Exploring the Effectiveness of Thinking Skills Framework on Academic Writing in Higher Education

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Abstract: Malaysian undergraduates have been facing writing difficulties as a result of lacking effective guidance tools in upskilling English writing and activating thinking skills. Failing to achieve writing competency, the problems extend to the high unemployment rate among fresh graduates. This paper proposes using Frangenheim's Thinking Skills Framework (TSF) to improve university students' academic writing proficiency. 60 students were selected to undergo a 6-week quasi-experiment to investigate the effectiveness of the TSF on academic writing and focus group discussions were held to explore students' perceptions on utilizing the TSF in writing processes. The results of the study confirmed the positive effect of using the TSF in improving students' academic writing and promoting the use of Higher-Order Thinking Skills (HOTS) throughout the writing process. Findings reveal students' perceptions on the TSF: an effective guidance tool with various writing strategies, comprises clues to activate suitable thinking skills, assists writers' idea generation and decision-making. The implications are important to tertiary stakeholders as a practical TSF is recommended as a supplementary tool to be infused in English writing syllabus to facilitate students in fulfilling the essential thinking skills and writing needs in higher education.

Keywords: Thinking Skills Framework, Higher-Order Thinking Skills, higher education, English academic writing

INTRODUCTION

In Malaysia, English language is learnt as a second language (ESL) and made compulsory in the educational curriculum at primary, secondary, and tertiary levels (Peng, 2019). To upskill students' tertiary skills, such as English productive skills and Higher-Order Thinking Skills (HOTS), Malaysian Ministry of Education has launched several educational policies to transform the education system by directing the focuses to students' mastery of English language skills and critical thinking skills. First, in Malaysian Education Blueprint 2015-2025 (Higher Education), the issue of low productivity and efficiency of higher education system is pointed out and claimed to be the main cause of low employment rate among fresh graduates as many graduates do not acquire adequate employability skills from the education system. As clarified in the blueprint, the employability skills include, but not limited to, English language proficiency in spoken and written production, and the application of thinking skills. It is taken into consideration under Shift two that tertiary students need to have academic writing skills for research and future employability. Moreover, The Roadmap 2015-2025 is an educational policy which focuses on resolving the problem of increasing misfit graduates in the 21st century job market. It is established with the objective of preparing tertiary educators to use different pedagogies in teaching English language skills and HOTS to develop 21st century students who are competent in using essential tertiary skills.

At the tertiary level, English writing skill is considered one of the key determinants of students' academic achievement as English language is the medium of instruction for most courses and the learning outcomes are mostly evaluated with written assignments or examinations, in the style of academic writing (Abdulkareem, 2013). Since students' academic writing competence is greatly associated with their cognitive ability (Putri, 2018), it is important for students to master the language skills and critical thinking skills before the enrolment of any tertiary courses.

At primary and secondary levels, English writing skill has been included as a compulsory language skill in the curriculum whereas in higher education it carries a greater weightage in high-stake language tests, as compared to other language skills (Othman & Nordin, 2013). In spite of the great emphasis placed on the teaching of writing skills, many tertiary students face the problem of writing difficulties or even suffer from writing anxiety as they are not equipped with strategic writing and thinking skills (Ismail, 2011; Lau & Rahmat, 2014; Wang & Zou, 2018).

Students are expected to learn English language skills and HOTS in the formal instructional settings. However, the acquired English writing skills are totally insufficient to prepare tertiary students for their academic writing tasks at the higher education as it is found that students lack writing strategies and thinking tools to produce effective academic writing which requires them to generate creative ideas, analyse the validity of the points, support points with sound evidence, and produce a coherent writing (Bailey, 2011; Yasin et al., 2010). Considering the fact that the use of HOTS and academic writing skills are key determinants of students' academic achievement in higher education, it is essential for tertiary educators to develop independent student writers by integrating the teaching of HOTS into the teaching of

academic writing. Regarding this, Singh et al. (2019) suggest using a thinking framework, complemented by relevant writing tasks, to assist students in acquiring the writing skills and employing the suitable thinking tools when necessary. For that reason, this study aims to explore the effectiveness of Frangenheim's TSF on university students' academic writing and students' perceptions on using TSF in academic writing.

