CHAPTER 3

Proposed Solution

3.1 Methodology towards Solution

There are many ways to improve professional developments but there are a few ways that can be the best fit for any workplace. The critical factor that leads to the solution that is most suitable to the workers and organization is to determine the root-cause of problem. The solution is then proposed on the determined problems.

Since the determination of SAOC learning problem is a foundation of the solution, the assessment of the students' learning style is indispensable. Regarding to the reviewed and mentioned preliminary analysis of SOAC learning, the individual differences of the students are among the main difficulties of the instructor, which needs to overcome in order to reach the desired learning outcomes. This included the designing appropriate learning tools, activities and processes to be utilized. Practically, this is rather difficult, since the backgrounds of each student are varied greatly. This is especially true for the SAOC within the RTAF where educational background could range from high school level to post doctorate degree, and the age could cover as large as two generations. Although, the traditional group learning approach is considered mostly suitable in this situation and could make use of the individual differences in an advantage way, it could not reach the expected outcome because of the very high individual differences. This research proposed an alternative learning framework of the SAOC as shown in Figure 3.1.

The idea is used to solve the root course of SAOC's problem. Unlike the other existing methods, this proposed idea is designed to accommodate and utilize the individual differences of the students. Firstly, students are assessed and classified based on their learning styles. This is conducted by applying the Kolb's learning style model. Group learning approach is still used as the learning activity. Because the group learning approach provides students with student center environment, and also allows the

freedom for students to express and share knowledge. Furthermore, this research proposes to apply the concept of negative reinforcement provoking the traditional group learning approach. After the classification of student's learning style, the student with the accommodator style is selected and placed as the leader of each group. To overcome the problem which is faced by the most organization, we are attempting to manage the knowledge worker effectively.
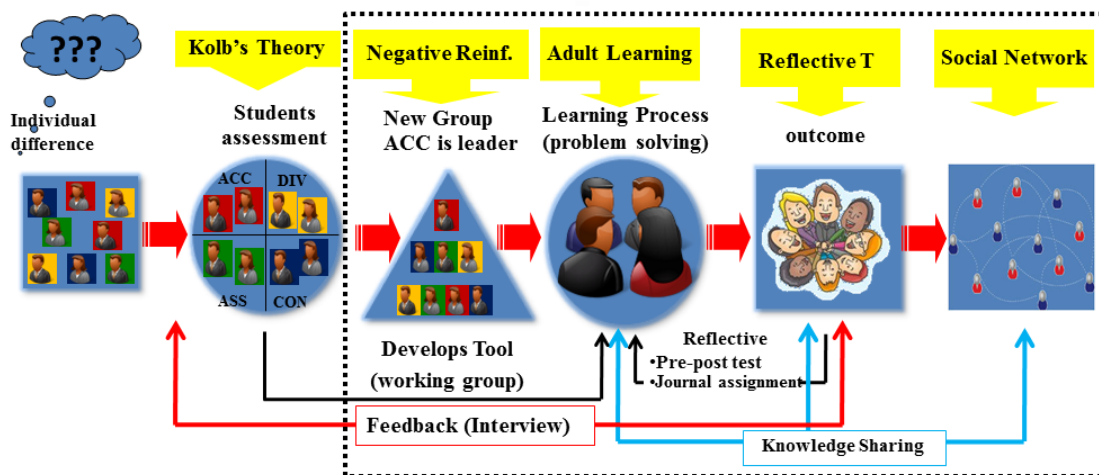

Figure 3.1 The negative reinforcement for GBL in individual difference

As for the leaning process, the concepts of adult learning and constructivism are utilized in the proposed negative reinforcement for GBL in individual difference. Hence, problem solving exercises are designed to facilitate the adult learning since adults, where they are motivated to learn from being in the situation, in which they are needed to learn and most suitable learn from their experiences. Moreover, the constructivism is also applied when designing the exercise, allow the students to construct their own knowledge on the basis of interaction with their environment. Finally, since the individual students engage to explore their experiences in order to lead the new understandings and appreciations. The reflective theory with an emphasis on the concrete experience is applied for the evaluation of student's performance including the SAOC examination committee. Moreover, the five point reflection scales is used to analysis the performance by measuring and comparing the student's score. To confirm the professional development of study and graduated students, the alumni's commander and their co–workers would be interviewed in the next six months after the course.

