INVESTIGATING AN ENGLISH TEACHER'S COGNITIVE AND METACOGNITIVE BEHAVIOR: THINKING ALOUD PROTOCOLS ANALYSIS

Helena Verusha Ali[1], Bayu Andika Prasatyo[2*]

[1]Doctoral Student in English Applied Linguistics (Faculty of Education and Languages, Atma Jaya Catholic University of Indonesia. Jakarta- Indonesia)
[2]Sekolah Tinggi Bahasa Asing Technocrat
Corresponding email: bayuandikaprasatyo@gmail.com*

Abstract

This study seeks to demonstrate the importance of clarity and accuracy in post-editing activity, From the perspective of metacognitive and cognitive processes proposed by Wenden' (1991).The research design of this study is a qualitative design. The data were two different translated texts. The post-editing activity was conducted online via Zoom meeting. This article uncovered that there are three types of cognitive and three types of metacognitive strategies implemented by the post-editor.). Further, the findings also show that the post-editor's metacognitive strategies include planning (i.e., reconsidering written text), monitoring (i.e., checking and verifying the text), and evaluating (i.e., revising the text.
Keywords: Post edit, metacognitive behavior, translation strategy, think aloud protocols

Abstrak

Penelitian ini mencoba menyingkap pentingnya kejelasan dan ketepatan dalam kegiatan pasca-penyuntingan, dari perspektif proses metakognitif dan kognitif yang diusulkan oleh Wenden (1991). Data penelitian ini berasal dari dua teks terjemahan Inggris-indonesia dan Indonesia Inggris yang berbeda. Kegiatan pasca-penyuntingan dilakukan secara online melalui pertemuan Zoom. Artikel ini menemukan bahwa ada tiga jenis strategi kognitif dan tiga jenis strategi metakognitif yang diterapkan oleh penyunting. Disamping itu, temuan lain juga menunjukkan bahwa strategi metakognitif post-editor meliputi perencanaan (mempertimbangkan kembali teks tertulis), pemantauan (memeriksa dan memverifikasi teks), serta evaluasi (merevisi teks).
Keywords: Pasca penyuntingan, strategi penerjemahan, perilaku metacognitif, think aloud protokol

INTRODUCTION

Translation involves transferring meaning from the source language to the target language with various methods (Munday, 2008). One of the techniques usually used by the translator is post-editing activity. The post-editing activity is one of the strategies to produce an accurate target text in the process of translation (Eftekhari, 2012). Since post-editing is part of the translation activity, it also involves transferring meaning and sense to get an accurate target language (Hutchins, 2000). In the post-editing activity, the cognitive process is activated to be the more physical process to get a satisfactory translated text (Eftekhari, 2012). The post-editing process also can be measured by several steps, which are technical, temporal, and cognitive (Nufus, 2022). In discovering the cognitive process when post-

editing, a post-editor commonly provides text-processing strategies called metacognitive strategies (Eftekhari, 2012). In addition, the metacognitive strategies affect specific problem-solving characteristics from and during correcting and revising the translation texts (Singhal, 2001).

Numerous scholars have categorized the metacognitive and cognitive processes, particularly in translation activity. In identifying the metacognitive and cognitive process, think-aloud protocols (hereafter TAP) are believed to be one of the methods (Kussmaul, 1995). According to Krings (2001), TAP is usually an attempt when the post-editors are asked to utter the utterance that went on in their minds while doing the post-editing. Those utterances are usually recorded and then analyzed to find the cognitive process behind the metacognitive efforts (Eftekhari, 2012).

Myriad previous studies on cognitive processes in translation activity using a think-aloud protocol (Martiini & Octasylva, 2022; Nufus (2022). Most studies only focus on students' TAP in post-editing activity (Eftekhari, 2012). However, there is barely any research on an English teacher's TAP activity during post-editing. Harnessing the think-aloud protocols (TAP), it is expected that the study finds new knowledge of post-editing phenomena from the perspective of metacognitive and cognitive processes.

A number of studies have been conducted studies on the cognitive process during post-editing activity in translation processes, such as Martiini & Octasylva (2022) and Nufus (2022). First, Matiini & Octasylva (2022) investigate the cognitive process in post-editing activity. The participant in the study was a librarian who was quite familiar with translation and post-editing activities. They found 11 metacognitive strategies implemented by the participants and seven cognitive processes applied by the participants that include planning, monitoring, and evaluation process.

