Global Problem-Based Learning with the Collaboration of Thai and Japanese Universities Companies Explaining the 3 - year Experience of our Kaizen PBL Program Development

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Received: March 11,2020/ Revised: April 24, 2020/ Accepted: April 24, 2020

***Abstract*—This paper is about a global problem-based learning (gPBL), called KAIZEN gPBL, developed by Panyapiwat Institute of Technology (PIM) and Shibaura Institute of Technology (SIT), in which program participants identify, analyze and discuss the problem, and to propose Kaizen ideas (= solutions) for the production line of the industrial chains (for tractors) in Thai local (or Japan-Thai) factories. This paper first explains the brief history and the contents of the program, and then describes its three types of uniqueness and contributions to the Japanese and Thai engineering education. The three types of uniqueness are: 1) the applicability of the program in which everyone (regardless of their age, gender, and work experience, etc.) can learn something new, 2) the excellent collaboration with universities. and companies in Japan and Thailand, and 3) providing the opportunity to see "real-world" problems.**

***Index Terms*—Industry University Cooperation, Global PBL, Thailand, Engineering Education, Graduate/Professional Schools**

I. INTRODUCTION

In these days, Kaizen (The concept/activities of continuous improvement) has been widely applied to Japanese companies all over the world, and the technique has been widely adopted by the local companies in newly developing countries as well. [1-3] Despite its prevalence, not many engineers in Japanese companies have direct experiences with Kaizen activities even though they might have heard the words or have some understanding of the concept. In addition, graduate schools face a major challenge for their implementing global Problem-Based Learning or gPBLs because of the time limitation for adult students. While the time to stay abroad should be minimized, the contents of the program should be fruitful enough for them to gain some insights. In addition, it is very important for both Thai and Japanese students (as future engineers) to know how Kaizen activities are taking place in factories in developing countries.

Though the target participants of the program in Japan have changed from graduate (adult) students to undergraduates since 2018, the program continues to produce good educational effects and have received good/positive feedback from participants. The reason why the program has continued for more than three years is due to the following three types of uniqueness: they are 1) the applicability of the program in which everyone (regardless of their age, gender, and work experience, etc.) can learn something new, 2) the excellent collaboration with universities. and companies in Japan and Thailand, and 3) providing the opportunity to see "real-world" problems. These strength in turn would keep attracting participant not only from universities, but also from companies. The following sections first define Kaizen concept, describe the outline of the gPBL, and explain the three types of uniqueness of the program. This finally introduces survey results and voices from the participants and concludes with discussions as well.

II. DEFINITION AND THE REASON FOR CHOOSING KAIZEN FOR THE PROGRAM

According to Brunet and New [4], Kaizen is the Japanese word for improvement, carrying the connotation in industry of all the uncontracted and partially contracted activities which take place in the Japanese workplace to enhance the operations and the environment. The biggest competitive advantages of Kaizen are supposed to be simple,

low cost, low technology and people focused, which primarily aimed to continuously enhance the firm's capabilities, productivity and quality [5]. Kaizen has been widely applied to Japanese companies all over the world. Also, the technique has been widely adopted by the local companies in newly developing ASEAN countries such as Thailand, Vietnam, and Indonesia. In fact, literature review indicates that numeous authors have written about Kaizen application in variety of companies in Japan and other countries [5]. As results of numerous studies and experiments as well as tries and errors on sites, the quality of the products made by local factories in these developing countries have improved remarkably in these days. While the concept is now universally prevalent, Japanese engineers working domestically rarely see, learn and apply Kaizen concept to their work process because manufacturing bases in most Japanese companies have been moved abroad. In 2017, more than a quarter (25.4%) of production is made in other countries especially in a manufacturing sector [6]. This is one of the main reasons why only a few engineers have a chance to learn Kaizen activities of local supplies in developing countries. Since Kaizen is deeply-rooted in the history of Japanese (manufacturing) business, it is important for engineers to have not only knowledge but also skills to implement Kaizen in a real setting. Therefore, using Kaizen activities as a theme of global Problem-Based Learning (gPBL) will be suitable for adult education at a graduate school. This is also imperative for engineering students and future engineers, to see the world of Kaizen in developing countries as well.

