

# AN APPLICATION OF ONLINE PSYCHOMETRIC ASSESSMENT; EMERGENETICS® PROFILE TEST, FOR UNDERSTAND LEARNING STYLE IN ENGLISH WRITING'S PROCESS OF VOCATIONAL TEACHERS STUDYING IN MASTER LEVEL

Nattira Horpibulsuk

Faculty of Business and Industrial Development,  
King Mongkut's University of Technology, North Bangkok.

Email: nattira.h@bid.kmutnb.ac.th

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## Abstract

This research aimed 1) to study the development of English writing process of vocational teachers who studied at the master's degree level by recorection, 2) to group the learning approaches of learners using Emergenetics®; the online learning approach assessment, and reflect on assignments' scores of each learning group, 3) to present the results of the satisfaction survey based on the recorection method. The purposive sampling is 14 vocational teachers in the fields of Tourism, Mathematics and Thai. Their average age was 35 and studied English with the communicative approach. This research was action research by recorecting assignments with descriptive review from lecturers and Emergenetics® test result to develop the writing process. The statistics were mean, standard deviation, Pair Sample t-Test and One-way ANOVA.

The results were; 1) The result of learners' writing process by re-editing twice with the lecturer comments on 4 topics; Writing an Introduction, Extended Essay, Explaining Picture and Freehand Writing. The recorection resolves problems of fragmentary writing, writing extended version, better clarified thesis statements and stop using the bullet points. The overall score of the assignments before and after the recorection was significantly different at the .05 level. 2) The pattern and sequence of their writing's problem then grouped and confirmed by Emergenetics® test; Conceptualizing for 2 persons, Structural learning for 5 persons, Social Relations for 4 persons, and Analytical learning for 3 persons. The overall writing scores of each group were  $\bar{X}=15.80$ , S.D.=0.00,  $\bar{X}=14.60$ , S.D.=1.28,  $\bar{X}=13.07$ , S.D.=0.90 and  $\bar{X}=12.43$ , S.D.=0.32. The average score of each Emergenetics® group was different at the .05 level. 3) The overall student satisfaction was at a very good level ( $\bar{X}= 4.18$  and S.D. = 0.15). In conclusion, the recorection process suited Thai adults studying English using a communicative approach. The students' writing capability was comprehensible with the results of Emergenetics®. The thought processes of people indicated the style and preference of writing.

**Keywords:** Online Psychometric Assessment, Learning Styles; English Writing; Recorection Process; Emergenetics® Profile Test

## Introduction

Most graduate students in Thai universities must be tested in English before entering into university. This process is applied with faculties of state universities. The graduate students' class of 2018 in one autonomous university had to be tested in English proficiency. Students would be enrolled in the Intensive English for Graduate Studies course, if they tested less than 50% (University of Phayao Bangkok Campus, 2018). 20 students with average score of 34.16% enrolled with the course. 14 out of 20 students were vocational teachers in various fields. Although the test was focused on grammar, the main learning objectives for the course are to be able to read and understand academic articles that are relevant to the subject areas of their study. In addition, students have to synthesize and be able to structure their writing. Grammatical accuracy is only one component, the ability to read and write at the required level are the main learning outcomes. To achieve the course objectives, a pre-survey was conducted by assessing English skills in grammar, speaking, reading and writing by using a ETS® TOEFL-like test and the Q : skill for success level 1, the elementary English level for university students of Oxford University Press (Scanlon et al., 2019). For the other English skills, the pre-survey results showed that the students could communicate quite well, as they were experienced using English in interactive learning. However, they were lacking in writing skills and experienced problems and struggled when assigned a writing test with a limited time period. All vocational teachers participated in the research were skillful in their fields but the questions of this paper were; “how they construct their writing in another language? what is the process of their writing? If the person with same problem existed, and how can we group them together to find the way of helping them learn?” This group of people will perform academic work in the future. If we can help them understand the process of their writing and know their learning styles when learning, it would help them learn.

