training.

4.2.1 Confirmatory Factor Analysis (CFA) Based on Pilot Survey Data

The factor analysis was done for every set of Factors. It was not conducted for the whole variables together due to the division of General Factors, Special Factors, and Transfer of Training Factors. CFA was done for the General Factors, Classroom Training Factors, and Transfer of Training Factors. The CFA process was carried out using SPSS AMOS, while the accompanying EFA was done using SPSS. The full procedure will be explained for the CFA of General Factors to show the exact analysis. The report for other CFA will only mention the key outcomes of the process. The objective of this process was to find the most parsimonious factor structures that could fulfill the validity and reliability requirements.

4.2.1.1 CFA of General Factors

The CFA for General Factors was done based on the data of 259 participants. The initial variables and Factors used in the analysis are as follows:

<p>Motivation to Learn</p> <p>1. This training motivated me to learn as much as I can (MOT₁)</p> <p>2. This training made me willing to invest effort to improve job skills & competencies (MOT₂)</p> <p>3. Taking this training was a high priority for me (MOT₃)</p> <p>Content Relevance</p> <p>4. This training program will enhance my career development. (RLV₁)</p> <p>5. The training program helped me identify how to build on my current knowledge and skills. (RLV₂)</p> <p>Clear Goals</p> <p>6. I had specific, clear training goals to aim for during this training program. (GOAL₁)</p> <p>7. I knew which of the goals I wanted to accomplish were the most important (GOAL₂)</p> <p>Learning</p> <p>8. After this training, I know substantially more about the training contents than before. (LEARN₁)</p> <p>9. I learned a lot of new things in the training (LEARN₂)</p>

From the initial structure, some changes were made in the model as explained in Table 13. The changes include integration of two factors and removal of a variable.

Table 13 Changes in CFA General Factors

Changes	Explanation
1) Integration of Content Relevance and Motivation to Learn into “Motivation and Relevance”	Constructs Content Relevance and Motivation to Learn did not achieve Discriminant validity, i.e. the constructs are not distinct enough from each other. To check whether the variables of these two factors belonged to the same construct, an EFA was done to the variables of these two constructs. The result showed that the variables of Content Relevance and Motivation to Learn belonged to one factor. Detail result of EFA is presented in Appendix A2.1.1
2) Removal of variable “Taking this training was a high priority for me” (MOT ₃)	Standardized loading estimate much lower than 0.7, (0.56)

The path diagram of the initial and final structure after CFA can be seen in Figure 5. The standardized loading estimates of each variable are shown on the arrows from the factors. In the path diagrams, it can be seen how the changes in the structure could affect the value of factor loadings and correlation value between factors. For example, in the initial structure, there was a high correlation of 0.86 between Motivation to Learn and Content Relevance, and in the path diagram of the final structure, there was no more correlation above 0.8, and the standardized loading estimates of the variables related to Motivation and Relevance changed. From the fit measurements in Table 14, it can be seen that the final model has slightly better fit-value than the initial model. However, the final model could fulfill the requirements of valid and reliable model as shown in Table 15, while also contributed to shorten the number of variables. The explanation of validity measurements in Table 15 was based on Table 16 and 17 which sequentially shows the value of measurements required for defining the validity of a model as mentioned in Table 7. In Table 16, the value that did not fulfill the requirements are noted by the yellow highlights.

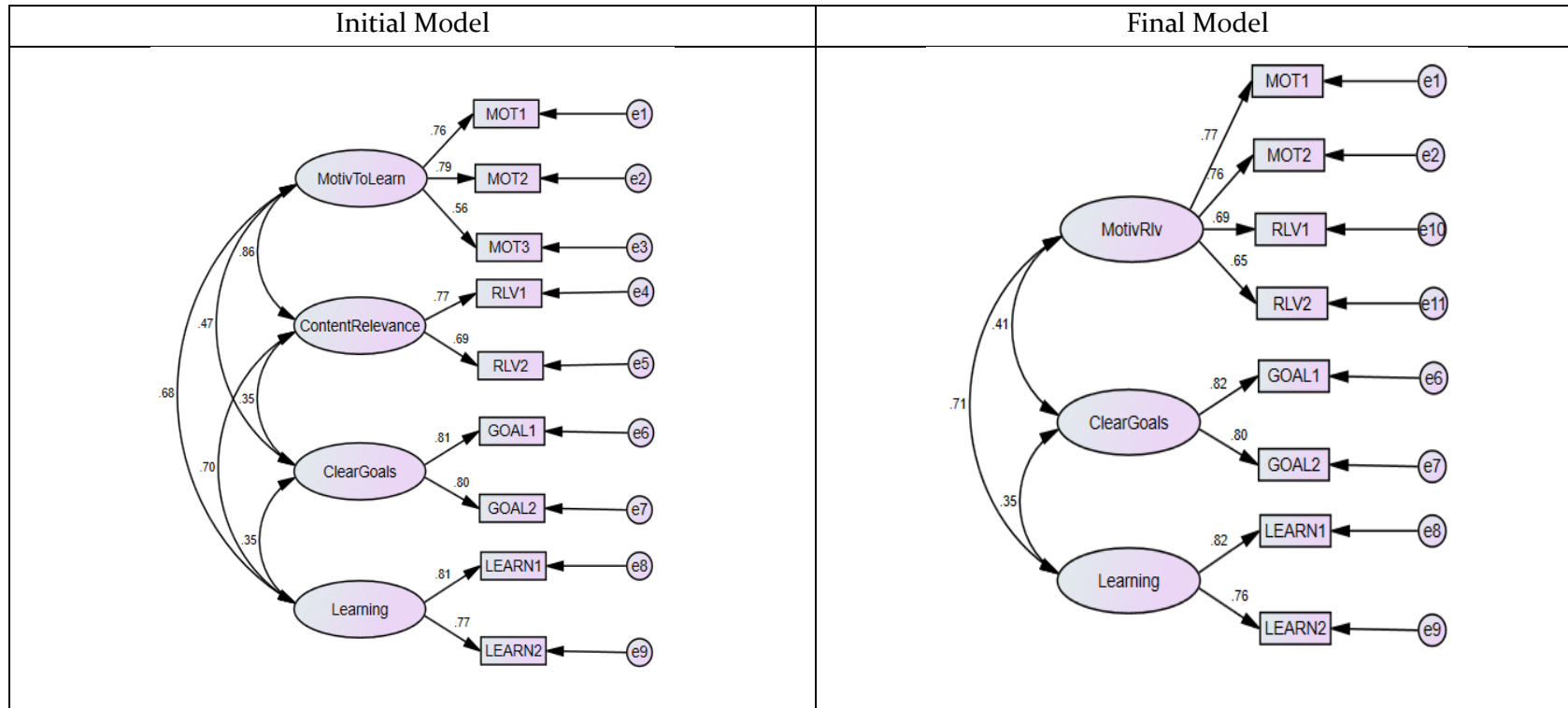


Figure 5 Path Diagram of CFA General Factors

Table 14 Fit-measurement for General Factors

Scale	Description	Initial	Final
CMIN/DF	Normed Chi-square Good fit: ~ 1 ; Acceptable fit: 1-3	2.232	1.928
RMSEA	≤ 0.01 excellent, ≤ 0.05 good, ≤ 0.08 mediocre fit	0.069	0.060
CFI	The closer to 1, the better fit CFI $> .95$: good fit	0.969	0.979
PNFI	The closer to 1, the better fit	0.552	0.581

Table 15 Validity Measurements CFA General Factors

Convergent Validity, consists of:	Initial Model (Based on Figure 5 & Table 16)	Final Model (Based on Figure 5 & Table 17)
Standardized Loading Estimates: Ideally 0.7 or higher	Variables that have standardized loading less than 0.7 are MOT ₃ (0.56) and RLV ₂ (0.69)	Variables that have standardized loading less than 0.7 RLV ₁ (0.69) and RLV ₂ (0.65) ~ approximately 0.7
AVE: Value for adequate convergent validity: 0.5 or higher	All constructs show adequate value of AVE for convergent validity	All constructs show adequate value of AVE for convergent validity
CR: Value for good reliability: 0.7 or higher	Motivation to Learn: 0.748 Clear Goals: 0.791 Content Relevance: <u>0.696</u> Learning: 0.773	Motivation & Relevance: 0.811 Clear Goals: 0.791 Learning: 0.773
Discriminant Validity, consists of:		
AVE > MSV	AVEs of Motivation to learn and Content Relevance are less than their MSVs	All construct's AVE are more than their MSV
AVE > ASV	AVE of all constructs are more than their ASV	All construct's AVE are more than their ASV
\sqrt{AVE} > inter-construct correlation.	\sqrt{AVE} s of Motivation to learn and Content Relevance are lower than correlation between them	All construct's \sqrt{AVE} are more than correlation between constructs.

Table 16 Validity & Reliability Measurement General Factors - Initial Model

	Cronbach's Alpha	CR	AVE	MSV	ASV	Clear Goals	Motivation to Learn	Content Relevance	Learning
Clear Goals	0.791	0.791	0.655	0.218	0.153	0.809			
Motivation to Learn	0.724	0.748	0.503	0.745	0.476	0.467	0.709		
Content Relevance	0.694	0.696	0.534	0.745	0.452	0.345	0.863	0.731	
Learning	0.772	0.773	0.630	0.493	0.360	0.348	0.682	0.702	0.794

Table 17 Validity & Reliability Measurement General Factors - Final Model

	Cronbach's Alpha	CR	AVE	MSV	ASV	Clear Goals	Motivation & Relevance	Learning
Clear Goals	0.791	0.791	0.655	0.169	0.336	0.809		
Motivation & Relevance	0.810	0.811	0.519	0.503	0.145	0.411	0.720	
Learning	0.772	0.773	0.631	0.503	0.311	0.348	0.709	0.794

Color code:

Green: Correlation between constructs (factors) ; **Blue:** Square root of AVE (\sqrt{AVE})

The final structure of the General Factors consists of the below factors and variables:

<p>Motivation & Relevance</p> <ol style="list-style-type: none"> 1. This training motivated me to learn as much as I can 2. This training made me willing to invest effort to improve job skills & competencies 3. This training program will enhance my career development. 4. The training program helped me identify how to build on my current knowledge and skills. <p>Clear Goals</p> <ol style="list-style-type: none"> 5. I had specific, clear training goals to aim for during this training program. 6. I knew which of the goals I wanted to accomplish were the most important <p>Learning</p> <ol style="list-style-type: none"> 7. After this training, I know substantially more about the training contents than before. 8. I learned a lot of new things in the training

4.2.1.2 CFA of Classroom Intervention Factors

The CFA for Classroom Intervention Factors was done based on the data of 253 participants. The initial variables and variables after CFA are shown in Table 18.

Table 18 Initial and Final Structure CFA Classroom Training

Initial Structure	Remarks	Structure after CFA
<p>Trainer Knowledge & Experience ($\alpha=0.923$)</p> <ol style="list-style-type: none"> 1. The trainer had sufficient experience with the topics covered during the training (TRAIN₁) 2. The trainer had sufficient knowledge about the topics covered during the training. (TRAIN₂) 	Stay as initial structure.	<p>Trainer Knowledge & Experience ($\alpha=0.923$)</p> <ol style="list-style-type: none"> 1. The trainer had sufficient experience with the topics covered during the training (TRAIN₁) 2. The trainer had sufficient knowledge about the topics covered during the training. (TRAIN₂)
<p>Fellow Trainee Support ($\alpha=0.668$)</p> <ol style="list-style-type: none"> 3. I could exchange knowledge easily and quickly with other course participants (FELLOW₁) 4. Learning in groups and cooperation with other trainees were fostered in the course (e.g., by group activities, discussions etc.) (FELLOW₂) 5. During the training, I got feedback from other training participants about the way I was applying the new knowledge and skills. (FELLOW₃) 	Item no. 3 was removed, and the other items were integrated into "Support, Feedback & Practice"	<p>Support, Feedback & Practice ($\alpha=0.838$)</p> <ol style="list-style-type: none"> 3. Learning in groups and cooperation with other trainees were fostered in the course (e.g., by group activities, discussions etc.) (FELLOW₂) 4. During the training, I got feedback from other training participants about the way I was applying the new knowledge and skills. (FELLOW₃) 5. During the training, I got feedback from the trainer about the way I was applying the new knowledge and skills (FEEDPRA₁) 6. There were sufficient exercises during the training to properly understand how I must apply the learned knowledge and skills into practice. (FEEDPRA₂)
<p>Feedback & Practice ($\alpha=0.377$)</p> <ol style="list-style-type: none"> 6. During the training, I got feedback from the trainer about the way I was applying the new knowledge and skills (FEEDPRA₁) 7. There were sufficient exercises during the training to properly understand how I must apply the learned knowledge and skills into practice. (FEEDPRA₂) 	Item no. 8 was removed, and the other items were integrated into "Support, Feedback & Practice"	

Initial Structure	Remarks	Structure after CFA
8. The trainer(s) used lots of examples that showed me how I could use my learning on the job (FEEDPRA ₃)		
Motivation to Transfer ($\alpha=0.896$) 9. I am happy to try out the skills that I have learnt at the training program (MTRANS ₁) 10. I am confident in my ability to use the new skills at work. (MTRANS ₂) 11. My training performance will have a direct impact on my results at my job. (MTRANS ₃) 12. This training program will increase my personal productivity. (MTRANS ₄) 13. I believe that this training program will help me do my current job better. (MTRANS ₅)	Item no. 10 was removed, and the other items stayed in this factor.	Motivation to Transfer ($\alpha=0.897$) 7. I am happy to try out the skills that I have learnt at the training program (MTRANS ₁) 8. My training performance will have a direct impact on my results at my job. (MTRANS ₃) 9. This training program will increase my personal productivity. (MTRANS ₄) 10. I believe that this training program will help me do my current job better. (MTRANS ₅)

From the initial structure, some changes were made in the model as explained in Table 19. The changes were made through four models to increase the model-fit and validity of the construct.

Table 19 Changes in CFA Classroom Intervention Factors

Changes	Explanation
1) Integration of Feedback & Practice and Fellow Trainee Support	The constructs Feedback & Practice and Fellow Trainee Support did not achieve sufficient discriminant validity. An EFA was done to the variables of these two constructs. The result showed that the variables of Feedback & Practice and Fellow Trainee Support belonged to one factor. Detailed results of EFA are presented in Appendix A2.1.4
2) Removal of variable “I could exchange knowledge easily and quickly with other course participants” (FELLOW ₁)	Has cross loading value Based on EFA in Appendix A2.1.4
3) Removal of variable “The trainer(s) used lots of examples that showed me how I could use my learning on the job” (FEEDPRA ₃)	Based on EFA it belongs to its own factor. But since it is not possible to have only one item in a latent construct (factor), FEEDPRA ₃ was also removed from the structure.
4) Removal of variable “I am confident in my ability to use the new skills at work” (MTRANS ₂)	Has standardized loading estimates less than 0.7 and less related to the context of motivation. More related to self-efficacy. Variable related to self-efficacy also has been represented by MTRANS ₁ which was not overpowered by the other variables

Table 20 Fit-measurement for Classroom Intervention Factors

Scale	Description	Initial Model	Final Model
CMIN/DF	Normed Chi-square Good fit: ~ 1 ; Acceptable fit: 1-3	1.957	1.741
RMSEA	≤ 0.01 excellent, ≤ 0.05 good, ≤ 0.08 mediocre fit	0.062	0.054
CFI	The closer to 1, the better fit CFI $> .95$: good fit	0.966	0.983
PNFI	The closer to 1, the better fit	0.718	0.706

The result in Table 20 shows that the final model had better fit-value except for PNFI. Based on Hair Jr, et al (2010), simpler model (i.e. model with fewer number of parameters to estimate) is expected to have higher PNFI, but in this case, the PNFI of the final model was slightly lower than the initial structure. The researcher considered that this may happen due to the integration of the variables of two factors that had low reliability (Cronbach Alpha's value) into one factor, thus increasing the complexity of the new integrated factor as part of the final model. This may also happen because the final model had low degrees of freedom (df), because PNFI value was measured by using the ratio of df used by a model to the total available df. In the CFA of General Factors and Transfer of Training Factors, the final structure also had lower df compared to the initial model, but the difference was small. In the final model of Classroom Training Factors, the df was reduced almost half from the initial model. However, the value of PNFI still fulfills the minimum acceptable value of 0.5 (Chen, Yen, & Hwang, 2012). The final model increased the Cronbach Alpha's value for every constructs to become acceptable. The validity test of the initial and final model in Appendix 2 showed that the final model improved the model by changing the non-valid model to become a valid model as it fulfills all validity requirements. The final structure also succeeded in removing three variables.