Consider the SAOC grouping based on wide range of learners experiences, the students were divided into groups by taking into account only is not the adequate factor for maximizing learning performance. There are many steps to build up the competence of the students' learning process and encourage the students' leadership in the SAOC, especially, the older and the less education but higher experience.

According to the aforementioned solution concept, the step toward the solution is divided into five phases as follow:

3.1.1 Phase 1: Population Survey

In this phase, the students are surveyed by the personal information questionnaires. The details of information are about age, sex, education and corps.

3.1.2 Phase 2: Experiment Process

This phase consists of 4 steps as follows:

Step 1: Assess the students' learning style (See Appendix A)
Step 2: Group seminar arranging
Step 3: Learning process managing
Step 4: Score evaluation

3.1.3 Phase 3: Result Analysis

In this phase, the results from the evaluation step are analyzed and compared.

3.1.4 Phase4: Model verifying

In this phase, the process of two continuing steps can be used and repeated in the next course again. The results of the two rounds are compared and verified the model.

3.1.5 Phase 5: Social network creation

In this phase, to make the negative reinforcement for GBL in individual difference framework to be the multiplier tools in his case, the face-book is created for the leader of the teams, accommodator, and instructors.

Since Phase 1 is related to the data collection whose details are generic, the description will be omitted. The details of each phase will be elaborated in the following sections.

3.2 Experimental Process

3.2.1 Assessment of SAOC Learning Style

There are many instructional techniques in SAOC such as lecture, group seminar, individual study, report, presentation, and game simulation. One of the techniques that support individual difference learner that is a group based learning. Furthermore, knowledge is shared during group activities. Therefore, SAOC grouping based on wide range of learners experiences. However, the students are divided into groups by taking into account only this factor (group based learning), which is not adequate for maximizing learning performance.

The survey was conducted in order to examine the relationship between learning style and learning outcome. The RTAF alumni from three courses with the tops, the medians, and the lasts of examination results were assessed by Kolb's learning style assessment (Kolb, 1984; Tennant, 1997; Whetten and Carmeron, 2007).

In 2010, one academic year consisted of 3 courses, each course contained 96 persons. In terms of student qualification, it varied from 38 to 54 ages, undergraduate to Ph.D. students, ranking from Squadron leader to Wing Commander, participating in pace support operations (or PS's) in various areas of the RTAF. Therefore, there were the corps varieties.

There were a total of 27 samples where the sample came from alumni of these courses, 9 persons from each course by using the learning outcome as criteria. 9 persons were divided into 3 groups, where group A consisted of students in the first-three highest score. Group B consisted of three medium score and group C consisted of the last-three lowest scores.

Kolb learning style assessment was used to evaluate the samples' learning style. The survey includes survey with personal information questionnaires in order to set the learners' information into the suitable groups before the learning process. The

assessment results were evaluated by Kolb learning style inventory scoring keys. A list of database from the learning style inventory scoring key was plotted in the scoring chart in order to report each alumnus' learning style.

The results from alumni learning style were analyzed by Kolb's learning style assessment as shown in Table 3.1.

Table 3.1 Shows the score of the alumni

Groups	CE	RO	AC	AE	Ages (Years)	Education	Learning Style	Crops
A	25.78	26.22	33.34	34.89	44.4	ML=7 UG=2	Converger	Med.
B	29.33	26	30.78	32.44	48.9	ML=1 UG =3 VL=5	Converger	Med & Supp.
C	31	26.44	28.78	32.78	51.4	UG=5 VL=4	Accommod ator	Supp.

VL: Vocation Level, UG: Undergraduate, ML: Master Level

From Table 3.1, the data, concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), active experience (AE), were plotted into Figures 3.1-3.3, which is shown the different type of learning styles.
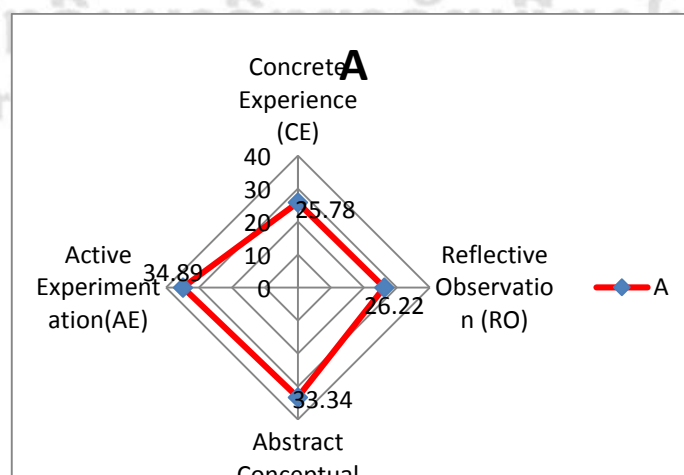