## Research Objectives

The objectives of this research were; 1) To understand the process of English writing of postgraduate students and 2) To confirm the writing capability with the learning styles& thought process derived from the Emergenetics® Profile Test. 3) To study the satisfaction levels of the students towards the application of Emergenetics® Profile Test for understand learning style in English Writing's Process.

## Literature Reviews

### The Thailand Educational Reform: The Communicative English

Learning how to write can be assumed as a lifelong learning, especially, for the non native speakers. For Education in Thailand, English was taught in schools from primary to postgraduate level (Darasawang, 2007). However, the majority of Thais seem incompetence in English communication, particularly writing one. Even, the curriculum reformation in 1977

changed the traditional method of grammatical oriented approach with teacher-centered one into the practical communication and learner-centered; the majority of learners could not use English effectively, though. On the process of English study after the educational reform in 1977, the English teaching of practical communication was focused on “The Learning Process” which allowed individuals to see their own potential and the teacher to be aware of students’ differences as a part of student-centered approach. Also, many methods were employed in Teaching English: 1) The task-based approach aimed to help students acquire language naturally, by completing a given task by producing the language learned throughout the unit. (Darasawang, 2007). The assignment of each unit used students’ creativity: i.e. short film, poster, role playing; etc. This made task-based instruction very close to communicative language teaching, 2) A self-access center provided facilities and materials for students to choose materials which suited their level of proficiency; and 3) E-Learning, the utilization of technologies for education, was used.

### **The student-centered approach: The Writing with Recorrection Process**

The student-centered approach for learning English stated in curriculum development was aimed for every level of the learners. Anyhow, the learning process for the postgraduate level differed from the compulsory one. For the postgraduate level who studied in Thai program, English was considered to be a part of international acceptance for his/her degree as it certified that at least they had come across some English texts and know how to write: i.e. English’s abstract. The task-based activity that appropriated for the adult learner should be concerned. Reviewing from the objective of learning English for postgraduate level that they should know some texts and write some short essay. Then, the task-based activity that suited the postgraduate one is “writing”. In addition, the learning process can be used the “supervision writing” as a viable tool. From Lee and Murray (2015), the supervision writing for postgraduate students comprised five principles as follows: 1) Writing as a draft-it needed feedbacking and recorrectioning the exercise, 2) Encultural approach-it included the arranging of writing buddies and reviewing by peers, 3) Conceptualize approach- this approach allowed students to know how to conceptualizing their work by realizing their writing potential, i.e. their writing style and find the way of adjusting it, 4) Emancipatory approach- it was an exploring their inspiration to write, and 5) Relationship development-it is a trust building created by the lecturer.

### **Technologies: The usage of E-Self-Assessment**

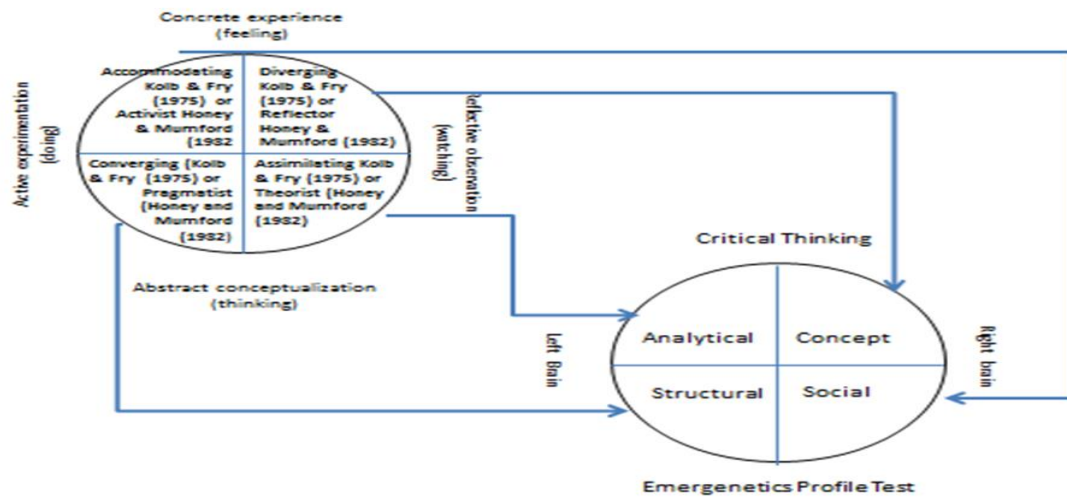
Technologies played an important role in continuously developing in the student-centered approach. The usage of E-learning and the Self-Assessment Center was already immersed as a part of people lifestyle. Recently, Thai people read more than before for 77% with online materials (National Statistic Office, 2016). Actually, there were also many personalities’ assessment programs (psychometrics) available via internet. Some of them