4.2.1.3 CFA of Transfer of Training Factors

The CFA for Transfer of Training Factors was done based on the data of 259 participants. The initial variables and variables after CFA are shown in Table 21.

Table 21 Initial and Final Structure CFA Transfer of Training Factors

Initial Structure	Remark	Structure after CFA
<p>Opportunity to perform ($\alpha=0.736$)</p> <ol style="list-style-type: none"> 1. I got opportunities to use this training in my job (OPPOR₁) 2. I had access to the resources I need to apply the training. (OPPOR₂) 3. There are sufficient resources available to allow me to use the skills that I acquired in training (OPPOR₃) 	<p>Item no. 1 was moved to "Opportunity and Implementation of Transfer"</p>	<p>Transfer Resource Availability ($\alpha=0.770$)</p> <ol style="list-style-type: none"> 1. I had access to the resources I need to apply the training. (OPPOR₂) 2. There are sufficient resources available to allow me to use the skills that I acquired in training (OPPOR₃)
<p>Supervisor support ($\alpha=0.925$)</p> <ol style="list-style-type: none"> 4. My supervisor met me to discuss ways to apply training on the job (SPV₁) 5. My supervisor met me regularly to work on problems I may be having in trying to use my training. (SPV₂) 6. My supervisor set goals for me that encourage me to apply my training on the job. (SPV₃) 7. My supervisor let me know I am doing a good job when I use my training. (SPV₄) 8. My supervisor helped me to set realistic goals for my work performance based on my training (SPV₅) 	<p>Stay as initial structure.</p>	<p>Supervisor support ($\alpha=0.925$)</p> <ol style="list-style-type: none"> 3. My supervisor met me to discuss ways to apply training on the job (SPV₁) 4. My supervisor met me regularly to work on problems I may be having in trying to use my training. (SPV₂) 5. My supervisor set goals for me that encourage me to apply my training on the job. (SPV₃) 6. My supervisor let me know I am doing a good job when I use my training. (SPV₄) 7. My supervisor helped me to set realistic goals for my work performance based on my training (SPV₅)

Colleague Support ($\alpha=0.828$) 9. My colleagues appreciate me using new skills I have learned in training (CLG ₁) 10. My colleagues encourage me to use the skills I have learned in training (CLG ₂) 11. My colleagues are patient with me when I try out new skills or techniques at work. (CLG ₃)	Item 11 was removed.	Colleague Support ($\alpha=0.864$) 8. My colleagues appreciate me using new skills I have learned in training (CLG ₁) 9. My colleagues encourage me to use the skills I have learned in training (CLG ₂)
Transfer of training ($\alpha=0.919$) 12. I successfully manage to apply the training contents in my everyday work (TOT ₁) 13. In my everyday work, I often use the knowledge I gained in the training. (TOT ₂) 14. I can accomplish the job tasks better using new knowledge and skills acquired from the training course. (TOT ₃)	Item "I got opportunities to use this training in my job" from previously factor Opportunity to Perform was added.	Opportunity & Implementation of Transfer ($\alpha=0.905$) 10. I got opportunities to use this training in my job (OPPOR ₁) 11. I successfully manage to apply the training contents in my everyday work (TOT ₁) 12. In my everyday work, I often use the knowledge I gained in the training. (TOT ₂) 13. I can accomplish the job tasks better using new knowledge and skills acquired from the training course. (TOT ₃)

From the initial structure, some final changes were made in the model as explained in Table 22. The changes were made through five models to increase the model-fit and validity of the construct.

Table 22 Changes in CFA Transfer of Training Factors

Changes	Explanation
1) Integration of Opportunity to Perform and Transfer of Training	Constructs Opportunity to Perform and Transfer of Training did not achieve sufficient Discriminant validity. The result of an EFA showed that variable OPPOR ₁ and variables of Transfer of Training belonged to one factor. Detailed results of EFA are presented in Appendix A2.1.7
2) Removal of variable "My colleagues are patient with me when I try out new skills or techniques at work." (CLG ₃)	Has standardized loading estimates less than 0.7

Table 23 Fit-measurement for Transfer of Training Factors

Scale	Description	Initial Model	Final Model
CMIN/DF	Acceptable fit: 1-3	<u>3.080</u>	2.521
RMSEA	≤0.01 excellent, ≤0.05 good, ≤0.08 mediocre fit	<u>0.090</u>	0.077
CFI	CFI >.95: good fit	0.943	0.964
PNFI	The closer to 1, the better fit	0.716	0.712

The result in Table 23 shows that the final model had slightly better fit value compared to the initial model. The bigger improvement that the final model had was that it fulfilled all the validity requirements as mentioned in Appendix 2, while the initial model was lacking in convergent and discriminant validity. The reliability of the factors in the final model which was shown by the Cronbach Alpha's values were acceptable, while also succeeded in removing one variable from the structure.

4.2.2 Exploratory Factor Analysis (EFA) Based on Pilot Survey Data

There were only 31 and 28 responses for E-learning Factors and Business Case Factors. CFA should be done to the whole structure to see all the correlations and fit of the whole model. CFA also could not show which variables are cross-loading to determine the structure. Therefore, EFA was done for E-learning Factors and Business Case Factors. Based on Hair Jr. et al. (2010), the general rule for number of sample size required for a Factor Analysis is at least five times the number of variables to be analyzed. So, in E-learning factors and Business Case Factors, the EFA was done per two factors.

4.2.2.1 EFA of E-learning Factors

The EFA was done based on 31 cases, with the initial and final structures shown in Table 24

Table 24 Initial and Final Structure EFA E-learning Factors

Initial Structure	Remark	Structure After EFA
<p>Content Quality ($\alpha=0.697$) 1. The content of the training program was up-to-date. (CQUAL₁) 2. The equipment/training material used in this training was up-to-date (CQUAL₂)</p>	<p>Addition of variable “The user interface (e.g., navigation, layout, font style and color) of the e-learning site is well designed”</p>	<p>Content Quality ($\alpha=0.744$) 1. The content of the training program was up-to-date. (CQUAL₁) 2. The equipment/training material used in this training was up-to-date (CQUAL₂) 3. The user interface (e.g., navigation, layout, font style and color) of the e-learning site is well designed (TECH₁)</p>
<p>Technical System Quality ($\alpha=0.578$) 3. The user interface (e.g., navigation, layout, font style and color) of the e-learning site is well designed (TECH₁) 4. The e-learning site could quickly load all the texts and graphics/videos (TECH₂) 5. The e-learning site functioned well all the time (TECH₃)</p>	<p>Item 3 was moved to Content Quality</p>	<p>Technical System Quality ($\alpha=0.804$) 4. The e-learning site could quickly load all the texts and graphics/videos (TECH₂) 5. The e-learning site functioned well all the time (TECH₃)</p>
<p>Trainee’s control ($\alpha=0.772$) 6. The e-learning program let me decide on my own at what times and where I am learning (e.g., at the office, at home) (CONTROL₁) 7. The e-learning program let me decide on my own about the pace of learning and the use of learning strategies (CONTROL₂) 8. The e-learning offered opportunities to increase my knowledge and to monitor my success (e.g., via tests, exercise) (CONTROL₃)</p>	<p>Stay as initial structure</p>	<p>Trainee’s control ($\alpha=0.772$) 6. The e-learning program let me decide on my own at what times and where I am learning (e.g., at the office, at home) (CONTROL₁) 7. The e-learning program let me decide on my own about the pace of learning and the use of learning strategies (CONTROL₂) 8. The e-learning offered opportunities to increase my knowledge and to monitor my success (e.g., via tests, exercise) (CONTROL₃)</p>

EFA Content Quality and Technical System Quality

Variables	Factor Loadings	
	Content Quality	Technical System Quality
1) The content of the training program was up-to-date	.923	
2) The equipment/training material used in this training was up-to-date	.714	
3) The user interface (e.g., navigation, layout, font style and color) of the e-learning site is well designed	.822	
4)The e-learning site could quickly load all the texts and graphics/videos		.872
5)The e-learning site functioned well all the time		.948

KMO and Bartlett's Test		Remarks
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.506	Above 0.5
Bartlett's Test of Sphericity	Sig. .000	Significant

EFA Content Quality and Trainee's control

Variables	Factor Loadings	
	Trainee's Control	Content Quality
1) The content of the training program was up-to-date		.788
2) The equipment/training material used in this training was up-to-date		.954
3) The e-learning program let me decide on my own at what times and where I am learning (e.g., at the office, at home)	.686	
4) The e-learning program let me decide on my own about the pace of learning and the use of learning strategies	.953	
5) The e-learning offered opportunities to increase my knowledge and to monitor my success (e.g., via tests, exercise)	.823	

KMO and Bartlett's Test		Remarks
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.626	Above 0.5
Bartlett's Test of Sphericity	Sig. .000	Significant

EFA Technical System Quality and Trainee's control

	Factor Loadings	
	Trainee's Control	Technical System Quality
1) The e-learning program let me decide on my own at what times and where I am learning (e.g., at the office, at home)	.655	
2) The e-learning program let me decide on my own about the pace of learning and the use of learning strategies	.823	
3) The e-learning offered opportunities to increase my knowledge and to monitor my success (e.g., via tests, exercise)	.904	
4) The user interface (e.g., navigation, layout, font style and color) of the e-learning site is well designed	.697	
5)The e-learning site could quickly load all the texts and graphics/videos		.923
6)The e-learning site functioned well all the time		.900

KMO and Bartlett's Test		Remarks
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.592	Above 0.5
Bartlett's Test of Sphericity	Sig. .000	Significant

From the results, it can be seen that variable “The user interface (e.g., navigation, layout, font style and color) of the e-learning site is well designed” (TECH₁) loaded in Trainee’s control and Content Quality rather than on Technical System Quality. Therefore, TECH₁ is a potential candidate to be restructured. Moving TECH₁ from Technical System Quality to Content Quality where it had the highest loading value increased the reliability of both constructs. In terms of content, the researcher also considered that the context of TECH₁ was more matched to Content Quality than Trainee’s Control.

4.2.2.2 EFA of Business Case Factors

The EFA was done based on 28 cases. The process was similar to the EFA in 4.2.2.1. The initial and final structure are as follow:

Initial Structure	Remarks	Structure after CFA
<p>Transfer design ($\alpha=0.828$)</p> <ol style="list-style-type: none"> The activities and exercises the trainers used helped me to know how to apply my learning on the job (TDESIGNB₁) It is clear to me that the people conducting the training understand how I will use what I learn. (TDESIGNB₂) The way the trainer(s) taught the material made me feel more confident I could apply it. (TDESIGNB₃) 	<p>Integrated with Fidelity to become “Fidelity of Design”</p>	<p>Fidelity of Design ($\alpha=0.850$)</p> <ol style="list-style-type: none"> The activities and exercises the trainers used helped me to know how to apply my learning on the job (TDESIGNB₁) It is clear to me that the people conducting the training understand how I will use what I learn. (TDESIGNB₂) The way the trainer(s) taught the material made me feel more confident I could apply it. (TDESIGNB₃)
<p>Fidelity ($\alpha=0.787$)</p> <ol style="list-style-type: none"> The methods used in training are very similar to how we do it on the job (FIDEL₁) The situations used in training are very similar to those I encounter on my job (FIDEL₂) 		<ol style="list-style-type: none"> The methods used in training are very similar to how we do it on the job (FIDEL₁) The situations used in training are very similar to those I encounter on my job (FIDEL₂)
<p>Feedback & Practice ($\alpha=0.190$)</p> <ol style="list-style-type: none"> During the training, I got feedback from the trainer about the way I was applying the new knowledge and skills (FPBUSS₁) The trainer(s) used lots of examples that showed me how I could use my learning on the job (FPBUSS₂) 		<p>Feedback & Practice ($\alpha=0.190$)</p> <ol style="list-style-type: none"> During the training, I got feedback from the trainer about the way I was applying the new knowledge and skills (FPBUSS₁) The trainer(s) used lots of examples that showed me how I could use my learning on the job (FPBUSS₂)

From the EFA result, it was found that Transfer design and Fidelity belonged to 1 factor. Then the possible modification for this construct was to merge Transfer Design and Fidelity into one factor. Looking at the content of those two factors, the researcher considered that the variables are all related to how the design of the training program can give insights to the participants

about the implementation of the knowledge to the job. Therefore, the variables of Transfer Design and Fidelity was recommended to be integrated to one factor “Fidelity of Design”.

Feedback & Practice had a very low Cronbach’s alpha of 0.190, but was not cross-loading to any other factors. Following the result from Classroom Training’s CFA, removal of FPBUSS₂ was also a candidate for modification. However, a construct can not only consist of 1 variable. Therefore, a modification or development of new variables to construct Feedback & Practice can also be another option to do in future research. Since there were only limited data available for this analysis, it will be better to do re-analysis when more sufficient data are available.