Second, the study was conducted by Nufus (2022). She investigates translation cognitive behavior in Indonesian – English text which explores the translation process of Indonesian text. This research used descriptive analysis to interpret the data. The data source is recording video or transcription data of a female student and her professor. The findings revealed that cognitive behaviors such as memory, learning, problem-solving, evaluation, and decision-making, these activities can help the translator to generate ideas in identifying difficult words from the source text to the target language.

However, far too little attention has been paid to the investigation of cognitive and metacognitive processes of a translation work conducted by a translator that employs think-

aloud protocols. Therefore, this current study attempts to scrutinize the translator's think aloud protocols activity during post editing.

METHOD

Research Design

The research is a qualitative design. Gay et al. (2011) highlight that qualitative research seeks to probe deeply into the research setting to obtain a depth understanding of the way things are, how "they are that way, and how the participants in the context perceive them" (pp. 969).

Participants of the Study

The participant of this study was an English teacher who was quite familiar with translation and post-editing activities. The participant was asked to volunteer in this study. The instruments used in this study are two different translated texts. The first text was English source text, translated into Indonesian with Google machine translation. The second text was the Indonesian text translated to English using Google translate. The post-editing activity was conducted online via Zoom meeting. Then the video of the participant post edit the text translation from zoom recording was used as the data source.

Data Analysis

In the data analysis process, several steps were conducted, following the method stages (Kvale, 1996) of analyzing and verifying the data, classifying, and reporting on the findings. The first step was that the transcribed data were coded for analysis. In this step, the researcher analyzed all coded data generated from the transcription captured from the video. In the second step, the researcher then classified into sub-categories the data of the participants' cognitive strategies found in the recorded video, and the cognitive and metacognitive strategies which have been detected from the transcription are categorized by the cognitive and metacognitive strategy taxonomy from Wenden (1991). The third step was relating all the coded data from step two to the conceptual frameworks. In addition to the narration, the description also included the writer's interpretation. Then the data were interpreted and presented descriptively.

Data Collection Procedure

The data were collected from several stages. Beforehand, the participant was given a brief explanation of how the data collection process works. The participant was asked to read and practice days before the recording time. The participant was aware of being recorded during the post-edit activity. The recorded video was used as the data source, and each video has an estimated time of 10-20 minutes of verbalization. The videos were then transcribed

manually, using an excel spreadsheet to note the time-lapses of every post-editing strategy brought by the participant.

FINDINGS AND DISCUSSION

Cognitive strategies

Based on the theoretical framework of Wenden (1991) and the purpose of the study above, the findings show that the participant's cognitive strategies include retrieval (i.e., re-reading the assigned questions, re-reading aloud, reading silently what had been written, self-questioning, thinking in one's native language/ Indonesian, writing till the idea would come/ in word, summarizing what have been written), clarification (i.e., defining terms, hypothesizing, and comparing), and resourcing (i.e., refer to dictionary/ Google). Thus the findings are illustrated in table 4 as follows:

Table 1 *The cognitive strategies applied by the post-editor*

COGNITIVE			
No	Types of Strategies	Strategies Applied	Freq
1	Retrieval	Re-reading the assigned questions	98
		Re-reading aloud	26
		Reading silently	8
		Self-questioning	11
		Thinking in one's native language	4
		Writing till the idea would come	38
		Writing in word	34
		Writing in lead	39
		Summarizing what have been written	6
2.	Clarification	Defining terms	45
		Hypothesizing	29
		Comparing	3
3.	Resourcing	Refer to dictionary/ Google	2

From the data in table 4 above, the findings show that the post-editor applied strategies that include retrieval, clarification, and resourcing during post-editing activity from the source language into the target language.

Retrieval type of strategy

There are nine types of retrieval strategies applied by the post-editor in the post-editing activity, which are re-reading the assigned questions, re-reading aloud, reading silently what had been written, self-questioning, thinking in one's native language/ Indonesian, writing till the idea would come, writing in word, writing in the lead, summarizing what has been written.

Re-reading the assigned question

Extract 1 -Minutes -00.08 *(See appendices ENG-IND)*

Utterances: *"Constructivism sees the world"*

The utterance in the Extract 1 shows the post-editor's activity during post-editing. In this event, the translator tries re-reading the assigned question from the English source text to post an edit into the Indonesian target text. The re-reading of the assigned questions strategy took the lead, which occurred 98 times frequency.