were even voluntary basis. However, concerning about the validity and reliability, since some of the psychometrics were used for a long period of time. People know how to trick when answering the question in order to get better scores: i.e. The Big Five personality test and Myers-Briggs Type Indicator test (MBTI) that developed since 1980s (Lussier, 2018). In addition, the above psychometric tests had been researched by using the sampling group from Baby Boomer and Generation X groups. Whereas, the way of thinking of the new generations was changing which affected the reliability of free online psychometric test that had been available online recently.

### **From Experiential Learning to Emergenetics® Profile Test**

The recent psychometric tended to measure the type of personality rather than cognitive ability and learning style. For the cognitive ability test, the IQ Test was still prominent. For the learning style assessment, the dominant one was the Learning Style by Kolb and Fry (1975) which stated about the four-stage learning cycle: 1) Concrete experience, 2) Reflective Observation, 3) Abstract and 4) Active Experimentation. Kolb and Fry (1975) then set out four distinct learning styles which combined the two staged learning cycle together as follows: 1) Diverging (concrete, reflective) - Imaginative approach to doing things tended to observe rather than act, 2) Assimilating (abstract, reflective) - Pulls a number of different observations and thoughts into an integrated whole. Likes to reason inductively and create models and theories, 3) Converging (abstract, active) - Emphasizes the practical application of ideas and solving problems and 4) Accommodating (concrete, active) - Uses trial and error rather than thought and reflection. Honey and Mumford (1982) simplified Kolb and Fry's Learning Styles into four distinctive preferences based on the above order: 1) Reflector, 2) Theorist, 3) Pragmatist and 4) Activist, respectively. The four distinctive learning styles aimed to measure the style of learning in order to find the most effective way of learning for each individual.

It was hard to find psychometric that aimed to measure both personality and learning style. (LaPrairie and Slate, 2009) However, recently, new psychometric assessment has been invented to reflect on human potential both personality and thought process (Fiordispini, 2017 and LaPrairie and Slate, 2009). Kolb Experiential Learning (Kolb and Fry, 1975) and Learning Style of Honey and Mumford (1982) were inspired the Emergenetics® (Fiordispini, 2017). Browning and Williams (1991) developed a brain-based approach to personality profiling called Emergenetics®. The Emergenetics® comes from two roots: "Emerging" and "Genetics". The Emergenetics® can be used as a tool for understanding the interactions of people and how learning from experience affected people thinking. It blended the idea that we live every day is caused by behaviors and life experiences. Emergenetics® assumed humans are genetically programmed to think and process information in certain preferred patterns. There are four thinking attributes that compromised with Kolb and Fry (1975) and Honey and Mumford (1982)



**Figure 1** : Kolb Experiential Learning Cycle is transferring to Emergenetics® Profile Test

Source: Researcher own picture

From the picture, it could be summarized that 1) Structural Thinking represented on the lower left column, which was equivalent to Converging by Kolb and Fry (1975) and Pragmatist (Honey and Mumford, 1982). It was the use of left brain features in compiler management, including process sequencing, pay attention to details, and clear rules, 2) Analytical Thinking represented on the upper left column, which was equal to Assimilating and Theorist. It was the use of left brain features of logical reasoning, analysis, 3) Social Interaction was represented on the lower right column, which represented the interaction with others. It was equal to Accommodation and Activist. This group of people tended to understand others as the right brain focused, and 4) Conceptual Thinking is represented on the upper right column. It was equivalent to Diverging and Reflector. It was the use of the right brain to create imagination, creativity and looking at the overall picture.