4.2.3 Sets of Factors and Variables Without Factor Analysis

Interventions Coaching, Outdoor Program, and Peer Group Counseling did not have enough data to enable Factor Analysis (number of responses respectively: 13, 12, 18). Thus, until more data become available, the final structure of those factors would follow its initial structure based on Literature Review and Interviews as follows:

Coaching Intervention Factors

Coach Support

1. The coach had sufficient experience with the topics covered during the mentoring/coaching process. (COACH₁)
2. The coach had sufficient knowledge about the topics covered during the mentoring/coaching process. (COACH₂)

Trust to coach

3. I believed my coach would keep what we discuss in the strictest confidence (TRUSTC₁)
4. I trusted my coach (TRUSTC₂)
5. Open and honest communication was emphasized between my coach and me (TRUSTC₃)

Coach commitment

6. My coach was dedicated to perform the coaching process (COMMIT₁)
7. My coach was fully present for each coaching session (COMMIT₂)
8. My coach was fully engaged in the coaching assignment (COMMIT₃)

Feedback & Practice

9. During the coaching, I got feedback from the coach about the way I was applying the new knowledge and skills (FPCOACH₁)
10. My coach used lots of examples that showed me how I could use my learning on the job (FPCOACH₂)
11. My coach helped me to improve my effectiveness in daily practice (FPCOACH₃)
12. My coach stimulated my learning process. (FPCOACH₄)

Outdoor Program Intervention Factors

Transfer design

1. The activities and exercises the trainers used helped me to know how to apply my learning on the job (TDESIGN₁)
2. It is clear to me that the people conducting the training understand how I will use what I learn. (TDESIGN₂)
3. The way the trainer(s) taught the material made me feel more confident I could apply it. (TDESIGN₃)

Feedback & Practice

4. During the training, I got feedback from the trainer about the way I was applying the new knowledge and skills (FPOUT₁)
5. The trainer(s) used lots of examples that showed me how I could use my learning on the job (FPOUT₂)

Peer Group Counseling Intervention Factors

Trust to peer

1. I believed my peer group member(s) would keep what we discuss in the strictest confidence (TRUSTP₁)
2. I trusted my peer group member(s) (TRUSTP₂)
3. Open and honest communication was emphasized between my peer group member(s) and me (TRUSTP₃)

Feedback & Practice

4. During the training, I got feedback from my peer group member(s) about the way I was applying the new knowledge and skills (FPPEER₁)
5. My peer group member(s) helped me to improve my effectiveness in daily practice. (FPPEER₂)
6. My peer group member(s) stimulated my learning process. (FPPEER₃)
7. My peer group member(s) used lots of examples that showed me how I could use my learning on the job. (FPPEER₄)
8. During the training, I got feedback from the trainer about the way I was applying the new knowledge and skills (FPPEER₅)

4.3 Predictive Validity Analysis

This section described the result of multiple regression analysis for Classroom Training, Blended Learning, and Pit-Stop Development Program. This part serves as the answer of Research Question no. 6. The multiple regression was done for three programs that were considered to have quite sufficient data to be analyzed (number of responses respectively: 182, 25, 28).

4.3.1 Classroom Training Analysis

Three Dependent Variables (DVs) that were analyzed: Rate (“How would you rate this training program considering all its aspects?”), Learning, and Opportunity and Implementation of Transfer. The independent variables (IVs) that were included for each dependent variable based on previous studies. The IVs for Rate were similar to the variables used in regression analysis for DV Rate in the research by Radhakrishnan (2015). Based on Literature review by Priyananda (2016), the factors that relate to Learning were only Trainer Knowledge & Experience and Support, Feedback & Practice. However, the other factors that were also used as IVs in measuring Rate were also included to see whether there was relation between Learning and all factors that are related to the situation during the training and development programs. Based on Holton (1996), Learning (Level 2 of Kirkpatrick) is the antecedent of Motivation to Transfer, therefore, Motivation to Transfer is excluded from the IVs of Rate (Level 1 of Kirkpatrick) and Learning, but will be included for predicting Opportunity and Implementation of Transfer (Level 3 Kirkpatrick). For Opportunity and Implementation of Transfer of Training, all factors were included.

Table 25 Dependent and Independent Variables for Classroom Training

Dependent Variable	Independent Variables
Rate (Level 1 Kirkpatrick)	Motivation & Relevance; Clear Goals; Trainer Knowledge & Experience; Support, Feedback & Practice;
Learn (Level 2 Kirkpatrick)	Motivation & Relevance; Clear Goals; Trainer Knowledge & Experience; Support, Feedback & Practice;
Opportunity and Implementation of Transfer (Level 3 Kirkpatrick)	Motivation & Relevance; Clear Goals; Trainer Knowledge & Experience; Support, Feedback & Practice; Motivation to Transfer; Learning; Transfer Resource Availability; Supervisor Support; Peer Support

Before starting the multiple regression analysis, an EFA was done to the variables of outcome construct Learning and Opportunity & Implementation of Transfer. The result showed that those variables were indeed belonged to 2 different construct: 1) Learning and 2) Opportunity and Implementation of Transfer of Training. The details can be seen in Appendix A3.1. The multiple regression will be divided into two sections, for hard and soft skill programs.

4.3.1.1 Analysis for Hard Skill Classroom Training Program

A correlation analysis was first done with the result shown in Table 26. The result showed significant correlation for almost all variables, and all Independent Variables had significant correlations to the three Dependent Variables. The Cronbach Alpha's value also showed that all variables were reliable with all value higher than 0.6.

Table 26 Correlation Table for Hard Skill Classroom Training

	Mean	Std. Deviation	1	2	3	4	5	6	7	8	9	10	11
1) Motivation & Relevance	5.341	.841	(0.782)										
2) Clear Goals	5.169	1.137	.265**	(0.816)									
3) Trainer Knowledge & Experience	6.259	.827	.178*	.226**	(0.928)								
4) Support, Feedback & Practice	4.991	1.240	.310**	.271**	.232**	(0.832)							
5) Motivation to Transfer	5.095	1.146	.718**	.391**	.260**	.302**	(0.892)						
6) Transfer Resource Availability	5.334	.995	.360**	.303**	.293**	.408**	.458**	(0.738)					
7) Supervisor Support	3.961	1.400	.482**	.178*	.011	.405**	.491**	.316**	(0.917)				
8) Peer Support	3.037	.940	.414**	.282**	.152	.357**	.621**	.347**	.630**	(0.877)			
9) Learning	5.559	1.038	.440**	.246**	.365**	.226**	.516**	.238**	.220**	.356**	(0.768)		
10) Opportunity & Implementation of Transfer	4.967	1.271	.532**	.320**	.202*	.416**	.737**	.535**	.527**	.627**	.407**	(0.898)	
11) Training Rate	7.534	1.062	.441**	.352**	.470**	.452**	.477**	.385**	.349**	.438**	.522**	.471**	

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Diagonal values with brackets show Cronbach's alpha

Number of Data: 145

After the correlation analysis, multiple regression analysis was done based on 145 complete data.

Table 27 Multiple Regression Hard Skill Classroom Training - DV: Rate

	Unstandardized Coefficients		Standardized Coefficients	Sig.	Collinearity Statistics	
	B	Std. Error	Beta		Tolerance	VIF
(Constant)	1.612	.605		.009		
1) Motivation & Relevance	.298**	.090	.236**	.001	.764	1.308
2) Clear Goals	.163**	.062	.174**	.010	.887	1.127
3) Trainer Knowledge & Experience	.392**	.088	.305**	.000	.833	1.200
4) Support, Feedback & Practice	.208**	.063	.243**	.001	.730	1.369

R² value :45% ; Note: ** for p<0.01; * for p<0.05

Table 28 Multiple Regression Hard Skill Classroom Training - DV: Learning

	Unstandardized Coefficients		Standardized Coefficients	Sig.	Collinearity Statistics	
	B	Std. Error	Beta		Tolerance	VIF
(Constant)	.155	.631		.806		
1) Motivation & Relevance	.579**	.094	.469**	.000	.764	1.308
2) Clear Goals	.072	.065	.079	.270	.887	1.127
3) Trainer Knowledge & Experience	.336**	.092	.268**	.000	.833	1.200
4) Support, Feedback & Practice	-.033	.065	-.040	.612	.730	1.369

R² value: 37.5% ; Note: ** for p<0.01; * for p<0.05

Table 29 Multiple Regression Hard Skill Classroom Training - DV: OIT

	Unstandardized Coefficients		Standardized Coefficients	Sig.	Collinearity Statistics	
	B	Std. Error	Beta		Tolerance	VIF
(Constant)	.138	.540		.798		
1) Motivation & Relevance	-.061	.113	-.040	.592	.369	2.708
2) Clear Goals	-.085	.058	-.076	.148	.764	1.309
3) Trainer Knowledge & Experience	-.099	.084	-.064	.243	.690	1.449
4) Support, Feedback & Practice	.078	.060	.076	.195	.612	1.635
5) Motivation to Transfer	.730**	.097	.658**	.000	.269	3.716
6) Learning	-.017	.076	-.014	.821	.535	1.869
7) Transfer Resource Availability	.264**	.072	.207**	.000	.663	1.509
8) Supervisor Support	.059	.060	.065	.327	.481	2.078
9) Peer Support	.184*	.093	.136*	.050	.436	2.292

R² value: 72% ; Note: ** for p<0.01; * for p<0.05

From the above result, it can be seen that all four variables had significant regression effects on Rate, together explained 45% of the variance. Motivation & Relevance and Trainer Knowledge & Experience had a significant effect on Learning, explaining 37.5% of the variance.

Furthermore, Opportunity and Implementation of Transfer (OIT) was only significantly affected by Motivation to Transfer and the work environment factors Transfer Resource Availability and Peer Support. Motivation to Transfer had a very high value of regression coefficient, however, its VIF value was also quite high (3.716). Variance Inflation Factor (VIF) is a coefficient that shows how severe the multicollinearity in the model. The high value of VIF of Motivation to Transfer showed that it is highly correlated with other independent variables. Based on literature study by Burke & Hutchins (2007), Motivation to transfer was a significant predictor of positive transfer of training, and was influenced by motivation to learn, self-efficacy, utility reaction, and transfer climate (work environment characteristics). Given this concept, it was decided to test whether there was a mediation effect of Motivation to Transfer between the relation of other factors and OIT. A mediation effect happens when a third construct (factor) intervenes between the IV and DV (Hair et.al., 2010). This effect will create an indirect effect (shown by arrow a and b in Figure 6) as an addition to direct effect (arrow c' in Figure 6).

The mediation effect was then tested using PROCESS add-ins by Hayes (2016). The illustration of the mediation effect can be seen in Figure 6. The result showed that Motivation to Transfer was indeed a mediator between other IVs to DV Opportunity and Implementation of Transfer. It had partial mediation effects (i.e. the case when direct effect is reduced after addition of mediator) for IV Supervisor Support, Peer Support, Transfer Resource Availability, and Support, Feedback & Practice. The complete mediation effects (i.e. the case when direct effect no longer available after addition of mediator) applied to Motivation & Relevance, Clear Goals, Learning, and Trainer Knowledge & Experience. The complete mediation results can be seen in Appendix A3.2. Due to the emergence of Motivation to transfer as mediator, another regression analysis between IVs to OIT was done by excluding Motivation to Transfer, and the summary result can be seen in Table 29.

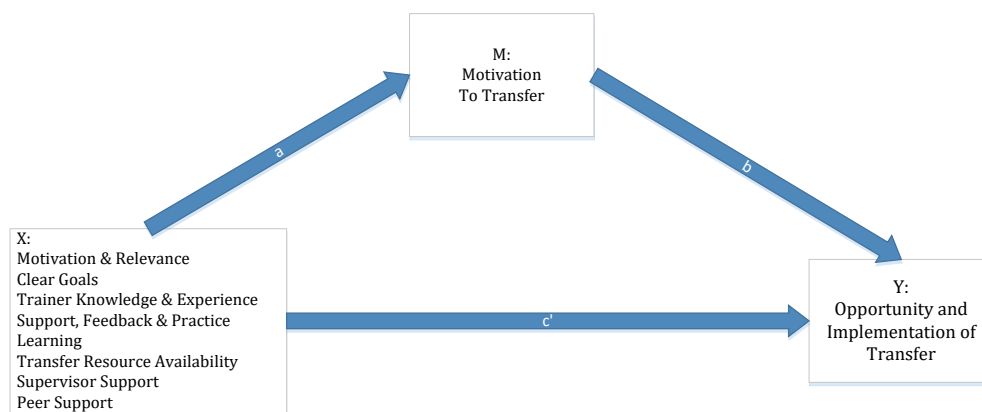


Figure 6 Mediation of Motivation to Transfer in Hard Skill Classroom Training

Table 29 summarized the factors that were significantly related to the dependent variables. There are four types of regression effects that are mentioned in Table 29: direct effects of IVs to Rate, direct effects of IVs to Learn, direct effects of IVs to Opportunity and Implementation of Transfer (OIT), and the total effect of each IV to OIT via mediation of Motivation to Transfer (Total effect = direct effect (c') + mediation effect (ab)). The total effects via mediation was taken from a mediation analysis which included only one IV, one DV, and one Mediator because the mediation effect could only be measured for every single IV. The mediation analysis was done one by one to each IVs. Figure 7 illustrates the above regression effects scheme.

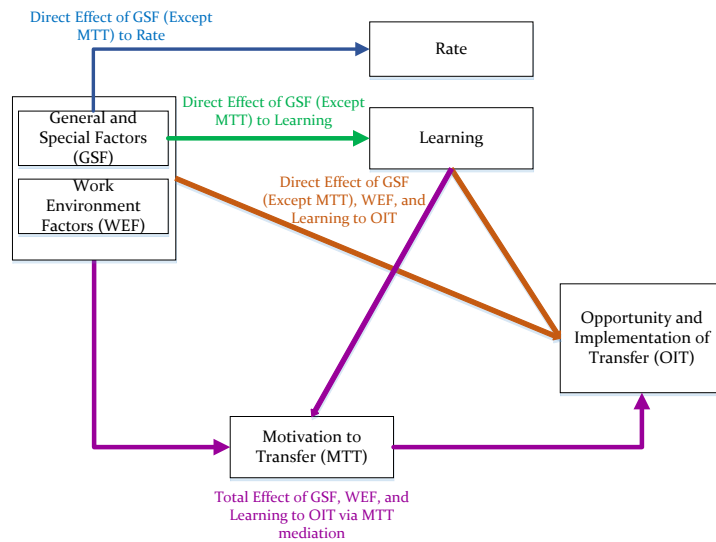


Figure 7 Regression Effects

Summary of factors significantly related to Dependent variables:

Table 30 Summary Significant Factors of Hard Skill Classroom Training

Dependent Variable	Significant Independent Variable(s)	B
Direct effect to Rate	1) Motivation & Relevance	0.298
	2) Clear Goals	0.163
	3) Trainer Knowledge & Experience	0.392
	4) Support, Feedback, & Practice	0.208
Direct effect to Learn	1) Motivation & Relevance	0.579
	2) Trainer Knowledge & Experience	0.336
Direct effect to OIT	1) Motivation & Relevance	0.387
	2) Transfer Resource Availability	0.327
	3) Peer Support	0.420
Total Effect to OIT through Mediation via Motivation to Transfer	1) Motivation & Relevance	0.935
	2) Clear Goals	0.356
	3) Trainer Knowledge & Experience	0.299
	4) Support, Feedback & Practice	0.401
	6) Learning	0.569
	7) Transfer Resource Availability	0.415
	8) Supervisor Support	0.522
9) Peer Support	0.870	

To define the weighted overall training program rating, below is the proposed structure:

The factors that would be included here were the factors that related directly to training program implementation in General Factors and Classroom Training Factors which excluded variables from Transfer of Training Factors. For the Transfer of Training Factors, the researcher recommended to see the average score of each factor to analyze which factors should be improved. Factor Motivation to Transfer was also excluded because it was a mediating variable which shows that this factor was a result from other factors rather than something that related

directly to the implementation of programs. All of the IVs used in this analysis were on the same, comparable scale of 1 to 7. Therefore, the B value can be used for explanatory purpose (Hair, et al, 200). As practically the weight will be assigned to an unstandardized unit rate, then the value that was used for predicting the weight should be based on the unstandardized coefficient of regression analysis (B).

The proportion for measuring total B value was taken from the proportion of effect of Rate, Learn, and OIT to OIT. A multiple regression was done with Rate and Learning as IVs and OIT as the DV. Since Rate used the unstandardized scale between 1 to 10, the scale of rate should be adjusted to 1 to 7 scale. The adjustment followed the process explained by IBM (2010) as the developer of SPSS mentioned in Appendix 4. The result of multiple regression showed that Rate had the B value of 0.558, higher than the B value of Learning: 0.379. Since OIT is the outcome and it still needed to be included in the proportion, the B value for OIT was assigned to be 1.00. The proportion then made between these three B values to the total B value of Rate, Learn, and OIT. The proportion became 29% for Rate, 20% for Learning, and 51% for OIT.

