

**SELF-DIRECTED LEARNING, ORGANIZATIONAL INNOVATION
ENVIRONMENT, AND PERFORMANCE OF WEB-BASED TRAINING—
AN EMPIRICAL ANALYSIS OF THEIR INTERRELATIONSHIPS AMONG
TAIWANESE FIRMS**

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ABSTRACT

The American Society for Training and Development (ASTD) suggests that the number of companies using Intranet or Internet-based training is growing each year. Nevertheless, many Taiwan's enterprises are still unwilling to adopt this effective training tool due to the unfamiliarity and inexperience in practical manipulation, as well as insufficiency in related research. Most notably, the research on what factors will affect the performance of Web-Based Training (WBT) is one of the most important issues that enterprises are seriously concerned.

Therefore, this research is to try to explore how the two critical factors— the Self-Directed Learning (SDL) and the Organizational Innovation Environment (OIE) affect the performance of WBT and the interrelationships among them will also be fully discussed.

Eventually, research findings indicate that the SDL, the OIE and the performance of WBT are highly interrelated. Furthermore, those companies, which accept our investigation, think that if their enterprises have a better OIE and their employees possess a better concept in SDL, and then their organizations will be able to own a better performance in WBT.

KEYWORDS : Self-Directed Learning (SDL), Organizational Innovation Environment(OIE), Web-Based Training (WBT)

I. INTRODUCTION

The information ages have brought many changes to the workforce and strengthen the need for workplace training. Competitive advantage is closely linked to the ability of employees to respond quickly to change. Today's 'Knowledge workers' have a continuous need for both new information and updated skills to respond to challenging and constantly changing job demands. Rapid response requires employees to know how to perform new job functions, and Web-Based Training (WBT) plays a very important role by allowing the delivery of courses and training modules in a timely, convenient, easily updated, and cost-effective manner (Whalen and Wright, 2000).

The American Society for Training and Development (ASTD) suggests that the number of companies using Intranet or Internet-based training is growing each year (Dewar et. al., 2000). The Information Week Online forecasts (Nolan, 2000) by 2003, U.S. companies project to spend \$11.5 billion annually on online education for their employees.

As for Taiwan's development, A recent survey by Commonwealth Magazine (2000) estimates that the potential e-learning market of Taiwan will reach approximately US\$160 million in 2003. Moreover, many experts are further predicted by 2002, Taiwan's enterprises will spend more than 30% of training expenditure in Internet-based training (<http://www.good2U.com>).

Thus, it can be seen that with its rapid market growth and countless advantages have made WBT accessible to organizations of various sizes and characters in Taiwan.

Particularly, Taiwan is now confronted by a severe transformation period and surrounded with many tough problems, such as increasing production cost, the out-going of traditional industries, the open market after joining the World Trade Organization (WTO), the intense competition among international industries and the fast updating of modern technologies. To overcome these difficulties, Most of enterprises think that only they can own the most prominent knowledge workers or they can not solve these difficulties.

In view of this, many enterprises now have considered to use WBT to nurture their workers. Nevertheless, some of them are still unwilling to adopt the effective training tools due to the unfamiliarity and inexperience in practical manipulation, as well as insufficiency in related research. Most notably, the research on what factors will affect the performance of WBT is one of the most important issues that enterprises are seriously concerned.

Therefore, this research is to try to explore how the two critical factors – the Self-Directed Learning (SDL) (Chang, 2000 ; Derryberry & Gomberg, 1998 ; Ellis, 1999 ; Kilby, 2001 ; Song, 1998) and the Organizational Innovation Environment (OIE) (Chang, 2000 ; Chang, 2001) affect the performance of WBT and the interrelationships among them will be also fully discussed.

II. RESEARCH OBJECTIVES

Because of above research background, the purpose of the research is to try to answer the following questions and propose some suggestions with a practical view to those enterprises, which have adopted or intended to implement WBT in the future.

