A Preliminary Study on Critical Thinking Skills and Reading for Learning Level of Secondary School L2 Learners

Nurul Aini Hanani Mohd Saidi[1], Yasmin Hanafi Zaid[2*], Wan Farah Wani Wan Fakhruddin[3], Faraha Hamidi[4]

[1]Faculty of Educational Science and Technology, Universiti Teknologi Malaysia

[2, 4]Language Academy, Universiti Teknologi Malaysia

[3]Language Academy, Universiti Teknologi Malaysia, Kuala Lumpur

ABSTRACT

This preliminary qualitative study examines the development of critical thinking skills and the level of reading for learning among secondary school L2 learners. The study involved two 15-year-old high-proficiency L2 learners from a Malaysian secondary school, using three qualitative instruments: think-aloud protocols, reflective journal writing, and structured interviews. Data were analysed according to the five stages of Reading for Learning – decoding, understanding, comparing, evaluating, and revising ideas. The participants read a narrative text selected from the KSSM Form 3 Close-Up B1 Students Book by Healan and Gormley (2018), entitled Survival in the Andes. Findings showed that both learners demonstrated critical engagement, particularly in making judgments and drawing connections with prior knowledge. However, the highest cognitive stage, revising one's ideas, was not observed during think-aloud sessions but emerged in reflective journals and interviews, indicating a time-delayed cognitive transformation that may be due to the amount of time participants spent doing independent research. The study highlights the multidimensional nature of critical thinking in L2 reading and underscores the importance of using multimodal, reflective approaches to foster deeper learning and cognitive development

Keywords: critical thinking, reading for learning, secondary school, L2 learners, think-aloud, reflective journal, qualitative study

INTRODUCTION

In the 21st century, critical thinking has become a fundamental skill for academic success, informed citizenship, and lifelong learning. As education systems worldwide move towards competence-based curricula, the ability to evaluate information, question assumptions, and make reasoned judgments is now essential. In second language (L2) learning contexts, this need is even more pronounced, as learners must not only decode and comprehend texts in a foreign language but also engage with them critically, interpretively, and reflectively.

One of the key domains for cultivating critical thinking is reading for learning, a process that goes beyond basic comprehension to include higher-order thinking such as analysis, synthesis, evaluation, and the revision of ideas. This concept, widely discussed in educational psychology and literacy studies, refers to using reading as a tool for constructing knowledge, questioning perspectives, and integrating new information with prior experience. For L2 learners in secondary schools, reading for learning presents a dual challenge: they must overcome language proficiency barriers while also developing the cognitive strategies required for academic literacy.

While considerable research has examined critical thinking in first language (L1) learners, studies on the interaction between critical thinking skills and reading for learning processes among second language (L2) learners, particularly at the secondary school level, remain limited. Much of the existing literature relies on

standardised assessments and quantitative surveys, which may not capture the nuanced internal processes involved in critical reading and reflective thinking.

This study addresses this gap by exploring how secondary school L2 learners engage in critical thinking through reading, using a qualitative, multi-method approach. Specifically, it draws on data from think-aloud protocols, reflective journal writing, and structured interviews to examine how two high-proficiency L2 learners process, interpret, and respond to a survival-themed reading passage. By providing a detailed, exploratory account of learner engagement, this study contributes to a richer understanding of how reading and thinking intersect in the L2 classroom and offers pedagogical insights for fostering critical literacy among adolescent learners.

LITERATURE REVIEW

According to Rowley (2007), in the hierarchy of wisdom, the four main components are summarised in a structure that begins with data, followed by information, knowledge, and wisdom. In Ackoff's (1989) original work,the hierarchy of data, information, knowledge, and wisdom (DIKW), also known as the knowledge hierarchy, is depicted as a triangle. Rowley (2007), however, proposed an inverted triangle to symbolise that data is filtered into information, then into knowledge, and ultimately, in its most refined form, into wisdom. Using the DIKW filtering concept, it is evident that the process of knowledge acquisition is structured and passes through several layers of transformation. Therefore, it is important to examine what L2 learners can do while completing tasks such as reading to ensure that explicit instruction and reading strategies can be taught and applied to improve their critical thinking skills.

When comparing Anderson and Krathwohl's (2001) revised Bloom's Taxonomy with Benjamin Bloom's (1956) taxonomy and Marzano and Kendall's (2007) New Taxonomy, it is evident that although all three taxonomies use different diagrams and structures to illustrate thinking processes, they all agree on the hierarchical organisation of information and knowledge from basic to general. This consensus arises from the nature of knowledge, which is a coherent collection of facts or information about a particular topic. Marzano et al. (2007) also acknowledge that a commonality between the New Taxonomy and Bloom's Taxonomy is that both place concepts and phrases at the lowest level of the information hierarchy, and generalisations and principles at the highest level. Therefore, this study will focus on the knowledge dimension of the thinking process, or the knowledge structure, to investigate the development of L2 learners' critical thinking skills by observing their awareness of knowledge structure in English and whether they can reach higher levels of reading for learning when engaging with a text.