The measurement for factor's weight is as follows:

Table 31 Weight Measurement for Hard Skill Classroom Training

Factor	B value to Rate (29% x B)	B value to Learning (20% x B)	B value to OIT (51% x B)	Total value	Proportioned total B value (Weight)
1) Motivation & Relevance	0.298 x 29% = 0.086	0.579 x 20% = 0.116	0.935 x 51% = 0.477	0.679	37%
2) Clear Goals	0.047	0	0.182	0.228	13%
3) Trainer Knowledge & Experience	0.113	0.067	0.152	0.333	19%
4) Support, Feedback & Practice	0.060	0	0.204	0.264	15%
5) Learning	-	-	0.290	0.290	16%
Total				1.796	100%

Note: When a factor had both the direct and mediation effect to OIT, the value that was used is the total mediation effect since it explained the relation better. The weighted overall training rate will be following the form of rate from 1 to 7.

4.3.1.2 Analysis for Soft Skill Classroom Training Program

A correlation analysis was first done with the result shown in Appendix A3.6. The result showed that Support, Feedback & Practice did not have a significant correlation with Learning and OIT, while Supervisor Support had no significant correlation with Rate. The Cronbach Alpha's value also showed that all variables were reliable with all value higher than 0.6.

From the result of multiple regression, soft skill classroom training showed a lower number of significant factors that affect the dependent variables. This might be related to the low sample size for Soft Skill (N=37). Mediation test was also done which showed complete mediation from Motivation to Transfer for Motivation & Relevance, Clear Goals, Learning, Transfer Resource Availability, Supervisor Support, and Peer Support. The detail mediation results can be seen in

Appendix A3.3. The summary of factors significantly related to Dependent Variables is shown in Table 32. In this table, it can be seen that Motivation & Relevance and Trainer Knowledge & Experience had significant regression effects on Rate, together explained 57.2% of the variance, and only Trainer Knowledge & Experience had significant regression effects on Learning, explaining 41.2% of the variance. Motivation to Transfer was again found to be the mediator between the other factors to Opportunity & Implementation of Transfer (OIT). The complete results of mediation effect can be seen in Appendix A3.3. The VIF are acceptable in all regression model.

Table 32 Summary Significant Factors of Soft Skill Classroom Training

Dependent Variable	Significant Independent Variable(s)	B	β	R ²
Direct Effect to Rate	1) Motivation & Relevance	0.980	0.436	57.2%
	2) Trainer Knowledge & Experience	0.861	0.381	
Direct Effect to Learning	1) Trainer Knowledge & Experience	0.445	0.418	41.2%
Direct Effect to Opportunity & Implementation of Transfer (OIT)	1) Transfer Resource Availability	0.488	0.394	65.6%
	2) Peer Support	0.936	0.566	
	3) Clear Goals	0.286	0.253	
Total Effect to OIT through Mediation via Motivation to Transfer	1) Motivation & Relevance	0.982	0.531	
	2) Clear Goals	0.516	0.457	
	3) Learning	0.565	0.465	
	4) Transfer Resource Availability	0.650	0.525	
	5) Supervisor Support	0.461	0.522	
	6) Peer Support	1.074	0.650	

The proportion for measuring the weight of each factor followed the proportion in Hard Skill Classroom Training because the regression analysis did not result in significant value as the sample size was low. For Support, Feedback, & Transfer, as it did not have any significant relation to any of the dependent variables, the researcher assigned a number for the proportion as the lowest number compared to the value of other factors. Rather than having 0% weight for the insignificant factor, the researcher considered that it is important to have weights for all the factors to define the overall training rate as all factors were found to be important for training program based on the literature review and this research had limited data for analysis. To keep the weight meaningful (i.e. not becoming very small) for the insignificant factor, the assigned B value was defined to be close enough to the lowest B value by rounding down the lowest B value. The weights are presented in Table 33.

Table 33 Weight for Soft Skill Classroom Training

Factor	Total B value	Proportioned total B value (Weight) Soft Skill	Proportioned total B value (Weight) Hard Skill
1) Motivation & Relevance	0.785	41%	37%
2) Clear Goals	0.263	14%	13%
3) Trainer Knowledge & Experience	0.338	18%	19%
4) Support, Feedback & Practice	0.200 (assigned number)	11%	15%
5) Learning	0.288	16%	16%
Total	1.855	100%	100%

4.3.1.3 Comparison to Previous Research at Vanderlande

In this research, factors that were found to have significant effect to training rate were Motivation & Relevance, Clear Goals, Trainer Knowledge & Experience, and Support, Feedback & Practice for Hard Skill programs. And for Soft Skill programs, the significant effect to training rate was given by Motivation & Relevance and Trainer Knowledge & Experience. The founding of this research was similar to what was found in the research by Radakrishnan (2015), and even with more significant factors. In Radakrishnan (2015), Practice & Feedback and Trainer Support were found to be significant for Hard Skill programs, and Trainer Support were found to be significant for Soft Skill programs. Those two factors consisted of variables that were also used to construct factors Trainer Knowledge & Experience and Support, Feedback & Practice.

4.3.2 Blended Training Analysis

This analysis was done based on 25 cases. A correlation analysis in Appendix A3.7 showed significant correlations between some of the independent variables and dependent variables. The Cronbach Alpha's value also showed that all variables had value higher than 0.6. The dependent and Independent variables that were included in the multiple regression analysis were the same as in Classroom Training, with the addition of factor Content Quality, Technical System Quality, and Trainee's Control as Independent variables for all three Dependent Variables.

The summary of factors significantly related to Dependent Variables is shown in Table 34. In this table, it can be seen that Motivation & Relevance and Trainer Knowledge & Experience had significant regression effects on Rate, together explained 79.2% of the variance, and only Motivation & Relevance had significant regression effects on Learning, explaining 60.4% of the variance. Motivation to Transfer was found to be the mediator between the other factors to Opportunity & Implementation of Transfer (OIT). The complete results of mediation effect can be seen in Appendix A3.4. The VIF are acceptable in all regression model.

The weights for measuring the overall training rating are presented in Table 35. The proportion for measuring the weight of each factor followed the proportion in Hard Skill Classroom Training. The total B value of Clear Goals, Support, Feedback & Practice, Technical System Quality, and Trainee's Control were assigned by rounding down the lowest B value. The results show that Motivation & Relevance had the highest weight.

Table 34 Summary Significant Factors of Blended Learning

Dependent Variable	Significant Independent Variable(s)	B	β	R ²
Direct Effect to Rate	1) Motivation & Relevance	0.742	0.627	79.2%
	2) Trainer Knowledge & Experience	0.427	0.450	
Direct Effect to Learning	1) Motivation & Relevance	0.674	0.657	60.4%
Direct Effect to Opportunity & Implementation of Transfer (OIT)	1) Motivation to Transfer	0.457	0.408	83.3%
	2) Peer Support	0.776	0.539	
Total Effect to OIT through Mediation via Motivation to Transfer	1) Motivation & Relevance	0.927	0.753	
	2) Content Quality	0.755	0.493	
	3) Learning	0.565	0.471	
	4) Supervisor Support	0.621	0.644	
	5) Peer Support	1.105	0.767	

Table 35 Weight for Blended Learning

Factor	Total B value	Weight
1) Motivation & Relevance	0.822	41%
2) Clear Goals	0.100 (assigned)	5%
3) Trainer Knowledge & Experience	0.123	6%
4) Support, Feedback & Practice	0.100 (assigned)	5%
5) Learning	0.288	14%
6) Content Quality	0.385	19%
7) Technical System Quality	0.100 (assigned)	5%
8) Trainee's Control	0.100 (assigned)	5%
Total	2.019	100%

4.3.3 Pit-Stop Development Program Analysis

This analysis was done based on 28 cases. A correlation analysis showed significant correlations between some of the independent variables and dependent variables. The dependent and Independent variables that were included in the multiple regression analysis were the same as in Classroom Training, with the addition of Business Case Factors as Independent variables for all three Dependent Variables.

The summary of factors significantly related to Dependent Variables is shown in Table 36. In this table, it can be seen that Trainer Knowledge & Experience had significant regression effects on Rate, explaining 49.9% of the variance, and Support, Feedback & Practice had significant regression effects on Learning, explaining 60% of the variance. Motivation to Transfer was found to be the mediator between the other factors to Opportunity & Implementation of Transfer (OIT). The complete results of mediation effect can be seen in Appendix A3.5. The VIF are acceptable in all regression model.

Table 36 Summary Significant Factors of Pit-Stop Program

Dependent Variable	Significant Independent Variable(s)	B	β	R ²
Direct Effect to Rate	1) Trainer Knowledge & Experience	0.567	0.378	49.9%
Direct Effect to Learning	1) Support, Feedback & Practice	0.804	0.502	60%
Direct Effect to Opportunity & Implementation of Transfer of Training (OIT)	1) Motivation & Relevance	0.491	0.301	84.4%
	2) Fidelity of Design	0.425	0.437	
Total effect to OIT through Mediation via Motivation to Transfer	1) Motivation & Relevance	1.277	0.784	
	2) Clear Goals	0.286	0.534	
	3) Fidelity of Design	1.051	0.792	
	4) Learning	0.593	0.663	
	5) Transfer Resource Availability	0.684	0.656	
	6) Supervisor Support	0.334	0.556	
	7) Peer Support	0.738	0.622	

The weights for measuring the overall training rating are presented in Table 37. The proportion for measuring the weight of each factor followed the proportion in Hard Skill Classroom Training. The total B value of Feedback & Practice was assigned by rounding down the lowest B value. The results show that Motivation & Relevance had the highest weight.

Table 37 Weight for Pit-Stop Program Evaluation

Factor	Total B value	Weight
1) Motivation & Relevance	0.651	31%
2) Clear Goals	0.146	7%
3) Trainer Knowledge & Experience	0.164	8%
4) Support, Feedback & Practice	0.160	8%
5) Learning	0.302	15%
6) Fidelity of Design	0.536	26%
7) Feedback & Practice	0.100 (assigned)	5%
Total	2.060	100%

4.4 Summary of Predictive Validity

Table 38 shows the summary of predictive effects between factors and the training or development program. In the table, factors that were found to have effects on Rate are defined as "R", factors that were found to have effects on learning are defined as "L", and factors that were found to have effects on Opportunity and Implementation of Transfer of Training through mediation of Motivation to Transfer are defined as "TM". Motivation to Transfer was defined as the mediator of the other factors to Opportunity and Implementation of Transfer of Training (T). The summary of weights for each factor for every type of program also mentioned in Table 37. This summary explains the answer for research question 6.

Table 38 Summary of Predictive Validity

No	Factors	Hard Skill Classroom Training		Soft Skill Classroom Training		Blended Learning		Pit-Stop Program	
		Predictive Validity	Weight	Predictive Validity	Weight	Predictive Validity	Weight	Predictive Validity	Weight
General Factors									
1	Motivation & Relevance (4)	R, L, TM	37%	R, TM	41%	R, L, TM	41%	TM	31%
2	Clear Goals (2)	R, TM	13%	TM	14%		5%	TM	7%
3	Learning (2)	TM	19%	TM	18%	TM	14%	TM	15%
Classroom Intervention Factors									
4	Trainer Knowledge & Experience (2)	R, L, TM	15%	R, L	11%	R	6%	R	8%
5	Support, Feedback & Practice (4)	R, TM	16%		16%		5%	L	8%
6	Motivation to Transfer (4)	Mediator to T		Mediator to T		Mediator to T		Mediator to T	
E-Learning Intervention Factors									
7	Content Quality (3)					TM	19%		
8	Technical System Quality (2)						5%		
9	Trainee's Control (3)						5%		
Business Case Intervention factors									
10	Fidelity of Design (5)							TM	26%
11	Feedback & Practice (2)								5%
Transfer of Training Factors									
12	Transfer Resource Availability (2)	TM		TM				TM	
13	Supervisor Support (5)	TM		TM		TM		TM	
14	Colleague Support (2)	TM		TM		TM		TM	

CHAPTER 5

DISCUSSION

This chapter provides the summary of findings from this research and the recommendation for implementation of new evaluation tool. Suggestion for future research is also mentioned to give Vanderlande insights on future implementation of new research regarding the evaluation tool. A conclusion is provided at the end of this chapter regarding the overall research.

5.1 Summary of Research Findings

This research had the objective to design a training and development programs evaluation tool that is applicable to be used across different interventions. The research started with defining factors to be included in the evaluation tool, which was then followed by the design of the new evaluation tool and evaluating the tool in a pilot study. The factors chosen to be included in the new evaluation tool were based on literature and suggestions by training and development experts at Vanderlande. Variables that construct the factors were determined based on validated scales from previous studies and Confirmatory Factor Analysis (CFA) of current evaluation tool using data from February to May 2016. The initial design of the new evaluation tool consisted of different templates of factors and variables customized for six interventions that are currently used at Vanderlande. The explanation of the new design of evaluation tool which was related to the answer of each research question 1, 2, 3, and 4 is shown in Chapter 3. A cross-sectional pilot study was carried out for seven different types of training and development programs that were done during the first half of 2016. The result of the study was used to evaluate the new design of evaluation tool. The result provided very limited data for some of the program and intervention templates, thus the factor analysis was done to three of the intervention templates and the general factors and transfer of training factors. There were three types of training outcomes that were investigated for predictive validity which correlate to the first three levels of Kirkpatrick's model, Level 1 – Reaction (Training Rate), Level 2- Learning (Learning), and Level 3 – Behavior (Transfer of Training).

5.1.1 Validity and Reliability of Evaluation Tool

This project succeeded in designing evaluation tool that could be applicable across different types of training and development programs. The factors and variables that were included in the pilot study fulfilled the content validity requirement. Based on Hair, Jr., et. al. (2010), content validity, or also called as face validity is the extent to which the content of the variables that represent a factor is consistent with the definition of the factor. This type of validity is based on the researcher's and experts' judgement. The factors that were chosen to be included in the pilot evaluation tool were based on literature study, which then ensured by interview with Training and Development experts at Vanderlande. The variables that construct the factors were defined based on validated scales from past research and CFA of current evaluation tool by Radhakrishnan (2015). All scales were found to be reliable based on the Cronbach Alpha's value. The scales were also reviewed by the experts during interview sessions, and the final set of variables for the pilot study was also reviewed by the Talent Development Manager. Three sets of intervention factors that had sufficient number of data (General Factors, Classroom Intervention Factors, and Transfer of Training Factors) were tested for construct validity by Confirmatory Factor Analysis, and the final structure of those three sets of factors fulfilled all requirements of construct validity as stated in Chapter 4.2.1. For E-learning factors and Business

Case Factors, the validity was tested by partial Exploratory Factor Analysis, and the validity was achieved in the final structure as stated in Chapter 4.2.2. All factors in those statistically valid scales were also found to have acceptable Cronbach's Alpha, thus ensuring the reliability of the scales. Due to limited number of responses, the statistical test for validity and reliability of Coaching Factors, Outdoor Program Factors, and Peer Group Counseling Factors could not be done in this project. However, the structure of those factors had the content validity, thus can also be used for evaluation at Vanderlande.

