Research Article

Effects of Thinking and Language Learning Integrated Model to Better the Academic Reading Skill of English Teachers

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Article History: Received: 11 January 2021; Revised: 12 February 2021; Accepted: 27 March 2021; Published online: 23 May 2021

Abstract: This study attempted to develop the academic reading skill of English teacher trainees at the Faculty of Education, Suan Sunandha Rajabhat University. PLADSER Model was implemented and the participants' opinions were surveyed. Eighty one English teacher trainees were the sampling group. The tools were a syllabus in accordance with the model, learning activities' worksheets, evaluation criteria on academic reading achievement, and an opinion survey form. The results revealed that the scores of the learning activity 1 and 2 were rated as good at the percentage of 78.22 and 84.66, respectively. However, the score percentage of the learning activity 3 was 73.42 and rated as average. In the learning activity 4 which was research idea presentation after reading, their score results were at the percentage of 76.01 or at the good level. From the opinion survey, 91.36 percent of them considered the information structuring methods for research were applicable. Meanwhile, 12.35 percent of them informed that obedience to detailed research methods caused mental difficulties in actual performance

Keywords: PLADSER Model, Academic Reading Skill, English teacher trainees, Learning Activities

1. Introduction

Due to the abundance of emerging knowledge and its fast spread through advanced technology mediums, especially the Internet, people can conveniently update themselves about the social currents, discoveries, viewpoints, and information sources. With the freedom of learning and information consumption, the awareness about misconception and single-sided information is of a greater concern. Close consideration before judgment is, thus, much important for knowledgeable people to live their lives knowingly. Furthermore, in the academic milieu, being sceptical of thoroughness, provability, and formation and sources of knowledge through questioning in several aspects is of greater realization before accepting, denying, and sharing (Ashley et al., 2010; Hao et al., 2014; Pentina & Tarafdar, 2014; Waree, 2019). Therefore, the development of mere communication skills for literally message receiving and sending is not enough as thinking skills need to be simultaneously grounded along the trajectory of human development.

Among all the communicative skills, Yantip (2004) reported that, in foreign language learning and communication, the well trained reading skill can exist in spite of seldom use while the others can be recovered through regular use. Furthermore, thinking skills always work while reading because the reading process requires the assistance of schemata, content knowledge, context understanding, perception, and language use analysis (Liu, 2010; Khalidiyah, 2015). However, Essien (2017) stated that textual comprehension difficulties in terms of interpretation and text cohesion often occur and, subsequently, learners cannot read independently without a teacher's parallel guidance. In reality, those with the basic reading skill can understand better when guided but they are neither unable to explain nor retell after reading. In an advanced level of learning, there is a greater concern in that higher reading proficiency is necessary for working on more complicated academic lessons. Hudson (2007) Akkakoson (2011) and Zhang and Seepho (2013) added that, unlike general reading or reading for entertainment, reading for academic purposes requires more than just reading for meanings of words, specific details, literal understanding and practice of fluency. This results in the huge necessity of higher order thinking and reading skill enhancement in a simultaneous manner as the academic reading skill for knowledge construction and self development (Pritchard, 2008).

In teacher education, primary understanding of the functions and the relationship among full text research chapters based on the research principles is a very important requirement for reading research to analyze learning problems, improve pedagogical techniques, investigate innovation and do further research. Under the circumstance of research competency preparation for English teachers, there is a rise of necessity for a training to develop their academic reading skill for assisting the research skills used in their profession. Besides, reading skill difficulties still need to be resolved through provision of reading experiences for both extensive learning of language use and effective thinking based on correct primary perception.

2. Literature Review

According to Hudson (2007) Pritchard (2008) Grosman (2011) Bharuthram and Clarence (2015) and Aksornkan (2016), the academic reading skill is defined as active reading whereby readers use higher order

thinking to construct knowledge, to draw a valid conclusion, and to apply reading strategies to comprehend subtle points in a text. Akkakoson (2011) and Lantsoght (2018) emphasized that from a discipline's introductory content to expertise, this skill needs to be cultivated in learners for knowledge gap fulfillment, complicated content understanding, and work performance development. Since it covers higher order thinking and reading strategies, these two inseparable properties always interplay while reading is in action.