III. The Outline of the gPBL

The purpose of the gPBL is to propose Kaizen ideas (= solutions) in which students will propose Kaizen ideas that improve a production system of the factory owned/operated by Thai companies. In the process, students make cross-border teams to:

II. visit and observe an actual workplace
(a factory) to identify problems,
III. develop Kaizen ideas based on their observations,
IV. try out their ideas, and finalize and present their Kaizen proposals.

Table I shows the counterparts and the participants of the gPBL. As seen in the table, the program was originally developed and organized by the two universities: Panyapiwat Institute of Management (PIM, Thailand) and Shibaura Institute of Technology (SIT, Japan). The corporate partners are as follows: Thai Metro Industry (1973) [7], Thai-German Boiler Manufacturing Limited (2018) [8], and SMC Thailand Ltd. Rayong Branch (2019) [9]. They are B to B manufacturing companies, and their product are quire various from a huge boiler to small equipment parts. Dr. Paritud of AME, PIM, who is the co-organizer of this program, has strong corporate connections in Thailand and the partners in the Table I are all from his networks. They were willing to provide their facilities as an "experimental site" of this program for participants.

TABLE I
Counterparts and the Participants of the gPBL

Year	2017	2018	2019
Organized & Designed by	Panyapiwat Institute of Management (PIM: Thailand) Shibaura Institute of Technology (SIT: Japan)	Panyapiwat Institute of Management (PIM: Thailand) Shibaura Institute of Technology (SIT: Japan)	Panyapiwat Institute of Management (PIM: Thailand) Shibaura Institute of Technology (SIT: Japan)
Particpant's of the program	-	King Mongkul's University of Technology Thonburi (KMUTI)	King Mongkul's University of Technology Thonburi (KMUTI)
Cooperate Partner	Thai Metro Industry 1973 (Manuf. Factory in Thailand)	Thai-German Boiler Manufacturing Limited. Bangkok, Thailand (Manuf. Factory in Thailand	SMC Thailand Ltd. Rayong Branch (Manuf. Factory in Thailand)
	-	a-Sol Co., Ltd. (Kaizen consulting firm)	-
Days in BKK	Nov. 3, 2017 - Nov. 5, 2017	Sep. 2, 2018 - Sep. 11, 2018	Sep. 1, 2019 - Sep. 10, 2019

III. The Schedule of 2018 and 2019

As shown in Table II, the total days of staying Thailand has changed in 2018 from 3 days to 10 days. Because the main participants have been undergraduates since 2018 (see Table I), programs can be held during their summer break. The longer stay in Thailand allowed two factory visits at interval, that turned out to be the biggest advantage of the program. For example, participants can focus on finding Kaizen points on the first visit, and they can spend time for prototyping for the second visit. The longer stay also enable students to spend more time together to build a good friendship.

TABLE I I

SCHEDULE OF THE PROGRAM (2017 – 2019)

2017			2018 & 2019		
Japan	Day 1	On-line lecture 1	Thailand	Day 1	Arrive at Bangkok
	Day 2	On-line lecture 2		Day 2	Orientation & lecture
				Day 3	Lectures & discussion
				Day 4	Factory visit - 1
				Day 5	Discussion & prep.
				Day 6	Factory visit - 2
				Day 7	Wrap-up
Thailand	Day 1	Lectures & discussion		Day 8	Making proposals
	Day 2	Factory visit - 1		Day 9	Presentation prep
	Day 3	Final presentation		Day 10	Final presentation

A. Preparations

Japanese students had English classes and one and a half-day Kaizen lecture in advance to the program in September. Thai students were recruited based on their interest in the program and were informed in advance about the important of English and/or Japanese as means or communication during the program.

The study in Bangkok

1) Orientation and Lectures

there are several lecturers who teach a part of Kaizen concepts as well as some knowledge of (international) group work. Dr. Kato (SIT) took a part of ice-breaking, explaining the outline, and the team development. Dr. Paritud of Automotive Manufacturing Engineering gave a lecture on basic knowledge of Toyota production methods at "Principles of Japanese Production Management (TQM, TPM, TPS)". A lecture on "Basic IE techniques" was given by Dr. Paitoon of Industrial Engineering, PIM. Finally, Mr. Kadowaki of a Sol Co., Ltd., a Japanese consulting firm with a branch in Bangkok gave a lecture on "Practical Kaizen - how to fix a problem". The explanation of Mr. Kadowaki based on practical experiences in consultation on productivity improvement for the manufacturing firms was also very good at capturing the students interests, and he was able to smoothly bring the concept of Kaizen, which was lectured by Dr. Paritud, into the actual workplace. The group worked to find the "seven wastes" while looking at the photos of the factory, and then made a presentation. Group work using visual evidences of actual factories would motivate them to visit the factories on the next day.

