Using WBL as ODI to Improve Work Environment and Well-being of Employee

Kijchai Chotikamankong

Organization Development and Management

Assumption University, Thailand

kijchai_c@hotmail.com

Abstract

This research is influenced from visiting workplace of SC Siam Supply and Sounds. Work environment and well-being of employees of organization are interesting and there is an opportunity of developing the set two areas. The objectives of research comprise of three; 1) To determine the current situation of work environment and well-being of employees. 2)To identify and using WBL as ODI to improve work environment and well-being of employee and 3) To compare the difference between pre-ODI and post-ODI. Data collection techniques of this study contains with survey, observation and interview while respondents are employees of production department. The OD interventions were based from Whole Brain Literacy model and implemented as four steps of ODIs, consisting of 1) awareness 2) idea creation 3) action and 4) sustainable.

The findings from the study revealed that there was difference between pre-ODI and Post-ODI in area of work environment. On the other hands, there was no significant difference in area of well-being of employees.

For future study, researcher recommended to included measurement scale, intensity of light and temperature scale, to determine and find out appropriate light and temperature for employees. Moreover, technology is a good choice to include in future study. An improvement of organizational technology would be able to improve work environment and well-being of employee as well.

Key words: Whole Brain Literacy, Work Environment, Employee's well-being, Small Business Entrepreneur

Introduction

In well-known organization, image of happy employees doing their job in office is usually published. Employees intend to work for organization. But it is not for many of Thai SMEs. Many of employees who work in Thai SMEs are dealing with work environment and well-being problem. They spend at least eight hours per day, five days a week to work for their organization without any enthusiastic. How possible that they will intend to work while they have to work at inappropriate work environment? Some of them have had accidents at work and injured. Some of have health problem because of insanitary work environment. It is a challenge for organization

how to improve work environment and well-being of employee to let them intend to work for organization? Therefore, the research aims to study organizational situation and determine appropriate OD interventions to improve work environment and well-being of employees and find out the difference between pre-ODIs and post-ODIs.

1. Literature Review
1.1. Organization Development

Organization Development (OD) is focused on improving the effectiveness of organizations and the people inorganization. With the goal of transferring knowledge and skills to organizations, OD approach requires the continuous process of diagnosis, action planning, implementation and evaluation to improve their capacity for finding a solution to the difficulties and managing future changes (Foster, 2013).

1.2. Change Management

Change is generally defined as "a new state of things, different from old state of things". Change could happen anywhere and anytime. Change management is important in OD. Because it is the approach to driving adoption and usage so initiatives deliver expected results and outcomes. The well-known theory of change management has form in 1940 by Lewin. The concept of Lewin remains famous until today.
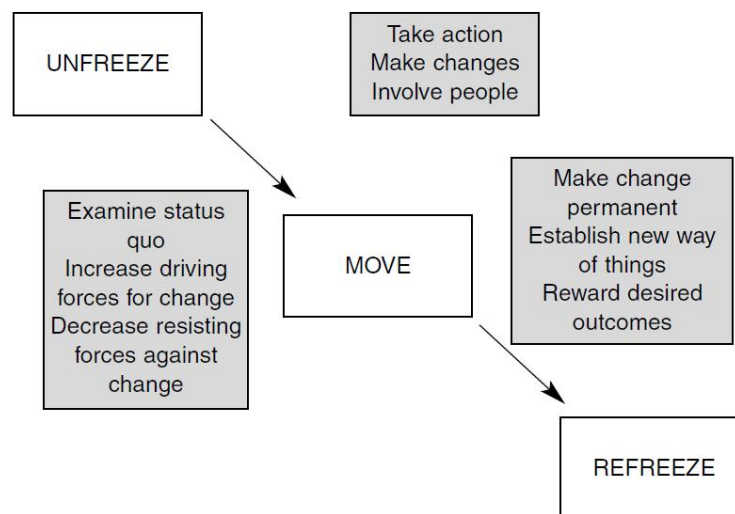

Figure 1 Lewin's Three-Steps Model (Lewin, 1951)

Lewin developed a change model involving three stages: unfreeze move and refreeze. The initial stage is "unfreeze". People naturally resist change. The goal of unfreeze stage is to create readiness for change. The necessary of change are shown to employee and make them accept the change. The next stage is "move". This stage also referred to as "changing. The change is implemented in this stage. During the changing, employees learn the new state of things. It is possible to move forth and back in this stage, since the mistake can be happened anytime. The last stage is "refreeze". Kent (2011) suggested that this stage cannot be overlooked. Because there is

possibility that people revert change to previous way that they are familiar with. Refreeze stage is a crucial process to ensure that temporary habit had change to permanent practice.

1.3. Relationship between Work Environment and Performance

Work environment refers to the surrounding within workplace. It is included physical environment, social and psychological environment. Hawthorne experiment is a well-known experiment which was done by Elton Mayo, an industrial researcger, in late 1920s and early 1930s. The result showed that paying attention to employees' needs would improve productivity. Afterwards, Landsberger, the interpreter, suggested that increased attention could lead to temporary increase in work performance. It is reactivity in which people improve because they are being observed. This is referred to observer effect which later researcher should be careful.

Later, there are many studies about correlation between work environment and performance. There is an interesting study by Kamaruzzaman and Sabrani (2011). The study shows that productivity can be interrupted by unhealthy of employee while appropriate work environment leads to an increase of productivity.

There is a study about correlation between indoor work environment and employee's comfort. A study was done by Pathak in 2014 and result shown that comfortable environment lead to an increasing of work performance.