The Emergenetics® were broadly used in academic institutes and firms. The Emergenetics® helped people realize the analytical thinking ability of each group of personality attribute. Even it based on Kolb and Fry (1975) and Honey and Mumford (1982) that people can be divided into four types of thought process. However, the Emergenetics® result did not solely indicate that people are limited into only four types of learning attributes. Some people have single types or combination between two, three or even four types. In addition, it promoted self-learning as they could do online whenever they want to by reading instruction.

## Research Conceptual Framework

From the literature reviews, the Conceptual Framework of the research is represented in the following Figure. 2:

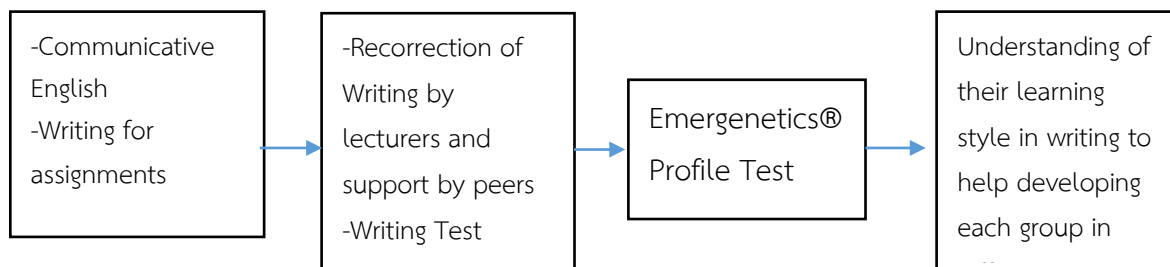


Figure. 2: Shows Research Conceptual Framework

## Research Methodology

### Step 1. Research Design:

This research used action research as the research design. 2 types of interventions which derived from the following student-centered approach: 1) Task-based approach of using the recorrection process and 2) The online psychometrics entitled Emergenetics® Profile Test.

### Step 2. Population and Sampling:

Population of this research was 20 postgraduate students who enrolled in the Intensive English for Graduate Studies Course, from the programs of M.B.A. for 6 persons, Tourism Management (T.M.) for 11 persons and Education Management (E.M.) for 3 Persons. Purposive Sampling was used in this study with 14 postgraduate students who are the vocational lecturers from T.M. and E.M.'s Programs as they would be responsible for teaching students. The participation in this research can be applicable to their careers. The other 4 students were exempted as there are in business field. All students provided their consent to participate in this research. Their names were kept confidential. The duration of data collection was 4 months.

### Step 3. Research Materials and Data Collection

The research tools can be divided into two types:

#### 1) Intervention tools:

1.1) the study plan composed of 15 units of study with 4 writing assignments; Process, Essay, Graphic Information, and Freestyle Writing (Final examination).

1.2) Assessment tools adapted from the grading rubric of the University of Warwick (2018): Comprehension, Analysis, Critique and Presentation. Grammar and sentence structure were included in the Presentation part. One may say that the grammar was of less concern than structuring and conceptualizing, which were more important.

2) The instruments used for collecting data were as followed;

2.1) Assignment score before & after recorection. For the assignments No. 1, it was used to know the students' writing problems. Once the researcher knew each student's writing style from their first time of submission. The recorection process would start with scores provided after 2 times of resubmission. Then, the same loops were repeated for another assignments. At this stage, the same problems were obviously seen by some students which will be tested by online psychometric for the next stage.