To answer research question 6, the predictive validity test was done for three types of training and development programs at Vanderlande that had quite sufficient data for analysis, which were the Hard and Soft Skill Classroom Training Program, Blended Learning Training Program, and Pit-Stop Development Program. From the summary of predictive effects in Table 37 (Chapter 4.4), it can be seen that each factors could give different effects to outcomes in programs that uses different types of interventions. In this project, Motivation to Transfer was found to be the mediator of other factors to Opportunity and Implementation of Transfer (OIT). For the general factors, based on literature review in Chapter 2, Motivation to Learn, Content Relevance and Clear Goals are factors that have effects on Transfer of Training in general. Learning was also found to be affecting Transfer of Training by Kraiger et. al. (1993). In this project, Motivation & Relevance which consisted of variables related to Motivation to Learn and Content Relevance, Clear Goals, and Learning were found to have effects on OIT through mediation for almost all types of programs, except that Clear Goals did not have effects to OIT in Blended Learning program. From this, it can be concluded that the factors included in General Factors were indeed had effects on the outcomes of training or development programs in general.

Motivation & Relevance showed effects on all three outcomes for hard skill classroom training and Blended learning while also showing effect on Rate for soft skill classroom training. Clear Goals also showed significant effect to Rate in hard skill classroom training. This shows that Motivation & Relevance played a big role in increasing the outcomes of training, which means that the motivation to learn and match between the training content and the competency that the participants need will affect to what extent they would be able to implement the knowledge and skills to on-the-job behavior. With this information, Vanderlande should be more aware to assign employees to the training or development program based on their needs and avoid assigning employees to non-relevant programs. Van der Horst (2013) did a research at Vanderlande where he found that there were cases where employees were assigned to the wrong training program due to difficulties in assessing soft-skill competencies needed by employees. Van der Horst then develop a competency self-assessment tool to solve this problem. Vanderlande should be able to manage this relevancy issue by assessing the needs of participants before the program. It can be done by using the participants' manager's judgement or by using a tool like the one that was developed by Van der Horst.

For the Classroom Training, Trainer Knowledge & Experience and Support, Feedback & Practice found to affect OIT through mediation for the hard skill classroom training. This effect is aligned with the literature study in chapter 2. However, this effect did not appear in the soft skill classroom training and the other programs that use other interventions as an addition of classroom intervention. Literature also suggested that Trainer's communication and support has effect on learning performance which was proved in this project by the significant effect of

Trainer Knowledge & Experience for both hard and soft-skill classroom training. Trainer Knowledge & Experience were also found to affect participant's satisfaction towards all inspected programs as shown by significant effect to Rating. Support, Feedback & Practice were found to have significant effect to Rating for hard skill classroom training and to Learning on Pit-stop program. The effect of Support, Feedback & Practice to the outcomes was different with the literature study which stated that it should have effect on the transfer of training for training and development programs in general. Moreover, in this project Motivation to Transfer were found to have high significant effect to OIT in all inspected programs. Later it was found that this happened because Motivation to Transfer was the mediator of relation between almost all factors in all inspected programs with OIT. This also shows that Motivation to Transfer happens as another outcome from the other factors. Therefore, it was decided to not include Motivation to Transfer for measuring the weighted overall rating of programs.

For E-learning interventions factors, the only factors that was found to have an effect on OIT through mediation was Content Quality in Blended Learning. Business case interventions factors also only showed one factor that have effect on OIT through mediation, which was Fidelity of Design, the integration of variables of Fidelity and Transfer Design in Pit-Stop program. This might be related to the limited number of data available for analysis. Finally, all the factors that were included in Transfer of Training Factors had effects on OIT through mediation for almost all types of inspected programs, except that Transfer Resource Availability did not have effect on OIT for Blended learning. This shows that the work environment factors are very important in achieving transfer of training at Vanderlande. With this information, Vanderlande should be able to encourage the supervisors/managers to support their employees and also to instruct them to ensure that the peer support is available when the participants are implementing their new knowledge and skills.

Overall, the result shows that the different use of interventions in a training or development program lead to different significant factors affecting the outcomes. Therefore, the set of variables used for evaluating a training or development program should be matched with the interventions used in the program.

5.1.2 Structure Parsimony and Weighted Overall Rating

In this project, CFA and EFA were done to define the final structure of each set of factors. For each type of training or development program, the content of the tool for evaluating the implementation of the program is consisted of the General Factors and the special factors based on the interventions used in the program. Below is the summary of the number of variables that construct the evaluation tool for seven types of training and development programs that are currently available at Vanderlande which also answers the research questions 5.

Table 39 Number of Variables in Final Structure

No	Name of Training/Development Program	No. of Variables
1	Classroom Training	21
2	E-Learning	19
3	Blended Learning (Classroom Training and E-learning)	29
4	Pit-Stop (Classroom Training and Business Case)	28
5	Authentic Leadership (Classroom Training, Peer Group Counseling, Outdoor Program)	34

No	Name of Training/Development Program	No. of Variables
6	Leadership I (Classroom Training, Coaching, Peer Group Counseling)	41
7	Personal Leadership (Classroom Training, Coaching, Peer Group Counseling, Outdoor Program)	46

Based on Table 39, it can be seen that there are different number of variables assigned to evaluation tool of different programs. For the Classroom Training, compared to the current evaluation tool by Radhakrishnan (2015) which was developed based on classroom training, the number of variables could be reduced from thirty one to twenty one which is a reduction of 32%, while still maintaining the validity and reliability of the evaluation tool. For E-learning and Blended Learning and Pit-Stop, the number of variables was also less than the current evaluation tool, while maintaining the validity, reliability, and completeness/relevancy of content related to the interventions. Therefore, it can be concluded that this project succeeded in developing a more parsimonious evaluation tool for those three programs compared to current evaluation tool. For the other three Leadership programs that included the intervention types that could not be analyzed due to limitation of data, more parsimonious sets of variables could not be achieved. However, as stated in 5.1.1, the structure of those three factors had the content validity and more complete (i.e. cover all the variables needed to evaluate each type of interventions).

This project also resulted in one set of evaluation variables related to the work environment and perceived transfer of training. The number of variables for this evaluation is thirteen, and this evaluation should be done after allowing some times for the transfer to happen. Kirkpatrick (2006) stated that having three months after the program is the best adjustments to send another survey to evaluate the transfer of training and how supportive the participant's work environment is.

Moreover, the determination of weights for weighted overall score was successfully carried out for hard and soft skill classroom training programs, Blended Learning, and Pit-Stop program. From the weights for all three programs, Motivation & Relevance had the highest weight which again showed that it is very important that the training program matched the competency requirements of the participants. For Classroom Training, other factors than Motivation & Relevance had similar weights. For Blended Learning, the special factor of E-learning: Content Quality has the second highest weight, and for Pit-stop program, the special factor of Business Case: Fidelity of Design has the second highest weight. These second highest weights had quite big difference to the next level of weight. This shows that the use of different types of interventions resulted in different weight structure.

5.1.3 Limitation of the Project

During the implementation of this project, there were some limitations to the process. The first limitation was that the pilot test was executed as a cross-sectional study rather than a longitudinal study due to time limitation. Longitudinal study would give more accurate explanation of the cause and effect relation between factors and outcomes. Another limitation was that there was limited data available for some types of interventions and programs so that not all pilot survey results can be statistically analyzed. This project was also done in a scope of one company (Vanderlande) and the participants of the pilot study were mostly from Vanderlande's main offices in The Netherlands. Therefore, more research should be done in

other companies or to get more participants from other branches of Vanderlande in the world to ensure the generality of the results.

5.2 Recommendations for Practical Implementation of New Evaluation Tool

For the implementation of the new evaluation tool, there are two key recommendations as explained in the following paragraphs.

Currently, Vanderlande carries out its training evaluation via an internal online web-site called Coachview. This system provides feature for sending evaluation invitation to training participants through an e-mail that includes the link that will direct the participants to the evaluation survey. Past research showed mixed results on which one between online and offline (paper-based) survey could attract more response rate (Gunter et. al., 2002). However, having personalized mail that addressed to a specific individual can increase the response rate for both the online and offline survey. For practicality, the researcher considered that using online survey is a more favorable option as it can automatically store the survey data to the system. If offline survey is used, a manual effort to put the data to the system for further analysis (i.e. calculation of average and weighted total score) is required, which have the risk of human error in the process, especially with so many programs to manage and large number of participants. Gunter et. al. (2002) stated that the number of attempts made to contact the participants can also increase the response rate. Therefore, using follow-up personal email is recommended to be applied to increase the response rate of the online survey. This already implemented during the pilot study.

The current online evaluation system is able to generate summary reports consisting of the average rate of training and details on number and percentage of participants who choose each choice of all variables. Another report that can be generated from the system is in the form of excel-compatible file that includes all answer from participants. The structure of the file is not always organized, especially when the survey gets a lot of response. For example, the variable is not always in the same order as shown in the online survey. Moreover, both forms of report do not generate the output that is required to draw conclusions effectively. The output that are recommended to be put in the report are:

- 1) The average score of each variables
- 2) The average score of each factors, including the factors of outputs: Rating, Learning
- 3) The weighted overall rating based on weighted score of the factors
- 4) The average scores of weighted overall rating of all training programs that uses the same interventions with the program that is being evaluated
- 5) Remarks on which factors scores fall below average of all programs or below the minimum score that is determined by Vanderlande.

Output no. 4 is aligned with the need of Vanderlande Academy (VA) to be able to compare the results of the evaluation of the training programs. The evaluation tool should also be able to recode the rating choice from word type into number type (i.e. from “Strongly disagree to Strongly agree” into “1 to 7”). Another option is to have the rate as number from the beginning. The report for Transfer of Training Factors can also follow the above structure, but excluding the weighted overall rating. The illustration figure of the report can be seen in Appendix 4. As the final rating will also be in the form of scale 1 to 7, the interpretation of the scale can be: 1:

Totally Unacceptable, 2: Unacceptable, 3: Slightly unacceptable, 4: Neutral, 5: Slightly acceptable, 6: Acceptable, 7: Perfectly acceptable.

Beside the above key recommendations, there are also some detail practical recommendations:

1. Sending the survey to the participants in the suitable time

As this research was done in the form of cross-sectional study, the participants filled in all variables at one time. In the implementation, there are two different times that are required to fill in the survey. The first one, is right after the training program. The evaluation that needs to be sent at this time includes the General Factors, the special factors for each type of intervention, and the three general questions. The second time is related to the Transfer of Training. Based on Kirkpatrick (2006), there should be some time available after the training or development program to allow the transfer of training to happen. Kirkpatrick (2006) also stated that three months after the program is the best adjustments to send the survey related to transfer of training

2. Placing several questions in one page

Based on the feedback that was given by the participants of pilot study, it will be more comfortable for the participants if they do not have to go through too many pages to answer all the survey variables. The current condition is that participants have to click on “next page” as much as the number of questions in the evaluation survey. This might also be the reason why not all participants are willing to complete the survey. Manfreda, Batagelj, & Vehovar (2002) stated that when a web questionnaire presents one question per page, the danger of not finishing all the questions is potentially high due to longer time required to go through all questions and more actions to do (i.e clicking “next button several times). Moreover, in the pilot survey, the information of the type of intervention related to the variables were put only before the first variable related to the respective intervention. Putting one question per page have the potential of participants forgetting which intervention related to the variable they are answering after getting through some pages. And going back to the previous pages to find the information will take more time.

Placing all items in one page has the potential to produce high correlation between questions (Couper, Traugott, & Lamias, 2001). Grouping related variables have the potential to reduce the time required to complete the survey by requiring only one orientation to answer the questions (Couper et al, 2001). Therefore, the researcher recommends to separate the page for the variable of General Factors and each type of Intervention factors. For example, the evaluation survey of participants of Blended Learning should have 4 pages consisting of page for General Factors, page for Classroom Intervention Factors, page for E-learning Factors, and the last page for the general 3 questions of rate, willingness to recommend the training program, and suggestions for the program. To avoid too much scrolling in one page, rather than having the response choice in vertical order, it will be beneficial if the responds to the answer can be put horizontally side by side or under the variables.

3. Use the suitable factors for different type of interventions.

Vanderlande should be able to use the different set of variables templates depending on the interventions used in a training or development program that has been found in this research. This will give deeper understanding of the result of program implementation, and

can give Vanderlande more insights into how to improve their training and development programs. It can also be useful to notify the training participants that they will receive evaluation surveys regarding each type of intervention they followed in the program. With this notification, the participants are expected to be more aware of the program implementation and be able to give accurate answers to the evaluation survey.

4. Utilizing the result of Training and Development Evaluation

The implementation of the new evaluation tool at two different times based on the suitable factors will give Vanderlande two types of insight. The first related to the actual implementation of training or development programs. With the scores that Vanderlande gets from this evaluation, an analysis to improve the program application can be carried out. Based on the report illustrates in Appendix 4, Vanderlande should be able to see the weighted score for each factors and the weighted overall rating of the program. When looking at the weighted overall rating, Vanderlande can see whether the overall rating of the program falls below or above the average overall rating and Vanderlande can also set a minimum weighted overall rating that is wanted to be achieved. When the rating does not achieve the minimum rating value, Vanderlande can also see which factor weighted score is low or falls below the average factor weighted score. And then the average score of variable rating can show which variable precisely that has low score.

Currently, when a training program does not achieve the minimum score that Vanderlande determined (Minimum self-rating: 8), Vanderlande will discuss it directly with the trainer or the organization that manages the training program. In using this new evaluation tool, Vanderlande should be able to see that the problem does not always come from the Trainer or the organizer of the program. For example, when a weighted overall rating score is low, and it is found that the cause of the low score comes from the variables related to the relevance of the program, then it is better to review the competency assessment rather than directly bringing up the problem to the trainer or organizer. For the low score related to the special factors of the interventions, Vanderlande can share the information to the internal trainer or external training organizer, so that discussions regarding the program can be carried out in more detail.

The second insight is related to the transfer of training. With the transfer of training evaluation that will be given to the participants after giving some time to allow it to happen, Vanderlande can get information on whether the participants are actually able to implement the knowledge and skills they get from the training or development program. Insights into the participant's work environment can also be gathered from this evaluation. Vanderlande can use this information to communicate with the participants and their managers to be able to increase the probability of transfer of training.

5. Pay attention to the aspect of motivation to learn and relevancy between training program and the required competency of participants

Based on the determination of weights, factor Motivation & Relevance has the highest weight in all programs that had been inspected. Therefore, Vanderlande should make sure that the participants follow the suitable training programs based on their needs and also to encourage the trainers to motivate the participants during the program.

5.3 Possible Improvements for Future Research

The limitation of this research was that it was conducted within a limited period of time, and the pilot study itself was done in the period that was not beneficial for the research, so that there were some types of interventions and programs that could not be fully analyzed due to limited number of participants. Therefore, there are some improvements that can be done for the future research:

1. The number of participants were small for the intervention types apart from Classroom Intervention. This was also due to the fact that almost all training programs at Vanderlande are done using classroom interventions. The data that was gathered for other interventions was not sufficient to carry out a CFA to determine the best set of variables and parsimonious structure for those interventions. The research for special interventions clearly requires more data to get a valid and more reliable result. Based on Hair et al. (2010), a factor analysis requires at least 5 cases for each variable it tests, and a minimum absolute sample size of 50. Analysis of the predictive validity of the other programs that had not been analyzed in this research due to data limitation should also be analyzed when sufficient data is gathered.
2. The number of questions can be too high when a program uses a lot of interventions. When sufficient data is gathered, there can be an analysis of the effect of all factors in each intervention type to training outcomes (Rate, Learning, Transfer of Training). With this result, Vanderlande can choose which factors are best to include in the evaluation tool based on the significant effect it gives to the training outcomes. The factor with the highest significant prediction value of transfer of training should be chosen to include in the evaluation tool. If there is no such factor, the outcome level can be lowered to Learning or Rating.
3. The measurement of learning and transfer of training in this project is based on subjective opinion of the participants. To have clearer insights to this aspects, the evaluation can also be extended by including the learning and transfer of training evaluation by the participants' supervisor/manager or subordinate that works alongside the participants daily.