A knowledge structure consists of concepts connected to other concepts through labelled relationships. A concept can be linked to any number of other concepts via various relationships. In academic reading, such as in a textbook, authors structure the presentation of knowledge in a specific way so that readers can accurately decode the information, either through a table of contents or by presenting the most important information at the beginning and repeating it at the end of the text. When L2 learners understand the structure of knowledge in English, they can analyse and evaluate the structure of sentences in the text to find meaning between the lines or make predictions based on textual clues. According to Eric Lunzer in his foreword to Davies et al. (1984), writers possess an internal knowledge structure. When writing, the writer uses the structure of the text to organise knowledge so that the reader can understand and comprehend it, creating a similar knowledge structure in the reader's mind. To follow and build this structure, L2 learners need strong information processing skills related to reading and reading to learn. The five stages of reading for learning focus on the ability to use reading material to acquire knowledge for learning purposes. These stages relate to the ability to decode the knowledge embedded in writing and to organise the information into meaningful schemas that enable learners to develop their critical thinking skills.

According to Anderson's (1977) schema theory model, background knowledge is organised in a meaningful and dynamic hierarchical structure, with readers guided by the text on how to retrieve or construct meaning from their previously acquired knowledge. Anderson states that reading comprehension is a two-way interaction between the text and the reader's background knowledge, and that comprehension requires the use of the reader's knowledge of the world. If schema theory is viewed as a filing system, good writers encode their knowledge in

a text by following the structure of their own schemata. Therefore, it is important for the reader to accurately identify the type of knowledge being presented so they can retrieve the appropriate schema (filing cabinet) containing the relevant background knowledge to aid understanding. Once the reader compares the new information with their background knowledge and understands the text, they can use their higher-order thinking skills to decide whether to incorporate the new knowledge into an existing schema (filing cabinet) or to create a new one to accommodate it. Schema theory generally assumes three main types of schemata: content, cultural, and formal (Carrell & Eisterhold, 1983). Thus, this study assumes that the structure of knowledge lies within the framework of schema theory and focuses specifically on the learning of information, i.e. formal schemata. Additionally, Bransford (1984) noted that early discussions of schema theory mostly focused on the activation of schemata, with less attention given to their construction. Therefore, this study examines the construction of formal and content schemata, as this aligns with the observation of L2 learners' awareness of the structure of knowledge in English. This study assumes that L2 learners who are highly aware of the structure of knowledge in English can organise their new and prior knowledge into meaningful formal and content schemata.

Kurtland (2000) suggested that critical thinking and critical reading work together harmoniously and support each other. Learners must not only understand what they read, but also be able to analyse and evaluate their reading to learn from it. The ability to analyse and evaluate constitutes critical thinking, as learners need to apply new knowledge from reading to their background knowledge and make evaluations. Understanding the text is the main purpose of reading, and according to Lunzer (1979), understanding involves both the ability and willingness to reflect. There are two types of reading: receptive reading, in which the reader does not pause to consider the overall meaning of the text, and reflective reading, in which the reader does pause. In this study, it is assumed that reflective reading develops higher-order thinking skills (HOTS) because it requires L2 learners not only to absorb information when reading English texts, but also to analyse and evaluate new information based on their prior knowledge. Directed Reading Thinking Activity (DRTA) tasks, such as discussion, answering questions, and writing, are introduced to encourage learners to pause while reading, creating opportunities for reflection. Through these pauses, learners progress through the higher stages of reading to learn. According to Lunzer et al. (1984), there are five stages of reading for learning, as shown in Figure 1.
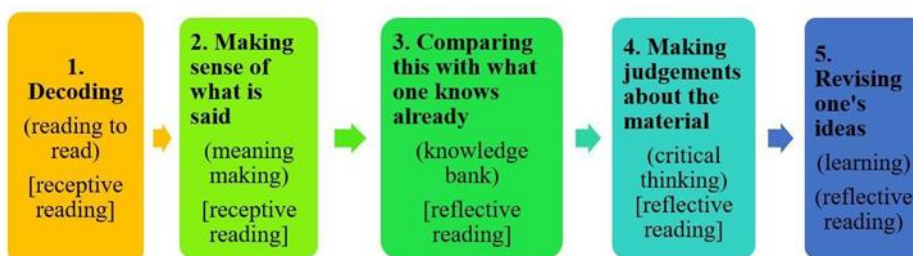

Figure 1: Five stages of reading for learning (Lunzer et. al, 1984)

Lunzer's (1984) five stages of reading for learning align with the cognitive domain in Bloom's (1956) taxonomy and Anderson and Krathwohl's (2001) revised taxonomy, as they progress from simple to increasingly complex processes. L2 learners initially use Lower Order Thinking Skills (LOTS), such as remembering vocabulary and word and sentence structures, to decode the text. Only in the next stage do they begin to make sense of the reading by understanding its meaning. Both of these stages involve receptive reading, as learners have not yet formed their own ideas and only read superficially. The subsequent stages require deeper engagement through reflective reading. At this point, learners must use Higher Order Thinking Skills (HOTS); they need to apply their new knowledge to their existing background knowledge and analyse it. They then evaluate the reading to determine whether to accept the new knowledge. This is where L2 learners' critical thinking skills are tested, as they decide whether the new information and the material they have read are true, meaningful, and important, and whether these can be incorporated into their background knowledge. In the final stage, L2 learners must create new learning content if they determine the new knowledge is important, adapting their previous ideas to integrate the new information.