To successfully empower the skill, Pritchard (2008) and Lantsoght (2018) stated that learners need to be equipped with the ability to differentiate between facts and opinions. While reading academic papers, reading facts requires a closer examination on selected theories, logic and validity of theoretical claims, results of academic proofs, and tendency or bias in claims and discussion points. They also added that a past theory can be still accepted in case it can explain recent phenomena or discoveries. That is, it is reading for critical consideration and gaining the most from provable knowledge. For the presence of opinions, the foremost realization for readers is that these can vary due to different experiences, expertise and perception of an author. From these principles, the consideration of both factual information and personal views needs understanding of influencing conditions, relevant social currents, and evaluation of author's credibility for effective reading interaction and strategic investigation for thoroughness (Pritchard, 2008; Hermida, 2009).

In reading for an academic purpose, the higher order thinking skills can be traced through the analysis, evaluation and creation modes which make use of interpretation and interrogation during reader-text interaction. That is, academic reading activities adopting argumentative issues, case studies, critiques on phenomena and discovery which are at a certain level above learners' real performance (Akkakoson, 2011) can be a good contribution to strengthen these advanced cognitive skills (Vijayaratnam, 2012; Boonphadung, 2017; Husamah et al., 2018). Importantly, the continuity of thinking practices (Aksornkan, 2016), self assessment on the academic reading skill (Hermida, 2009), and scaffolding techniques (Akkakoson, 2011) comprise supportive properties of the academic reading skill development. As a result, learners with well-trained academic reading skill typically possess scepticism, systematic consideration, flexible resolution and a good sense of finding indirect meanings or hidden intention (Anderson et al., 2001; Gleason et al., 2011; Boonphadung, 2017; Nourdad et al., 2018).

In regard to promoting learners' self development through reading, Haromi (2014) used Martin and White's appraisal theory, which contain 3 considerations — attitude, engagement and graduation, for development of critical reading of undergraduates majoring in English and literature. The materials for reading activities were editorial articles. The results showed that the activities helped improve their reading skill. Wannathong (2017) created a set of strategic reading activities for higher order thinking skill enhancement. The activities for undergraduate English majors focused on higher order thinking while reading general texts. The results unfolded that their thinking skills were better at the significance level of .01. In addition, Juntiya and Chattiwat (2018) developed PPPTE Model which was based on task-based learning and cognitive academic language learning approach for teaching reading and learning strategies of undergraduate English majors in article reading. This model consisted of Planning (P) Performing Reading Task (P) Practice (P) Transfer (T) and Evaluation (E). After the implementation, the participants' achievement improved at the significant level of .01 and their use of learning strategies was at the 'high' level. Above all the success, reading more advanced materials to synthesize, apply or create innovation is determined as an expected outcome for learners as well.

Reading skill improvement can be of greater effectiveness through the mixture of language proficiency development and thinking skill strengthening throughout the instructional process. Although integrating thinking skills to language skill development was assumed difficult to put into practice due to the overwhelming language-focused paradigm (Yoke et al., 2015), the implementation of thinking skill instruction can, in fact, help learners convey messages analytically (Shirkhani & Fahim, 2011) and make their learning more meaningful through strategically gaining both language use experiences and thinking strategies from a wide range of content or activities simultaneously (Malini & Sarjit, 2014; Yoke et al., 2015). Therefore, several approaches of language teaching have been extensively applied and several teaching methods have also been modified according to higher order thinking teaching principles. In this regard, Unnanantn (2018) developed PLADSER Model to enhance Thai learners' communicative English skills and to support their higher order thinking skills simultaneously for effective communication. Thus, it was brought into extended implementation as a structure of research reading and instruction. Regarding this, both language sensitivity and thinking could be mutually nurtured through the implementation of the model to teach research reading. According to Unnanantn (2018), the model creation process applied the key principles of research synthesis by Cooper (1998) Wiratchai (1999) and Nillapun (2000) and the content analysis by Yoddumnern-Attig and Tangchonlatip (2009) was brought in for especially working on qualitative data through a string of raw data interpretation, analysis, and, then, data coding for categorization, theme setting, and analysis of relationship types. Consequently, useful knowledge from several qualified sources were procedurally gathered and could be used for communicative English skill improvement and the process was described below:

- Synthesis Preparation: The researcher designed a research quality evaluation form, evaluation criteria, and a data record form for surveying, evaluating, and collecting data from postgraduate dissertations on Thai learners' English skill development.
- Data Gathering for Synthesis: The researcher surveyed, evaluated, and recorded teaching methods from 173 full text postgraduate dissertations from top five Thai universities in the educational field rated by QS World Ranking.
- Qualitative Synthesis: The researcher conducted the research synthesis with the content analysis by Yoddumnern-Attig and Tangchonlatip (2009) for categorizing and setting themes of all the teaching methods as gained.
- Model Formation: the researcher primarily grouped the teaching methods into seven categories according to the synthesis coding: 1) Preparation, 2) Lead-in, 3) Activation, 4) Development, 5) Solidification, 6) Evaluation, and 7) Revision. These were defined as the model's structure.