2) Factory visit

The boiler factory, in case of 2018, was created by German capital and is currently 100% Thai-owned (publicly owned), but the conceptual design of the boiler is done by a German company and the engineering design is done by its own company. Mr. Theerasak Thegrumphung, Vice President, gave a brief overview of the factory and its products, followed by a tour of the site. Since there were many "seven wastes" that students with little Kaizen knowledge could easily identify, they enthusiastically looked around the factory and ask questions to factory leaders and Thai students.

Fig. 1. Group introduction by participants.

Fig. 2. Group discussions and process observation at Thai-German Boiler Manufacturing Limited in 2018.

3) Group discussions

Fig. 1 shows the group introduction by participants and Fig. 2 and Fig. 3 shows the group discussions activities. Students brought several Kaizen points from the factory for discussed their proposal as a group and planned a prototype for the next visit. The also develop questionnaire for asking factory workers on the re-visit. The most difficult part for them (as engineering students) was the fact that they had to discuss conceptual issues (invisible issues), which is very different from their typical goals such as making materials. In addition, there is a language barrier

between Thai and Japanese students. Both students worked hard to communicate using smartphones and gestures. They sometime asked for help to teaching staffs for translation, but in general they managed themselves to solve the communication problems. Their attempt to solve the problem was very impressive. When it's time for breaks and meals, students talk happily with each other, such as "What is this in Japanese?" "What is this in Thai?" It's been a few days since it started, but the most drastic change has been the brilliance of each SIT student. And the expression is much richer than at the time of departure.

Fig. 3. Group discussions to prepare the proposal by participants with English as means for communication.

4) Factory re-visits

On the re-visit in 2019; there was time in which a factory manager and the staff of SMC Thailand walked around students' groups (Fig. 4) to listen to their ideas and give some advices for further improvement of their proposal. Students focused more on the particular process and the place, and asked more specific questions to factory workers. Some of the on-site staff are not very fluent in English, so Japanese students asked their Thai friend for an interpreter.

Fig. 4. Factory visit at SMC Thailand Ltd. Rayong Branch in 2019.

5) Group discussions

Based on the findings and advices from the factory staff, they finally wrapped-up their discussions and started preparing for the final presentations. On that day, teaching staffs announced evaluation criteria and prizes (the first to third places) and that the plant manager would attend and would be a main judge of the presentation.

6) Final presentations (Fig. 5)

Each group held 15 minutes of presentation and 5 minutes of Q and A. Thought it was very difficult to summarize Kaizen's proposal in English in a short time (about two business days), the five groups enthusiastically presented their proposals one after another. The three teams were selected by the plant manager and the direct manager to be commended as the best proposal with two runner - ups. After the commendation, the factory manager commented on the importance of thinking. Manufacturing is also important, but it is important to understand the reality and think first. Young people commented in particular that they should not neglect "think". The factory management commented that they were really grateful for hearing the ideas they did not even expect (especially the idea of having a larger wall clock in the factory for better operation control).

Fig. 5. Group final presentation attended by participants, teaching staff, and factory people.

IV. THE SCHEDULE OF 2017

The schedule for 2017 is very different from the schedule after 2018. As mentioned at the beginning, adult students cannot take a lot of breaks and travel abroad. Therefore, we divided the PBL into two parts: 1) Pre-Study period (studying in Japan) and 2) Staying in Bangkok.

A. The pre-study periods

In the pre-study period as shown in Fig. 6, Japanese graduate students had lectures for Kaizen, movies for coming up of the proposal, and exercises for the presentation in Bangkok. Throughout the both periods, Japanese and Thai universities closely working with companies in Japan and Thailand to provide lectures and opportunities for students.

Fig. 6. Pre-study of Thai-Japan tele-conference (left) and the lecture by Mr. Kadowaki (right).