5.4 Conclusion

This research focused on the design of a new evaluation tool for the training and development programs at Vanderlande that is valid, reliable, applicable across different types of training and development interventions, and have a feature of weighted overall score based on weighted mean scores of factors related to the different types of interventions used in the program. This research succeeded to fulfill all those requirements for three types of training and development programs. The results of analysis of these three programs showed that for different types of intervention, the factors that affect the training outcomes also varied. There were three other development programs evaluations that included interventions that only had limited number of data, thus was not able to be tested statistically for the validity, reliability and structure. However, the structure of these three sets of evaluations fulfilled the face validity as explained in 5.1.1. The determination of weights also could not be carried out for these three development programs. This research also succeeded in extending the scope of the evaluation level from only subjective reaction to the program (personal rating) to the perceived learning and transfer of training.

References

- Aguinis, H., & Kraiger, K. (2009). Benefits of Training and Development for Individuals and Teams, Organizations, and Society. *Annual Review of Psychology*, 60, 451-474.
- Alliger, G. M., Tannenbaum, S. I., Bennett Jr., W., Traver, H., & Shotland, A. (1997). A meta-analysis of the relations among training criteria. *Personnel Psychology*, 50, 341-358.
- Alvarez, K., Salas, E., & Garofano, C. M. (2004). An Integrated Model of Training Evaluation and Effectiveness. *Human Resource Development Review*, 385-416.
- Arthur Jr., W., Bennett Jr., W., Edens, P. S., & Bell, S. T. (2003). Effectiveness of Training in Organizations: A Meta-Analysis of Design and Evaluation Features. *Journal of Applied Psychology*, 88, 234-245.
- Baldwin, T., & Ford, J. K. (1988). Transfer of training: A review and directions for future research. *Personnel Psychology*, 41, 63-105.
- Barron, A. E., Dawson, K., & Yendol-Hoppey, D. (2009). Peer coaching and technology integration: an evaluation of the Microsoft peer coaching program. *Mentoring & Tutoring: Partnership in Learning*, 83-102.
- Berg, M. E., & Karlsen, J. T. (2012). An evaluation of management training and coaching. *Journal of Workplace Learning*, 177-199.
- Blume, B. D., Ford, J. K., Baldwin, T. T., & Huang, J. L. (2010). Transfer of Training: A Meta-Analytic Review. *Journal of Management*, 1065-1105.
- Britton, L. R., & Anderson, K. A. (2010). Peer coaching and pre-service teachers: Examining an underutilised concept. *Teaching and Teacher Education*, 306-314.
- Burke, L. A., & Hutchins, H. M. (2007). Training Transfer: An Integrative Literature Review. *Human Resource Development Review*, 263-296.
- Chatzimouratidis, A., Theotokas, I., & Lagoudis, I. (2011). Decision support systems for human resource training and development. *The International Journal of Human Resource Management*, 23, 662-693.
- Chen, S., Yen, D., & Hwang, M. (2012). Factors influencing the continuance intention to the usage of Web 2.0: An empirical study. *Computers in Human Behavior*, 28, 933-941.
- Chiu, C., Chiu, C., & Chang, H. (2007). Examining the integrated influence of fairness and quality on learners' satisfaction and web-based learning continuance intention. *Info Systems*, 17, 271-287.
- Clutterbuck, D. (2008). What's happening in coaching and mentoring? And what is the difference between them? *Development and Learning in Organizations: An International Journal*, 22, 8-10.
- Couper, M., Traugott, M., & Lamias, M. (2001). Web survey design and administration. *American Association for Public Opinion Research*, 65, 230-253.
- Elbers, W. (2010). *Improving transfer of training*. Unpublished master's thesis. Eindhoven University of Technology.
- Ely, K., Boyce, L. A., Nelson, J. K., Zaccaro, S. J., Hernez-Broome, G., & Whyman, W. (2010). Evaluating Leadership Coaching: A Review and Integrated Framework. *The Leadership Quarterly*, 21, 585-599.
- Ferrin, D., Dirks, K., & Shah, P. (2006). Direct and indirect effects of third-party relationships on interpersonal trust. *Journal of Applied Psychology*, 91, 870-883.
- Finch, W. H. (2013). Exploratory Factor Analysis. In T. Timothy, *Hanbook of Quantitative Methods for Educational Research* (1st ed., pp. 166-186). Auckland: Sense Publisher.
- Fitzgerald, W. (1992). Training versus development. *Training & development*, 46, 81-84.

- Garavan, T. N., Carbery, R., & Rock, A. (2012). Mapping talent development: definition, scope and architecture. *European Journal of Training and Development*, 36, 5-24.
- Goldstein, I. L., & Ford, J. K. (2002). *Training in Organization*. Canada: Wadsworth Group.
- Gunter, B., Nicholas, D., Huntington, P., & Williams, P. (2002). Online versus offline research: Implications for evaluating digital media. *Aslib Proceedings*, 54, 229-239.
- Hair, Jr., J., Black, W., Babin, B., & Anderson, R. (2010). *Multivariate data analysis* (5th ed.). New Jersey: Pearson Prentice Hall.
- Hayes, A. F. (2016). *The PROCESS macro for SPSS and SAS*. Retrieved August 2016, from <http://processmacro.org/>
- Holton, E. F. (1996). The flawed four-level evaluation model. *Human Resource Development Quarterly*, 7, 5-21.
- Holton, E., Bates, R., & Ruona, W. (2000). Development of a generalized learning transfer system inventory. *human Resource Development Quarterly*, 11, 333-360.
- Jones, P. J., & Oswick, C. (2007). Inputs and Outcomes of Outdoor Management Development: Of Design, Dogma and Dissonance. *British Journal of Management*, 18, 327-341.
- Karim, M., & Behrend, T. (2013). Controlling engagement: The effects of learner control on engagement and satisfaction. *Cutting-edge Technologies in Higher Education*, 6G, 59-82.
- Kasunic, M. (2005). *Designing an Effective Survey*. Massachusetts: Carnegie Mellon University.
- Kirkpatrick, D. L. (1996). Great Ideas Revisited. Techniques for Evaluating Training Program. *Training & Development*, 50, 54-59.
- Kraiger, K., Ford, J. K., & Salas, E. (1993). Application of Cognitive, Skill-Based, and Affective Theories of Learning Outcomes to New Methods of Training Evaluation. *Journal of Applied Psychology*, 311-328.
- Laker, D. R., & Powell, J. L. (2011). The Differences Between Hard and Soft Skills and Their Relative Impact on Training Transfer. *Human Resource Development Quarterly*, 22, 111-122.
- Landy, F. J., & Conte, J. M. (2013). *Work in the 21st Century*. Chichester: John Wiley & Sons, Inc.
- Lau, P. Y., & McLean, G. N. (2013). Factors influencing perceived learning transfer of an outdoor management development programme in Malaysia. *Human Resource Development International*, 186-204.
- Lim, H., Lee, S., & Nam, K. (2007). Validating E-learning factors affecting training effectiveness. *International Journal of Information Management*, 27, 22-35.
- Manfreda, K., Batagelj, Z., & Vehovar, V. (2002). Design of web survey questionnaires: Three basic experiments. *JCMC* 7, 3.
- Matell, M., & Jacoby, J. (1971). Is there an optimal number of alternatives for Likert scale items? Study I: Reliability and Validity. *Educational and Psychological Measurement*, 31, 657-674.
- Noe, R. A. (1986). Trainees' Attributes and Attitudes: Neglected Influences on Training Effectiveness. *The Academy of Management Review*, 11, 736-749.
- Noe, R. A. (2010). *Employee Training and Development*. New York: McGraw-Hill/Irwin.
- Osborne, J., & Costello, A. (2009). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Pan-Pacific Management Review*, 12, 131-146.
- Park, J., & Wentling, T. (2007). Factors associated with transfer of training in workplace e-learning. *Journal of Workplace Learning*, 19, 311-329.

- Parker, P., Hall, D. T., & Kram, K. E. (2008). Peer Coaching: A Relational Process for Accelerating Career Learning. *Academy of Management Learning & Education*, 487-503.
- Phillips, J. (2012). *Handbook of training evaluation and measurement methods* (3rd ed.). New York: Routledge.
- Piccoli, G., Ahmad, R., & Ives, B. (2001). Web-Based Virtual Learning Environments: A Research Framework and a Preliminary Assessment of Effectiveness in Basic IT Skills Training. *MIS Quarterly*, 401-426.
- Radhakrishnan, P. (2015). *An Assessment Tool to evaluate the Effectiveness of Training Programs at Vanderlande*. Unpublished master's thesis. Eindhoven University of Technology.
- Salas, E., & Burke, C. (2002). Simulation for training is effective when ... *Quality & Safety in Healthcare*, 11, 119-120.
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (5th ed.). Amsterdam: Prentice Hall.
- Shan, S., Li, C., Shi, J., Wang, L., & Cai, H. (2014). Impact of Effective Communication, Achievement Sharing and Positive Classroom Environments on Learning Performance. *Systems Research and Behavioral Science*, 31, 471-482.
- Singh, H. (2003). Building Effective Blended Learning Programs. *Educational Technology*, 43, 51-54.
- Sitzmann, T., Kraiger, K., Stewart, D., & Wisher, R. (2006). The comparative effectiveness of web-based and classroom instruction: A meta analysis. *Personnel Psychology*, 623-664.
- Turner, D. W. (2010). Qualitative Interview Design: A Practical Guide for Novice Investigators. *The Qualitative Report*, 15, 754-760.
- Van Aken, J., Berends, H., & Van der Bij, H. (2012). *Problem solving in organizations : a methodological handbook for business and management students*. Cambridge: Cambridge University Press.
- Van der Horst, S. I. (2013). *Competency Management*. Unpublished master's thesis. Eindhoven University of Technology.
- Vanderlande. (2015). *Year in Review CY2015*. Veghel: Vanderlande.
- Vanderlande. (2016). Retrieved from Vanderlande Intranet: <http://intranet.vi.corp>
- Vanderlande. (2016, April 27). *Vanderlande*. Retrieved from Vanderlande: www.vanderlande.com
- VanderlandeAcademy. (2016). *Vanderlande academy training catalogue*.
- Yousef, A. M., Chatti, M. A., Schroeder, U., & Wosnitza, M. (2015). A Usability Evaluation of a Blended MOOC Environment: An Experimental Case Study. *International Review of Research in Open and Distributed Learning*, 69-93.

APPENDIX

Appendix 1 – Detailed Information of CFA of Current Evaluation Tool

A1.1 Path Diagram Initial Structure of Current Evaluation Tool

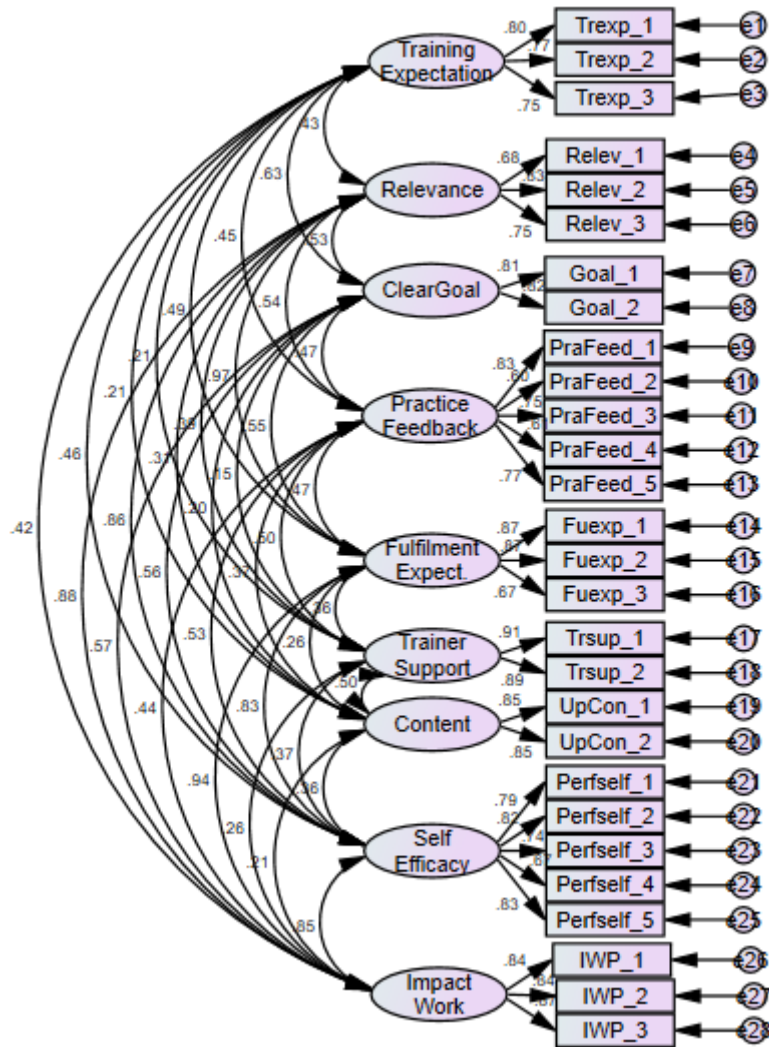


Figure A1 Path Diagram Initial Construct of Current Evaluation Tool

Table A1 Validity of Initial Construct of Current Evaluation Tool

	CR	AVE	MSV	ASV	1	2	3	4	5	6	7	8	9
1) Self Efficacy	0.881	0.599	0.731	0.401	0.774								
2) Training Expectation	0.814	0.594	0.394	0.187	0.455	0.771							
3) Training Relevance	0.798	0.570	0.947	0.433	0.855	0.431	0.755						
4) Goal Clarity	0.797	0.663	0.394	0.237	0.559	0.628	0.535	0.814					
5) Practice & Feedback	0.840	0.516	0.292	0.225	0.532	0.453	0.540	0.469	0.718				
6) Fulfilment Expectation	0.850	0.657	0.947	0.432	0.827	0.491	0.973	0.546	0.473	0.811			
7) Trainer Support	0.897	0.813	0.250	0.132	0.372	0.214	0.391	0.149	0.497	0.356	0.902		
8) Up-to-date Content	0.839	0.723	0.250	0.100	0.356	0.207	0.309	0.198	0.368	0.255	0.500	0.850	
9) Impact on Work	0.887	0.723	0.878	0.399	0.851	0.420	0.881	0.573	0.443	0.937	0.261	0.213	0.850

Color code:

Green: Correlation between constructs (factors)

Blue: Square root of AVE (\sqrt{AVE})

Items in yellow highlights shows that the validity requirements were not fulfilled.