1. What are the relationships and interrelationships among the SDL, the OIE and the performance of WBT?
2. What are the relationships between the SDL and the performance of WBT? And how does the SDL affect the performance of WBT?
3. What are the relationships between the OIE and the performance of WBT? And how does the OIE affect the performance of WBT?

III. RESEARCH SCOPE AND RESEARCH LIMITATIONS

3.1 Research scope

Many factors can affect the performance of WBT (Chang, 2000 ; Moore et. al., 1996; Song, 1998). This study is only concentrated on the exploratory research of these two factors -the SDL and the OEI- due to taking into account the conscientiousness and feasibility of research. As for those factors, which are possible to affect the performance of WBT, will not be discussed in this research.

3.2 Research limitations

In the developing process of WBT, there are very tight interrelationships between "technology" and "management", but this research is only inclined to discuss the managerial aspect. As for the technology problems, research will not take into

consideration due to the rapid change in Internet technology. Besides, most of enterprises that accept our investigation are more focused in hi-tech companies because they can accept the high technology easier than those traditional enterprises do.

Based on above reasons, research will anticipate having the following limitations,

1. Most of enterprises that accept our investigation are hi-tech companies.
2. Samples are not thoroughly sufficient because many traditional business firms have not adopted WBT yet.

IV. LITERATURE REVIEWS

People wish to have a concrete picture of this research that they must have a sufficient understanding in its related characteristic. Thus, in the first instance research will collect and consult the domestic and foreign interdisciplinary research or report, and then go into detail about the following issues. 1. The definition of WBT 2. The rationale for introducing WBT to business firms 3. The importance of SDL to the performance of WBT 4. The relationships between the OIE and the performance of WBT 5. The WBT's performance evaluation method

4.1 The definition of WBT

Clark (1996) describes WBT as "individualized instruction delivered over public or private computer networks and displayed by a Web browser." Chang (2000) defines WBT as one kind of online training, learner can use web browser, such as Netscape, Navigator,

Microsoft Explorer to view or navigate the sever-based Hyper TextMarkup Language (HTML).

Kilby(2001) suggests that "WBT is a computer-based training that uses Webtechnologies (TCP/IP, browsers) and is delivered across networks. WBT is not downloaded CBT, but rather on-demand training stored in a server and accessed across a network. Web-based training can be updated very rapidly, and access to training controlled by the training provider."

Though the above definitions are not identical, there is a common theme, which is that WBT takes advantage of the Internet and World Wide Web to deliver information.

4.2 The rationale for introducing WBT to business firms

Many writers have noted the benefits of WBT. Wilson (1999) suggests that these benefits include cost saving, increased productivity, no fear, fun, and continuous traced learning. Gayeski (1998) thinks that many of the problems of conventional training and job aid approaches, such as difficulty of updating, cost of distribution and duplication, challenges in scheduling training and finding necessary content, and barriers to providing just-in-time information are now much easier to overcome.

Whalen and Wright(2000) suggest that using WBT for employee training have both qualitative and quantitative benefits. Qualitative benefits include the following.

- Convenience to employees in terms of training location and use of familiar technologies;

- Access to expertinstructors regardless of geographic location;
- Added value to thelearning experience through the interactivity of technology-assistedinstruction;
- Increased employeaccess to training due to the elimination of scheduling restrictions and thereduced costs of training delivery.

Apart from costsavings, calculated as a return on investment, quantitative benefits related tolearning efficiency and retention include the following (Ciancarelli, 1998),

- Faster (by 60%)learning curve;
- Higher (by 25-60%)content retention;
- Greater (by 56%)learning gains;
- Better (by 50-60%)consistence of learning;
- Faster (by 38-87%)training comprehension.

Ellis et al., (1999) suggests thatthe advantages of WBT are different with those classroom-based training andtheir differences are shown as table 1.