1.4. Subjective Well-being

Subjective Well-Being (SWB) is a person cognitive and affective evaluations of life (Diener et al., 2002). Cognitive element refers to what people think about their life satisfaction. The affective element refers to emotions, moods and feelings. The people who have high level of satisfaction would be deemed to have high level of SWB or easily mean very happy.
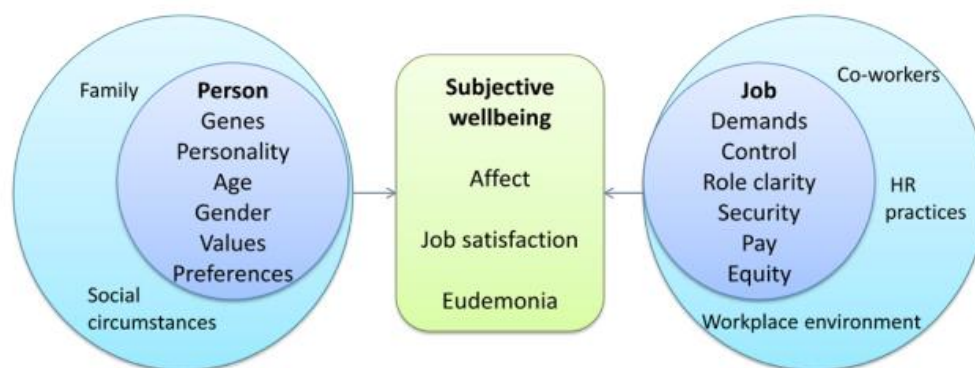

Figure 2 Factors influencing SWB at work (Bryson et al., 2014)

SWB is influenced by individuality and work (Bryson et al., 2014). Individuality refers to personal characteristic and social circumstance of people while another element refers to job and workplace environment. Warr (2007) studied about gender and the result shown that female have more job satisfaction than male although have higher level of anxiety and depression. Furthermore,

older employees are satisfied with their job more than younger employees (Birdi et al., 1995, Clerk et al.,1996). Nature of job also affect to SWB. There is a study of Nozal (2009) about employees' health and job. Nozal mentioned that employed person typically have better heath than unemployed. However, it does not mean that employed person is satisfied. It also depends on demand of pleasing job and etc. Eudemonia refers to well-being as distinct from happiness. Waterman (1993) suggested that eudemonia occurs when people's life activities are most congruent or meshing with deeply held values and are holistically or fully engaged which can be from both sides of social circumstance and work environment.

1.5. Whole Brain Literacy

Whole Brain Literacy (WBL) is a concept of human's thinking system. It is an integral thinking-though process to generate a wholistic view outcome by connecting four quadrants around the center core on purpose. WBL was developed from Brain Map Model (Lynch, 1984) extrapolated and evolved by Tayko (2010) for instruction and organization development activities.
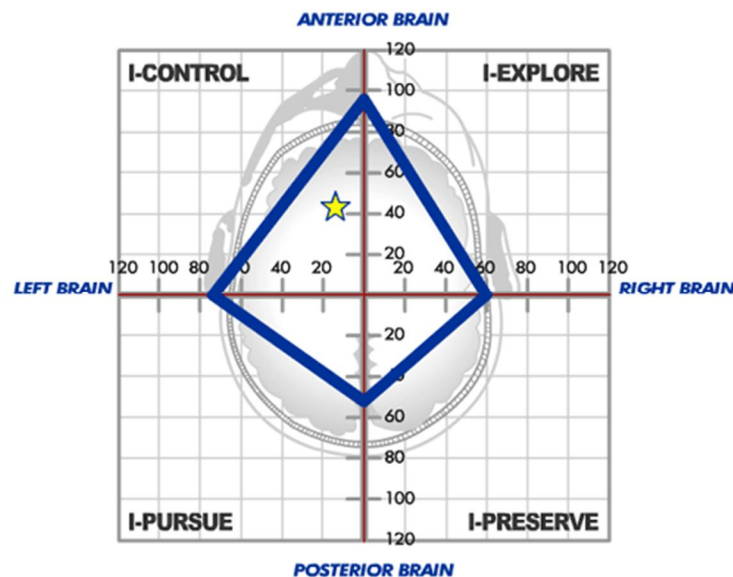

Figure 3 Brain Map Model (Lynch, 1984)

The figure 3 illustrates four quadrants of brain which called I-Control, I-Explore, I-Preserve and I-Pursue. Lynch (1984) believed that four quadrants of brain work in different mode of information.

Tayko and Reyes-Talmo (2010) had created one point connecting four quadrants of brain at the center core which called "core purpose". It is known as Whole Brain Literacy (WBL). It is a concept which required people to think thoughtfully with full consciousness by using all part of brains to process information and considering all data thoroughly until reach the conclusion.