To process information and comprehend complex forms of knowledge, they require HOTS to achieve a higher level of literacy. As the development of reading, particularly at the stage of reading for learning, influences L2

learners' critical thinking skills, this study focuses on observing the stages of reading for learning in secondary schools and how these affect L2 learners' critical thinking skills. Thorndike (1917) argued that reading is a thinking process. He described reading as a complex process involving determining the order of elements in a sentence, understanding how they are organised and related, deciding which connotations to add or omit, and integrating various factors to draw a conclusion. In cognitive science, reading is seen as the storage of information in long-term memory, which later forms the structure of knowledge. L2 learners can construct new knowledge and make connections to other elements when they become aware of the structure of knowledge in English through reading English texts. Therefore, teachers can connect the concept of a lesson – through topic, text structure or genre, and teaching strategy – with new information from previous knowledge to help L2 learners learn in a meaningful way.

METHODOLOGY

This study adopts a qualitative research design to gain a deeper understanding of the phenomenon, specifically the thinking processes of L2 learners as they transform information into knowledge while reading English texts. According to Creswell (2014), qualitative research is most appropriate for addressing research problems where the variables are unknown and exploration is required. Therefore, a qualitative research design is the most suitable methodology for investigating the abstract thinking processes involved, as there are various stages of reading for learning skills and differing levels of L2 learners' awareness of the structure of knowledge in the English language, which are fundamentally crucial for their critical thinking skills development in reading English texts. To enhance the credibility and validity of the research findings, triangulation will be employed. Creswell (2014) defines triangulation as the process of corroborating evidence from different individuals, such as participants with varying levels of English proficiency, and different methods of data collection using three instruments: think-aloud protocol, reflective journal writing, and structured interviews. The reader, text, and context all play important roles in L2 learners' reading, thinking, learning processes, and knowledge structuring. Therefore, this study proposes a case study design to observe how these four aspects influence the L2 learners' thinking processes.

Yin (2017) suggested four basic types of case study designs, as shown in Figure 3.1 below. This study uses the Type 2 case study as the research design.
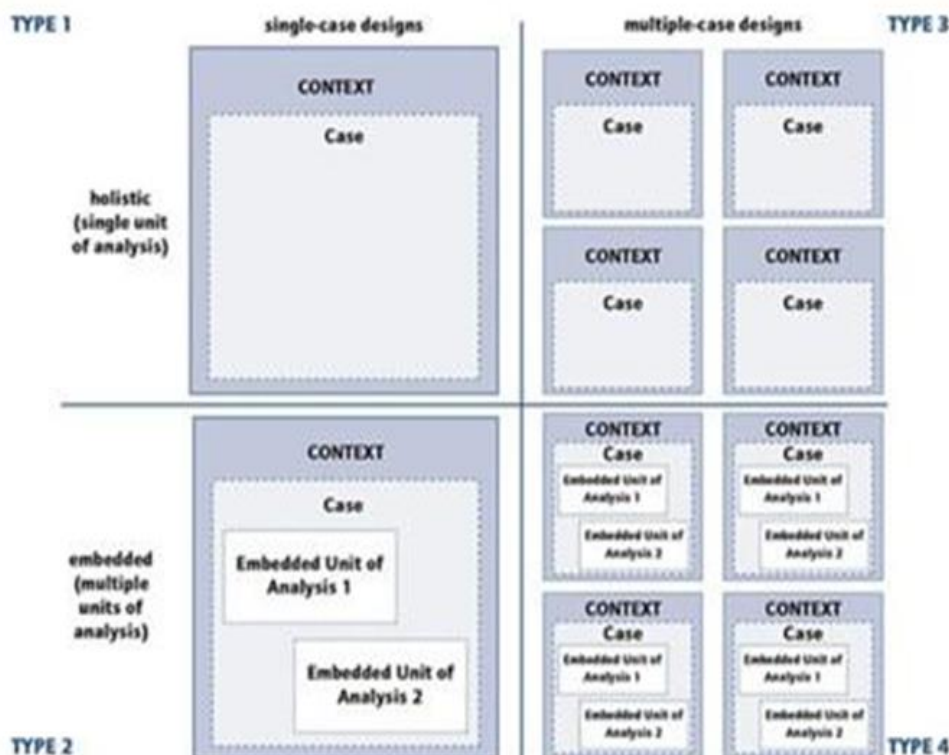