LITERATURE REVIEW

According to Klimova (2013), academic writing skill is an important language skill which helps develops thinking skills, express values and ideas, generate justified arguments, and prepare students for the fulfilment of academic requirements. As defined by Pirsl et al. (2011), academic writing requires the sophisticated use of HOTS and writing skills to synthesize the information obtained from different sources into valid claims. Hence, it is understandable that the term "academic writing" is used to describe the writing tasks in higher education, instead of the writing tasks involved in primary and secondary education. Most importantly, the academic writing skills and HOTS should be acquired before the enrolment of tertiary courses as these skills are key determinants of students' academic achievement in higher education (Abdulkareem, 2013; Musa et al., 2012). Students with skilful writing are more likely to have greater achievement in courses conducted in English language, as compared to those who do not (Abdulkareem, 2013).

Unfortunately, it is reported that many Malaysian undergraduates have writing anxiety issue which refers to the negative psychological effects, such as tension and stress, triggered by students' excessive fear when they are instructed to write a composition (Lau & Rahmat, 2014). Moreover, in the meta-analysis conducted by Tiew and Abdullah (2019), it is concluded that most English classrooms involves only LOTS and some practices which integrate the teaching of HOTS are teacher-centered learning. This also explains the finding reported in Musa et al. (2012) that the reason why students fail in independent writing is students being overdependent on teachers' guidance, leading to the poor usage of HOTS when they write.

Besides, Al badi (2015) investigated on Malaysian tertiary students' academic writing difficulties and realized the crucial reason of students failing to write is due to poor understanding of writing expectations. As suggested by Stanny (2016), writing task expectations can be delivered through a clear and specific way by using the task verbs in the Bloom's Taxonomy. Therefore, there is a need to provide students with a practicable framework incorporated with thinking tools and relevant task verbs to serve as the optimum scaffold in learning how to write. It helps students develop their cognitive abilities and writing skills at their own pace to become independent writers.

Bloom's Taxonomy in English Language Teaching

Bloom's Taxonomy is a system which classifies the cognitive skills and relevant measurable task verbs into 6 levels, namely remembering, understanding, applying, analysing, evaluating and creating (Bloom et al., 1956). Sham (2016) examined using Bloom's Taxonomy to teach English writing and critical thinking skills to adult learners. The findings reported that learners

are able to foster critical thinking skills and develop logical ideas when they undergo the six levels of thinking skills in Bloom's Taxonomy in the writing process.

Moreover, Moseley et al. (2005) reviewed and evaluated 35 thinking frameworks, and later concluded that Bloom's Taxonomy is a valuable framework in categorising and laying down the educational objectives, especially for HOTS cognitive domains. Korzh (2017) also stated that the measurable task verbs included in the Bloom's Taxonomy can clearly present the expectations of the thinking skills and writing requirements to the students. In regards with fostering students' cognitive abilities and writing skills, Nevid et al. (2017) claimed that using the elements in Bloom's Taxonomy to design writing tasks helps students apply lower order thinking skills (LOTS) and HOTS effectively, and minimises the gap between the thinking skills learnt in the classrooms and those of that required to answer the exam questions.

Serving as the theoretical framework of the study, Bloom's Taxonomy provides the fundamentals of Frangenheim's TSF which was used as a guidance in designing the writing lessons and relevant tasks to teach both writing skills and critical thinking skills to the tertiary students.

Frangenheim's Thinking Skills Framework

To provide a simplified and comprehensive guideline to use writing strategies and HOTS, Frangenheim (2006) adopts Bloom's Taxonomy and integrates several components into the framework, such as task verbs, icons and descriptions, sentence starters, and thinking tools (see Figure 1). Frangenheim's TSF was created by Frangenheim (2006) with the objective to simplify and refine Bloom's Taxonomy. All the components are structured in Frangenheim's TSF according to the six levels of thinking skills.