2. Research Methodology

This study focused on improving work environment and well-being of employees. This chapter describes the research methodology which includes research design, respondent, instrument, data collection technique, data collection procedure and data analysis.
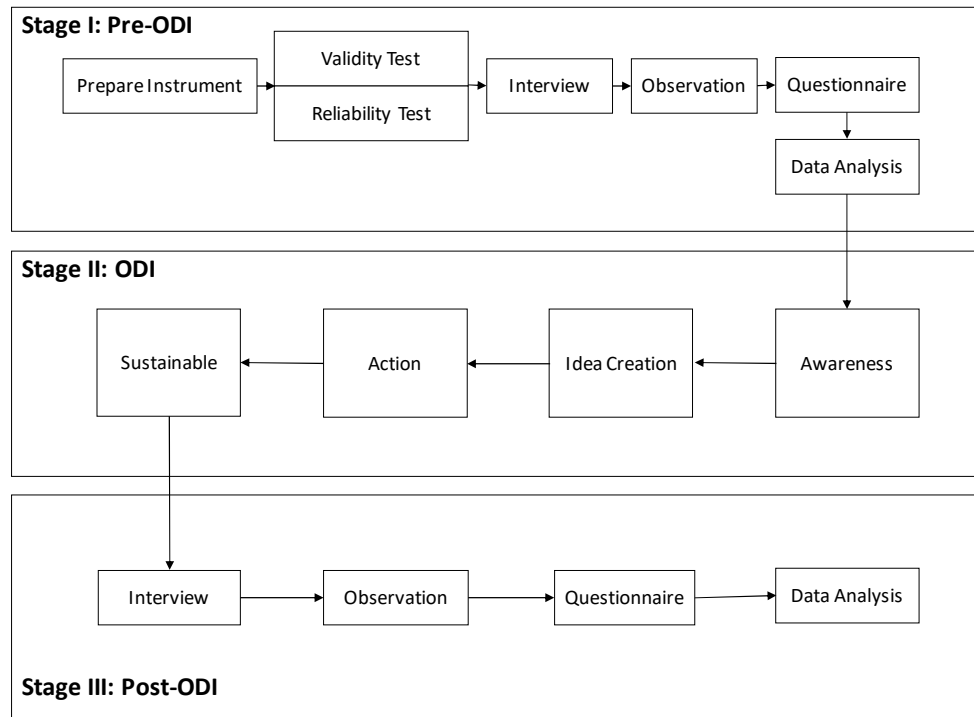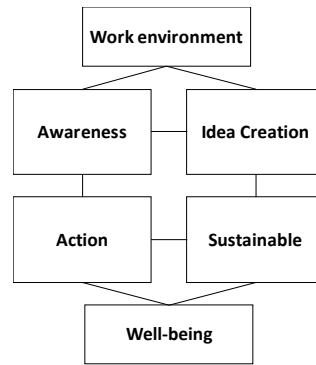
```
┌─────────────────────────────────────────────────────────────────────┐
│ Stage I: Pre-ODI                                                    │
│                        ┌─────────────┐                              │
│                        │Validity Test│                              │
│  ┌──────────────┐      ├─────────────┤   ┌─────────┐ ┌───────────┐ ┌──────────────┐ │
│  │Prepare Instrument│  │Reliability  │   │Interview│ │Observation│ │Questionnaire│ │
│  └──────────────┘      │    Test     │   └─────────┘ └───────────┘ └──────────────┘ │
│                        └─────────────┘                            ┌──────────────┐ │
│                                                                   │Data Analysis │ │
│                                                                   └──────────────┘ │
└─────────────────────────────────────────────────────────────────────┘

┌─────────────────────────────────────────────────────────────────────┐
│ Stage II: ODI                                                       │
│  ┌──────────┐    ┌────────┐    ┌────────────┐    ┌──────────┐       │
│  │Sustainable│◄──│ Action │◄──│Idea Creation│◄──│Awareness │       │
│  └──────────┘    └────────┘    └────────────┘    └──────────┘       │
└─────────────────────────────────────────────────────────────────────┘

┌─────────────────────────────────────────────────────────────────────┐
│  ┌─────────┐    ┌───────────┐    ┌─────────────┐    ┌─────────────┐ │
│  │Interview│──►│Observation│──►│Questionnaire│──►│Data Analysis│ │
│  └─────────┘    └───────────┘    └─────────────┘    └─────────────┘ │
│ Stage III: Post-ODI                                                 │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 4 Research Methodology

Research was designed to determine impact of ODI by using Pre and Post comparison. So, research was designed into three stages; 1) pre-ODIs 2) ODI 3) post-ODIs.

1) The Pre-ODI stage is for collecting data and determine the current situation. In this stage, researcher prepare instrument, doing data collection and data analysis. There are three instruments used in this research which were twenty questions of questionnaire, interview guide and observation checklist. All three instruments were created based on WBL. Each instrument was generated from four quadrants of brain (I-Control, I-Explore, I-Preserve, I-Persue), four questions per variables. Validity test and reliability test were done before questionnaire was distributed. The actual respondent of this study were 34 employees of SC Siam Supply and Sounds Partnership who work in production team. Respondents required to rate on a 6-point Likert-type scale from strongly disagree to strongly agree. All data were recorded and analyzed by SPSS program version 11.5.

2) ODIs was designed as 4 steps of implementing OD interventions. WBL was applied in this stage by connecting four quadrants of brain through process of Awareness, Idea creation, Action and Sustainable.