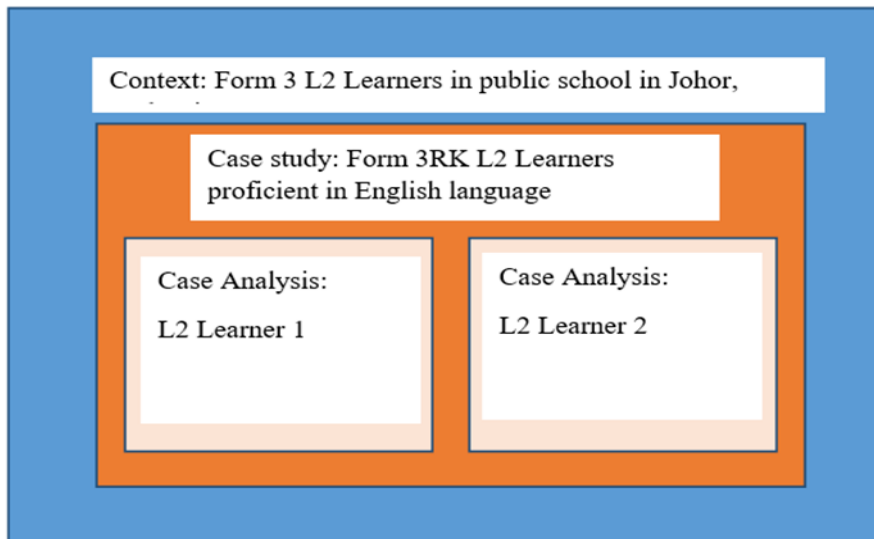Figure 3.1 Basic Types of Designs for Case Studies

Figure 3.2: Type 2 case study design

Figure 3.2 was developed based on Yin's (2017) Type 2 case study design. According to the methodology and design of the study, purposive sampling was chosen to select the participants. Creswell (2014) states that in purposive sampling, researchers intentionally select individuals and sites to learn about or understand the central phenomenon. The study will use maximal variation sampling to select participants who can provide a range of perspectives for the case study. The context of the case study involves two 15-year-old L2 learners from a public school in Johor, Malaysia, where the researcher is a teacher. The L2 learners are selected from the 3RK Mutiara class, a special class for learners with high academic achievement and motivation. They are also learners with strong thinking skills, as demonstrated by their active participation in class discussions and their confidence in expressing opinions. This will ensure that the data includes the thinking processes of L2 learners with high English proficiency while reading to learn from English texts, using the structure of knowledge in the English language, and can provide in-depth and rich data for this qualitative study. To compare data by gender, the learners were of different genders. The following table illustrates the comparison, results, and summary of the preliminary study.

Data Collection

Data collection was conducted in three stages for each participant. The first stage took place during the reading process, which involved the think-aloud method. In the second stage, after the reading process, the learners wrote a reflective journal using guided questions. The third stage involved a structured interview using a set of questions. In Stage 1 of the case study, participants read an English text and responded using the Think Aloud Protocol, also known as the 'Verbal Protocol'. Verbal Protocol is a term used to describe data collected from an individual under specific conditions, where the person is asked to either 'talk aloud' or 'think aloud', and Verbal Protocol Analysis (VPA) is used to make inferences about the cognitive processes that produced the verbalisation (Green, 1998). The participants read a text selected from the KSSM Form 3 Close-Up B1 Students Book by Healan and Gormley (2018), entitled Survival in the Andes. The researchers acted as a non-participant observer during the Think Aloud Protocol but prompted the learners with questions when necessary. While reading the text, learners were encouraged to express any questions, comments, realisations, feelings, or thoughts that occurred in response to their reading, using the six prompt questions. These questions were designed to elicit as much information as possible from the learners about their thought processes while reading. Most of the time, thinking is unconscious and silent; however, this preliminary research challenged the learners to become more aware of their thinking processes and to verbalise them so the researcher could record the data.

List of prompt questions and instructions as follows.

1. Read the text and explain in your own words what you understand.

2. Explain what you mean by that.

3. How did you arrive at that understanding?

4. What do you think is the theme of this reading?

5. If you do not know a word, what can you do?

6. If you do not understand a phrase, sentence, or paragraph, what can you do?

The feedback was later categorised according to the five stages in Reading for Learning, as shown in Table 4.1 below.

Table 4.1 Reading for Learning category

5 Stages of Reading for Learning	Words said	Action to look for
1. Decoding	This word means… I don't know this word…	Reading to read/remember word meaning
2. Making sense of what is said	This phrase/sentence/paragraph means…	Understand what is being read
3. Comparing this with what one knows already	I know that… I remember that…but…	Use prior knowledge to relate
4. Making judgement about material	I think… I feel…	Tell opinion/feeling
5. Revising one's idea	I learn something... I used to think like this..but now…	Learn something new/ relearn

In the second stage, to examine the participants' stages of reading for learning and their awareness of the structure of the English language while reading in English, the participants were asked to write a reflective journal on the reading text they read in their own time. According to Kerka (1996), the reflective journal is used as an instrument for developing reflective learners, as they need to relate what they have learned in class to real-life situations. The participants used the guiding questions in the form of the KWHLAQ Chart by John Barrell (2007), as shown in Table 4.2.