The special feature in this period is two Kaizen-related lectures: "The Introduction to Industrial Engineering" by a Thai lecturer (through Teleconference), and "The Applied Kaizen" by Mr. Kadowaki of a-Sol Co., Ltd. Though the initial level of understanding and experiences of Kaizen were different among Japanese students, the lectures could enable them to understand the Kaizen concept for drawing up Kaizen proposals later on.

Another special feature in this period is to use the movies (taken by the Japanese consultant when visiting Bangkok) so that the Japanese students could understand the production line and potential Kaizen points while they were in Japan.

B. The study in Bangkok

The study in Bangkok had been done from November 3-5. On the first day, Japanese and Thai students visited the factory of the Thai Metro Industry (1973) Co., Ltd. to see and test their proposed Kaizen ideas/tools and then discussed with each other for brushing-up their final proposals. On the second and the final day, students had final presentations to wrap-up their three-month activities with all the faculty and staff who in charge of this program.

The special feature of this period is the generous support of the factory, allowing students to test their ideas/tools in the real production line. This opportunity made students realized the importance of 3-Gen principles (Genba, Genbutsu, and Genjitsu).

VI. THREE UNIQUENESS OF THE PROGRAM

A. 1st strength - Applicability

The first strength is the applicability of the program itself in which everyone (regardless of their age, gender, and work experience, etc.) can learn something new. The concept of Kaizen is consisted of the following components: 1) Understanding the concept of MUDA (= wastes), 2) Observing what happens in a (real) work setting, 3) problem identifying/solving skills, and 4) autonomous and pro-active behavior. These components are highly applicable to other areas of specialty.

B. 2nd strength – The excellent collaboration

In this program, there is an excellent collaboration among universities. and companies in Japan and Thailand. As introduced at the beginning, this program includes four players and each player has its own role. For PIM, KMUTT and SIT, this became the opportunity to 1) expand their network with Japanese (Thai) universities, 2) develop a new gPBL program that focuses on managing processes in an actual

workplace (different from making visible products). For the Japanese consultant, this was an excellent opportunity to 1) expand his business opportunity in Thailand, and 2) Increase his presence in academia by having a lecture for university students. Finally, for the factories, this is an excellent opportunity to 1) get Kaizen ideas by people who can take a fresh look at the factory, 2) encourage their employees to learn/conduct Kaizen activities by interacting with people outside the factory, and 3) expand its business network beyond Thailand.

C. 3rd strength - Seeing the "real world" problems

The third and the final strength of the program is to providing the opportunity to see "real-world" problems as shown in Fig. 2 and Fig. 7. In general, factories do not always welcome people outside to get in the site, because production process is usually the center of a factory and carries a lot of confidential information. The corporate partners of the program were, however, quite open in terms of sharing their Kaizen ideas/activities with others. As shown in the pictures below, students could actually talk with floor staff, ask them to change the arrangement of parts and stocks based on their Kaizen idea, and test the jig that they made and brought from Japan. With the interactions with the floor staff, students could analyze the feasibility of their Kaizen ideas/tools and adjust their final proposals accordingly. Prototyping at the factory also became the core feature of the program.

As for the three companies in particular, they could be classified as small and medium size enterprise or SME. The introduction of Japanese management techniques of Kaizen into the workplace is rather new or difficult due to the lack of knowledge or qualified technical personnel. [10-11] In fact Kaizen is an umbrella that covers other powerful operation improvement tools such as TQM, TPM, TPS, etc. So, the gPBL program could be initial learning for good manufacturing practices of these three.

Fig. 7. Process observation at Thai Metro Industry (1973)

in 2017.

For the graduated students (full-time engineers), this was an excellent opportunity to 1) have a chance to get in a local factory to see how it goes (seeing is believing), 2) try out their prototypes (e.g. JIGs) in a real setting at the factory, and 3) think about their business from a different point of views. For the undergraduate students, this was an excellent opportunity to 1) realize that parts of the products that they use in their everyday life are made in an environment such like this, 2) know that they may go abroad in the future to work with people like those in the factory, and 3) have some confidence that their ideas and creativity can help solve problems in real work settings.

VII. RESULTS

Though no quantitative/rigid experiment was implemented before and after the program, we collected the voice from participants before and after the program.