In each category, the systematization of all the teaching methods, in regard to the synthesis coding, made 6 themes: 1) instructional and learning management, 2) psychological strategy implementation, 3) language teaching, 4) communication strategy teaching, 5) integrative development between cognitive and communicative skills, and 6) explicit performance support. That is, some teaching methods from different themes could fall into some other categories' nature.

From all the principles, the convention of learner-centered learning management obviously characterizes the model and its instructional stages below:

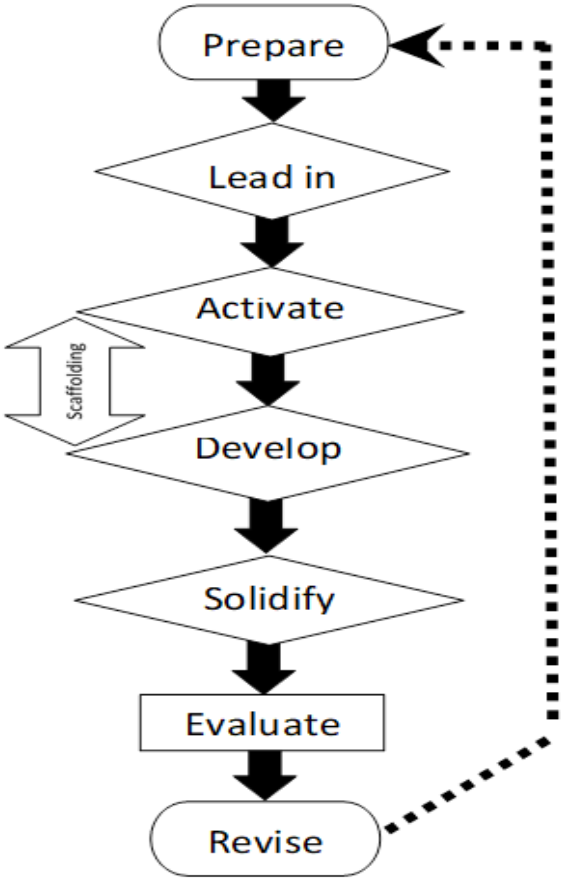

Figure. 1 The Structure Chart of PLADSER Model (Unnanantn, 2018)

- Prepare (P): A teacher analyzes learning styles and abilities of learners and a course's content as well as plans for appropriate activities and facilities for a class.
- Lead-in (L): A teacher introduces a course or a lesson's content as a general view.
- Activate (A): A teacher explains a key concept, important skills, related details and language knowledge, and demonstrates related task performing. Besides, scaffolding concerning the learning assessment is provided after checking understanding.

- Develop (D): A teacher and learners work on a formulaic interactive and thought provoking task together. Alternatively, a teacher assigns them to do a conditioned task by themselves as exemplified. The learning assessment is still in use but the frequency and scope of scaffolding is more limited.
- Solidify (S): A teacher assigns learners to make a creation or do manifestation of performance on their own to reflect their progress of language use and thinking skills. The learning assessment is made according to the quality of a finished task.
- Evaluate (E): A teacher judges the overall quality of language and thinking skills from accomplishments and test papers, and considers the instruction's quality from learners' feedback.
- Revise (R): A teacher provides supplementary learning resources for further self study to correct their weaknesses and encourage their strengths. The information from learning observation and feedback is also used for preparing a consecutive teaching loop.

Considering the nature of full text research components, its procedural arrangement lies different but interrelated reporting functions from chapter to chapter (Livingston, 2012; Marchant, 2012; Srijunpetch, 2017). For this reason, the content chunking and the model's concept on communication and higher order thinking skill improvement were altogether in consideration for activity design. Because of the model's openness to several teaching methods based on learner-centeredness, the learning activities in Research Training for English Instruction Development are as follows:

- Chapter 1 was solely separated as the learning activity 1. Since it portrays a research initiative, a context of a research problem, trends of research and innovation, a possibility of success and a framework, Six Thinking Hats by De Bono (1985) was selected to teach flexible and versatile thinking toward knowledge, plans or solutions in several aspects — facts (White Hat), personal attitudes (Red Hat), obstacles (Black Hat), benefits (Yellow Hat), alternatives (Green Hat) and thinking processing and systematization (Blue Hat).