Table 1. Comparative advantages

Web-Based Training	Classroom-Based Training
·Addresses learning at the individual level.	·Addresses learning in a group context.
·Can be designed for use anytime and	·Must be schedule for a time and a location.

anywhere	
·Maximizes connections among learners and resources.	·May be limited by resources physically present.
·Can be designed to be learner-driven at a pace that corresponds to an individual's learning style.	·Moves at a pace set by the group.
·Can be used at the trainee's job site, as time is available.	·May require travel and time away from the trainee's regular job.
·Makes it possible to access resources quickly and easily at any time through online search engines	·Content is tied to the classroom setting or to predetermined, prepared materials.
·May require less of an investment in on-site instructors.	·May require a significant investment in training personnel to deliver training.
·Does not require additional physical space	·Requires physical space.
·Connects learners in diverse locations	·Addresses participants only in the same physical space.
·Enables immediate implementation of new learning	·Implementation of learning can be overridden by crises at hand.
·Facilitates seamless connection between training and performance support.	·Training and performance support are more likely to be approached as separate efforts.

4.3 The importance of SDL to WBT

Adult learning is inclined to the SDL (Merriam & Caffarella, 1991) and the latest research indicates that 70 percent of adult learning belongs to SDL (Meredith, 1999). Peter Drucker (1999), the master of management, reveals in his book of "Management Challenges for the 21st Century" that "the concept of SDL will produce an important influence to those knowledge workers of enterprises".

Besides, many scholars and experts emphasize that WBT is one kind of training that is highly depended on the learners' concept of self-directed and self-paced learning (Chang, 2000 ; Chang, 2001 ; Derryberry & Gomberg, 1998 ; Kilby, 2001 ; Song, 1998). Song (1998) suggests that self directed and motivated attitude of learners' is fundamentally to be required in order to fully utilize the resources on WBT and it is surely a challenge to the learner themselves as well as the instructors. Ellis et al., (1999) indicates that "many course design issues are relevant to traditional computer-based training approaches, but the Web enables learners to access huge arrays of training option and requires them be more self-directed than did earlier approach".

As discussed above, enterprises must understand if enterprises can not put the SDL concept into a serious consideration, they will not be able to obtain a well performance in WBT, because WBT is belonging to the scope of adult learning.

4.4 The relationships between the OIE and the performance of WBT

Using the World Wide Web and Web-based technologies to train employees rises and develops in recent years among Taiwanese business firms. Nevertheless, WBT is a new technology and a new method for some enterprises so not all enterprises can accept this new technology easily. In particular, those companies which are lacking of an excellent OIE.

The OIE is one of critical factors to affect the enterprises' members to adopt new technology (Chang, 2000 ; Chiou, 2000 ; Lin, 1995) and OIE can be seen as an organizational innovation attitude. In other words, the organizational members will be

able to accept the new affairs easier if their organizational innovation atmospheres are better, and then their organization will be able to obtain a well performance in all respects (Amabile, Conti, Lazenby & Herron, 1996 ; Oldham & Cummings, 1996 ; Bailyn, 1985 ; Donnelly, 1994 ; Kanter, 1983).

As above mention, people can know that only enterprises possess the better OIE, and then those people who have so-called technophobia in their organizations will not resist WBT. Eventually, enterprises can obtain a good performance in WBT.

4.5 The WBT's performance evaluation method

Many methods can evaluate the performance of business training. Goldstein (1986) proposes a validity evaluation method including 1. Training validity 2. Transfer validity 3. Intra-organizational validity 4. Inter-organizational validity. Erwin & Gruber (1999) also proposes a so-called "human capital" approach.

In addition to above methods, there are many evaluation ways existed in enterprises. Yet, what is the most popular evaluation method for business training? Kirkpatrick's (1987) Four-Stage Model, which recommends the reactions, learning, behavior and results could be one of the most popular evaluation methods.

Nevertheless, some people think that Kirkpatrick's evaluation model is not the most appropriate model to appraise the performance of business training because it can not exactly evaluate the financial utility of training. For solving the insufficiency of Kirkpatrick's model, many experts propose a new model. This model is to add the Return

On Investment (ROI) method (Derryberry, 1998; Schreiber & Berge, 1999) into Kirkpatrick's model.