1. Thinking Skills & Task Verbs — The Task 'WHY'		2. Bloom's Six Thinking Levels — The Broad 'WHY'		3. Sentence Starters — The 'WHAT'	4. Thinking Tools — The 'HOW'
HIGHER ORDER SKILLS					
Create, Elaborate, Extrapolate, Invent, Forecast, Formulate	Generate, Hypothesise, Modify, Organise, Plan, Propose	**DESIGN**	Acting like an inventor, experiencing 'WOW light bulb' moments for new products, ideas or processes	Formulate a set of criteria to judge… / Compose a song, jingle or rap to… / Plan an argument to persuade people to… / Generate key questions for… / Create a role play/experiment to… / Modify an existing project studied so that… / Organise a personal action plan to…	1:4:Publish:Circle:Refine / FRESH / Pros:Cons:Improve / Real Problem-Solution 1 & 2 / Word/Image Association / Y Chart, Split Y Chart
Argue (for/against), Assess, Conclude, Decide, Determine, Judge	Justify, Prioritise, Rate, Recommend, Select, Verify	**EVALUATE**	Acting like the Scales of Justice to 'weigh up' the evidence to make and justify a decision based on the Analysis data	Determine to what extent… / Decide which of the two…would be better for… / Justify the decision of… / Judge which is more effective, A or B. / Evaluate the effectiveness of… / Select which is the best option…or… / Rank the following from…to most…	Court Case / Decision-Making Matrix / Extended PCQ / Extent Barometer / Extent Barometer with Perspectives / Tournament Prioritising / Y Chart
Argue (about), Compare, Complex Summary, Contrast, Differentiate	Discuss (in depth), Distinguish, Explore, Investigate, Separate	**ANALYSE**	Acting like a Microscope to identify the component parts of an issue, situation or object	Examine…from at least 4 perspectives… / Discuss the similarities and differences of… / Investigate all factors that could influence…in… / Explain how parts interact in… / Explore research on the issue of…in order to gain a deeper understanding of… / Compare the pros and cons of…	Double Bubble Map / Icon Prompt / KWL, KWHL / PCQ, Extended PCQ / S.W.O.T. Analysis / T Chart / Y Chart
FOUNDATION SKILLS					
Arrange, Calculate, Compile, Complete, Construct, Demonstrate	Extrapolate, Illustrate, Practise, Show, Solve, Use	**APPLY** ($A^2 = B^2 + C^2$)	Acting like a Formula, to apply new skills, rules and concepts to related and new situations	Apply previously learnt knowledge to construct… / Interview a group of people to identify… / Compile 4 questions based on your knowledge of… / Write a letter to the editor pointing out… / Construct a flow chart for… / Manipulate a spreadsheet to answer 'what if'… / Show/demonstrate how to…	Predict:Observe:Explain (POE) / Silent Card Shuffle
Comprehend, Describe, Explain, Interpret, Outline	Paraphrase, Recognise, Summary (basic), Translate, Understand	**UNDERSTAND**	Acting like an AHA! Bubble, showing understanding of words, concepts, cause and effect and 'reasons for'	Explain how…has impacted on… / Describe in clear logical steps… / Use a…metaphor to help others understand… / Paraphrase in your own words… / Using words, pictures and icons, explain what you know about… / Give reasons for…	Cause–Effect / Concept Maps / Metaphor / Multiple Intelligence Model / Silent Card Shuffle / Six Icon Summary
Define, Find, Label, List, Locate, Memorise	Name, Quote, Remember, Retell, State	**REMEMBER**	Acting like an Information Desk to recall information, facts and data	Make an A–Z list of… / Name all the… / Describe what happened at… / Repeat what…said about… / What is…(facts/definition etc.)? / Quote 10 facts about… / List the ways that you are like…	Alpha Ladder / KWL / Silent Card Shuffle

Figure 1. Frangenheim's Thinking Skills Framework (Frangenheim, 2006)

This study was an extended research of Ganapathy and Kaur's (2014) study in which the past study investigated secondary students' perceptions on using Frangenheim's TSF in English descriptive writing whereas this study focused on the academic writing in the higher education context. The findings in the past study indicated that students perceived the framework as a helpful writing and thinking tool as the tools in the Frangenheim's TSF fascinated them and helped them remove mental block. The researchers also recommended future researches to be carried out to investigate the effectiveness of TSF in other ESL contexts.