- Chapter 2 and 3 were combined to define the learning activity 2 because the reviewed knowledge in Chapter 2 can be used as a guideline for designing a methodology. On the other hand, the logic and correctness of a methodology is influenced by an effective review of literature. Therefore, K-W-L Plus by Carr and Ogle (1987) and the analytical thinking principle by Anderson et al. (2001) were used in combination.

In K-W-L Plus, the procedural components are 1) Knew (K) or telling prior knowledge; 2) Want to Know (W) or listing unknown areas of knowledge; 3) Learnt (L) or expressing gap-filling knowledge and exploring unanswered questions and 4) Plus or arranging knowledge in a mind map and summarizing. In addition, the analytical thinking principle is composed of 1) differentiating or an ability to categorize highlights of information; 2) organizing or an ability to link and structure information and 3) attributing or an ability to infer theories in use or purposes. In this study, there were thinking issues of the three analytical thinking types in Knew, Want to Know and Learnt each.

- Chapter 4 and 5 were grouped into the learning activity 3 for analyzing the provability of results, the discerning quality of a discussion and the practicality of recommendations. In this manner, the analytical thinking principle by Anderson et al. (2001) was a good match for practices in this activity.

- The learning activity 4 was intended to prove the efficiency of learners' academic reading skill with learning evidence. Thus, it was defined as a session for presenting research ideas with the use of the learned research and language knowledge after reading the full text studies in the previous activities.

For the effectiveness of teacher development, the implementation of this model could better the academic reading skill in which the language knowledge could be strengthened and the scepticism could be grounded in the English teacher trainees themselves for multi-dimensional consideration or higher order thinking as a long term intellectual quality in dealing with information from various sources and constructing new knowledge, proofs or academic discoveries from research. In addition, this intellectual asset, as equipped in teachers, could be of a great contribution for educating learners of different levels and next generations to be quality human resources to the society.

3. Objectives

- To enhance the academic reading skill of English teachers using the thinking and language learning integrated model
- To investigate the opinions of English teachers after using the thinking and language learning integrated model to develop the academic reading skill.

4. **Research Questions**

- How are the English teachers' achievement on the academic reading skill throughout the use of the thinking and language learning integrated model?.
- What are the English teachers' opinions toward using the thinking and language learning integrated model to develop the academic reading skill?

5. **Population and Sample**

The purposive selection was used in this study by considering the results from Webometrics Ranking of World Universities (https://www.webometrics.info/en/asia/thailand). The ranking results display Suan Sunandha Rajabhat University has been in the first rank since 2015. Therefore, among English teachers in Thailand, eighty one English teacher trainees at Faculty of Education, Suan Sunandha Rajabhat University were selected.

6.. **Data Collection**

As this research was based on time series through the use of PLADSER Model, the English teacher trainees' progress was taken into consideration after each activity. The content covered reading for knowledge investigation and extension, research principles in English instruction, practicality of instructional theories, research ethics, academic language, and understanding citation. The independent variable was PLADSER Model implementation and the dependent variables were the academic reading skill of the English teacher trainees and their opinions toward the instruction.

The research tools were a syllabus complying a full range of PLADSER Model's structure encompassing a full range of learning activities, the activities' worksheets, evaluation criteria on the academic reading skill, and an open ended opinion survey form. After the evaluation by 5 experts, the IOC results of all the items were above 0.6, or accepted (Hair et al., 2010), and the researcher improved the instruments as advised.

The details of instruction can be portrayed in Figure 2 and elaborated as follows:

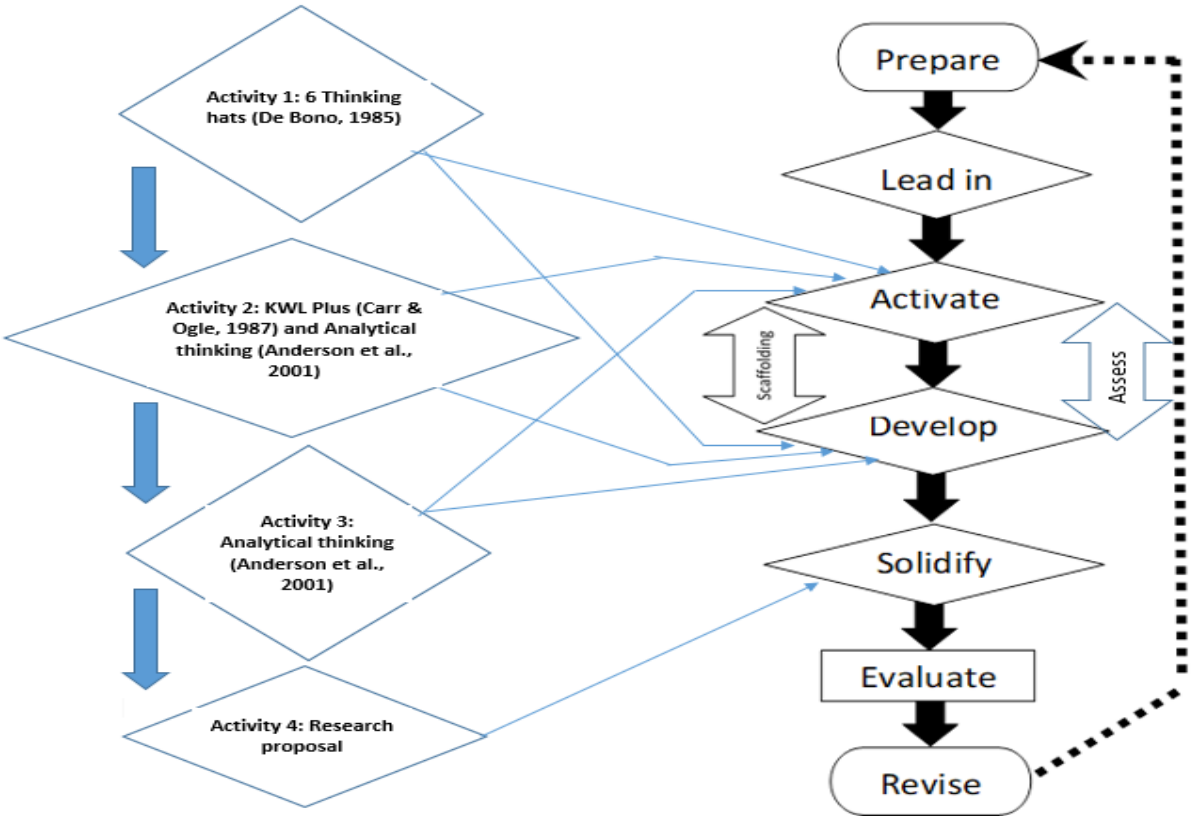

Figure. **2** The Academic Reading Skill's Instructional Process of PLADSER Model

6.**1**.**Prepare**

The researcher selected online research repository websites and full text research studies on communicative English skill development for the English teacher trainees.

6.**2**.**Lead-in**

The researcher organized a class discussion on introductory principles of research principles, and English instruction research and its structure. Next, the researcher showed a short film about a school teacher's techniques for classroom management and learning motivation increase. The English teacher trainees then reflected their lessons learned and arranged them in a simplified research structure.

6.**3**.**Activate**

Regarding the nature of teaching full text research reading to the English teacher trainees, the activities which were designed for Activate, and also Develop, were 1) Six Thinking Hats for Chapter 1 reading or the learning activity 1; 2) K-W-L Plus and the analytical thinking principle for Chapter 2 and 3 reading or the learning activity 2 and 3) the analytical thinking principle for Chapter 4 and 5 reading or the learning activity 3.

The instruction of the mentioned three activities in Activate was started by the researcher's explanation about research knowledge, content, and language use in the selected full text studies. After that, the academic reading skill was demonstrated by the researcher and, simultaneously, explained through the selected teaching methods to answer the worksheets with a language part. The researcher assessed their achievement from their worksheets and academic interaction together with selectively using appropriate scaffolding strategies to learning problems afterward.

6.**4**.**Develop**

The English teacher trainees read their full text research, selected from their interests, on their own as demonstrated and drafted answers in their activity worksheets. Then, they were asked to share their answers in group discussion and presented theirs to the class. Next, they constructed their knowledge by updating, extending, and systematizing their knowledge after commenting, questioning, and gaining feedback and feedforward during presentations. At the end of this stage, the researcher assessed their achievement from their worksheets and academic interaction and selectively used appropriate scaffolding strategies to learning problems.

For each of the three activities, when one was accomplished in Develop, another could continue consecutively in Activate and end in this stage.

6.**5**.**Solidify**

The researcher assigned the English teacher trainees the final activity in which they were to apply their knowledge from research reading to write a research proposal to show their creative research ideas. This activity was defined as the research proposal competition of the English Department where the top three would be selected for grants and support for a conference presentation.