Table 4.2 KWHLAQ Chart

KWHLAQ Chart by John Barrell, 2007	
K	What do we think we already know? Explore prior knowledge.
W	What do we want and need to find out?
H	How will we proceed to investigate our questions? How will we organize time, access to resources and reporting? How will we self-assess our progress?

L	What are we learning? And what have we learned at the end of our investigations?
A	How and where can we apply the results of our investigations to this and other subjects to our daily lives?
Q	How might we pursue them in our next units? What new questions do we have now?

In the final stage, the participants took part in a one-to-one structured interview. Hochschild (2009) noted that interviews can achieve more than surveys, as they allow for in-depth exploration of issues and observation of how people frame their ideas and their reasons for doing so. Interviews also capture how people make connections between ideas, values, events, opinions, behaviours, and the reasoning behind them. Therefore, structured interviews can yield more in-depth data. Below are the structured interview questions, along with some probe questions that were asked of the learners. The interview was recorded and the conversation was then transcribed.

1. What is your opinion and feeling after you completed the think-aloud activity?

2. Do you think the think-aloud activity is beneficial for you?

3. Do you think it is possible to do a think-aloud during class time?

4. Do you think you have enough time to do a think-aloud during class time?

5. Do you think you can do this on your own without the teacher's help or prompting?

6. From your think-aloud session, I noticed that you have strong opinions and feelings, particularly about the government and empathy towards people who nearly lose hope.

7. How do these strong feelings help or prevent you from taking action?

8. From your think-aloud session, I observed that you can relate to the story from a rational perspective. Why do you think you are able to do this?

9. If one of your friends who is not a student leader read the story, would they be able to relate to it as you do?

Data analysis

To prepare for the analysis, data from the three research methods were collected and organised by labelling each individual learner. The video recordings for each learner were transcribed and organised into tables with the corresponding questions or text to which the participants were responding. The learners' reflective journals were scanned into digital images, converted into Word documents, and labelled accordingly. Next, a preliminary exploratory analysis was conducted by reading all the data to gain a general idea of how to categorise it. According to Creswell (2014), preliminary exploratory analysis assists with data exploration by noting ideas, considering how to organise the data, and determining the need for additional data. Subsequently, the data were coded to narrow them into specific themes that help answer the research questions. First, the text segments that answered or were connected to the research questions were identified, while those that did not were ignored. Second, text segments relating to similar research questions were grouped into codes. Finally, codes with more data or text segments were categorised as similar themes. The data were displayed using a comparison table.

FINDINGS AND DISCUSSIONS

This section presents findings from three qualitative data sources: think-aloud protocols, reflective journal writing, and structured interviews. Two 15-year-old high-proficiency L2 learners from the 3RK class, one male and one female, participated in the study.

Findings from Think-Aloud Protocols (TA)

The think-aloud protocols provided insights into how both participants, FE and AD, engaged with the reading material through the five stages of Reading for Learning: (1) Decoding, (2) Making sense of what is said, (3) Comparing with what one already knows, (4) Making judgements about the material, and (5) Revising one's ideas. While both learners demonstrated critical engagement, the nature and frequency of their responses varied.

Participant FE (Female)

Participant FE demonstrated active engagement across four of the five stages of reading, with the strongest evidence in Stage 4: Making judgements about material, where she produced 10 responses, far surpassing the other stages. Table 6.1 presents the data from the Think Aloud Protocol (TA).

Table 6.1 FE Think Aloud Protocol Feedback

FE Think Aloud (TA)		
5 Stages of Reading for Learning	**Words said referring to text in paragraph (P1-P6)**	**Number of feedbacks**
1. Decoding	P2: So that means they have to keep together la. Okay understand.	1
2. Making sense of what is said	P1: How they can crash? (Disbelief, touching head) P3: Human helps human (agree. nod head)	2
3. Comparing this with what one knows already	P1: Where is Uruguay? P5: 65 km is from here to JB P6: Wow so long, pause to look at the beginning date and calculate... after three months	3
4. Making judgement about material	P2: Why so long? P2: How dare them! My gosh! P3: My gosh! (Shocked face) P3: Pity them. So sad. (Sad face) P4: Oh my gosh. How can? (Shocked face) P4: I am very disappointed at this moment (cradle head) P4: Nothing. (Answer question in text) P5: Pause to think. Oh no. P5: Pause to think. wow P6: Sigh of relief. Glad to hear that.	10
5. Revising one's idea		0

Stage 1: Decoding

FE showed minimal decoding activity (one feedback), indicating her fluency in L2 reading. For example, she remarked, "So that means they have to keep together la. Okay understand," which reflects surface-level comprehension.

Stage 2: Making Sense of What is Said

Two responses were coded under this stage, including "How can they crash?" (P1) and "Human helps human" (P3), indicating attempts to interpret meaning beyond the literal.

Stage 3: Comparing with What One Knows Already

FE made three connections to prior knowledge. These include geographic reference points ("65 km is from here to JB") and time-related calculations (e.g., "pause to look at the beginning date and calculate... after three months"), suggesting the application of background knowledge to contextualise information.