Despite the insightful findings from the past studies, there is no study conducted on the learning of academic writing skills through Thinking Skills Framework in higher education in Malaysian contexts. As suggested by the researchers (Ganapathy & Kaur, 2014; Singh et al., 2019), this study identified a research gap, and therefore, this study aimed to explore the effectiveness of TSF on academic writing in higher education and tap into students' perceptions on TSF.

METHODOLOGY

Sample

This study involved 60 ESL university students who took the course of Academic Writing in a private university in Kampar, Perak. Purposive sampling was used to select the participants among a population of 62 students under the criteria of the student being a Malaysian and had registered under the course. Two students were excluded as they did not manage to complete the registration before the commencement of the study.

Procedure

This study was a mixed-mode study which combined quantitative and qualitative research methods. 60 participants were then randomly divided into two equal groups, known as control and experimental groups. Each group consisted of 30 students respectively. All participants took the pre-test in which they were instructed to compose an argumentative essay related to the topic of social media.

As the purpose of the study was to examine the effectiveness of using TSF in academic writing, the control and experimental groups were taught differently. There were three instructors involved in the experiment. Before the experiment, the instructors had participated in a workshop conducted by the researchers to make sure the instructors were equipped with relevant knowledge on the procedure of experiment and the scoring criteria in grading the tests. Two course instructors were involved in the teaching and grading while the other instructor was in charge of checking the graded papers and finalising the test scores to maintain the inter-rater reliability.

During the intervention, after the students were given prior knowledge on the topic, the students were asked to complete the writing task based on the writing instructions given. The control group received standard treatment in which the students were taught with task-based approach. The instructor posted some general questions to the students and guided them through brainstorming session to complete the task. On the other hand, in addition to the pre-teach of prior knowledge, the experiment group received experimental treatment, including the teaching of the TSF components, such as the T-chart and concept maps, as learning tools for the students to complete the writing task. The lesson plan (Table 1) was adapted from Ganapathy and Kaur (2014).

Table 1. *Lesson plan on the topic "Social Media"*

Thinking Skills in Frangenheim's TSF	Task Sequence
Remember: Acting like an Information Desk by recalling the relevant facts and knowledge taught by the teacher and existing knowledge based on past experience, if applicable. List the components of an effective essay and match the elements of an argumentative essay to the correct definitions.	Students are given a copy of the TSF poster for their reference. Students are given facts and knowledge regarding the elements of an argumentative essay. Students are told to act like an Information Desk. Students were then required to answer 'WHAT' questions on the components of an argumentative essay by recalling the knowledge and matching the elements to the correct definitions.
Understand: Acting like the 'AHA' bubble to show the understanding of the topic and the expectations of the writing tasks. Describe the reasons why people use social media and explain how the effects of social media on human interactions.	Students are involved in a discussion on the topic regarding whether the social media, such as Instagram, promotes or discourages human interactions. Students were then required to answer "WHY" and "HOW" questions to describe the reasons of using social media and explain its effects on human interactions.
Apply: Acting like a formula to apply new or related knowledge, skills, and concepts to complete the writing task. Construct and use a mind map to compile and illustrate their ideas regarding the functions of social media.	Students are instructed to construct a concept map and use it to illustrate the functions of social media based on their understanding on this topic. Students are allowed to apply any related knowledge as per discussed in the previous lessons.
Analyze: Acting like a microscope to analyze a problem or situation by identifying the components. Analyze the topic, discuss in depth the effects of social media in terms of human interactions and explore both agreeable and disagreeable views with a T-chart.	Students investigate the effects of social media on human interactions from two points of view – whether social media socializes people or isolates people. Students discuss this topic in depth and explore the different points of view by using a T-chart.
Evaluate: Acting like the scales of justice to evaluate the arguments and evidence based on the data collected at the Analysis stage. Evaluate and judge the arguments, argue about a topic, and justify the claim.	Students are the 'judge' to evaluate the arguments and justify their claim. Students evaluate the points stated in the T-chart created in the previous lesson. Using the T-chart, students argue on the topic by stating their claim, counterclaim and counterarguments. Students select the effective arguments (points) supported with reasoned evidence to justify their claim.
Design: Acting like an inventor by designing an output based on the information obtained. Generate ideas or elaborations, plan the entire essay, organize the essay structure and create an argumentative writing.	Students plan their essays by generating more supporting details on the writing topic. Students organize the structure of the essay with an outline before composing the entire essay. Students create an essay of 500 to 600 words to discuss whether social media socializes or isolates people.