Voices before the program

In terms of voices before the program, 14 Japanese participants in 2018 described their expectations of the program when they created their profile. Their expectations are categorized/organized into the following Table III (multiple answers possible).

TABLE III
EXPECTATION OF THE JAPANESE PARTICIPANTS IN 2018

Item	Description	Frequency
1	Brushing up English (communication/presentation)	5
2	Communicating/interacting with students, faculty, and local people in other culture	13
3	Brushing up problem-identifying/ problem-solving skills	2
4	Seeing and learning new cultures	5
5	Having an experience of going abroad	5
6	Telling our culture to foreigners	2
7	Expanding my view/value	3
8	Learn Kaizen and a production system in Thai local factories	7

A. Voices after the program

In terms of voices after the program, we collected their voices by 1) having a survey (all participants) and 2) submitting a report (Japanese participants only). The aim of the survey is to see overall satisfaction of the program, and the aim of the report is to understand what they've learned from the program in detail.

TABLE IV
RESULTS FROM THE SATISFACTION ISURVEY ITEM DESCRIPTION

Item	Description	1	2	3	4	5
1	Sequence of the program			2	10	11
2	Contents of lectures			6	12	5
3	Lecturer: Dr. Paitoon/ IE Technique		2	7	5	9
4	Lecturer: Dr. Paritud/ Jap. Manu. Tech		1	3	9	10
5	Lecturer: Mr. Kadowaki/ Kaizen			2	11	10
6	Factory as a Case Study		1	5	10	7
7	Meeting Venue			2	12	9
8	Hotel		2	8	8	5
9	Transportation	1	2	4	11	5
10	Provided Food/ Break			6	10	7
11	Staff Assistant		1	1	7	14
12	Side trip (Koh Kred, Shopping, etc)			2	9	12

The survey results in 2018 are shown on the Table IV above. As the table shows, most of the participants (both Thai and Japanese) were satisfied with the contents of the program, thought there are some rooms for improvement in terms of their accommodation and transportation.

Voices from the participants' reports are organized by the uniqueness described in the previous section, In terms of applicability, there are following comments from participants.

From 2017 participants: "Though I've never used the Kaizen concept in my workplace, it's quite useful for me to learn and practice the concept in this PBL (Female - IT)". "The Kaizen concept seems to be quite applicable to my workplace in which serious labor shortage and productivity increase are the most imperative issues (Female - construction)". "I really felt the importance of 3-Gen principles (Male: R&D in manufacturing)".

From 2018 participants: "I found a lot of MUDAs at the factory, but it doesn't mean that I could develop a lot of Kaizen ideas. Actually, it was very difficult to come up ideas because we had to consider the cost of implementing these ideas at the factory (Female-sophomore)". "I found it's important to propose ideas that are feasible and acceptable as well as that make the process efficient (Female – Sophomore)". "Making each part of process efficient isn't very difficult, but we need to coordinate each part to maximize its efficiency, that is much more difficult (Female - Sophomore)". The key to develop Kaizen proposal is to imagine the whole production process (Male – Senior)".

In terms of seeing the "real world" problems, there are following comments from participants.

From 2017 participants: "I even felt some pressure to know that the factory manager and the floor staff deeply committed to work hard for Kaizen (Tech Trading: Consultant)". "It's quite rare and therefore very valuable opportunity to try our ideas and prototype in a real setting (The factory)". "Once again I realized how important to communicate with floor staff when we do something new (Tobacco: R&D)".

From 2018 and 2019 participants: "Seeing is believing. By observing the processes, we could find that there were problems to be solved but difficult to deal with. Changing working environment was much more difficult than we originally thought (Male – sophomore)". "Observing the actual workplace made us realized that the "real" Kaizen requires mutual agreement between workers and us in term of how to interpret Kaizen and how to implement it (Male – sophomore)".

VIII. DISCUSSIONS AND CONCLUSIONS

This paper first defines Kaizen concept, describes the outline of the gPBL, and then explains the three strengths of the program. As shown in the previous section, participants enjoyed the opportunity provided by the gPBL program such as "true experiences" of Kaizen activities in the "real" global context. In addition, there are several impressive comments from Japanese students. For example, some participants (mainly from business) appreciate the opportunity of observing what is happening in the other countries especially newly developed countries. Their comments are as follows:

"I was amazed to see the modern buildings neighboring with old ones/slums. I could find it because I went there (Male: tech-trading)". "I could see the enthusiasm of the plant manager and the staff to do the Kaizen, which gave me a sense of impending crisis (Male: grad student)".