Re-reading aloud

Extract 2- Minutes 04.22 (*See appendices, ENG-IND*)

Utterances: "…*are not caused*"

The utterances in extract 2 show that the post-editor tries to re-read aloud the words during post editing activity from the English source text into the Indonesian target text. The re-reading aloud strategy occurs in the event of post-editing activity for 26 times of frequency.

Reading silently

Extract 3- Minutes 00.49 (*See appendices, ENG-IND*)

Utterances: *umm*

The utterances in extract 3 show that the post-editor tries to read the words silently that had been written during post editing activity from the English source text into the Indonesian target text. The reading silently strategy occurs in the event of post-editing activity for 8 times of frequency.

Self- questioning

Extract 4- Minutes 01.22 (*See appendices, ENG-IND*)

Utterances: "*Nature of reality*"

The utterances in extract 4 show the data of self-questioning strategy. In this event, the post-editor tries to self- question herself if the translation process of the English source text and Indonesian target text were similar to her expectation. Self-questioning strategy occurs in the event of post-editing activity for 11 times of frequency.

Thinking in one's native language

Extract 5- Minutes 03.40 (*See appendices, ENG-IND*)

Utterances: "*kurang mengancam*" (less threatening)

The utterances in extract 5 show the data applied by the post-editor is thinking in one's native Indonesian strategies. In this event, the post-editor tries to think by repeating the words "kurang *mengancam*" during the post-editing activity using Indonesian. Thinking in one's native language strategy occurs in the TAP video event of post-editing activity for 4 times frequency

Writing till the idea would come

Extract 6- Minutes 03.01 (*See appendices, ENG-IND*)

Utterances: "*yang mengilustrasikan konstruksi social*" (which illustrates social construction)

The utterances in extract 6 show the data applied by the post-editor in writing till the idea would come strategies. In this event, the post-editor tries to write complete sentences to discover the idea. By writing the words "*yang mengilustrasikan konstruksi social,*" she tries to copy the sentence from the target language until her idea comess up. Writing the idea strategy occurs in the event of post-editing activity for 38 times of frequency.

Writing the words

Extract 7- Minutes 08.43 (*See appendices, ENG-IND*)

Utterances: "*memahami context sosialnya*" (understand the social context)

The utterances in extract 7 show the data applied by the post-editor is writing the words strategies. In this event, the post-editor tries to type the idea that came into her mind. Writing the idea strategy occurs in the event of post-editing activity for 34 times frequency.

Writing in lead

Extract 8- Minutes 03.01 (*See appendices, IND-ENG*)

Utterances: "*representation*"

The utterances in extract 8 show the data applied by the post-editor is writing in lead strategies. Writing in the lead strategy is an act the post-editor applies by writing the target language without showing behaviors during the post-editing activity. In this event, the post-editor simply writes her target language knowledge in advance. By writing the words "representation," she knows the words to be translated into the target language. Writing the ideal strategy occurs in the event of post-editing activity for 39 times frequency.

Summarizing

Extract 9- Minutes 06.25 (*See appendices, IND-ENG*)

Utterances: "*implies a different set of interest*"

The utterances in extract 9 show the data applied by the post-editor as summarizing strategy. Summarizing in this present study means the post-editor tries to summarize each word that has been converted into a sentence during post- editing activity. Summarizing strategy occurs in the event of post-editing activity for 6 times frequency.

Clarification types of strategy

There are three types of clarification strategies applied by the post-editor in the post-editing activity that includes defining terms, hypothesizing, and comparing.

Defining terms

Extract 10- Minutes 01. 19 (*See appendices, IND-ENG*)

Utterances: "*...identities*"

The utterances in extract 10 show the data applied by the post-editor as clarifying strategy, in which she tries to define the words' term translation in the target language. The

post-editor tries to define some terms as the strategy that occurred in the event of post-editing activity for 45 times frequency.

Hypothesizing

Extract 11- Minutes 06.52 (*See appendices, IND-ENG*)

Utterances: "from that implied by the large state"

The utterances in extract 11 show that the strategy applied by the post-editor is hypothesizing. Hypothesizing in this study means the translator tries to hypothesize the sentence that will be written in the target language during post- editing activity. Hypothesizing strategy occurs in the event of post-editing activity for 29 times frequency.