Stage 4: Making Judgment About Material

This stage was most prominent in FE's verbal responses. Her frequent expressions, such as "How dare them!", "Pity them. So sad," and "I am very disappointed at this moment," show strong emotional engagement and evaluative reasoning. She exhibited critical affective responses aligned with empathy, ethics, and justice, which are core components of critical literacy.

Stage 5: Revising One's Idea

No feedback was recorded at this stage during the think-aloud activity. This suggests that while FE engaged deeply in interpreting and judging the content, she did not overtly reflect on or modify her own understanding during the reading task.

Participant AD (Male)

Participant AD also engaged in all stages except Stage 5, but with a slightly more balanced distribution than FE. His think-aloud protocol showed strong analytical and reflective tendencies, especially in Stages 3 and 4. Table 6.2 presents the data from the Think Aloud Protocol (TA).

Table 6.2 AD Think Aloud Protocol Feedback

AD Think Aloud (TA)		
5 Stages of Reading for Learning	**Words said referring to text in paragraph (P1-P6)**	**Number of feedbacks**
1. Decoding	**P2:** From what I can understand here the 'great danger' mean from the temperature or any animals like predators	1
2. Making sense of what is said	**P3:** oh. (understanding) **P6:** oh, is that a change of season? **P6:** oh...ok **P6:** Ah…then there must be a farm.	4
3. Comparing this with what one knows already	**P1:** I wonder how high is the mountain **P1:** Wait. I just know that there is a mountain in Chille. **P4:** I wonder what they eat while they are climbing. **P5:** I wonder how they measure the distance. **P5:** Yeah. That is what I was wondering what they were eating.	5
4. Making judgement about material	**P1:** Oh, that is interesting. **P2:** I guess that make sense because it is better to have a confine place. **P2:** Oh, that is unfortunate! **P3:** These must be very thick socks. **P3:** That is kind of scary. **P3:** Yeah, everyone should rely their hope on them. **P5:** That is good to know. **P7:** That is very good. They get to live to tell the story.	8
5. Revising one's idea		0

Stage 1: Decoding

AD provided one decoding comment: "From what I can understand here, the 'great danger' means from the temperature or any animals like predators." This indicates that he was decoding not only vocabulary but also implied meaning, suggesting inferential decoding.

Stage 2: Making Sense of What is Said

AD gave four responses in this category. He demonstrated a process of sense-making through comments such as "Is that a change of season?" and "Oh… then there must be a farm," illustrating real-time comprehension building.

Stage 3: Comparing with What One Knows Already

AD actively connected the text content to his own knowledge base, with five statements coded here. His questions, such as "I wonder how high the mountain is" and "I wonder what they eat while they are climbing," demonstrate curiosity and the use of prior schema to evaluate the plausibility or reality of the narrative.

Stage 4: Making Judgment About Material

Like FE, AD showed high engagement in this stage, with eight coded responses. However, while FE's judgments were emotional and affective, AD's responses leaned more towards evaluative reasoning. He said, "That is very good. They get to live to tell the story," and "I guess that makes sense because it is better to have a confined place," reflecting logical assessments and value-based analysis.

Stage 5: Revising One's Idea

Similar to FE, AD did not provide any verbal evidence of revising his thoughts during the reading. This may suggest that deeper reflections or belief revisions, if any, occurred after the task or were internalised rather than verbalised.

Cross-Participant Observations

Table 6.2 Participants TA Feedback Comparison

TA Number of Feedback Comparison		
5 Stages of Reading for Learning	**FE Frequency**	**AD Frequency**
1. Decoding	1	1
2. Making sense of what is said	2	4
3. Comparing this with what one knows already	3	5
4. Making judgement about material	10	8
5. Revising one's idea	0	0

As shown in Table 6.2, both participants demonstrated critical engagement primarily in judgement and comparison, revealing that high-proficiency L2 learners do not merely decode texts but actively evaluate and interpret them. Notably, neither participant explicitly revised their ideas during reading, suggesting that critical reinterpretation may not always occur simultaneously with textual engagement.

Findings from Reflective Journal Writings

The findings from the reflective journal entries of the two participants, FE (female) and AD (male), revealed distinct approaches and insights into their critical thinking and reading for learning processes. Both participants used the KWHLAQ chart (John Barrell, 2007) to guide their reflections, providing a structured framework for their learning experiences and inquiry-based thinking.