Figure 3.2 Shows the plot of group A alumni learning style

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In Figure 3.2, the data shows that group A alumni scoring chart, which is a distinct tendency in abstract conceptualization and active experimentation, so they are in the converger style.
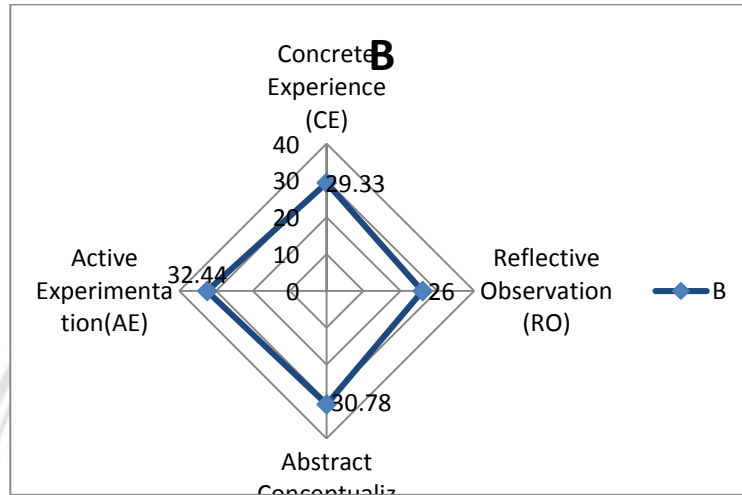

Figure 3.3 Shows the plot of group B alumni learning style

It is clear that although the group B alumni get score less than group A, the scoring chart is a distinct tendency in abstract conceptualization and active experimentation, so they are converger style too.
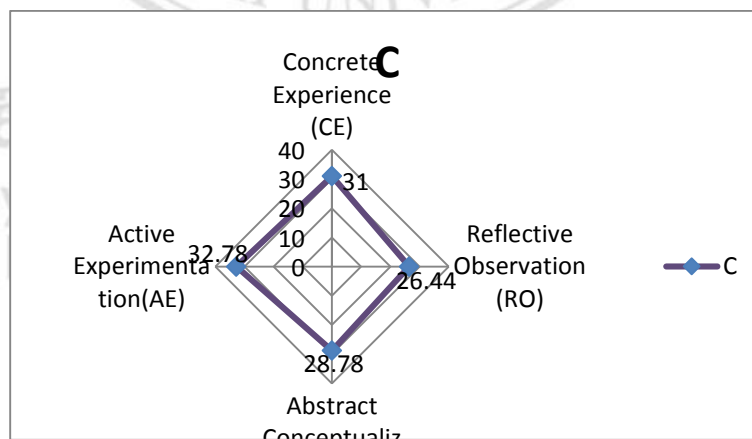

Figure 3.4 Shows plot of group C alumni learning style

Figure 3.4 illustrates that the group C alumni scoring chart is a distinct tendency in active experimentation and concrete experience, so they are in the accommodator

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style. The comparison of three alumni groups with ages, education level and corps, which is shown in Table 3.2

Table 3.2 The comparison results of individual different group

Groups	Average Ages (Years)	Education	Learning Style	Crops
A	44.4	M=7,UG=2	Converger	Med.
B	48.9	M=1,UG=3,VL=5	Converger	Med.&Supp.
C	51.4	UG=5,VL=4	Accommodator	Supp.

Remark: VL: Vocational level, UG: Undergraduate
ML: Master Level, DL: Doctoral Level

Table 3.2 describes the process of SAOC alumni learning style, which is divided into three groups from three courses involving adaptive learning models; group A and group B tended to be converger while group C is accommodator. Moreover, we find that group A is the youngest of all three groups, whereas group B is younger than group C. Despite of the different age, they are compared to their education and explained as followings.

In group A comprises of 7 ML and 2 UG students. The group B comprises of 1 ML, 3 UG and 5 VL students. The group C comprises of 5 UG and 4 VL students. When we compare the previous SAOC's instructional techniques to Kolb's instructional techniques, the results are shown in Table 3.3.