Now, this Five-Stage Evaluation Model has become a very popular model for enterprises to evaluate the performance of e-learning or WBT (Phillips et al., 2000; Phillips, 1995; Swanson, 1988).

V. METHODOLOGY

For achieving research goals, research will employ a questionnaire investigation method to those people who are really in charge of WBT in sixty domestic business firms, which have adopted WBT and obtained a preliminary training performance.

Concerning the questionnaire's design, research will refer to the Guglielmino's (1977) Self-Directed Learning Readiness Scale, the Chiou's (2000) Creative Organizational Climate Inventory Scale, the Kirkpatrick's (1987) Four-Stage Training Performance Evaluation Scale and the Five-Stage Evaluation Model on e-learning proposed by Phillips et al. (2000).

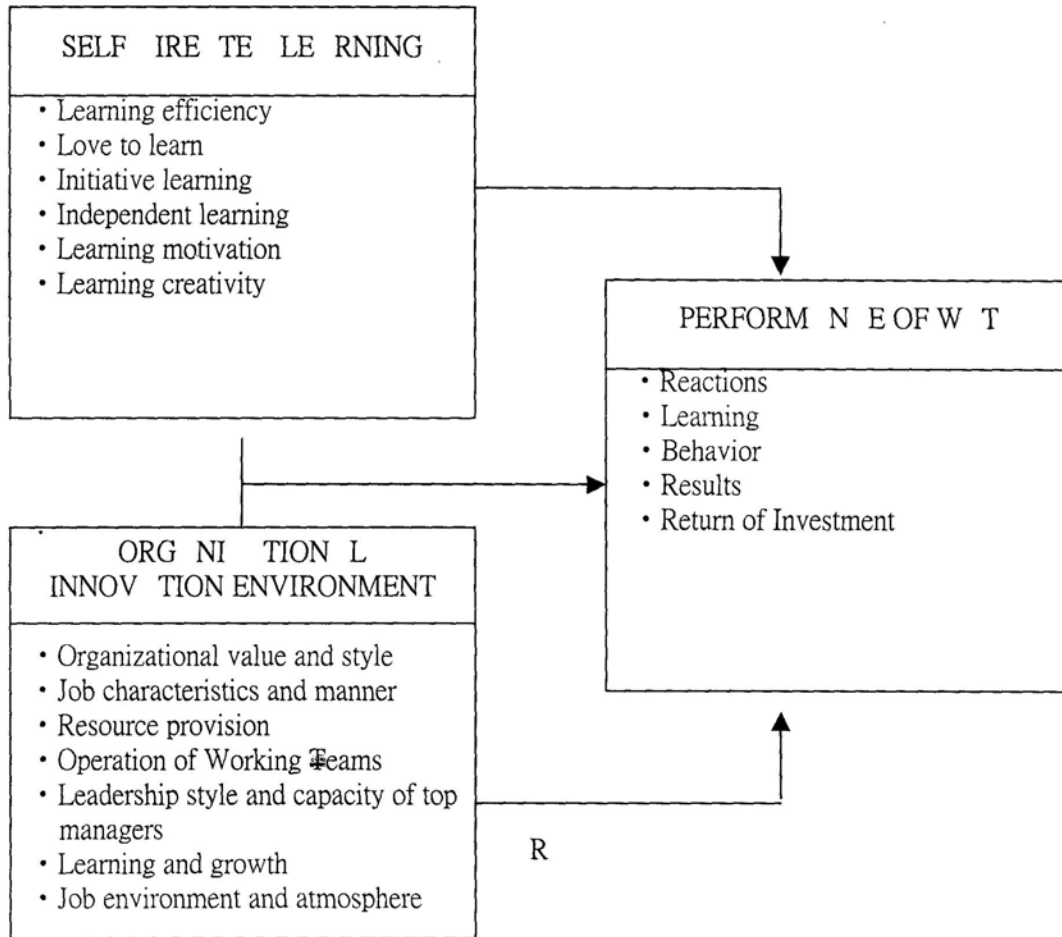
Besides, questionnaires are also using Likert's five-scale evaluation method to test the respondents' recognition to those questions, which are designed by this research.