Also, both graduate (adult) and undergraduate participants enjoyed the different culture and realized the importance of learning other language not just for study but for knowing a new world. Their comments are as follows:

"I really felt that I need to study English continuously (Female: construction)". "The most important thing is not how well I can speak English, but how well I can deliver my thoughts to my counterparts. I found it only because I went there to communicate with them in person (Male: grad student)". "This gPBL gave me a chance to break out of my shell in learning English (Male: R&D in construction)".

Although it was a tight program in which participants spent most of their days for learning, no one was able to make a sound. They even gathered voluntarily in the free time for discussions and presentations. It was quite impressive to see guts of students from both Japan and Thailand, their ability to adapt to the environment, and the changes in their eyes and attitudes. By hearing from participants in 2018, we realized that the program worked well for both graduate (adult) students and undergrad students. These results came solely from the excellent teamwork among PIM, SIT, and KMUTT, which developed the above-motioned uniqueness. These uniqueness in turn would keep attracting participants not only from universities, but also from companies. We believe that our own Kaizen spirit has made us one of widely-recognized programs in both universities (PIM and SIT).

ACKNOWLEDGEMENT

The authors would like to express our sincere gratitude to Mr. Pipob Vivattanaprasert, Managing Director of Thai Metro Industry (1973), Mr. Suchart Mongkolareepong, CEO and President of Thai-German Boiler Manufacturing Limited or GETABEC, PLC., and Mr. Panyapol Supannawong, Managing Director of SMC (Thailand) Ltd. who kindly provided the excellent opportunities for PIM, SIT, and KMUTT students and staffs as case studies in 2017, 2018, and 2019, respectively.

REFERENCES

[1] Toyota, (2020, February, 11). "Kaizen – Toyota Production System guide" [online]. Available: https://blog.toyota.co.uk/kaizen-toyota-production-system

[2] GRIS Development Forum, "Introducing Kaizen in Africa," *GRIPS*, pp. 1-11, Oct. 2009.

[3] Japan Brand ODA, (2020, February, 11). Japan's approach towards quality and productivity the driving force of Japan's rapid growth. [online]. Available: https://www.jica.go.jp/english/publications/brochures/c8h0vm0000avs7w2att/japan_brand_02.pdf

[4] A. P. Brunet and S. New (2003). "Kaizen in Japan: an empirical study," *International Journal of Operations & Production Management*. vol. 23, no. 12, pp. 1426-1446, Dec. 2003.

[5] S. Zailani, M. R. SHaharudin, and B. Saw, "Impact of kaizen on firm's competitive advantage in a Japanese owned company in Malaysia," *Int. J. Productivity and Quality Management*, vol. 16, no. 2, pp. 183-210, Jan. 2015.

[6] K. Jigyou, K. Kihon, and C. Gaiyou, "The 48th Basic Survey of Foreign Business" Ministry of Economy, Trade and Industry ,Tokyo 100-8901, July. 2017.

[7] ICM, (2020, February,11). "Thai Metro Industry (1973) Co., Ltd. has more than 40 years of experience in manufacturing high quality roller chain under ICM™ brand." [online]. Available: http://www.tmichain.com

[8] BIRER (2020, February, 11). "Thai-German Boiler Manufacturing Limited." [online]. Available: https://alzheimerfriesland.nl/2020-Jan-12/24173.html

[9] SMC, (2020, Feb). "SMC Thailand Ltd."[online]. Available: https://www.smcworld.com/overseas/sguide/en-jp/thailand.html

[10] P. Bhandhubanyong and J. T. H. Pearce, "Appraisal of SME casting industry in Thailand," *International Scientific journal of engineering and technology*, vol. 1 no. 1, pp. 1-8, Jan-June. 2017.

[11] J. T. H. Pearce and P. Bhandhubanyong, "Improving capability in small Thai manufacturing companies," *International Scientific journal of engineering and technology*, vol. 1 no. 1, pp. 6-13, July-Dec. 2017.

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