2.2) Online Psychometric entitled the Emergenetics® Profile test to test the learning styles. From contact with the Emergenetics® Profile Test Agency, the students who participated in this research were granted permission to enter to the Emergenetics® Profile Test's site to register and do the test under the researcher supervision.

2.3) Satisfaction survey with 3 experts' opinions on Items of Objective Congruence of the questions.

3) The Validity & Reliability of the research

3.1) Instrument Validity: The four types of writing activities: (1) Process writing, (2) Structural Essay writing, (3) Graphic Information, and (4) Free Writing, were used to conduct this research.

3.2) Reliability: (1) A co-instructor acted as a peer reviewer when constructing the examination (2) The usage of questionnaires from the websites of English testing organizations such as a ETS® TOEFL-like test and the Q : skill for success level 1, the elementary English level for university students of Oxford University Press (Scanlon et al., 2019) as a Pre and Posttest. (3) Grading Rubric from Centre of Education Studies, University of Warwick which are; 1) Comprehension, 2) Analysis, 3) Critique and 4) Presentation (University of Warwick, 2018). (4) The Emergenetics® Profile Test: the test of human potential both personality and thought process which backed by significant research that has been revalidated over the past 30 years, the Emergenetics® assessment and resulting Profile meet the Standards of Educational and Psychological Testing (Fiordispini, 2017, Emergenetics®.com, 2018).

#### **Step 4. Data analysis**

For objective 1, to understand the process of English writing of graduate students the data were analyzed using the scores of their written assignments. Then, the descriptive statistics: mean and standard deviation (S.D.) and inferential statistics: Pair Sample t-Test with the significant level of 0.05 to compare the outcome of the four activities and the comparison between their writing performance before and after recorection.

For objective 2, the result of Emergenetics® Profile Test would be presented as 4 domains which students would occupy one dominant domain plus with the minor one (if present). Then, the grouping of students with the same result and compare the scores

among students in the same domain by comparing the average scores and variance of each group results. The data were analyzed using descriptive statistics: mean and standard deviation (S.D.) and inferential statistics: One-way ANOVA with the significant level of 0.05 to compare assignments' mean of each Emergenetics®'s groups.

For objective 3, the data of satisfaction with the recorection method were analyzed by using descriptive statistics: mean and standard deviation (S.D.).

## Research Results

**Objective 1**, to study the development of English writing process of vocational teachers who studied at the master's degree level by recorection. It can be summarized as before and after intervention by using the writing assignments. As for the results, the researcher found that most students shared the following problems: Writing a short introduction, in which none of the 14 students presented a clear statement of the essay to be presented. For the body paragraph, students were accustomed to writing in bullet points instead of using complete, narrative sentences. Their structure of writing was not according to the usual form of writing an essay in English as some wrote theirs in Thai first. Some students wrote in very long sentence fragments. From interviewing students about how they constructed their assignments, the researcher found that the students think first in Thai, which presents problems because sometimes the subject, verb or even predicates were omitted. Once the researcher knew each student's writing style from their first submission, the recorection process would start by discussing the problems, focusing on important characteristics of academic writing: Audience, Purpose, Organization, Strategy and Style, Flow and Presentation (Swales and Feak, 2012). The first four are typically interconnected. Purpose means displaying familiarity, expertise, intelligence and logic. As such, the structural writing by using T.B.E.R (Pimsarn, 2005) was considered. "T" was Topic sentence, "B" was Bridge, "E" was Examples or Explanations. "R" was Restatement, which concludes the overall story. For their further development, it could be seen in the next Assignment No. 2, writing extended essays and No. 3, writing for explaining graphs & charts (Assignment No. 4 is free hand writing as the Final Examination).

After the second recorection, the results showed that the sequence of their writing seems to be the problem, which represented their thought process. Anyhow, recorection could resolve problems of fragmentary writing. Their thesis statements were clearer and they stopped using bullet points. The results after recorection showed that the majority of students wrote better with self-recorection. Students started to write simple sentences and then combined them together. Their scores are presented in Table No. 1, the results of recorection process from assignments Nos. 1-3.