Comparing

Extract 12- Minutes 11.17 (*See appendices, ENG-IDN*)
Utterances: "*pengertian* are not fixed"

The utterances in extract 11 show that the strategy applied by the translator is comparing strategy. Comparing strategy in this present study means the post-editor tries to compare the source text and the target text during the post-editing activity. Comparing strategy occurs in the event of post-editing activity for 3 times frequency.

Resourcing types of strategy

The types of strategy that applied by the post-editor in the post editing activity that includes resourcing strategy which refer to dictionary or Google.

Extract 13- Minutes 01.31 (*See appendices, ENG-IDN*)

Utterances: *"nature of…"*

The utterances in extract 13 show the strategy applied by the post-editor is resourcing. Resourcing means an act applied by the post-editor by referring to looking up to dictionary or Google translate to translate during post-editing activity. In this event, the post-editor just simply looks up to the dictionary or Google translate to translate the words that need to be

post-edited from the source language into the target language. The resourcing strategy has occurred in the event of post-editing activity for 2 times frequency.

The taxonomy of cognitive strategies of retrieval, clarifying, and resourcing were mentioned in table 2 and the explanation above. The retrieval strategy appears more often in the post- editing activity. The clarification strategy exists when the post-editor encounters difficulties and needs to compare the source text and target text. Last, the resourcing strategy takes place in order for the post-editor needed to confirm her understanding during the post-editing activity. The dominant cognitive strategy used by the post-editors is re-reading the assigned question, which is part of the retrieval types of strategy.

Metacognitive Strategy

Using the same theoretical framework of Wenden (1991) and the purpose of the study above, There are quite a few metacognitive strategies used by the post-editor. For the general result, the post-editor has her own method to post-edit the text. The findings show that the post-editor's metacognitive strategies include planning (i.e., reconsidering written text), monitoring (i.e., checking and verifying the text), and evaluating (i.e., revising the text). Thus the findings are illustrated in table 5 as follows:

Table 2**.** *The cognitive strategies applied by the post-editor*

METACOGNITIVE			
No.	**Types of strategies**	**Strategies applied**	**Freq**
1.	Planning	Reconsidering written text	1
2.	Monitoring	Checking and verifying the text	1
3.	Evaluating	Revising the text	12

From the data in table 5 above, the findings show that the post-editor applied strategies that include planning (i.e., reconsidering written text), monitoring (i.e., checking and verifying the text), and evaluating (i.e., revising the text) during post-editing activity from the source language into the target language. First, the planning strategy is occurred in the event of post-editing activity for one time of frequency (see appendices ENG-IND). Second, the planning strategy is occurred in the event of post-editing activity for one time of frequency (see appendices ENG-IND). Lastly, evaluating strategy is occurred in the event of post-editing activity for 12 times frequency (see appendices IND-ENG).

Based on the taxonomy of metacognitive strategies, the researcher found that the post-editor used many different types of strategies to find out the appropriate words that, include planning (i.e., reconsidering written text), monitoring (i.e., checking and verifying the text), and evaluating (i.e., revising the text) as mentioned in table 2 and explanation above. The planning process appeared at the beginning of the post-editing activity when the post-editor applied the strategy to reconsider her written text mostly. The monitoring process exists in the hesitation phenomena, the semantic analysis, and the comprehension that the post-editor applied this strategy mostly to checking and verifying the text. Lastly, the evaluation strategy takes place in modification and decision-making in order to revise the text from the result of Google machine translation.

The dominant metacognitive strategy used by the post-editor is the evaluating strategy. These findings were contradicted by Matiini and Octasylva's (2022) study that investigated the cognitive process using think-aloud protocols (TAP). They explained that the most dominant metacognitive strategy used by the translator in their study was monitoring. Thus, there is a slight difference between Matiini and Octasylva's (2022) study, and this study is the most dominant use type of strategy.

CONCLUSION

To conclude the research, there are three types of cognitive and three types of metacognitive strategies implemented by the post-editor. It is a few since the post-editor has different ways to post-edit, though it is believed that every post-editor may also come to different strategies. From those strategies, three types of cognitive strategies were found in the study that includes retrieval (i.e., re-reading the assigned questions, re-reading aloud, reading silently what had been written, self-questioning, thinking in one's native language/ Indonesian, writing till the idea would come/ in word, summarizing what have been written), clarification (i.e., defining terms, hypothesizing, and comparing), and resourcing (i.e., refer to dictionary/ Google). Further, the findings also show that the post-editor's metacognitive strategies include planning (i.e., reconsidering written text), monitoring (i.e., checking and verifying the text), and evaluating (i.e., revising the text).