Table 3.3 A comparison of SAOC alumni learning style (previous SAOC's instructional techniques) to Kolb's instruction techniques

Groups	Learning style	Kolb's instructional techniques	Previous SAOC's instructional techniques
A&B	The Converger prefers to strongly use the practical idea applications and solve the specific problem using the hypo-deductive reasoning. They are not	The suitable instructional techniques are practical application including how question, experiment with new idea, simulations and laboratory works.	1.Lecture 2.Group Seminar 3.Report 4.Presentation 5.Game simulation
C	They prefer to have the experiments with problem solving, risk taking and good reaction in immediate circumstance.	The suitable instructional techniques are groups learning and question of feedback after doing.	1. Lecture 2. Group Seminar 3. Report 4. Presentation 5. Game simulation

From Table 3.3, it can be explained that group A and B have the converger learning styles. They are able to adapt themselves for the former SAOC's instructional techniques. While, the accommodator is good in group learning but the former SAOC's instructional techniques have varieties of techniques, thus, the mismatching between students learning style and instructional techniques is brought the unachieved learning outcomes.

The results of the preliminary analysis have shown that the old military officer generations are categorized as accommodator style. They possess more experiences but perform poorly in examination comparing to the younger military officer generations. Moreover, the results have also shown that the existing instructional technique leads to them not participating in the group activities and not developing the leadership characteristics. Since this older generations of military officer tend to get promotion and become head of the division, where they need to be able to conduct new and younger generation through their knowledge and experiences. Hence, the negative reinforcement and other theories focusing on this generation are applied when the learning process in the conceptual framework is designed, which is presented in this research.

3.2.2 Group Seminar Arranging

After SAOC students are assessed by Kolb's learning style assessment. The students are divided into four group styles; including accommodator, diverger, converger, and assimilator. In step 2, the students are arranged in eight seminar groups which each group composes with various learning styles, corps, average age and education level. The negative reinforcement is an important tool for the first four seminar groups by addressing the Accommodators as the leaders of the groups, which is called an "experimental group". The leaders of the other four seminar groups are the converger, assimilators and diverger, which are called a "control group".

The group based learning is necessary and more special in the SAOC's learning process because of the adult and individual difference students. To set the group of students, the personal data is used and contained age, core and education. In each group is comprised of the same average in ages, education, various learning styles and crops.

From the preliminary analysis of SOAC learning, it is found that the accommodator group is important. They are the older and the less education, have higher experience but low learning outcome. In this group, the students lack confidence to share experience. They believe in the students who have higher education. That makes them do not share their opinion. Thus, negative reinforcement will influence students' behavior by assigning the role of them to be a leader of group. They will practice their leadership characteristics and they are confident to share experience.

3.2.3 Learning Process Managing

In this step, the learning process is managed into a group-based learning. The design of learning activity must be concerned with individual difference and adult learners. The group learning is selected to be the suitable learning activity which the students interact with each other to acquire and practice the elements of a subject matter and to meet common learning goals. This is based on the belief that these groups based learning activity and processes are practically the most suitable, and can accommodate and allow students to learn together effectively. In reality though, the rationale of this SAOC group based learning framework is actually only considered the differences in

student's work background. The students from various divisions within the RTAF can share their experiences and ideas as a group.

Before the students are in learning process, they are tested by the pre – test questions (See Appendix B). After that, each group will get the assignments. For the process of exercise designing, the researcher uses the constructivist learning design, (Piaget, 1967) and problem solving process to build up the exercises. The students are given the assignment that they have to interpret the main problem into concrete by using the problem solving in order to search the best solution. The assignment is ranged from the beginning to the intermediate levels that develop the students learning process and construct how to solve the problems, where the best alternative way can be obtained. In the exercise (See Appendix C), the Constructivist learning design is emphasized these six important elements: Situation, Groupings, Bridge, Questions, Exhibit, and Reflections, respectively. The most difficult task is the revisions of the whole assignment emphasized by the 6 important elements given earlier. These six elements have the following details:

a) Situation: The exercise and title will be given by assigning the policy of Royal Thai Air Force to each seminar, where the policy will be transferred into the action plan. Each group must cooperate under the leader who is set in various styles. Every seminar could describe a process of solving problems, answering the questions, creating the metaphors, making decisions and drawing conclusions.

b) Groupings: There are two categories of groupings

Group A, the four experimental groups are the Accommodators who worked as the leaders.