6.**6**.**Evaluation**

For the reason of authenticity of evaluation, all the proposals were evaluated with the competition's criteria designed by the lecturers invited as the evaluators. Also, the researcher investigated the English teacher trainees' opinions toward the use of PLADSER Model by means of distributing an open-ended opinion survey form.

6.**7**.**Evaluation**

The researcher uploaded supplementary resources on research process, language instructional theories, and academic language practices for self improvement and academic assistance.

7.**Data Analysis and Interpretation**

The researcher calculated the raw scores into percentage and defined the criteria below:

- The percentage of 0-49 means needing improvement.
- The percentage of 50-62 means fair.
- The percentage of 63-75 means average.
- The percentage of 76-88 means good
- The percentage of 89-100 means very good.

The results from each activity were displayed for the analysis of achievements and the opinion survey results were statistically analyzed by means of calculating for comment frequency.

8.**Findings**

The results of the development and the opinion survey were presented in the tables below:

Table.**1**. The mean scores of the English teacher trainees during the instruction with PLADSER Model to develop the academic reading skill (N=81)

Results	**Activity 1 (10)**	**Activity 2 (15)**	**Activity (10) 3**	**Activity 4 (30)**
Score	7.87	12.70	7.34	22.80
S.D.	0.70	1.13	0.94	2.55
Percentage	78.72	84.66	73.42	76.01
Level	Good	Good	Average	Good

Interpretation of table-1.

The English teacher trainees' score results passed the criteria. In the first activity where an aim to extend their views toward preliminary ideas in research's chapter 1 was put into action, their academic reading skill after taking their own practicing role was 78.72 percent or rated as good. In the second activity where chapter 2 and 3 were taught, they could do better at thought arrangement and analytical thinking with the highest score of 84.66 percent which was rated as good. However, their score dropped to 73.42 percent or the average level in the third activity which focused on analytical thinking in reading statistical results and relevant discoveries in chapter 4 and 5 reading. The improvement to the good level or 76.01 percent was made in the last activity on research idea presentation.

Table.**2**. The opinions of the English teacher trainees toward the instruction with PLADSER Model to develop the academic reading skill

Results of Opinion Survey	**Numbers of Informants (N = 81)**	**Percentage**
New Knowledge		
Research on integrated communicative skill development	60	74.07
Teaching techniques from research reading	61	75.31
Theories related to English teaching	55	67.90
Differences between findings reporting and discussion writing	55	67.90
Interrogative and analytical principles of knowledge consideration	58	60.71
Application		
Information arrangement in research structure	74	91.36
Systematic thinking while reading	60	74.07
Research conducting process	51	62.96
Techniques for discussion in research	50	61.73
Academic language	50	61.73
Thinking techniques for knowledge inquiry	71	65.87
Difficulties		
Statistical calculation	65	25.80
Technical terms in statistics	58	60.71
Additional Needs		
-	-	-
Positive Feelings		

Results of Opinion Survey	**Numbers of Informants (N = 81)**	**Percentage**
Assistance by the teacher	72	88.89
Different viewpoints from research critiques	66	81.48
Complete knowledge	70	86.42
Research's value	69	85.19
Negative Feelings		
Worry and difficulties due to research method concern	10	12.35

Interpretation of table-2.

From Table 2, the results reflected that the majority had positive views toward the model's implementation. From all these results, the percentage of 91.36 had a similar viewpoint that techniques of organizing information to suit the procedural structure of research were useful for shaping thoughts after reading. Nevertheless, the minority of 12.35 percent voiced that adherence to the research based thinking caused worry in decision making and difficulties in solving problems in an authentic teaching context.

9.**Conclusion and Discussion**

From all the score results in the learning activity 1 to 4, the English teacher trainees passed the criteria. They scored in the good level in the learning activity 1 and maintained the same level in the next one. In spite of the fall to average in the learning activity 3, their score results increased to the good level in the last activity.

In the first and the second activities, the idea frames which followed higher order thinking development by De Bono (1985), Carr and Ogle (1987) and, Anderson et al. (2001) not only helped strengthen their actual thinking skills from reading but also grew thinking flexibility in themselves. They could learn more from knowledge examining, reasoning in several aspects, being open-minded to different schools of thoughts, and carefully analyzing critiques. That is, retrieving experiences from teaching observation in schools to share and discuss for knowledge comparison and updates while reading research could lead them to knowledge gap fulfillment and shape their methods of knowledge construction. Artzt and Newman (1990), Bruffee (1995), Thousand et al. (2002), and Khammanee (2017) supported that growth mindset, as a supportive factor, to learn from different thoughts, knowledge analysis, and various experiences can benefit learners' thinking process improvement and their formation of knowledge investigation and construction principles. During these activities, misconception in argumentative points and idea sharing in a collaborative manner was of a great awareness. Therefore, the knowledge revision and confirmation after group discussions were proved imperative to take action. In doing so, using mind mapping as scaffolding in support of explanation, process display, and information scattering worked effectively in grounding the understanding of research knowledge and academic reading (Wood et al., 1976; Bowornwattanaset, 2016; Lanchwathanakorn & Na-Songkhla, 2018)