**Table 1** The result of recorection process from assignments Nos. 1-3

Score of all students per each assignment	$\bar{X}$	S.D.	t	P
Assignment 1 before recorection (5 scores)	3	0.00	-6.10	0.000*
Assignment 1 after recorection for 2 times (5 scores)	3.75	0.46		
Assignment 2 before recorection (5 scores)	2.34	0.67	-12.72	0.000*
Assignment 2 after recorection for 2 times (5 scores)	4.39	0.81		
Assignment 3 before recorection (5 scores)	2.80	0.78	-4.67	0.000*
Assignment 3 after recorection for 2 times (5 scores)	3.86	0.25		

\*sig.  $p < 0.05$

From Table 1, the writing test results from Assignment No.s 1-3, both before and after the revision process was significantly different at the 0.05 level, indicating that the students were able to improve their writing process. In any case, some students still experienced difficulty with how to scale down the story like an upside-down pyramid, some persisted in writing unnecessarily complex sentences, as they thought that simple sentences displayed merely elementary level student writing. This shows some development to structure the writing. This was their way of compiling ideas and analytical capabilities. However, their problems were not only with grammar. They also struggled with choosing the best verbs based on the facts. Thus, problems with logical thinking were also seen.

**Objective No. 2**, to group the learning approaches of learners using Emergenetics® and reflect on assignments' scores of each learning group. Emergenetics® were used as an intervention tool. Average scores of Assignment Nos. 1-3 for both before and after recorection and Final Examination result were used as outcome of English writing of each student. Their scores were accumulated based on the Emergenetics®'s result. It is shown in Table No. 2 that the result of the Emergenetics® tests for each student compared with the results of Assignment Nos. 1-4.

**Table 2** The result of the Emergenetics® of each student compared with the average scores before and after recorection of Assignment Nos. 1-4

Name	Emergenetics® Result	$\bar{X}$ of Assign. 1	$\bar{X}$ of Assign. 2	$\bar{X}$ of Assign. 3	$\bar{X}$ of Final Assign.	Total	$\bar{X}$ of Group Score	S.D.
A	Concept +Structure	3.50	3.50	4	4.80	15.80	15.80	0.00
D	Concept	4	4	3.50	4.30	15.80		
C	Structure	3.50	3.60	3.80	4.70	15.60	14.60	1.28
D	Structure+ Analytic	3.10	3	3	3.50	12.60		

Name	Emergenetics® Result	$\bar{X}$ of Assign. 1	$\bar{X}$ of Assign. 2	$\bar{X}$ of Assign. 3	$\bar{X}$ of Final Assign.	Total	$\bar{X}$ of Group Score	S.D.
K	Structure	3.50	3.60	3.80	4.90	15.80		
L	Structure+ Analytic	3.50	3.60	3.20	4.50	14.80		
N	Structure	3.40	3.60	3.80	3.40	14.20		
E	Social +Structure	3.30	3.10	3	4	13.40	13.07	0.90
F	Social Interact	3.30	3.30	3.40	4.20	14.20		
G	Social Interact	3.30	3.30	3.10	2.70	12.50		
H	Social Interact	3.10	2.30	3.10	3.70	12.20		
B	Analytic	3.40	3.40	3	3	12.80	12.43	0.32
J	Analytic	3.10	3.20	2.80	3.20	12.30		
M	Analytic	3.40	3.40	3	2.40	12.20		

From Table 2 shows the average score for each group ranked from high to low in Conceptual, Structural, Social Interaction, and Analytical thinking styles ( $\bar{X}$  = 15.80 with S.D. = 0.00,  $\bar{X}$  = 14.60 with S.D. = 1.28,  $\bar{X}$  = 13.07 with S.D. = 0.90, and  $\bar{X}$  = 12.43 with S.D. = 0.32 respectively).