Group B, the four control groups are other learning styles such as diverger, assimilator and converger, which work as the leaders.

c) Bridge: This is an initial activity, which intends to determine students' prior knowledge and to build a bridge between what the students already know and what they might learn by explain the situation.

d) Questions: The guiding questions are about the students who have the prior knowledge, where they could explain their thinking and keep active learning.

e) Exhibit: This involves the students to make and exhibit for other students such as they could write the staff report and present the best solution to the instructor committee in class.

f) Reflections: The students reflect their thought about while they attend in class including their attitudes, skills and concepts, which they can take out the door. The reflection tool is the five point scale that can be described in the score evaluation.

3.2.4 Score Evaluation

To reflect the learning outcome, the students are evaluated during learning process and after learning process accomplishment. The concept of reflective is the cultivation of the capability to reflect in action whilst doing something, and to reflect on action – after it has been done. There are 3 directions in the evaluation step. The first direction, the pre and post-test scores are evaluated by the paper examination. The second direction, the score team performances from every seminar groups are evaluated by the SAOC instructor committee, where they are obtained from the journal writing and presenting. The third direction, individual score is evaluated by the instructor using the Bain et al.'s (1999) 'Five Point Reflection Scale'. The scale is composed by five levels, where they are reporting, responding, relating, reasoning and reconstructing respectively (See Appendix D). That reflective action extends learning in terms of depth and personal learning process, which is stimulated through dialogue during interaction in team. The team performance is evaluated by the SAOC committee.

3.3 Result Analysis

In this phase, the results from the evaluation step are analyzed and compared. Results of the first individual score from the pre-post test, the second, the score team performance between the experiment group and the control group and the third individual score of the Accommodator students who play a role as the leader and difference position are compared. Finally, the whole results are explained with the various theories that are used in the SAOC learning framework.

3.4 Model Verifying

In this phase, the process of the two continuing steps can be used and repeated in the next course again. The results of the two rounds are compared and verified the model. Moreover, to add the value of the framework for more student learning achievements, the second case study will be experimented where all processes are similar to the first case. But in addition, the relationship between the instructor learning and student learning styles is concerned and used for more student learning outcome improvements. Therefore, in the student learning style assessment and instructor learning styles are assessed too. The various styles of instructors and students are arranged and matched together. The experiment in the second case is followed by the research process.

3.5 Social Network Creation

To share knowledge and continuing improvement, the social networks, especially, facebook is created for the leader of the teams, Accommodator, and instructors. The social networks are constructed to be the multiplier tool by setting and composing with the instructors and students in every course. This tool is used in the situation where the leaders will ask and answer the questions that are the problems during the assignment. For the alumni who are members of the group network, they are able to answer the question from the new students in the verifying course (See Appendix E). Most of assignment came from the Air Chief Marshal's aim policy. The alumni have continuing development and make the students create the new alternative to solve the problem. It will be the COP in which the alumni are developed the competency and improved the learning outcome of the SAOC students. Finally, the people in organization are dynamic learning in COP and getting the productivity. The organization will be developed to be the learning organization in the future.

3.6 Scopes of Study

In this research, population and the selection criteria of the sampling group are explained. Moreover, tools and technique utilized in this proposed framework is also given. Evaluation method is also included.

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3.6.1 Population

The population is the SAOC students including 320 persons in four courses, where each course contains 80 individual different students, in which the ages are between 38 and 54 years. Their education levels are in the vocational and Ph.D. from various areas in RTAF.

3.6.2 Selection criteria of sampling

The Kolb learning style inventory is used to assess the student learning style by four styles, where they are accommodator, diverger, converger and assimilator. It was found in the preliminary study that the accommodator was the old generation students, where the oldest, high experience and low education level students are selected to be the group leader by negative reinforcement theory.

3.6.3 Tool and Technique

1) Student groups are arranged into 4 learning styles in order to gain the knowledge and experience sharing by Kolb inventory.

2) The student roles, especially the accommodator are assigned to be leader by negative reinforcement, where the leadership can be established.

3) The exercise is designed to appropriate the accommodator by the constructive learning, in which the concrete experience can be performed.

3.6.4 Evaluation Method

The reflective learning, the Five Point Scales is used as the suitable tool for score evaluation, in which the new framework can be tested and confirmed.

3.7 Conclusion

The solution is proposed based on both evidential and theoretical investigation. The implementation and the proof the proposed solution are challenging. The application of the proposed method is thus necessary. Next chapter shows the application of the method of which the results and discussions will be described.