In the third activity, they underwent difficulties in technical terms in statistics. These were their obstacles to understand the content thoroughly. With the nature of English majors, even though they could memorize the meanings, they could not link their memory to which concepts and principles those statistical terms belong to. Due to limited understanding, they faced difficulties in interpreting result descriptions and analyzing main points and their supporting details. In relation to this, they could not systematize their thoughts while reading findings and linking them to a conclusion and discussion part. Although rules of statistical treatment are generally apart from the area of reading skill development, they actually comprise a concerning dimension to support subject matter comprehension in research reading. When the reading skill met numerical data in statistical display, teaching reading required a computational understanding as support. Therefore, the provision of programming support as a supplementary material for a computational demonstration of statistical rules was explicitly a good contribution to clearer explanation and extension. Importantly, the provision of a supplementary material set was conducted concerning the statistical interrelation of each numerical element frequently used in their educational research field. Tomlinson (2010) and McGrath (2013) added that a supplementary material is useful for teaching efficiency enhancement to build imagery understanding or to organize memories. Due to different learning styles, only a single type of text or lecture is known having some explanatory limitations to make learning meaningful. Thus, a good supplementation needs to be able to make retention, covers key learning objectives or themes, and causes a positive attitude after using and revisiting for learning.

Because Solidify stage is an open session for them to create a masterpiece or show performance which represents their improvement in the language and the thinking skills, the fourth activity was determined as a research proposal competition. In this activity, their proposals with good arrangement of knowledge and possible creativity were valued as evidence that they were able to apply the research principles and initiate innovative ideas after reading and practicing the thinking skills. Furthermore, a motivational condition of rewarding or offering opportunities for progress could encourage their self development to reach their goals. This meets the positive reinforcement of the operant conditioning theory by Skinner (1974) in that the more desire is served or the more rewarding a condition is, the more responses there are. This can also be explained with self-efficacy theory by Bandura (1986; 1996) which states that the acknowledgment of one's own success and ability levels in perceived self-efficacy can have an effect on interest, effort, pride, and goal setting. From these theoretical claims, the maturity to improve from direct feedback, on the other hand, can psychologically lead them to sustainable self development. Besides, because their errors in grammar and word use obstructed the clarity of research ideas and could cause misunderstanding, the analysis of language in the content needs to be made a supplementary session for a remedy reason. Shirkhani and Fahim (2011) added that the communicative skills with a good use of language can be improved through the analysis of solutions to learning problems, conveying techniques, linguistic accuracy, and types of manuscripts.

From all the above, the researcher also found in research studies by Rojanaphong and Suwanmonkha (2013) and Suphap (2018) that teaching research reading requires a greater understanding on text structure, specific content, technical terms, statistical presentation, and selected concepts or theories, and practices of effective reading strategies. Besides, using activities or setting learning conditions in which learners can altogether retrieve their schemata, apply language and meaning strategies, extend their views, and consider information with scepticism is of a major developmental contribution. In the research by Rojanaphong and Suwanmonkha (2013), 42 Thai police cadets were taught academic reading through CORI (Concept-Oriented Reading Instruction) activities which consisted of 1) observing and personalizing 2) searching and retrieving 3) comprehending and integrating and 4) communicating to others. Through these procedural activities, the participants' schemata were activated by news, movies and other media relevant to real operations in their career for the reason of motivation building. After that, reading strategies were taught in a controlled format and self-practiced for strengthening both reading and thinking skills. Also, peer interaction was assigned for understanding checking, different idea sharing, and information fulfilment. Then, they were assigned to express the learnt knowledge in a variety of alternatives, for example, debate or creative writing, for their communicative skill improvement. The results revealed that the police cadets could memorize and understand more of important points, academic and technical terms, expressions, and research structure, and had higher level of reading motivation due to top-down relationship from background knowledge building to learning for extensive understanding and, then, reliable knowledge presentation. Suphap (2018) investigated academic reading behaviors of 100 Thai undergraduates and found that the students read textbooks to revise their learnt lessons the most. In addition, the highlighting technique was used the most for better memorization and the summary technique came the second. The extensive search, the peer discussion and the literal translation techniques were also used, respectively. Because reading advanced level texts needs more thinking skills for clear understanding, learners of different learning pace and reading proficiency can trigger different strategies to overcome language and content obstacles. A study concerning this circumstance in terms of metacognitive strategies the learners of different performance levels use should be conducted. Besides, in case of language obstacles due to technical terms, academic words, and unfamiliar grammatical structures in academic readings, making a glossary which includes their contextual meanings and examples of usage should be considered to assign. A glossary can be based on mind mapping to show word families, pictures for memory retention, and a table of structure analysis.