```
                    ┌──────────────────┐
                    │ Work environment │
                    └──────────────────┘
                    ╱                  ╲
        ┌─────────────┐          ┌──────────────┐
        │  Awareness  │──────────│ Idea Creation│
        └─────────────┘          └──────────────┘
        ┌─────────────┐          ┌──────────────┐
        │   Action    │──────────│  Sustainable │
        └─────────────┘          └──────────────┘
                    ╲                  ╱
                    ┌──────────────────┐
                    │    Well-being    │
                    └──────────────────┘
```

The first step was to communicate with employee to show the advantages of improve work environment and well-being of employees. It is to create self-awareness as a turning point for change. Second step was to explore for an appropriate solution for improving. Session was created for idea collection, blend and determine the action. Moving forward to the next step by taking an action by implementing with collaboration of employees. The last step was to refreeze change with sustainable session.

3) Post-ODIs was the final stage of research methodology. Researcher collect information after implemented ODIs. All data were recorded and analyzed by SPSS. Descriptive statistic, Inferential statistic, Content analysis and Participant observation were used in data analysis and applied to test the hypothesis.

3. Findings and Data Analysis

From table 1, of all 30 respondents, 40 percent are male and 60 percent are female. The majority are 36 to 45 years old at 73.33 percent. About two out of third work at SC Siam Supply and Sounds for 3 years and more (66.67 percent).

Table 1 Respondents Profile (30 person)

Respondent's Factors		Frequency of respondents (percentage)
Gender	Male	40.00
	Female	60.00
Age	Less than 26 years old	6.67
	26 to 35 years old	6.67
	36 to 45 years old	73.33
	46 to 55 years old	13.33
	56 years old and more	0.00
Working Experience	Less than 1 year	3.33
	1 to 2 years	10.00
	2 to 3 years	20.00
	3 years and more	66.67

The quantitative data analysis used to describe result from twenty questions of questionnaire. Questionnaire consists of five sections; light, temperature, smell, spirituality and emotion.
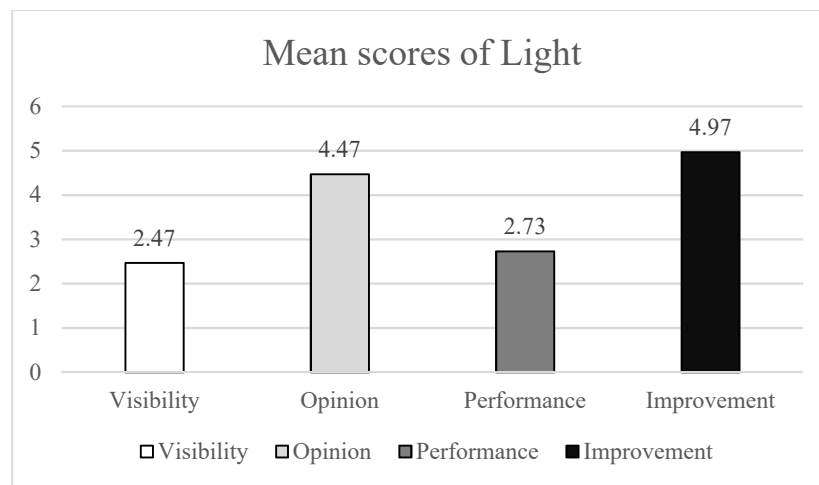
Figure 5 Mean scores of light

Under current light at workplace, result showed that respondent disagreed for clearly vision at work with mean score 2.47 out of 6.00. In part of opinion, Respondents agreed that they can work better if there is adequate light with mean score 4.47 out of 6.00. Respondents slightly disagreed that they can work effectiveness under current light. Respondents agreed that organization should have an improvement about light with mean score 4.97 out of 6.00.
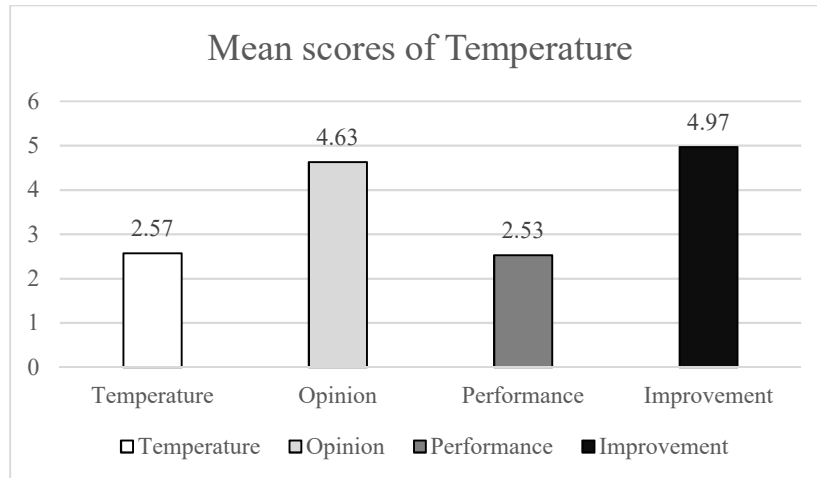
Figure 6 Mean scores of temperature

In part of temperature, respondent disagreed about comfortable temperature at work with mean score 2.57 out of 6.00. For opinion, they agreed that they can work more effective in comfortable temperature with mean score 4.63 out of 6.00. But under current temperature, they disagreed that they had good performance with mean score 2.53 out of 6.00. For an improvement, they agreed that organization should have an improvement with mean score 4.63 out of 6.00.
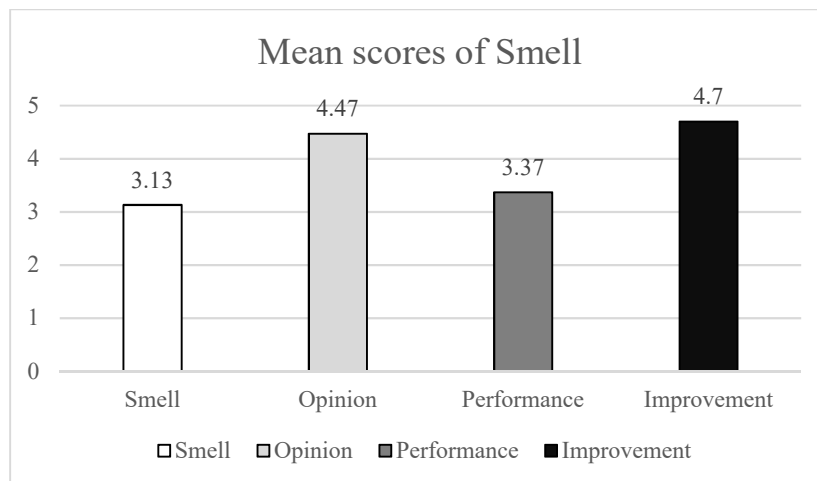

Figure 7 Mean score of smell

In part of smell, respondent slightly disagreed that there is no smell at work with mean score 3.13 out of 6.00. They agreed that they can work better with mean score 4.47 out of 6.00. But under current smell in workplace, they slightly disagreed that they had good performance with mean score 3.37 out of 6.00. For an improvement, they agreed that organization should improve in part of smell with mean score 4.70 out of 6.00.
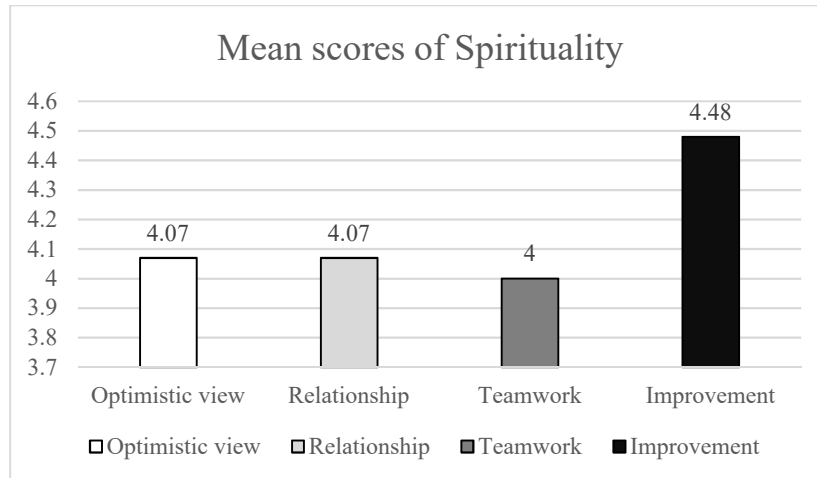