After 6 sessions of the treatment, the post-test was distributed to all the participants to examine the performance of the two groups. The tests were graded and the scores were collected by two instructors who were the teachers and also the graders. Then, the graded papers were later checked by the other instructor to minimise the discrepancy between the scores given by two different instructors. The results of the pre-test and post-test were analysed and compared by using Paired Sample T-test. The data analysis was done using SPSS version 23.

After the quasi-experiment, focus group discussions were carried out to explore university students' perceptions on TSF based on their experience throughout the treatment. All the experimental students participated in the discussions to share how the use of TSF affect their writing capability and the use of HOTS in writing. The data was analysed using thematic analysis.

Instruments

There were three instruments used in this study: (1) intervention lesson plan (2) pre-test and post-test, and (3) question guide used in the focus group discussion. Since this study was an extended study of Ganapathy and Kaur (2014), the lesson plans and question guide were adapted from the past study, with modifications done to suit the proficiency level of tertiary students.

Next, to increase the content validity of the pre-test and post-test, the writing topic used in the tests were adopted from the past study conducted by Özdemir (2018). As reported by Özdemir (2018), this writing topic on social media was selected by 132 teachers as one of the prominent topics for argumentative writing practice at the tertiary level. Pilot test was conducted with 24 students before the experiment to ensure the validity of the instruments. Minor modifications were done to improve the clarity of the test items.

FINDINGS AND DISCUSSION

Descriptive Statistics

Table 2. *Paired samples test results of pre-test*

	Mean Difference	t	df	Sig. (2-tailed)
Pre-Test (Control) - Pre-Test (Experimental)	3.73333	1.249	29	.222

As shown in Table 2, there was no significant difference in the pre-test scores obtained by control and experimental groups ($p > 0.005$). With the small difference in the mean scores and the p value larger than 0.005, it was shown that the participants are homogeneous and they were randomly assigned into two groups.

Table 3. *Test scores obtained in the pre-test and post-test*

Group	N	Test	Lowest Score	Highest Score	Mean Score	Standard Deviation
Control	30	Pre-test	32	68	53.37	9.898
		Post-test	50	81	62.87	12.028
Experimental	30	Pre-test	29	69	49.63	9.165
		Post-test	54	88	70.17	10.539

Table 3 indicates the test scores obtained by the participants of control and experimental groups in the pre-test and post-test. The students' mean scores in the pre-test for the control and experimental groups were 53 and 50, whereas the mean scores in the post-test were 63 and 70.

The experimental group obtained 70 marks in average for the post-test, whereas the control group obtained 63 marks in average for the post-test. Despite the fact that both groups achieved improvement in the post-test, the experimental group outperformed the control group by obtaining a higher mean score in the post-test, as compared to the control group. This finding indicates that the students performed better when they were taught with the integration of Frangenheim's TSF in the writing process. This finding is in line with Ganapathy and Kaur's (2014) findings that secondary students' writing performance can be improved through the use of TSF. The finding of the present study indicates that not only the framework is useful for secondary students, but also, it can serve as a great learning tool in the context of tertiary ESL classrroms. Besides, this finding also concurs with findings from Anwar and Sohail (2014) that students perform better while using the Bloom's Taxonomy as they are able to understand, rearrange, apply, and judge the main points which are discussed in the classrooms. In the context of higher education, Frangenheim's TSF can be used as a supplementary tool in ESL writing classrooms as it has great potential in upskilling tertiary students' academic writing proficiency.

Students' Perceptions on TSF
The findings collected from the focus group discussions were presented according to three components of TSF which are the task icons, task verbs and thinking tools. The students' perceptions on these components were analysed and presented based on the identified themes.