5.1 Research framework

[1] ROI analysis seeks to demonstrate that a program or intervention has a direct positive impact on an organization's competitiveness and productivity (Derryberry, 1998). As for the formula of ROI, it can be depicted as follows. $ROI(\%) = \text{earnings} / \text{investment} \times 100$

The detail research framework is depicted as follows.

Figure 1. Research framework



As to the research hypotheses, we categorize them into as follows,

Hypothesis1: There are significant interrelationships in the SDL, the OIE and the performance of WBT.

Hypothesis2: There are significant interrelationships between the SDL and the performance of WBT and the performance of WBT is affected by the SDL.

Hypothesis3: There are significant interrelationships between the OIE and the performance of WBT and the performance of WBT is affected by the OIE.

5.3 The method for data analysis

Concerning the analysis of questionnaires, multi-regression and Pearson product-moment correlation methods are used to analyze the interrelationships of the SDL, the OIE and the performance of WBT. Meanwhile, research uses simple regression method to analyze the relationships between the SDL and the performance of WBT as well as the relationships between the OIE and the performance of WBT.

The detail analysis method is detailed as follows,

(1) Multi-regression analysis

$$\log Y = \beta_0 + \beta_1 A_1 + \beta_2 B_2 + \varepsilon_i$$

A. Model of multi-regression

$$\varepsilon_i \sim N(0, \sigma^2)$$

Y : Performance of WBT

A1 : Self-directed learning

B2 : Organizational innovation environment

B. Meaning of regression coefficients

Its main purpose is to observe the coefficients of β_1 and β_2 . If β_1 and β_2 are significant differences with 0, that means the performance of WBT is affected by the SDL and the OIE. If only β_1 is significant differences with 0, it means that the performance of WBT is only affected by the SDL. In addition, if only the coefficient of β_2 is significant differences with 0, it means that the performance of WBT is only affected by the OIE.

(2) Simple-regression analysis

A. Model of simple-regression

$$(A) \quad \log Y = \beta_0 + \beta_1 A_1 + \beta_2 B_2 + \varepsilon, \quad \text{Model 1.}$$

$$\varepsilon_i \stackrel{i.i.d}{\sim} N(0, \sigma^2)$$

Y: Performance of WBT

A1: Self-directed learning

$$(B) \quad \log Y = \beta_0 + \beta_1 A_1 + \beta_2 B_2 + \varepsilon, \quad \text{Model 2}$$

$$\varepsilon_i \stackrel{i.i.d}{\sim} N(0, \sigma^2)$$

Y: Performance of WBT

B2: Organizational innovation environment

(3) Description of variable

In variable aspect, the SDL includes six dimensions. They are 1. Learning efficiency 2. Love to learn 3. Initiative learning 4. Independent learning 5. Learning motivation 6. Learning creativity.

As to the OIE, it includes seven dimensions. They are 1. Organizational value and style 2. Job characteristics and manner 3. Resource provision 4. Operation of Working Teams 5. Leadership style and capacity of top managers 6. Learning and growth 7. Job environment and atmosphere.

(4) Meaning of regression coefficients

In model 1, if β_1 is significant differences with 0, it means that the performance WBT is affected by the SDL. In model 2, if β_2 is significant differences with 0, it means that the performance of WBT is affected by the OIE.

VI. RESULTS AND DISCUSSION

Out of 60 questionnaires, 34 valid questionnaires are returned and a 57% response rate is achieved. As for the detail research findings, please refer to the following introduction.

6.1 The basic data analysis for those enterprises which accept our investigation

(1) Industry of enterprises

Table 2 shows that the industrial classification to those enterprises, which accept our investigation, electronic industry is ranked the first, and then is software, telecommunication, life insurance and banking industry.