A1.2 Path Diagram Structure of Current Evaluation Tool after CFA

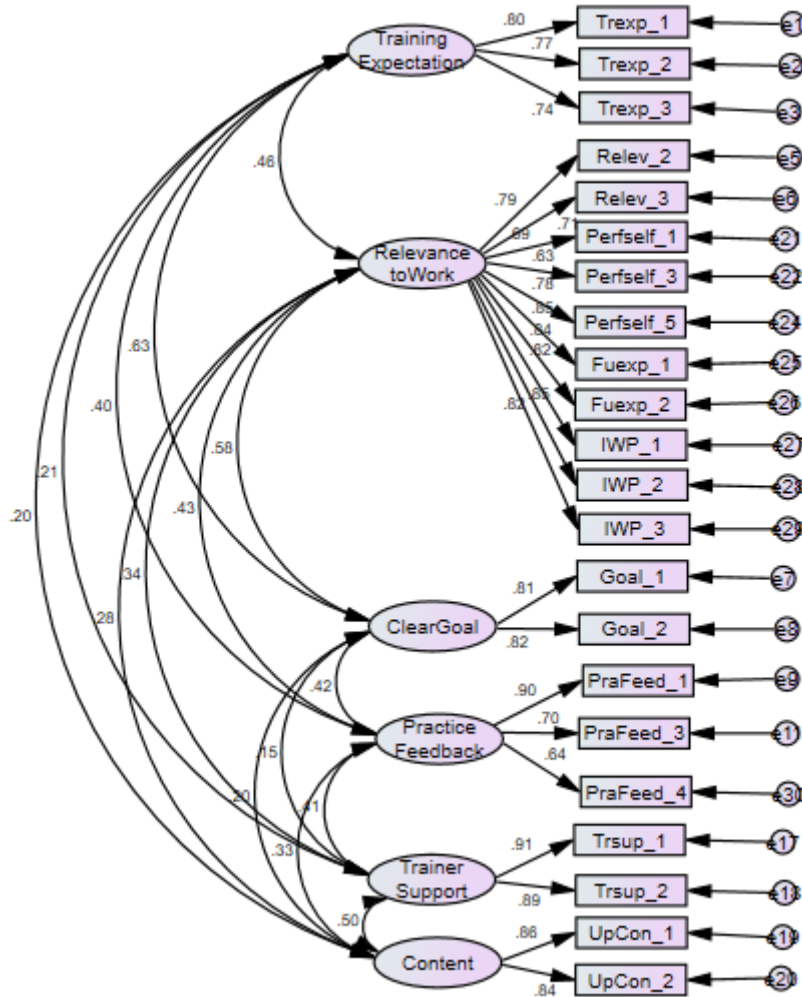


Figure A2 Path Diagram Current Evaluation after CFA

Table A2 Validity of Current Evaluation Tool after CFA

	CR	AVE	MSV	ASV	Trainer Support	Training Expectation	Relevance To Work	Clear Goal	Practice Feedback	Content
Trainer Support	0.897	0.814	0.251	0.121	0.902					
Training Expectation	0.814	0.594	0.393	0.171	0.213	0.771				
Relevance to Work	0.940	0.612	0.335	0.186	0.342	0.461	0.782			
Goal Clarity	0.797	0.663	0.393	0.193	0.149	0.627	0.579	0.814		
Practice & Feedback	0.794	0.567	0.186	0.161	0.413	0.404	0.431	0.423	0.753	
Up-to-Date Content	0.839	0.723	0.251	0.103	0.501	0.202	0.280	0.195	0.327	0.850

Color code:

Green: Correlation between constructs (factors)

Blue: Square root of AVE (\sqrt{AVE})

Appendix 2 – Detailed Information of CFA of New Design of Evaluation Tool

A2.1 Factor Analysis General Factors Constructs

A.2.1.1 EFA result General Factors - Content Relevance and Motivation to Learn

The KMO Measure of Sampling adequacy shows the value of 0.801 which is above the minimum value of 0.5 and the Bartlett test of sphericity shows the value of 0.000. This means that the variables have significant correlation so that it is appropriate to apply EFA to the data. The result in Table below shows that the variables of Content Relevance and Motivation to Learn belong to 1 factors.

Table A3 EFA General Factors

	Factor
	1
MOT1	.791
MOT2	.809
MOT3	.644
RLV1	.797
RLV2	.729

A2.1.2 Validity & Reliability Measurement of General Factors Initial Model

Table A4 Validity & Reliability Measurement of General Factors Initial Model

	CR	AVE	MSV	ASV	Clear Goals	Motivation to Learn	Content Relevance	Learning
Clear Goals	0.791	0.655	0.218	0.153	0.809			
Motivation to Learn	0.748	0.503	0.745	0.476	0.467	0.709		
Content Relevance	0.696	0.534	0.745	0.452	0.345	0.863	0.731	
Learning	0.773	0.630	0.493	0.360	0.348	0.682	0.702	0.794

Color code:

Green: Correlation between constructs (factors)

Blue: Square root of AVE (\sqrt{AVE})

Items in yellow highlights shows that the validity requirements were not fulfilled.

A2.1.3 Validity & Reliability Measurement of General Factors Final Model

Table A5 Validity & Reliability Measurement of General Factors Final Model

	CR	AVE	MSV	ASV	Clear Goals	Motivation & Relevance	Learning
Clear Goals	0.791	0.655	0.169	0.336	0.809		
Motivation & Relevance	0.811	0.519	0.503	0.145	0.411	0.720	
Learning	0.773	0.631	0.503	0.311	0.348	0.709	0.794

A2.1.4 EFA result Classroom Intervention Factors - Feedback & Practice and Fellow Trainee Support

The KMO Measure of Sampling adequacy shows the value of 0.818 which is above the minimum value of 0.5 and the Bartlett test of sphericity shows significant value of 0.000. The result in Table below showed that the variables of Feedback & Practice and Fellow Trainee Support belong to 1 factors.

Table A6 EFA result Classroom Intervention Factors

	Component	
	1	2
FELLOW1	.506	.442
FELLOW2	.749	
FELLOW3	.841	
FEEDPRA1	.868	
FEEDPRA2	.802	
FEEDPRA3		.939

A2.1.5 Validity & Reliability Measurement of Classroom Intervention Factors Initial Model

Table A7 Validity & Reliability Measurement of Classroom Intervention Factors Initial Model

	CR	AVE	MSV	ASV	Feedback & Practice	Trainer Knowledge & Experience	Fellow Trainee Support	Motivation to Transfer
Feedback & Practice	0.597	0.425	0.927	0.445	0.652			
Trainer Knowledge & Experience	0.934	0.877	0.245	0.176	0.495	0.937		
Fellow Trainee Support	0.687	0.434	0.927	0.438	0.963	0.439	0.659	
Motivation to Transfer	0.897	0.639	0.194	0.149	0.405	0.299	0.440	0.799

Items in yellow highlights shows that the validity requirements were not fulfilled.

A2.1.6 Validity & Reliability Measurement of Classroom Intervention Factors Final Model

Table A8 Validity & Reliability Measurement of Classroom Intervention Factors Final Model

	CR	AVE	MSV	ASV	Support, Feedback, & Practice	Trainer Knowledge & Experience	Motivation to Transfer
Support, Feedback, & Practice	0.843	0.576	0.216	0.187	0.759		
Trainer Knowledge & Experience	0.936	0.880	0.216	0.146	0.465	0.938	
Motivation to Transfer	0.898	0.690	0.157	0.116	0.396	0.274	0.831

A2.1.7 EFA result Transfer of Training Factors – Opportunity to Perform and Transfer of Training

The KMO Measure of Sampling adequacy shows the value of 0.831 which is above the minimum value of 0.5 and the Bartlett test of sphericity shows the value of 0.000. This means that the variables have significant correlation so that it is appropriate to apply EFA to the data. The result in Table below shows that the variable of OPPOR1 and variables of Transfer of Training belong to 1 factors.

Table A9 EFA result Transfer of Training Factors

	Component	
	1	2
OPPOR ₁	.680	
OPPOR ₂		.991
OPPOR ₃		.766
TOT ₁	.938	
TOT ₂	.952	
TOT ₃	.912	

A2.1.8 Validity & Reliability Measurement of Transfer of Training Factors Initial Model

Table A10 Validity & Reliability Measurement of Transfer of Training Factors Initial Model

	CR	AVE	MSV	ASV	Colleague Support	Opportunity to Perform	Supervisor Support	Transfer of Training
Peer Support	0.840	0.641	0.479	0.407	0.801			
Opportunity to Perform	0.743	0.494	0.601	0.399	0.554	0.703		
Supervisor Support	0.926	0.714	0.436	0.364	0.660	0.539	0.845	
Transfer of Training	0.921	0.795	0.601	0.482	0.692	0.775	0.607	0.891

Items in yellow highlights shows that the validity requirements were not fulfilled.

A2.1.9 Validity & Reliability Measurement of Transfer of Training Factors Final Model

Table A11 Validity & Reliability Measurement of Transfer of Training Factors Final Model

	CR	AVE	MSV	ASV	Colleague Support	Transfer Resource Availability	Supervisor Support	Opportunity & Implementation of Transfer
Colleague Support	0.864	0.761	0.513	0.371	0.873			
Transfer Resource Availability	0.803	0.680	0.341	0.217	0.393	0.825		
Supervisor Support	0.926	0.714	0.445	0.325	0.667	0.395	0.845	
Opportunity & Implementation of Transfer	0.908	0.714	0.513	0.409	0.716	0.584	0.612	0.845

Appendix 3 - Detailed Information of Regression Analysis of New Design of Evaluation Tool

A3.1 EFA of Learning and Opportunity and Implementation of Transfer

Table A12 EFA of Learning and Opportunity and Implementation of Transfer

	Factor Loadings	
	Opportunity & Implementation of Transfer	Learning
LEARN ₁		.948
LEARN ₂		.849
OPPOR ₁	.662	
TOT ₁	.914	
TOT ₂	.971	
TOT ₃	.888	

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.783
Bartlett's Test of Sphericity	Approx. Chi-Square	506.106
	df	15
	Sig.	.000

A3.2 Mediation Effect of Motivation to Transfer in Hard Skill Classroom Training

	X predicts Y (c)	X predicts M (a)	X&M together predicts Y		Indirect Effects	Confidence Interval (CI)	Remarks
			M predicts Y (b)	X no longer predicts Y or is lessened predict Y (c')			
Supervisor Support	p<0.01 R ² : 0.331 b: 0.522 β: 0.575	p<0.01 R ² : 0.297 b: 0.446 β: 0.545	R ² : 0.673		b: 0.345 β: 0.380	0.228-0.473 does not cross 0	Partial mediation
			p<0.01 b: 0.773 β: 0.698	p: 0.020 b: 0.177 β: 0.195			
Peer Support	p<0.01 R ² : 0.415 b: 0.870 β: 0.647	p<0.01 R ² : 0.418 b: 0.788 β: 0.644	R ² : 0.673		b: 0.582 β: 0.433	0.414-0.785 does not cross 0	Partial mediation
			p<0.01 b: 0.738 β: 0.666	p<0.01 b: 0.289 β: 0.214			
Transfer Resource Availability	p<0.01 R ² : 0.415 b: 0.643 β: 0.503	p<0.01 R ² : 0.163 b: 0.465 β: 0.404	R ² : 0.684		b: 0.370 β: 0.289	0.206-0.562 does not cross 0	Partial mediation
			p<0.01 b: 0.796 β: 0.718	p<0.01 b: 0.273 β: 0.214			
Motivation & Relevance	p<0.01 R ² : 0.383 b: 0.935 β: 0.619	p<0.01 R ² : 0.566 b: 1.025 β: 0.752	R ² : 0.647		b: 0.935 β: 0.619	0.658-1.145 does not cross 0	Complete mediation
			p<0.01 b: 0.864 β: 0.779	P=0.665 b: 0.050 β: 0.033			
Clear Goals	p<0.01 R ² : 0.102 b: 0.356 β: 0.318	p<0.01 R ² : 0.181 b: 0.429 β: 0.425	R ² : 0.647		b: 0.356 β: 0.318	0.246-0.556 does not cross 0	Complete mediation
			p<0.01 b: 0.904 β: 0.816	P=0.610 b: -0.032 β: -0.028			
Learning	p<0.01 R ² : 0.217 b: 0.569 β: 0.465	p<0.01 R ² : 0.358 b: 0.661 β: 0.598	R ² : 0.647		b: 0.569 β: 0.465	0.454-0.764 does not cross 0	Complete mediation
			p<0.01 b: 0.907 β: 0.818	P=0.694 b: -0.030 β: -0.025			
Trainer Knowledge & Experience	P=0.019 R ² : 0.038 b: 0.299 β: 0.195	p<0.01 R ² : 0.051 b: 0.313 β: 0.226	R ² : 0.646		b: 0.299 β: 0.195	0.041-0.537 does not cross 0	Complete mediation
			p<0.01 b: 0.888 β: 0.801	P=0.784 b: 0.022 β: 0.014			
Support, Feedback & Practice	P<0.01 R ² : 0.153 b: 0.401 β: 0.391	p<0.01 R ² : 0.102 b: 0.295 β: 0.319	R ² : 0.666		b: 0.248 β: 0.241	0.136-0.379 does not cross 0	Partial mediation
			p<0.01 b: 0.838 β: 0.756	P<0.01 b: 0.153 β: 0.150			

A3.3 Mediation Effect of Motivation to Transfer in Soft Skill Classroom Training

	X predicts Y (c)	X predicts M (a)	X&M together predicts Y		Indirect Effects	Confidence Interval (CI)	Remarks
			M predicts Y (b)	X no longer predicts Y or is lessened predict Y (c')			
Supervisor Support	p<0.01 R ² : 0.272 b: 0.461 β: 0.522	p<0.01 R ² : 0.239 b: 0.313 β: 0.489	R ² : 0.744		b: 0.461 β: 0.522	0.136-0.586 does not cross 0	Complete mediation
			p<0.01 b: 1.085 β: 0.787	p: 0.177 b: 0.121 β: 0.137			
Peer Support	p<0.01 R ² : 0.422 b: 1.074 β: 0.650	p<0.01 R ² : 0.382 b: 0.741 β: 0.618	R ² : 0.753		b: 1.074 β: 0.650	0.388 -1.108 does not cross 0	Complete mediation
			p<0.01 b: 1.009 β: 0.731	p: 0.077 b: 0.327 β: 0.198			
Transfer Resource Availability	p<0.01 R ² : 0.276 b: 0.650 β: 0.525	p<0.01 R ² : 0.274 b: 0.470 β: 0.523	R ² : 0.738		b: 0.650 β: 0.525	0.268-1.003 does not cross 0	Complete mediation
			p<0.01 b: 1.099 β: 0.797	P: 0.300 b: 0.134 β: 0.108			
Motivation & Relevance	p<0.01 R ² : 0.282 b: 0.982 β: 0.531	p<0.01 R ² : 0.366 b: 0.811 β: 0.605	R ² : 0.729		b: 0.982 β: 0.531	0.434-1.510 does not cross 0	Complete mediation
			p<0.01 b: 1.158 β: 0.840	P=0.836 b: 0.043 β: 0.023			
Clear Goals	p<0.01 R ² : 0.209 b: 0.516 β: 0.457	p: 0.012 R ² : 0.167 b: 0.334 β: 0.408	R ² : 0.743		b: 0.516 β: 0.457	0.129-0.705 does not cross 0	Complete mediation
			p<0.01 b: 1.104 β: 0.801	P=0.180 b: 0.147 β: 0.131			
Learning	p<0.01 R ² : 0.190 b: 0.760 β: 0.436	p<0.01 R ² : 0.289 b: 0.679 β: 0.537	R ² : 0.730		b: 0.760 β: 0.436	0.455-1.311 does not cross 0	Complete mediation
			p<0.01 b: 1.201 β: 0.871	P=0.763 b: -0.056 β: -0.032			
Trainer Knowledge & Experience	P=0.309 R ² : 0.030 b: 0.319 β: 0.172	P: 0.202 R ² : 0.046 b: 0.289 β: 0.215	R ² : 0.729		b: 0 β: 0	- 0.435- 0.788 cross 0	No mediation No Effect
			p<0.01 b: 1.181 β: 0.857	P=0.896 b: -0.022 β: -0.012			
Support, Feedback & Practice	p: 0.144 R ² : 0.060 b: 0.404 β: 0.245	p: 0.055 R ² : 0.101 b: 0.381 β: 0.318	R ² : 0.666		b: 0 β: 0	-0.050 - 0.989 cross 0	No mediation No Effect
			p<0.01 b: 1.190 β: 0.863	P=0.756 b: -0.049 β: -0.030			