Figure 8 Mean scores of spirituality
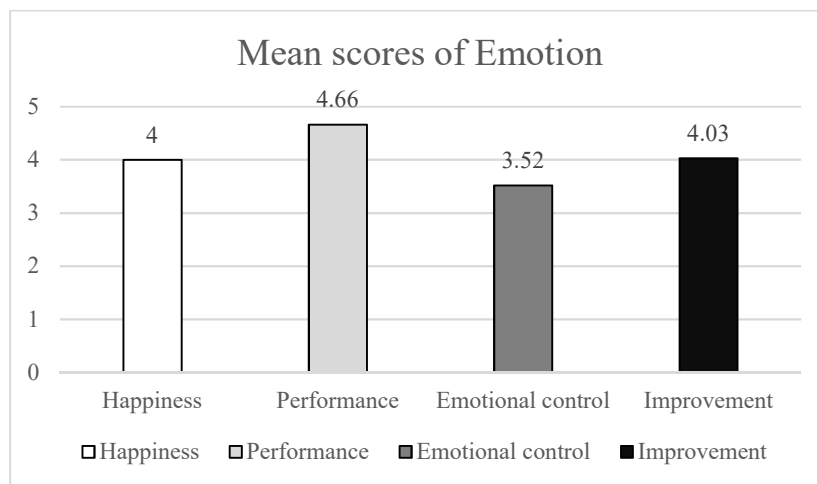
Figure 9 Mean scores of emotion

For well-being of employees, respondents slightly agreed that they are optimistic view person, has a good relationship and able to work as a team with mean scores 4.07, 4.07 and 4.00 out of 6.00 respectively. While respondents agreed that they are ready for an improvement with mean score 4.48 out of 6.00.

In part of emotion, respondents slightly agreed that they are happy at work, good emotional control and ready for an improvement with mean scores 4.00, 3.52 and 4.03 out of 6.00 respectively. While they agreed that happiness lead to work effectiveness with mean score 4.66 out of 6.00.

The quantitative data analysis used to describe result of interview and observation. From interview, respondents mention that they are satisfied with their job but organization should improve work environment. From observation, there is no accident during the period of study. Employees lack of enthusiasm while working. Work environment is insanitary because of dirt, snacks, empty bottle and etc surrounding workplace.

ODIs were implemented based on four steps mentioned in research methodology. The result of ODIs were summarized as following:

Table 2 Result of ODIs

Process of ODI	Objective	Result
1. Awareness	1. Understand the important of work environment and well-being. 2. Influence employees to change	1. Employees understand the advantage of good work environment and important of well-being. 2. Employees want to improve work environment and well-being.
2. Idea creation	1. Collect ideas from employees 2. Finding appropriate ODIs	1. Ideas were collected and blended. 2. Session was arranged. It is a session which employees have to think about their well-being and drawing desire work-environment. 3. Seven appropriate ODIs were generated from mapping employees' need within scope and limitation of improvement.
3. Action	1. Improve work environment 2. Improve well-being of employees	1. Workplace is cleaner than before. 2. There is new multipurpose area for employees. 3. There is new information board and knowledge corner. 4. Employees had additional income from garbage and workplace is clean. 5. New light bulbs and fans were installed. 6. Employees have good perspective to their colleague and show their enthusiastic for work. 7. Employees have bike for exercise and able to ride for lunch.
4. Sustainable	1. To make it sustainable	1. Employees know their own responsible and keep improving their work environment. 2. Employees able to maintain enhanced work area.

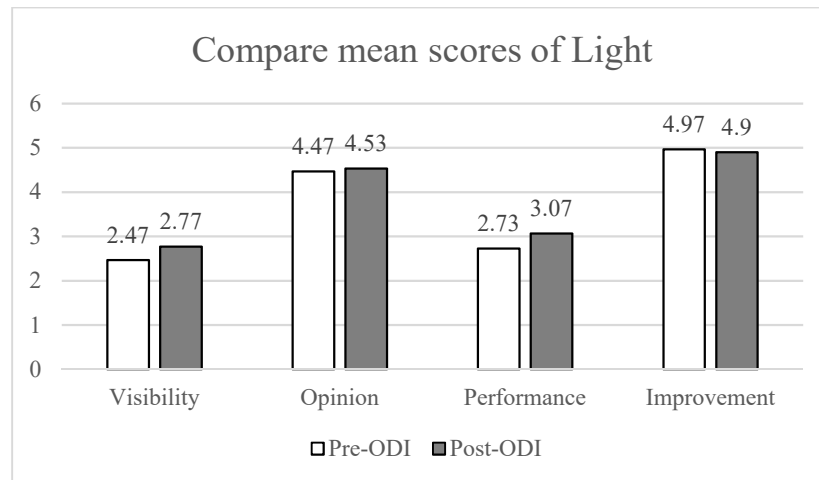The result after ODIs were implemented as following:

Figure 10 Compare mean scores of light

Mean variance scores for light were slightly changed. Visibility increased for 0.30. Opinion of employees were change from 4.47 to 4.53. Performance after ODIs were implemented increased for 0.34. Employees still need an improvement with decreasing of mean score for 0.07.
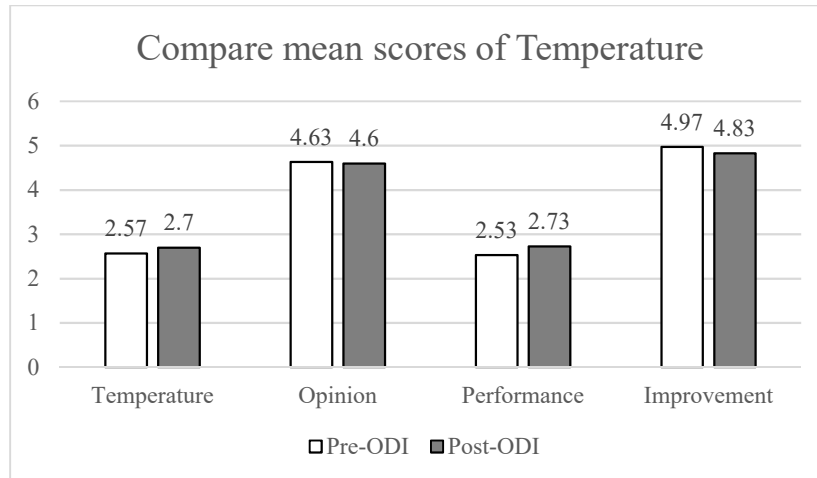
Figure 11 Compare mean score of temperature

Mean scores of temperature changed as following. Emplyoees slightly disagreed that organization had comfort temperature with increase of mean score for 0.13. They agreed that they could work better with mean score 4.60 out 6.00. The current performance changed from 2.53 to 2.73 which was in ranged slightly disagreed while employees agreed to improve work environment with mean score 4.83 out of 6.00.
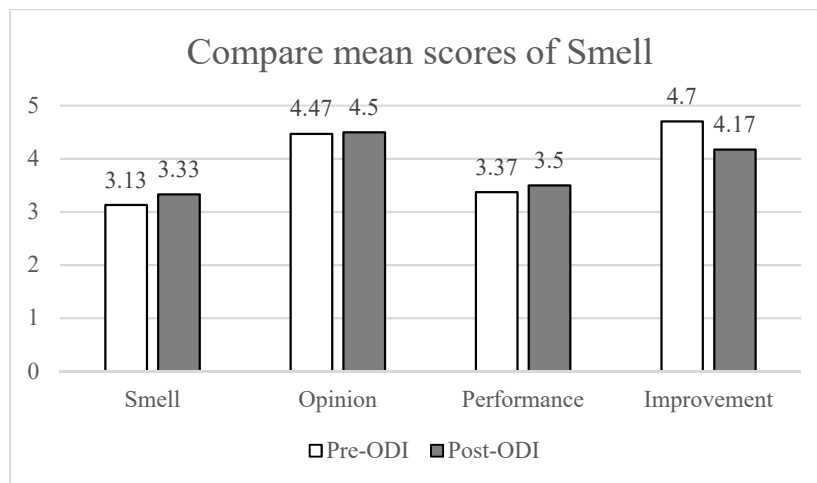

Figure 12 Compare mean score of smell

The smell in office was reduced with increasing of mean score for 0.20. Employees agreed that they can work better as same as pre-ODIs with mean score 4.50 out of 6.00. The current performance of employee increased from 3.37 to 3.50. Mean score of need an improvement from employees dropped from 4.70, agreed, to 4.17 as slightly disagreed.