REFERENCES

Allen, J. (2003). *Post-editing. In H. Somers (Ed.), Computers and translation*: A translators guide. Benjamins Translation Library, 35. John Benjamins.

Angelone, E., & Shreve, G. (2011). Uncertainty management, metacognitive bundling in problem- solving and translation quality. In S. O'Brien (Ed.), Cognitive Explorations of translation (pp. 108–129). Continuum.

Arenas, A. G. (2013). What do professional translators think about post- editing. The Journal of Specialized Translation, (19).

Cambridge, Blog (2015). *What is cognition & cognitive behavior- Cambridge Cognition*, www.Cambridgecognition.com

Cer E. (2019). *The instruction of writing strategies; The effect of the metacognitive strategy on the writing skills of pupils in secondary education*. *SAGE journal*. DOI; 10.1177/2158244019842681.

Chamot, A. U., & Kupper L. (1989). Learning strategies in foreign language instruction. *Foreign Language Annals*, 22, 13-24. https://doi.org/10.1111/j.1944-9720.1989.tb03138.x

Congjun M. (2005). *A Taxonomy of ESL Writing strategies*, In Proceedings Redesigning Pedagogy: Research, Policy, Practice, Pages 1-10, Singapore.

Eftekhary, Ali & Aminizadeh, Shayesteh. (2012). Investigating the use of thinking aloud protocols in translation of literary texts. *Theory and Practice in Language Studies*, 2. DOI: 10.4304/tpls.2.5.1039-1047.

Flavell, J.H. (1976). Metacognitive aspects of problem solving. In L. B. Resnick (Ed.), The Nature of Intelligence, pp. 223-335. Hillsdale, NJ: Laurence Erlbaum Associates

Gay, L. R., Mills, G.E,. & Airasian, P.W. (2011). Educational research competencies for analysis and applications tenth editions. Pearson Prentice Hall

Kussmaul,P.&Tirkkonen-Condit,S.(1995). Think aloud protocol analysis in translation studies. *TTR*,8(1),177-199.

Krings, H. P. 2001. *Repairing texts : Empirical investigations of machine translation post-editing processes*. Kent State University Press.

Kvale, S. (2003). The psychoanalytic interview as inspiration for qualitative research. In P. M. Camic, J. E. Rhodes, & L. Yardley (Eds.), *Qualitative research in psychology* (pp. 275– 297). American Psychological Association.

Laurian, A. M. (1984, July). *Machine translation: What type of post-editing on what type of documents for what type of users.* In Proceedings of the 10th international conference on Computational linguistic*s* (pp. 236-238). Association for Computational Linguistics.

Matiini & Octasylvia (2022). Investigating the Cognitive Process in the Post- Editing Activity using Thinking Aloud Protocols. (Thesis, 2022: Institut Teknology Indonesia)

Mesa-Lao, B. (2013). Eye-tracking post-editing behaviour in an interactive translation prediction environment. In K. Holmqvist, F. Mulvey. & R. Johansson (eds.), *Book of abstracts: 17th European Conference on Eye Movemement*, 541. Lund University.

Munday, J. (2008) Introducing Translation Studies: Theories and Applications. 2nd Edition, Routledge,   London. https://doi.org/10.4324/9780203869734

Nufus, T (2022). Cognitive behaviours in Indonesia- English translation: exploring translation process. *Prosodi Jurnal Ilmu Bahasa dan Sastra. Vol. 16/01*.

Oxford, R. (1990). Language learning strategies: What every teacher should know. Newbury House Publishers.

Shreve, G. M. (2002). Knowing translation: Cognitive and experiential aspects of translation expertise from the perspective of expertise studies. In A. Riccardi (Ed.), *Translation studies: Perspectives on an Emerging Discipline* (pp. 150–171). Cambridge University Press.

Siregar, B. U. (2021). Metacognition (Power Point slides).

Singhal, M. (2001). Reading proficiency, reading strategies, metacognitive awareness and l2 readers. The Reading Matrix, 1.

Wenden, A. L., (1991). *Learner strategies for learner autonomy: Planning and implementing learner training for language learners*. Prentice-Hall International