From the opinion survey, the majority of 91.36 percent agreed that information organizing techniques to suit the research structure were applicable. Nonetheless, the minority of 12.35 percent assumed that adhering to the detailed research methods could implicate worries in decision making process and difficulties in taking action with confidence.

Among all the survey results which were mostly positive, some viewed that strict obedience to the research principles can cause hesitation in planning, deciding and working in real situations. In closer consideration, the researcher found that the confusion due to statistical terms and reasons of statistical treatment types, which are part of research principles, made reading more time consuming. From their voices, their lack of research experience may have been a cause of this confusion and the misconception about the importance of thinking based on research methodology for problem solving and further learning. Therefore, using scaffolding techniques which are adaptive to procedural nature of content and real time learning problems (Wood et al., 1976; Bowornwattanaset, 2016; Lanchwathanakorn & Na-Songkhla, 2018), by simulated exemplification, raising analogies, sequential investigative questioning, and giving guidance, could enlighten them a realistic concept about the value of thinking based on research methodology including the practicality of statistics. This also

complies with Vygotsky's zone of proximal development (1978) in that experiential or instructional support by the more experienced can definitely elevate learners' current ability to their potential level.

In instruction for developing researcher's attributes in learners, the strategic and procedural provision of experience that suits their actual competency levels can support their understanding on principled components used in research whenever they read to learn or conduct their own studies. Khetchatturat and Punturat (2016) added that since research competencies are part of the key requirements for teacher education, teachers need to be able to define research problems, hypothesize, determine research methodology, and conclude. In their research, research-based learning was implemented to develop 10 Master's degree students' statistical competency whereby the students were assigned to conduct mini research studies and all the research process was guided by them. This study showed that research-based learning could improve their statistical competencies through the provision of opportunity to conduct mini research where the students were to consider statistical principles and select ones to suit their research design. Besides, this led to the majority's positive attitude toward statistics in research. Suwanno and Sintana (2018) also applied research-based learning to develop learning achievement and research skills of undergraduates in their educational research course. As research-based learning supports learning by doing, extensive self-learning, and higher order thinking, they designed 3 research activities: 1) investigating how and what principles and theories were used to solve research problems 2) exploring new discoveries from research findings and 3) conducting mini research. After the activities, the sampling group, 43 English teacher trainees, scored above the criterion of 70% in both learning achievement and research skills. From the implementation of this learning approach, the researchers recorded that the participants were cooperative and dependent on teamwork where different thoughts were embraced for consideration before making judgment. However, guidance by the researchers was necessary to help shape their thinking process, ensure their learnt concepts, and develop their endurable understanding about research. In close consideration, assigning inexperienced learners a researcher role to do mini research where reading as much academic work to complete their entire work can strategically be an alternative to use in a research training. In addition to this, a teacher's confirmation of understanding while working on knowledge from academic resources can courageously strengthen their academic reading skill and solidify their research knowledge along with the hands-on process. Alternatively, helping learners gain the research skills can be conducted through the integration of inductive and deductive approaches where reading to learn and learning to read purposefully with guidance can take place. Regarding this, an instructional model for practically enhancing the skills with embedded research supervision process should be created.

10.**Acknowledgement**

This research was successfully accomplished mainly due to a grant supported by the Institute of Research and Development, Suan Sunandha Rajabhat University (SSRU) and the procedural support by the President, Dean of Faculty of Education and personnel at the Institute of Research and Development. I would also like to express my gratitude to Dr. Khuntalee Boriraksontikul, Principal of Pratchatorn School, Bangkok, Thailand, for giving advice for the implementation of this research to academic service. The constructive comments from Asst. Prof. Dr. Suttipong Boonphadung, Dr. Teeraporn Plailek, and Ms. Abigail Melad Essien were a helpful contribution to my research. Last but not least, I would like to place my sincere thanks to Ms. Pattamawan Supasri for cordial assistance

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