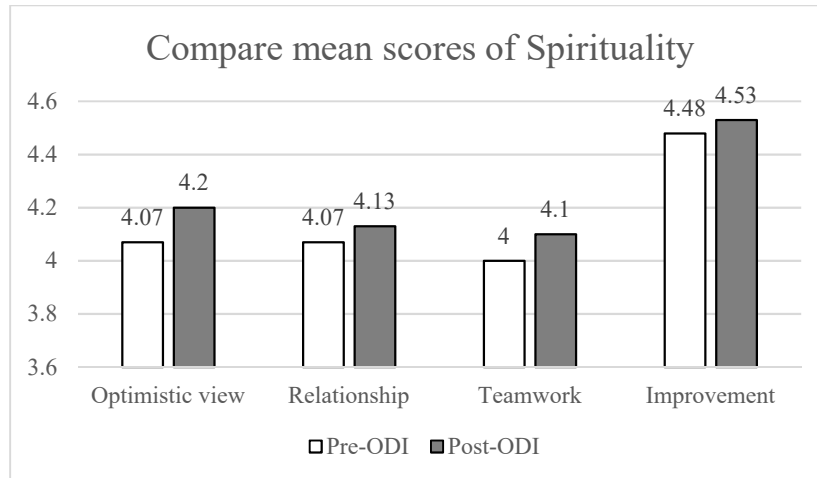
Figure 13 Compare mean scores of spirituality

For spirituality, mean scores of pre-ODIs and post-ODIs of four questions were in the same range of 6-point Likert value of scale. The mean scores of optimistic view, relationship, teamwork and need improvement increased for 0.13, 0.06, 0.10 and 0.05 respectively.
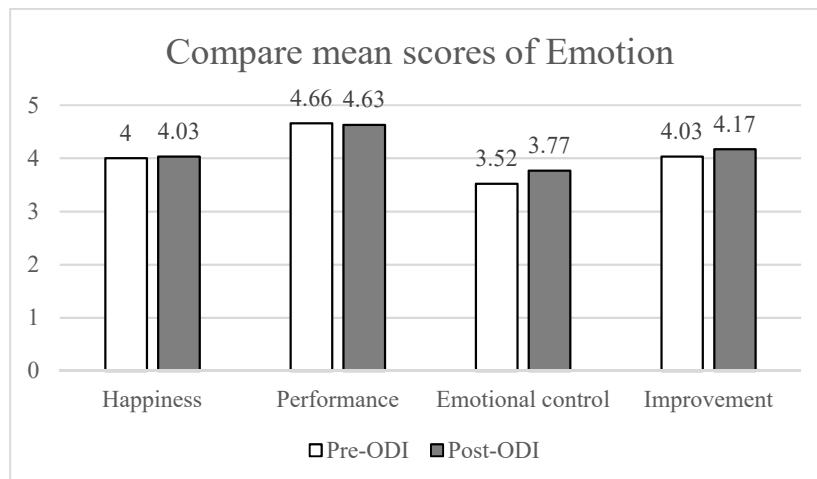

Figure 14 Compare mean scores of emotion

For emotion, mean score of happiness of employees mostly the same with mean variance 0.03. Work effectively's mean score decrease for 0.03. Mean scores of emotional control and need improvement increased from 3.52 to 3.77 and 4.03 to 4.17 respectively.

Statistical significance (t-test) was used to determine the difference between pre-ODIs and post-ODIs. The significant level was set at 0.05.

Table 3 Analysis result of statistical significance test (work environment)

Questionnaire	Paired Differences					t	df	Sig.(2-tailed)
	Mean	Std. Deviation	Std.Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Work environment								
Visibility	.3000	.59596	.10881	.0775	.5225	2.757	29	.010
Opinion	.0667	.44978	.08212	-.1013	.2346	.812	29	.423
Performance	.3333	.71116	.12984	.0678	.5989	2.567	29	.016
Improvement	-.0667	.44978	.08212	-.2346	.1013	-.812	29	.423
Temperature	.1333	.34575	.06312	.0042	.2624	2.112	29	.043
Opinion	-.0333	.55605	.10152	-.2410	.1743	-.328	29	.745
Performance	.2000	.48423	.08841	.0192	.3808	2.262	29	.031
Improvement	-.1333	.57135	.10431	-.3467	.0800	-1.278	29	.211
Smell	.2000	.48423	.08841	.0192	.3808	2.262	29	.031
Opinion	.0333	.76489	.13965	-.2523	.3189	.239	29	.813
Performance	.1333	.43417	.07927	-.0288	.2955	1.682	29	.103
Improvement	-.5333	.97320	.17768	-.8967	-.1699	-3.002	29	.005

Table 4 Analysis result of statistical significance test (well-being of employees)

Questionnaire	Paired Differences					t	df	Sig.(2-tailed)
	Mean	Std. Deviation	Std.Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Well-being								
Optimistic view	.1333	.73030	.13333	-.1394	.4060	1.000	29	.326
Relationship	.0333	.41384	.07556	-.1212	.1879	.441	29	.662
Teamwork	.0667	.86834	.15854	-.2576	.3909	.421	29	.677
Improvement	.1000	1.37339	.25075	-.4128	.6128	.399	29	.693
Happiness	.0667	.44978	.08212	-.1013	.2346	.821	29	.423
Performance	-.0333	.61495	.11227	-.2630	.1963	-.297	29	.769
Emotional control	.2333	1.56873	.28641	-.3524	.8191	.815	29	.422
Improvement	.1333	1.38298	.25250	-.3831	.6497	.528	29	.601

To sum up, employees have better vision, better temperature and smell with significant value 0.01, 0.043 and 0.031 respectively. They had better performance because of improvement of light and temperature with t-test scores 0.016 and 0.031 while there is no significant difference of performance after an improvement of smell. Therefore, employees still need improvement of light and temperature as same as pre-ODIs except in area of smell that mean value decreased with significant difference score 0.005.Under area of well-being, there is no variable had significant

different score less than 0.05. Hence, there is no significant different in area of well-being of employees.

Content analysis and participant observation were used to describe result from interview and observation. Results were concluded as following.

pre-ODIs   post-ODIs

Figure 15Compare work environment 1

Employees realized work environment was improved by collaboration of organization and employees. Waste area was changed to multipurpose area which employees could sit for lunch and relax.
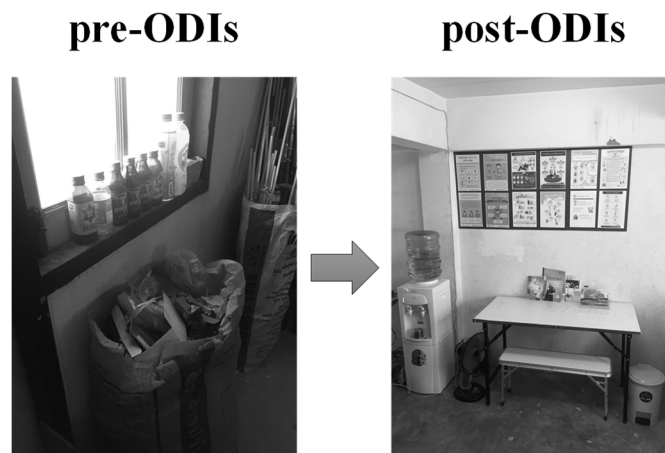
pre-ODIs   post-ODIs

Figure 16 Compare work environment 2

Employees mentioned that cleanness of work environment was better. Everyone keep the work area clean. Garbage was collected in provided area, sold and generated income for employees. There was additional area for employees which was called knowledge and announcement corner. The infographic knowledge about health and financial was provided here along with an announcement from organization.