In exploring students' perceptions on TSF, the experimental students were asked to talk about their experience, using the icons to act like certain objects while activating the specific levels of thinking tools. For example, students act like a receptionist at the information desk to recall information. Student D from Group 2 stated that:

"*It was so excited when I needed to act like a receptionist as I have never tried something like this before. Turns out it was very interesting and I tried my best recalling the information because I feel if I'm a receptionist at the information desk, I should be able to give as much information as I could.*"

There were seven other students from Group 1, 3 and 4 gave similar feedback as Student D's one. They found it interesting and were "looking forward to the next activity". Besides, Student E in Group 3 gave a notable feedback which he stated:

"The acting part was like role-playing. Since I have my role to play as a receptionist, I feel more confident to give more information." Another student in Group 3 also perceived it as a role-playing activity.

From the students' responses, it indicates that using TSF icons can promote the students' curiosity and participation in the classroom activities. Besides, some students perceive this as a role-playing activity which can boost their confidence in recalling and presenting information.

Students' Perceptions on TSF Task Verbs
Besides, students were also asked to discuss how the use of TSF task verbs assist them in completing the writing tasks at different levels of thinking skills, as shown in Table 4.

Table 4. *Students' perceptions on task verbs (N=30)*

Types of Responses	Frequency, N (%)
Deliver clear and specific instructions	25 (83%)
Use the verbs as effective keywords or clues	8 (27%)
Understand the task expectations	22 (73%)
Complete the tasks independently	10 (33%)

Many students (83%) in the experimental group opined that the task verbs were able to specify what were expected from them, as one of the students in Group 2 stated:

"The task verbs are very specific words and I can think better when I see the words. For example, when I see the word 'list' in the instruction, I know that I should write the answers in the bullet points instead of writing in paragraphs. Then, if I see 'explain', I will write in paragraph forms, state the points and include some explanations."

Some students (27%) used the task verbs to assist them in understanding the learning outcomes. Another student from Group 4 also mentioned the verbs were like the "clues" for her to understand what she had to do to complete the task. Other than that, some students (33%) from Group 3, 4 and 5 also pointed out that the task verbs allowed them complete the task independently, as quoted from Student A from Group 4:

"Previously, I always cannot understand the task and I need teacher explain to me so that I know how to complete the task. But for the exercises we did for the past weeks, the instructions were clear. The verbs are clear enough for me to understand what to do with the exercise. I don't need extra explanation from teacher. When the teacher gives me the exercise, I just proceed my writing without further questions because I see the keywords, such as explain the topic and construct a concept map."

This finding shows that TSF is an effective pedagogical tool for tertiary educators to set learning outcomes as all the participants in the experimental group agreed that the task verbs were able to clarify and specify the expectation of the writing tasks. As supported by Stanny (2016), the most important feature of the task verbs is that they serve well to articulate learning in specific and standardised terms because they can effectively reduce ambiguity in tertiary students' comprehension of the writing tasks. This also allowed the students take up the role of being an independent student writer as they needed no further guidance from the instructors when the instructions were clear and specific. This finding concurs with Korzh's (2017) findings that the task verbs in the Bloom's Taxonomy should be practiced by educators at all levels as they are effective in developing students' writing skills, presenting task expectations, and set clear and measurable learning outcomes based on different levels of thinking skills as the tasks require. It is also agreed by Chandio et al. (2016) that the teaching-learning process and language assessments should be incorporated with Bloom's Taxonomy as it levels the assessments from LOTS and HOTS to improve the learning process from rote memorization to meaningful production of language.

Students' Perceptions on TSF Thinking Tools

Table 5. Students' perceptions on thinking tools (N=30)

Types of Responses	Frequency, N (%)
Explore the writing topic	26 (87%)
Use different tools for different writing purposes	16 (53%)
Require background knowledge to maximize the effectiveness	9 (30%)
Use T-chart in evaluating and selecting arguments	23 (77%)

Almost all the students (87%) had collectively voiced out that the concept maps are particularly useful in exploring the topic in depth. As for the reason, Student C from Group 1 explained that:

"*I like using concept map because I can draft out my points based on the topic and it helps me better understand the topic. I use the map and branches to organise the points, like main points and subpoints. For example, I can use the branches to expand my main points accordingly instead of writing the messy points here and there.*"

Student A from Group 4 also stated that he could see how the points were connected when he used the concept map in generating the points.