Table 6.3 FE Reflective Journal Writing Feedback

Participant FE Reflective Journal Writing using KWHLAQ Chart by John Barrell, 2007	
KWHLAQ Chart	Reflective Feedback
KNOW 1. What do we think we already know? 2. Explore prior knowledge.	• The title Survival in the Andes
WONDER 1. What do we want and need to find out?	• How and who is survive? • Why did the goverment stop search and rescue activities?
HOW 1. How will we proceed to investigate our questions? 2. How will we organize time, access to resources and reporting? 3. How will we self-assess our progress?	• I will do research on the interne about why the goverment stop search and rescue activities. • I supposed to spend less an hour, but I take 2 hours to finish research. • I found that the government is subject to laws that do not allow them to do anything.
LEARN 1. What are we learning? 2. And what have we learned at the end of our investigations?	• The attitude of not giving up quickly. • The way they can survive for a few months.
APPLY 1. How and where can we apply the results of our investigations to this and other subjects to our daily lives?	• In learning you should not have an attitude of giving in. • There will always be room for improvement.
QUESTION 1. What new questions do we have now? 2. How might we pursue them in our next units?	• I want to know more about laws that prevent rescuers and give more information about law.

Table 6.4 AD Reflective Journal Writing Feedback

Participant AD Reflective Journal Writing using KWHLAQ Chart by John Barrell, 2007	
KWHLAQ Chart	Reflective Feedback
KNOW 1. What do we think we already know? 2. Explore prior knowledge.	• I know that it is very hard to survive a plane crash and survive the below zero climate. • I know a different case to this where people do survive but it involves cannibalism.
WONDER 1. What do we want and need to find out?	• How did they survive? • What do they feel? • How many died?
HOW 1. How will we proceed to investigate our questions? 2. How will we organize time, access to resources and reporting? 3. How will we self-assess our progress?	• Read the article first, then do researches online. • Doesn't need much time around 30 minutes each night.
LEARN 1. What are we learning? 2. And what have we learned at the end of our investigations?	• They survived because they want to keep living • They didn't give up
APPLY 1. How and where can we apply the results of our investigations to this and other subjects to our daily lives?	• Never give up • As a science student I can't give up
QUESTION 1. What new questions do we have now? 2. How might we pursue them in our next units?	• What if I'm in their shoes? • What if they gave up?

Approach to Inquiry and Learning

FE's reflections indicated a methodical approach to learning, as she identified prior knowledge and sought to explore specific aspects of the subject, such as the reasons for the government's cessation of search and rescue operations. Her journal demonstrated an organised investigative process, beginning with online research to answer her questions. Although she initially intended to spend one hour researching, she spent two hours, reflecting her engagement and interest in the topic. This demonstrates her willingness to explore and dedicate extra time to understanding complex issues. FE's reflections suggest that she places significant emphasis on perseverance and survival skills, indicating a growing realisation that persistence is critical in both academic and personal contexts.

AD's reflective journal also demonstrated a strong focus on inquiry and research. His approach involved reading the article first, then conducting online research to deepen his understanding. He reflected on the challenges of surviving a plane crash in extreme conditions and expressed curiosity about the emotional and physical states of survivors. AD's reflections indicated that his learning process was relatively time-efficient, with research completed in short, focused sessions of around 30 minutes each night. AD also showed a clear connection between the subject matter – survival in extreme conditions – and broader themes of perseverance, aligning the lesson with his own life as a science student who values resilience and determination.

Critical Thinking and Application

FE's critical thinking skills appeared to focus on understanding the broader implications of survival in extreme circumstances. She reflected on attitudes of perseverance, drawing connections between the lessons learned from the survivors in the Andes and how these lessons could be applied to other areas of life, including her academic journey. However, her reflection suggests she engaged more with the factual elements of the story (such as why the government stopped the search and rescue) and did not explore the emotional or psychological aspects of survival as deeply.

AD's critical thinking focused on both the physical and emotional aspects of survival. He was particularly interested in the personal experiences of the survivors, including their motivations and feelings. This interest indicates a higher level of engagement with the psychological and humanistic aspects of the story, beyond the survival mechanics. AD's application of the lesson, as reflected in his journal, centred on the importance of never giving up, which he linked to his identity as a science student. This personal connection to the concept of perseverance highlights a more holistic application of critical thinking in his learning process.

Challenges Encountered

FE faced a challenge in balancing the depth of her inquiry with time constraints. Although she planned to spend only an hour on research, her engagement with the topic exceeded her original expectations. This suggests that while FE demonstrated a strong willingness to investigate and learn, she may sometimes overextend herself in her pursuit of understanding, resulting in time management issues.

AD's challenge involved exploring the emotional and psychological aspects of survival, which, although intriguing, were not fully addressed in his research. His reflection on what might have happened "if they gave up" indicates an emerging interest in alternative outcomes and human resilience, but this area may require further development in future investigations.

Future Inquiry and Questions

Both participants expressed a desire to explore related topics further. FE was interested in learning more about the laws that prevent rescue operations, indicating curiosity about legal frameworks and their real-world consequences. This interest suggests a deeper exploration of societal systems and governance, which could connect to her broader academic inquiries.

AD's curiosity was directed towards imagining himself in the same situation as the survivors. His reflective question, "What if I were in their shoes?" indicates a strong sense of empathy and a desire to connect personally with the learning material. This type of question suggests a deeper level of introspection, which could lead to richer personal and academic insights.