4. Conclusion and Recommendation

Research was designed to determine current situation, finding appropriate ODIs, implemented and finding the impact of ODIs. The result shown that seven activities; cleaning, multipurpose area, information board and knowledge corner, trash to cash, light and fan, employee of the month and bike for all, in fours step of ODIs had impact to work environment. On the other hand, implemented ODIs had no impact to well-being of employees.

For recommendation, the study suggested that change of well-being need more time for tracking and evaluate. Both spirituality and personal emotion could not be changed in short period of time. Researchers recommended to add technology into the future study due to the new technology could help to improve both work environment and well-being of employees. The new technologies could study from other organizations in similar business.

Reference

Alpana, P.M.P., Dongre, R., & Shiwalkar, J.P. (2014). Impact of Spatial, Thermal and Lighting Parameter of the Efficiency and Comfort of Users in Indian Workspaces. Retrieved from http://www.ccsenet.org/journal/index.php/jsd/ article/viewFile/39122/21749

Anderson, D., & Anderson, L.A. (2010). Beyond Change Management. How to achieve breakthrough results through conscious change leadership.

Bakker, A.B., & Leiter, M.P. (2010). Work engagement: A handbook of essential theory and research. New York: Psychology Press.

Bakker, A.B., Schaufeli, W.B., Leiter, M.P., & Taris, T.W. (2008). Special issue: Engagement at work. Work & Stress, 22.

Bakker, A.B., Schaufeli, W.B., Leiter, M.P., & Taris, T.W. (2008). Work engagement: An emerging concept in occupational health psychology. Work & Stress, 22, 187-200.

Beckhard, R. (1969). Organization development: Strategies and models. Reading, Mass: Addison-Wesley.

Bryson, A., Forth, J., & Stokes, L. (2014). Does worker well-being affect workplace performance. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/ file/366637/bis-14-1120-does-worker-wellbeing-affect-workplace-performance-final.pdf

Bulletin, M. (2013). What is Whole Brain Literacy. Retrieved from https://ph.news .yahoo .com/whole-brain-literacy-093408217--finance.html

Cameron, E., & Green, M. (2009). Making sense of change management: A complete guide to models, tool and techniques of organizational change, 2nd edn, Kogan Page, London

Che-Ani, A.I., Tawil, N.M., Musa, A.R., Yahaya, H., & Tahir, M.M. (2012). The architecture studio of Universiti Kebangsaan Malaysia (UKM). Has the indoor environment quality standard been achieved? Retrieved http://www.ccsenet.org/journal/index.php/ ass/article/viewFile/22700/14676

Chuaprapaisilp, A. (1997). Thai Buddhist Philosophy and the Action Research Process. Retrieved from http://www.tandfonline.com/doi/pdf/10.1080/ 09650799700200023

Clark, A.E. (1996). Job Satisfaction in Britain. British Journal of Industrial Relations, 34, 189-217.

Diener, E., & Diener, C. (2008). Happiess: Unlocking the Mysteries of Psychological Wealth. Blackwell: Oxford.

Diener, E., Lucas, R.E., & Schimmack, U. (2008). National Accounts of Well-Being. UK: Oxford University Press.

Daszko, M., & Sheinberg, S. (2005). Survival is Optional: Only Leaders with new knowledge Can Lead the Transformation Theory of Transformation Final to Short article.

Foster, C. (2013). OD Theories and Theorists. Retrieved from http://organisationdevelopment .org/history-of-od/od-theories-and-theorists

Foster, C. (2014). The Ultimate Practitioners Guides to all Things OD. Retrieved from http://organisationdevelopment.org

Gorgievski, M.J., & Bakker, A.B. (2010). Passion for work: Work engagement versus workaholism. Handbook of employee engagement: Perspectives, issues, research and practice, 264-271.