A3.4 Mediation Effect of Motivation to Transfer in Blended Learning

	X predicts Y (c)	X predicts M (a)	X&M together predicts Y		Indirect Effects	Confidence Interval (CI)	Remarks
			M predicts Y (b)	X no longer predicts Y or is lessened predict Y (c')			
Supervisor Support	p<0.01 R ² : 0.414 b: 0.621 β: 0.644	p: 0.032 R ² : 0.186 b: 0.371 β: 0.431	R ² : 0.716		b: 0.253 β: 0.262	0.076-0.922 does not cross 0	Partial mediation
Peer Support	p<0.01 R ² : 0.589 b: 1.105 β: 0.767	p<0.01 R ² : 0.340 b: 0.749 β: 0.583	R ² : 0.749		b: 0.414 β: 0.287	0.072 -1.117 does not cross 0	Partial mediation
Transfer Resource Availability	p: 0.093 R ² : 0.118 b: 0.593 β: 0.344	p<0.01 R ² : 0.269 b: 0.798 β: 0.519	R ² : 0.602		b: 0 β: 0	0.254-1.545 does not cross 0	No mediation No Effect
Motivation & Relevance	p<0.01 R ² : 0.567 b: 0.927 β: 0.753	p<0.01 R ² : 0.580 b: 0.837 β: 0.762	R ² : 0.662		b: 0.927 β: 0.361	0.154-0.799 does not cross 0	Complete mediation
Clear Goals	p:0.965 R ² : 0.0001 b: 0.011 β: 0.009	p: 0.368 R ² : 0.035 b: 0.208 β: 0.188	R ² : 0.616		b: 0 β: 0	-0.192- 0.564 cross 0	No mediation No Effect
Learning	p:0.017 R ² : 0.221 b: 0.565 β: 0.471	p: 0.013 R ² : 0.242 b: 0.527 β: 0.492	R ² : 0.608		b: 0.565 β: 0.352	0.134-0.882 does not cross 0	Partial mediation
Trainer Knowledge & Experience	P=0.092 R ² : 0.118 b: 0.340 β: 0.344	P<0.01 R ² : 0.389 b: 0.550 β: 0.624	R ² : 0.600		b: 0 β: 0	- 0.435- 0.788 cross 0	No mediation No Effect
Support, Feedback & Practice	p: 0.773 R ² : 0.004 b: 0.070 β: 0.061	p: 0.480 R ² : 0.022 b: 0.152 β: 0.148	R ² : 0.666		b: 0 β: 0	-0.291 - 0.455 cross 0	No mediation No Effect
Content Quality	p: 0.012 R ² : 0.243 b: 0.755 β: 0.493	p: 0.014 R ² : 0.237 b: 0.665 β: 0.487	R ² : 0.615		b: 0.755 β: 0.493	-0.016 -1.317 cross 0	Complete mediation
Technical System Quality	p: 0.800 R ² : 0.003 b: -0.103 β: -0.053	p: 0.940 R ² : 0.0003 b: 0.030 β: 0.018	R ² : 0.602		b: 0 β: 0	-0.397 - 2.102 cross 0	No mediation No Effect
Trainee's Control	p: 0.130 R ² : 0.097 b: 0.704 β: 0.311	p: 0.020 R ² : 0.215 b: 0.936 β: 0.464	R ² : 0.600		b: 0 β: 0	0.237 -1.674 does not cross 0	No mediation No Effect

A3.5 Mediation Effect of Motivation to Transfer in Pit-Stop Program

	X predicts Y (c)	X predicts M (a)	X&M together predicts Y		Indirect Effects	Confidence Interval (CI)	Remarks
			M predicts Y (b)	X no longer predicts Y or is lessened predict Y (c')			
Supervisor Support	p<0.01 R ² : 0.309 b: 0.334 β: 0.556	p: 0.012 R ² : 0.221 b: 0.234 β: 0.470	R ² : 0.790		b: 0.334 β: 0.556	0.034-0.104 does not cross 0	Complete mediation
			p<0.01 b: 0.945 β: 0.785	p: 0.083 b: 0.112 β: 0.187			
Peer Support	p<0.01 R ² : 0.387 b: 0.738 β: 0.622	p<0.01 R ² : 0.347 b: 0.580 β: 0.588	R ² : 0.780		b: 0.738 β: 0.622	0.189 -0.913 does not cross 0	Complete mediation
			p<0.01 b: 0.934 β: 0.776	p: 0.166 b: 0.196 β: 0.165			
Transfer Resource Availability	p<0.01 R ² : 0.431 b: 0.684 β: 0.656	p<0.01 R ² : 0.307 b: 0.480 β: 0.554	R ² : 0.805		b: 0.425 β: 0.407	0.064-0.809 does not cross 0	Partial mediation
			p<0.01 b: 0.886 β: 0.735	P: 0.027 b: 0.259 β: 0.249			
Motivation & Relevance	p<0.01 R ² : 0.614 b: 1.277 β: 0.784	p<0.01 R ² : 0.436 b: 0.356 β: 0.660	R ² : 0.839		b: 0.678 β: 0.416	0.260-1.179 does not cross 0	Partial mediation
			p<0.01 b: 0.760 β: 0.631	p<0.01 b: 0.599 β: 0.368			
Clear Goals	p<0.01 R ² : 0.285 b: 0.386 β: 0.534	p: 0.013 R ² : 0.212 b: 0.277 β: 0.461	R ² : 0.785		b: 0.386 β: 0.534	-0.033-0.524 cross 0	Complete mediation
			p<0.01 b: 0.959 β: 0.796	p: 0.122 b: 0.121 β: 0.167			
Learning	p<0.01 R ² : 0.440 b: 0.593 β: 0.663	p<0.01 R ² : 0.492 b: 0.521 β: 0.701	R ² : 0.768		b: 0.593 β: 0.663	0.201-1.052 does not cross 0	Complete mediation
			p<0.01 b: 0.967 β: 0.803	p: 0.467 b: 0.089 β: 0.099			
Trainer Knowledge & Experience	p: 0.164 R ² : 0.073 b: 0.500 β: 0.270	p: 0.135 R ² : 0.084 b: 0.445 β: 0.290	R ² : 0.763		b: 0 β: 0	- 0.104-1.239 cross 0	No mediation No Effect
			p<0.01 b: 1.045 β: 0.868	p: 0.855 b: 0.035 β: 0.019			
Support, Feedback & Practice	p: 0.059 R ² : 0.130 b: 0.518 β: 0.361	p: 0.157 R ² : 0.075 b: 0.327 β: 0.274	R ² : 0.779		b: 0 β: 0	-0.056 -0.792 cross 0	No mediation No Effect
			p<0.01 b: 1.008 β: 0.837	p: 0.191 b: 0.188 β: 131			
Fidelity of Design	p<0.01 R ² : 0.763 b: 1.051 β: 0.810	p<0.01 R ² : 0.555 b: 0.923 β: 0.745	R ² : 0.820		b: 0.703 β: 0.451	0.091-0.614 does not cross 0	Partial mediation
			p<0.01 b: 0.730 β: 0.606	p<0.01 b: 0.348 β: 0.358			
Feedback & Practice	p<0.01 R ² : 0.763 b: 1.051 β: 0.236	p: 0.339 R ² : 0.035 b: 0.221 β: 0.187	R ² : 0.768		b: 1.034 β: 0.442	-0.025-0.141 cross 0	No Mediation, Direct Effect
			p<0.01 b: 0.072 β: 0.075	p<0.01 b: 1.034 β: 0.859			

A3.6 Correlation Matrix of Soft Skill Classroom Training

	Mean	Std. Deviation	1	2	3	4	5	6	7	8	9	10	11
1) Motivation & Relevance	5.818	0.655	(0.790)										
2) Clear Goals	5.108	1.075	.523**	(0.664)									
3) Trainer Knowledge & Experience	6.365	0.652	.205	.036	(0.688)								
4) Support, Feedback & Practice	5.912	0.734	.584**	.143	.418*	(0.691)							
5) Motivation to Transfer	5.561	0.879	.595**	.409*	.233	.370*	(0.905)						
6) Transfer Resource Availability	5.527	0.979	.235	.332*	.387*	.213	.547**	(0.893)					
7) Supervisor Support	4.330	1.372	.407*	.385*	.086	.185	.513**	.391*	(0.925)				
8) Peer Support	3.072	0.733	.450**	.228	.126	.123	.588**	.345*	.615**	(0.834)			
9) Learning	5.851	0.696	.400*	.347*	.356*	.211	.580**	.475**	.498**	.621**	(0.688)		
10) Opportunity & Implementation of Transfer	5.203	1.212	.502**	.462**	.325*	.208	.837**	.633**	.528**	.612**	.532**	(0.951)	
11) Training Rate	7.811	1.474	.461**	.355*	.408*	.378*	.578**	.352*	.308	.451**	.509**	.606**	

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Diagonal values with brackets show Cronbach's alpha

N: 37 responses

A3.7 Correlation Matrix of Blended Learning

	Mean	Std. Deviation	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1) Motivation & Relevance	5.340	1.050	(0.886)													
2) Clear Goals	5.440	1.044	.038	(0.680)												
3) Trainer Knowledge & Experience	5.380	1.309	.464*	-.016	(0.921)											
4) Support, Feedback & Practice	4.890	1.123	.245	.256	.594**	(0.750)										
5) Motivation to Transfer	5.290	1.154	.655**	.277	.522**	.202	(0.893)									
6) Content Quality	5.480	0.907	.382	-.105	.165	-.059	.244	(0.721)								
7) Technical System Quality	5.720	0.792	.552**	-.063	.463*	.240	.462*	.389	(0.605)							
8) Trainee Control	5.747	0.572	.350	.249	.221	.056	.482*	.194	.452*	(0.724)						
9) Transfer Resource Availability	5.600	0.750	.550**	.308	.526**	.428*	.504*	.170	.458*	.481*	(0.693)					
10) Supervisor Support	4.608	1.340	.695**	.034	.225	.120	.602**	.296	.577**	.262	.363	(0.949)				
11) Peer Support	3.173	0.898	.613**	.182	.273	.216	.678**	.295	.431*	.298	.424*	.730**	(0.908)			
12) Learning	5.580	1.077	.601**	.168	.477*	.141	.529**	.015	.373	.406*	.338	.397*	.506**	(0.884)		
13) Opportunity & Implementation of Transfer	5.200	1.293	.799**	.091	.395	.152	.800**	.441*	.390	.392	.455*	.659**	.757**	.572**	(0.895)	
14) Training Rate	7.280	1.242	.695**	-.005	.534**	.186	.778**	.179	.424*	.394	.373	.587**	.485*	.619**	.716**	

*. Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Diagonal values with brackets show Cronbach's alpha

N=25

A3.8 Correlation Matrix of Pit-Stop Program

	Mean	Std. Deviation	1	2	3	4	5	6	7	8	9	10	11	12
1) Motivation & Relevance	6.054	0.529	(0.542)											
2) Clear Goals	5.571	1.192	.246	(0.884)										
3) Trainer Knowledge & Experience	6.571	0.466	.291	.140	(0.854)									
4) Support, Feedback & Practice	6.268	0.601	.213	-.114	.534**	(0.717)								
5) Motivation to Transfer	5.759	0.715	.550**	.241	.164	.202	(0.867)							
6) Business Case Design	5.339	0.757	.447*	.142	.285	.457*	.576**	(0.807)						
7) Transfer Resource Availability	5.643	0.826	.486**	.218	.355	.614**	.414*	.570**	(0.899)					
8) Supervisor Support	4.707	1.436	.356	.319	.238	.221	.372	.507**	.448*	(0.932)				
9) Peer Support	3.000	0.726	.290	-.016	.069	-.016	.501**	.405*	.112	.309	(0.778)			
10) Learning	5.839	0.963	.382*	.106	.281	.511**	.559**	.531**	.429*	.101	.318	(0.699)		
11) Opportunity & Implementation of Transfer	5.411	0.861	.633**	.335	.158	.198	.740**	.687**	.443*	.598**	.427*	.301	(0.904)	
12) Training Rate	8.607	0.699	.288	.264	.588**	.433*	.220	.237	.287	.355	.107	.374*	.229	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Diagonal values with brackets show Cronbach's alpha

N=28

Appendix 4 – Adjustment of scales

The scale adjustment follows the process explained by IBM (2010).

To adjust scale from 1-10 to 1-7, there are two steps that should be done:

1. Find a linear formula that can transform the scale to have 0 as the minimum, and 1 as maximum. The formula is:

$$X = (x-a)/(b-a)$$

Where:

a = minimum of initial scale (in this case is 10)

b = maximum of initial scale (in this case is 1)

x = the initial scale (1,2,...,10)

2. Find a linear formula that undo the first formula to become the desired scale. The formula is:

$$Y = (B-A) * X + A$$

Where:

Y = the final transformed scale

A = minimum of desired scale (in this case is 7)

B = maximum of desired scale (in this case is 1)

X = the transformed initial scale as the result of formula in explanation no.1

To put the formula together, the formula to change the scale becomes:

$$Y = (B-A) * ((x-a)/(b-a)) + A$$

To adjust scale from 1-10 to 1-7, the formula becomes:

$$Y = (7-1) * ((x-1)/(10-1)) + 1$$

$$Y = 6/9 x - 6/9 + 1$$

$$Y = 6/9 x + 3/9$$

This formula is used to transformed the scale in SPSS.

Appendix 5 – Example Illustration of Recommended Evaluation Report



Program Subject: E-learning Basic Excel
 Participants: 20
 Survey Respondent: 18

No	Items	Average Score	Weighted Factor Score	Average of All Programs
	Motivation & Relevance		2.1	1.5
1	This training motivated me to learn as much as I can	5.2		
			
	Clear Goals		0.4	0.9
5	I had specific, clear training goals to aim for during this training program.	3.6		
			
	Learning		0.9	0.6
7	After this training, I know substantially more about the training contents than before.	4.8		
			
	Content Quality		0.6	0.4
9	The content of the training program was up-to-date.	4.5		
			
	Technical System Quality		1.8	1.2
12	The e-learning site could quickly load all the texts and graphics/videos	3.5		
			
	Trainee's control		0.5	0.5
13	The e-learning program let me decide on my own at what times and where I am learning (e.g., at the office, at home)	6.9		
			
	Total Score		6.3	5.1
16	Personal Rating		8	7

Recommendation to other people: Yes: 12 ; No: 8

Other recommendations:

..... (Based on the answers to open question about recommendations for the program, and or explanation in each variables)