**Table 3** The comparison between the average scores of 4 assignments of each Emergenetics®' group.

Source of Variation	SS	df	MS	F	P-value
Between Groups	1.738385	3	0.579462	5.352733	0.014271*
Within Groups	1.299064	12	0.108255		
Total	3.037449	15			

\*sig.  $p < 0.05$

From Table 3, the comparison between the average scores of 4 assignments of each Emergenetics®'s group were different with the significantly different at the 0.05 level.

**Objective No. 3**, to study the satisfaction levels of the students towards the writing process. The satisfaction of the students was presented in Table 4-5.

**Table 4** The satisfaction survey

The satisfaction survey	$\bar{X}$	S.D.
How well you prepare yourself before attending the activity, i.e. read a book, review the previous session.	4.00	1.13
Quality of Presentation by facilitators	4.10	0.78
Learning from Co-Participants i.e. discussion with classmates.	4.11	0.73
New knowledge Building	4.44	0.69

The satisfaction survey	$\bar{X}$	S.D.
Support Services (the information provided by the university about the program.	4.22	0.78
This program should be arranged for the next group of participants.	4.22	0.78
<b>Overall</b>	<b>4.18</b>	<b>0.15</b>

From Table 4 presents the results of the satisfaction survey based on the recorection method. One may say that students were satisfied with the recorection method  $\bar{X}=4.18$ , S.D.=0.15. In addition, as for new knowledge building, students agreed that they received new knowledge from the program and the method of the recorection. The results are confirmed by the university satisfaction survey in Table 5.

**Table 5** The university satisfaction survey

The university satisfaction survey	$\bar{X}$	S.D.
Planning for the program	4.60	0.10
Quality of program arrangement	4.80	0.07
Learning outcome as expected	4.74	0.10
<b>Overall</b>	<b>4.71</b>	<b>0.09</b>

From Table 5 shows the Expected Learning Outcome (ELO) was  $\bar{X}= 4.74$ , S.D.=0.10. One may say that the program met the students' expectations as  $\bar{X}= 4.71$  with S.D. =0.09. As for Tables 4-5, one may say that the understanding of their analytical ability helped them become more aware of their weaknesses in their English writing skills, which could then be improved.

## Discussions and Conclusion

### The discussion on the research objective 1

For Objective No. 1: To better understand the process of English writing of postgraduate students, the researcher found that the recorection process and peer review were important in student development, discussed as follows: Thai students' ability to study in English can be quite problematic. Despite efforts to improve English language skills at the elementary level, problems with English; in terms of reading, speaking and especially writing, may also persist at the postgraduate level (Akaraniithi and Panlay, 2007). The main cause of this problem is that students do not use English in their everyday lives. At the postgraduate level in some Asian countries, even for those who passed International English Standardized Testing; for example, the TOFEL Test, a passing score did not guarantee that they could write a passage with correct grammar (Edwards, 2008). Sample surveys and research on the problem of lack of English skills in Thai students by Akaraniithi and Panlay (2007) analyzed the causes of students' problems in the "One District, One Scholarship Project" or the Local Development Scholarships for studying in European countries that use English-language

curricula. That study stated that difficulties with language, environment and culture adversely affected student achievement. According to the results of that study, 321 students with government scholarships to study in Europe had problems learning. Only 19 students achieved excellent results. Therefore, learning by using adult learning techniques could be applied to this research.

Learning to improve English writing at the postgraduate level would be considered adult learning, including the aspect that the learning can be done whenever they want (Mondy, 2016). In addition, this can be confirmed by Lee and Murray (2019), that the recorection process can be a part of self-learning, self-assessment and the understanding of individual differences.

From the literature review, the practice of free writing and recorection based on structural writing could help students develop, which comports with the ideas of Zhang and Yin (2018) in the research on Exploring the Use of Focused Freewriting in Developing Academic Writing. Furthermore, the use of peer review by pairing two dissimilar students or two similar students: 1) Students with completely different problems and 2) Students with similar problems. Both kinds of pairing could help students develop.