Table 2. The industrial classification of those enterprises which accept investigation

Industrial classification	Number of companies	Percentage
Electronic industry	14	41.2%
Software industry	6	17.7%
Telecommunication industry	8	23.5%
Life insurance industry	5	14.7%
Banking industry	1	2.9%
Total	34	100%

Source: this research

(2) Enterprises' capital and employees' amount

Table 3 and table 4 show that the enterprises, which accept our investigation, own the characteristics of higher capital and higher number of employees. This means that the enterprises to adopt WBT are trying to produce the effectiveness of scale of economy. In other words, they are trying to obtain higher cost-saving in training.

Table 3. The enterprises' capital Unit: million (US\$)

Capital	Number of companies	Percentage
Below 3.03	3	8.8%

Between 3.03 and 15.15 (3.03 is not included)	2	5.9%
Between 15.15 and 30.30 (15.15 is not included)	4	11.8%
Between 30.30 and 151.15 (30.30 is not included)	16	47.0%
Between 151.15 and 303.30 (151.15 is not included)	4	11.8%
Between 303.30 and 606.06 (303.30 is not included)	3	8.8%
Over than 606.06 but not including 606.06	2	5.9%
Total	34	100%

Source: this research

Table 4. The number of employees Unit: person

Number of employees	Number of companies	Percentage
Below 100	3	8.8%
Between 100 and 500 (100 is not included)	6	17.6%
Between 500 and 1000 (500 is not included)	12	35.3%
Between 1000 and 2000 (1000 is not included)	5	14.7%
Between 2000 and 3000 (2000 is not included)	4	11.8%
Between 3000 and 5000 (3000 is not included)	2	5.9%
Over than 5000 but not including 5000	2	5.9%
Total	34	100%

Source: this research

(3) Time and expenditure for putting into WBT

Table 5 and table 6 points out that the expenditure for enterprises putting into WBT is still quiet few. This is because enterprises implement WBT is still not a very long time, the expenditure on WBT must be lower.

Table 5. Time for putting into WBT Unit: year(s)

Time	Number of companies	Percentage
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Below 1	10	29.4%
Between 1 and 2 (1 is not included)	12	35.3%
Between 2 and 3 (2 is not included)	10	29.4%
Over than 3	2	5.9%
Total	34	100%

Source: this research

Table 6. Expenditure for putting into WBT Unit: (US\$) million

Money	Number of companies	Percentage
Below 0.015	10	29.4%
Between 0.015 and 0.0303 (0.015 is not included)	15	44.1%
100-200不含100	3	8.8%
200以上	6	17.7%
Total	34	100%

Source: this research

(4) Reasons for implemented WBT

Table7 shows that the reasons for enterprises to implement WBT can be categorized into the following, 1. Encouraging employees to learn more 2. Saving training time 3. Saving training cost 4. Easy to store data and easy to revise training courses and so on.

Table7. Reasons for implemented WBT

Reasons	Frequencies
Encouraging employees to learn more	34
Saving training time	32
Saving training cost	25
Others (including easy to store data, easy to revise training courses,	30

easy to learn and so on)	
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Source: this research

(5) Employees' level and course content for WBT

Table8 indicates that the people who are new employed are ranked the first for participation in WBT, then is middle managers, office employees, and basic level employees. As for the course content, table 9 and table 10 show that most of the training courses are concentrated in non-skill, human resources, marketing and R&D and so on.

Table8. The employees' level for participation in WBT

Level	Frequencies
Decision makers	21
Middle managers	26
Office employees	25
Basic level employees	8
People who are new employed	32

Source: this research

Table 9. The course content of WBT (I)

Course content	Frequencies
skill	16
Non-skill	33

Source: this research

Table 10. The course content of WBT (II)

Course content	Frequencies
Human resource	32
Marketing	31
R&D	15
Finance	13
Production management	13
Others	32

Source: this research

(6) Software and Platform

Table11 shows that Notes and Learning Space are the most popular platform and software for enterprises.