Judge, T.A., Thoresen, C.J., Bono, J.E., & Patton G.K. (2001). The job satisfaction-job performance relationship: a qualitative and quantitative review.

Handel, M.J. (2005). Trends in perceived job quality, 1989 to 1998: Work and Occupation, 32(1), 66-94.

Hartzell, S. (n.d.). Lewin's 3-Stage Model of Change: Unfreezing, Changing & Refreezing, Retrieved from http://study.com/academy/lesson/lewins-3-stage-model-of-change-unfreezing-changing-refreezing.html

Harzell, S. (n.d.). The Hawthorne Effect. The Study of Employee Productivity. Retrieved from http://study.com/academy/lesson/the-hawthorne-effect-the-study-of-employee-productivity .html

Kamaruzzaman, S. N., & Sabrani, N. A. (2011). The Effect of Indoor Air Quality (IAQ) Towards Occupants. Psychological Performance in Office Buildings. Design + Built, 4(2001), 49–61.

Karakas, F. (2009). Spirituality and performance in organizations. Retrieved from http://oro .open.ac.uk/22966/2/Karakas(3).pdf

Karasek, S. (1979). Job demands-control model: A Summary of current issues and recommendations for future research. Emerald Group Publishing Limited, 237-268.

Kongalla, R. (2013). Organization Development Interventions Retrieved from http://www .slideshare.net

Lewin, K. (1951). Field Theory in Social Science: Selected Theoretical Papers.

Marpady, P., & Singhe, M.S. (2012). Work environment and its impact on performance. A study on woman employees of BSNL Mangalore. Retrieve from Academia.edu. Retrieved from http://www.academia.edu/6349206/work_environment_and_its_impact_on_performance_a _study_on_women_employees_of_BSNL_mangolore

McNamara, C.N.D. (2015). Thinking About Organizations as Systems. Retrieved from http://managementhelp.org/organizations/systems.htm

Miller, L.M. (2011). Lean Organization & Whole-System Architecture, Retrieved from http://www.lmmiller.com/2011/01/24/organization-design-and-process-improvement/lean-organization-whole-system-architecture/,

Nozal, A.L. (2009). The effect of Work Status and Working Conditions on Mental Health In Four Oecd Countries. National Institute Economic Review, 209(1), 72-87.

National Statistic Organization (2014). Working status of Thai people in 2014. Retrieved from http://service.nso.go.th/nso/nsopublish/themes/files/lfs57/SumResult57.pdf

Prakash, P., & Singhe, M.S. (2005). Effect of indoor environment quality on occupant's perception of performance. Retrieved from http://www.cce.ufl.edu/wp-content/uploads/2012/08/

Pryor, M.G., Sonia, T., John, H., Donna, A., & Lisa, S. (2008). Challenge facing Change Management Theories and Research. Delhi business review, 9(1), 1-20.

Russell, J.A. (2003). Core affect and the psychological construction of emotion. Psychological Review, 145–172.

Schaufeli, W.B., & Bakker, A.B. (2010). Defining and measuring work engagement. Bringing clarity to the concept, in Work Engagement. A Handbook of Essential Theory and Research Psychology Press, 10–24.

Schaufeli, W.B., Salanova, M., Gonzalez-Romá, V., & Bakker, A.B. (2002). The measurement of engagement and burnout: A confirmative analytic approach. Journal of Happiness Studies, 3, 71-92.

Siegrist, J. (1996). Soziale krisen und gesundheit [Social crises and health]. Gottingen, Germany: Hogrefe.

Steward, J.B. (2013). A Place to Play for Google Staff: Looking for a Lesson in Google's Perks, B1.

Tayko, P.R.M., & Talmo, M.L.R. (2013). Whole Brain Literacy: Key to Holistic Education and Success in Today's World.

Tririon, A., Macias, E.F., Hurley, J., Vermeylen, G. (2007). Fourth European Working Condition Survey. Dublin: European Foundation for the Improvement of Living and Working Conditions.

Vimalanathan, K. (2014). The effect of indoor environment on the work performance, health and well-being of office workers. Retrieved from http://www.ijehse.com/content/12/1/113