The rewriting activity in class with peer discussion helped with correction as students gained more support from friends. This confirms the research of Kalong (2016), that Thai students could improve by using the peer review process when writing. The process of recorection by both lecturer and peers also confirms the adult learning theory that there are four groups of learning styles (Kolb and Fry, 1975; Honey and Mumford (1986:b); and Browning and Williams (2006). And, some students prefer social interaction to help them learn (Kalong, 2016).

### **The discussion on the objective 2**

For Objective No. 2, grouping the learning approaches of learners using Emergenetics® and reflect on assignments' scores of each learning group, it found that average score of each Emergenetics® group was different with Significant level at 0.05. It presented the uniqueness of their learning styles based on personality that are different (Kolb and Fry, 1975). The grading rubrics; 1) Comprehension, 2) Analysis, 3) Critique and 4) Presentation, derived from University of Warwick (2018) were used, it presented the outcome of writing and attributed each Emergenetics®'s group score. It was found that students with these four different thinking attributes had characteristics as evidenced by the scores and performance as follows: Students with the conceptual thinking style tended to get higher scores in comparison to other groups of students. They had a tendency to view the big picture and wrote well as they already had the concept in their minds. They are pragmatist which tried to overcome all the problem by rewriting to gain the overall score based on the grading rubric. The second group, with the structural thinking style, tended to conform to

rules and regulations. They submitted their assignments on time and the frequency of submission was higher than the other groups. The social interaction group scored the lowest for every activity. However, as expected, they performed well in class discussions and group assignments. It conformed with Horpibulsuk (2022) that the social capital and social network relations produced the explorative learning outcomes. Finally, the analytical thinking group tended to study English often by interpreting the text using their own mindset rather than translating directly from the text. It could be said that this group thought too much and wrote too complexly. This affected their writing ability and the audience might have found them difficult to understand them. One may say that the students' writing capability was indeed shown in their Emergenetics® profile test results. In addition, the understanding of their thinking styles helped students become more aware of how they think, which may influence how they may write in the future.

### **The discussion on the objective 3**

From the satisfaction survey based on the recorection method, students agreed that they all received new knowledge from the program for  $\bar{X}=4.44$ , S.D.= 0.69 and This program should be arranged for the next group of participants for  $\bar{X}=4.22$ , S.D.= 0.78. For the university satisfaction survey, the researcher also found that the quality of program arrangement met their requirements for  $\bar{X}=4.80$ , S.D.=0.07. Also, the program met their expected learning outcome for  $\bar{X}=4.74$ , S.D.=0.10. It is comprehended with the student-centered approach for postgraduate level of Lee and Murray (2015) that the task-based activity for the postgraduate one is writing with supervision for providing feedback and recorrecting by both lecturers and peers. It will enhance students learning and development.

### **Conclusion**

The process of English writing for postgraduate students who participated in this research who were familiar with communicative English were interested in the recorection process, and devoted their time to recorection, a method of learning for adult students. This aligns with the experiential learning discussed earlier. In addition, the recorection process suited this group of Thai adults who studied English as a second language in view of the problem stated earlier; that they do not use English in their everyday lives.

As for comparing writing capability with the results from the Emergenetic® profile test, it was found that analytical thinking ability derived from the Emergenetic® profile test aligned with the development process of the students as follows: Firstly, as the topic selected and the score, students could write well with a topic that aligned with the results of the Emergenetic® profile test; e.g., structural group was keen on structural writing. Secondly, as for the attribution and the score; for the overall score, the researcher found that students with structural thinking style tended to have consistent development. On the other hand, those with the conceptual thinking style presented logical ideas and could

conceptualize well but may have presented other discrepancies. They did well with their own preference and were quite independent.

## Suggestions

The thinking ability affects the style and preference of writing. So, the assignments provided should be varied, not only the structural writing and graphic explanation as often done when taking an English test. The assignments should provide an equal chance for everybody to write for their achievement, self-esteem and expression of their tacit knowledge for the sake of learning.

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