Table11. The software and platform used by enterprises

Platform	Software	Number of companies	Percentage
NOTES	Learning Space	28	82.4%
NOTES	E-agent	1	2.9%
UNIX SOLARIS	Software designed by Prof. Chen	1	2.9%
NOTES	Training on demand	3	8.9%
NOTES	Pospo	1	2.9%
Total		34	100%

Source: this research

6.2 The performance of WBT significantly affected by the SDL and the OIE

Table 12, 13 and 14 show that the SDL, the OIE and the performance of WBT are highly interrelated and this can be shown in the R-Square analysis which reaches to 7.26.

Besides, research also finds that the SDL and the OIE strongly affect performance of WBT

In the other words, the performance of WBT will be better if the employees own the better concept in SDL and the OEI is better. Meanwhile, table 15, 16 and 17 show that the SDL and the OIE have significant interrelationships. This can be seen from the R-Square analysis between them, which reaches to 0.7467.

Hence, people can see that not only the SDL, the OEI and the performance have strong interrelationships, but also the SDL and the OEI have very tight interrelationships. The above results do completely conform to our previous research hypothesis.

Table 12. Pearson correlation coefficients for the performance of WBT, SDL and OIE

	Y(Performance of WBT)	A1(SDL)	B2(OIE)
Y(Performance of WBT)	1.00000	0.80110	0.83833
	0.0	0.0001	0.0001
A1(SDL)	0.80110	1.00000	0.86414
	0.0001	0.0	0.0001
B2(OIE)	0.83833	0.86414	1.00000
	0.0001	0.0001	0.0

N=34

Table 13. Analysis of variance for the performance of WBT, the SDL and the OIE

Source	DF	Sum of Squares	Mean Square	F-Value	P-Value
Model	2	1205.53166	602.76583	41.071	0.0001*
Error	31	454.96834	14.67640		
C Total	33	1660.5			

*:p < 0.01; **:p<0.05;***:p<0.1 R-Square = 0.7260 ; Adj R-sq. = 0,7083

Table 14. Parameter Estimates for the performance of WBT, theSDL and the OIE

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	P > T
β_0	1	1.366650	0.1140	12.0	0.0002*
β_1	1	0.213717	0.06922765	3.087	0.042**
β_2	1	0.003125	0.0012	2.621	0.011**

*:p < 0.01; **:p<0.05;***:p<0.1

Table15. Pearson correlation coefficients between the SDL and the OIE

	B2(OIE)	A1(SDL)
B2(OIE)	1.00000	0.86414
A1(SDL)	0.86414	1.00000
	0.0	0.0001
	0.0001	0.0

N=34

Table 16. Analysis of variance for performance between the SDLand the OIE

Source	DF	Sum of Squares	Mean Square	F-Value	P-Value
Model	1	3225.60132	3225.60132	94.354	0.0001*
Error	32	1093.9571	34.18617		
C Total	33	4319.55882			

*:p < 0.01; **:p<0.05;***:p<0.1 R-Square = 0.7467 ; Adj. R-sq. = 0,7388

Table 17. Parameter Estimates between the SDL and the OIE

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	P > T
Xo	1	57.793960	10.34358173	5.587	0.0001*
A1	1	0.516483	0.05317110	9.714	0.0001*

*:p < 0.01; **:p<0.05;***:p<0.1

6.3 The performance of WBT significantly affected by the SDL

Table 18 and table 19 show that the performance of WBT has a strong interrelationship with the employees' concept of SDL and it is highly affected by the factor of SDL. Especially, the performance of WBT is highly influenced by the following dimensions, 1. Learning efficiency 2. Love to learn 3. Initiative learning 4. Independent learning 5. Learning-motivation 6. Learning creativity. These results do also fully conform to the hypothesis that research has set up ahead.