Moreover, more than half students (53%) also claimed that they preferred using different tools for different purposes of writing tasks. One of the students made claims as follow:

"*Personally, I like using concept maps as they are more flexible, but when it comes to selecting points, comparing points, or evaluating points, I prefer using T-chart. This is because when I put the points at two sides, I can clearly see the points from different views and it helps me filter some unwanted or weak points.*"

Regarding the effectiveness of the tools, some students (30%) also highlighted the importance of background knowledge. Student F from Group 4 stated that:

"*I can use the tools if I understand the topic. If I don't understand much about the topic, it will take long time for me to use them. So, it will be great if teacher can give us some information before asking us to write.*"

Most students from each group (77%) agreed that using T-chart helped them select the strong points to include in their argumentative essay. Thus, to a certain extent, T-chart helps student construct strong arguments.

Based on the findings, it is shown that students hold positive feedback on using Frangenheim's TSF in writing process as they perceived those thinking tools as strategic measures in terms of enhancing their academic writing competence and their ability to apply HOTS. With regards to academic writing aspects, the thinking tools have great potential to facilitate students' writing processes, such as exploring the topic, structuring the text and constructing strong arguments. Most importantly, it is found that students cannot achieve these skills without applying HOTS in the TSF. All students agreed that the tools helped them complete the writing tasks which requires certain thinking skills with the right tools. For example, T-chart was the preferred tool among students while comparing and evaluating two opposite views whereas concept map was preferrable when the students were instructed to generate ideas on the writing topic. Based on the experimental students' improvement in test scores and their positive feedback, the finding is in agreement with Nevid et al.'s (2017) finding in which the researchers concluded that tertiary students are able to effectively tackle the examination of written production when they are taught with HOTS writing tasks. Singh et al.'s (2019) also strongly suggested that thinking skills framework should be employed by students with little or no usage of English language to acquire the writing skills and ability of using the thinking tools.

In short, the findings of this study suggest that Frangenheim's TSF facilitates university's writing skill development and promotes the use of HOTS in writing classrooms which are deemed necessary to master English language as the second language. Besides, it is important for educators to take note that pre-teaching activities are required for students to obtain sufficient background knowledge on the writing topic and promote active thinking to maximize the effects of Frangenheim's TSF in assisting students' writing process. As explained by Sun (2014), students who are provided with background knowledge on the writing topic and writing strategies through various pre-writing activities, such as using semantic maps and brainstorming session, are more likely to internalize the writing materials and express themselves using the input.

CONCLUSION AND RECOMMENDATION

In conclusion, Frangenheim's TSF brings positive effects on enhancing university students' development of academic writing skills and HOTS. It is a practicable and viable option to be a strategic framework to help students overcome the writing difficulties which result from the

lack of effective writing strategies and thinking tools. Moreover, the three components in Frangenheim's TSF receive positive feedbacks from the students. In general, students perceive this framework as a useful guideline which facilitates the thinking and writing processes as it specifies the task expectations, promotes topic exploration, and helps students make better decisions in argument selection and evaluation.

Due to the recent shift of the educational aspirations set by the Ministry of Education, tertiary ESL teachers and students are recommended to place emphasis on not only the linguistic competency, but also the integration of HOTS in language teaching and learning. Hence, the findings of the study bring implications: developing independent learners by giving them a simple and comprehensive guideline; supporting educators in setting clear and appropriate learning outcomes for tertiary students; giving insights to other tertiary stakeholders on the potential pedagogical tool to be used in ESL classrooms. It is also suggested for future researches to examine the effectiveness of TSF on the teaching of English language with a larger sample size and in other contexts, especially in primary education, provided that the learning outcomes and lesson plans are designed in the fulfilment of students' language needs and proficiency.

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