Table 18. Analysis of variance between the SDL and the performance of WBT

Source	DF	Sum of Squares	Mean Square	F-Value	P-Value
Model	6	1334.09799	222.34966	18.393	0.0001*
Error	27	326.40201	12.08896		
C Total	33	1660.5			

*:p < 0.01; **:p<0.05;***:p<0.1 **R-Square = 0.8034 Adj.R-sq. = 0.7597**

Table 19. Parameter Estimates between the SDL and the performance of WBT

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	P > T
a1. Learning efficiency	1	0.882059	0.29684015	2.971	0.0062*

a2. Love to learn	1	0.502868	0.19741553	2.547	0.0169**
a3. Initiative learning	1	0.816998	0.33712396	2.423	0.0224**
a4. Independent learning	1	0.502336	0.19841521	2.501	0.0170**
a5. Learning motivation	1	0.133819	0.15100704	0.886	0.3838
a6. Learning creativity	1	0.876582	0.28671201	2.880	0.0071*

*:p< 0.01; **:p<0.05; ***:p<0.1

6.4 The performance of WBT significantly affected by the OIE

Table 20 and table 21 show that the performance of WBT has a strong interrelationship with the OEI and it is highly affected by the OEI. Especially, the performance of WBT is tightly affected by the following dimensions, 1. Job characteristics and manner 2. Resource provision 3. Operation of Working Teams 4. Learning and growth 5. Job environment and atmosphere. Again, these results do thoroughly conform to the hypothesis that research has set up ahead.

Table 20. Analysis of variance between the OIE and the performance of WBT

Source	DF	Sum of Squares	Mean Square	F-Value	P-Value
Model	7	1202.43650	171.77664	9.750	0.0001*
Error	26	458.06350	17.61783		
C Total	33	1660.5			

*:p < 0.01; **:p<0.05; ***:p<0.1 R-Square = 0.7241 Adj. R-sq. = 0.6499

Table 21. Parameter Estimates between the OIE and the performance of WBT

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	P > T
b1. Organizational value and style	1	-0.035748	0.41213176	-0.762	0.4528
b2. Job characteristics and manner	1	0.8406241	0.33241553	2.550	0.0159**

b3. Resource provision	1	0.8169210	0.33712370	2.422	0.0223**
b4. Operation of Working Teams	1	0.8414410	0.33142258	2.539	0.0174**
b5. Leadership style and capacity of top managers	1	0.122347	0.55183425	0.222	0.8261
b6. Learning and growth	1	0.876582	0.28671201	2.880	0.0071*
b7. Job environment and atmosphere	1	1.69458	0.54758335	3.94	0.047**

*:p< 0.01; **:p<0.05; ***:p<0.1

V. CONCLUSIONS AND SUGGESTIONS

Research findings strongly suggest from those enterprises, which accept our investigation that if their employees own a better concept in SDL and their organizations have better OIE, their business firms will have a better performance in WBT. If not, they will not be able to obtain a well performance of WBT. That is to say, that the SDL, the OIE and the performance of WBT are highly interrelated; thus, these two factors must be given a serious attention when enterprises are planning to implement WBT.

Furthermore, it is also important for management in corporations to support WBT not only because it is cost saving with better ROI rate but also because WBT is a helpful mechanism to enhance employees' learning and performance. Managers with training professionals need to understand methodology of WBT and wisely determine in the markets which type of WBT can be suitable for their organizations.

As discussed above, there are several factors and efforts to take a consideration to take full advantages of WBT as a great resource of learning for individuals' as well as

organization. Integration of efforts by individuals, instructors, and management in the organization is essential to make WBT more helpful and effective as a prospective training mechanism.

Eventually, most of research samples are from hi-tech companies due to the research limitations. Hence, this research only can be seen as an exploratory research and its result can not be completely inferred or applied to the whole industries. Under this situation, it is worthy of those people who are interesting in this topic to do a further research after one or two more years. During that time, we trust that they will be able to provide a more concrete research result to the academics circles and the industrial circles

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