These findings indicate that both participants demonstrated critical thinking skills in their learning processes, but applied these skills differently. FE focused more on factual understanding and perseverance, while AD engaged more with the emotional and human aspects of survival, and made a clear connection between the lesson and his personal life as a student. Both students expressed a desire for further learning, emphasising real-world applications and deeper inquiry into the topics they explored.

Findings from Structured Interviews

The structured interviews offered further insights into the participants' reflections on their critical thinking skills and reading for learning levels. Feedback from both FE (female) and AD (male) was considered in relation to their earlier responses in the think-aloud protocol and reflective journal writing.

Table 6.5 FE structured interviews feedback on the think-aloud protocol

Structured Interview Question about Think Aloud Protocol experience	FE Feedback
1. What is your opinion and feeling after you did the think aloud?	For me I should not blame the government because they have rules they have to follow and cannot due the rescue any time they want and they have so many procedures they have to do before that. It is my fault for blaming them at first but I think it is still their fault too.
2. Do you think think aloud activity is a good activity for you?	For me it is a very good activity because I don't usually think a lot in my daily life to know why and why and why but that day after the activity I really want to know why and why. For me I suppose to make thinking a practice more often and broader, but I did not do so I think aloud is a good exercise.
3. Do you think it is possible to do think aloud during class time?	Of course, because we are not supposed to be confine to the class environment only to learn and we should think outside the box. Sometime when the teacher is teaching we should respond so the learning can become two ways but in my situation sometimes I will ask question and sometimes I will not. I do not think it is good for me to not ask question. Because when I ask question I will think but when I do not ask question I will not get answer to my question.
4. Do you think you have time to do think aloud during class time?	Of course, because it is a lie if I say I do not have time to think because we think every day so it is not possible not to think broadly.
5. Do you think you can do this on your own without the teacher to help or ask you to do?	Of course, I can because when I read an article or use my mobile phone I will think 'why this thing happens?' 'What will happen if I do this?' and I will try to make sure that my hypothesis is true.
6. From your think aloud session, I noticed that you have a very strong opinion and feeling. One is about the government and empathy towards the people who nearly lose hope. How does having these strong feeling help you or prevent you from doing something?	In my life I always say to myself if I give up now I will regret it, so no matter what happen do not give up although I feel so tired. For the government if other people around me think that I cannot do it, I should not think that same thing. I wish that I can prove to them and I did it.

Table 6.6 FE structured interviews feedback on reflective journal writing

Structured Interview Question about Reflective Journal Writing experience	FE Feedback
1. How does having new information affect you?	I feel like I am not supposed to blame them because it is not entirely their fault. They are human and they are bounded by orders from their superior. I should not put all the blame on them. It is their job and if they do it not following procedure, they might lose their job and how they can provide for their family.
2. If you didn't do this research and just rely on your reading article and stop there what will be the difference?	I will keep blaming the government
3. How will that effect your life after this?	I will keep blame other people and think myself is perfect but in reality, it is not.
4. Is there a part of you that have changed after doing all three phases?	I think my mindset and that the way I think about the world and myself have changed. Before this, when I make a mistake, I will put the blame on other people and other people will receive the consequence but now I can accept it.
5. Is there anything else you learn from your experience?	I think I learn many new thing and now I know the story about the plane crash. Maybe in the future I can make a law to stop the rescue from pulling off rescue in short period.

Table 6.7 AD structured interviews feedback on the think-aloud protocol

Structured Interview Question about Think Aloud Protocol experience	AD Feedback
1. What is your opinion and feeling after you did the think aloud?	I really think people need to do this kind of activity more. For example, I am the student leader and I think it is better to tell people what you think, we can discuss about what you think and we make thing happen like make improvement for the thing
2. Do you think aloud activity is a good activity for you in the class?	Actually yes, for example in the class when I explain to the teacher that this thing is wrong and this is correct, the teacher might not agree with me then teacher can elaborate and discuss about the thing I don't agree on.
3. Do you think you have experience to do think aloud during class time?	It depends on the timing, if I am distress I wont do think aloud but when I am calm, I will do think aloud.
4. So does this mean you need to be in a calm situation to do think aloud?	Yes.
From your think aloud session, I can see that you can relate to the story from a rational point of view. Why do you think you are able to do that?	I think it is because I am the student leader. There is one program that I handle and there are so many problems, and then the teacher asks me to decide fast when one thing fail what can I do so I have to think rationally and I have to think fast.
5. If one of your friends who is not a student leader read the story, will they be able to relate the story like you do?	Maybe they will see the story from a different point of view

Table 6.8 AD structured interviews feedback on reflective journal writing

Structured Interview Question about Reflective Journal Writing experience	AD Feedback
1. Can you share your experience writing this journal?	I wrote it on the weekend, Saturday and I only took an hour or 30 minutes. I just read the article and search some stuff online. And then I answer the question. I also ask my friend about some points
2. What is it that you don't understand?	About the self-assess. I don't understand what it mean.
3. You wrote three questions that you wonder. Did you manage to find the answer?	Yes, from what I can tell getting that kind of experience is very traumatic so my guess is they will get PTSD but they also feel relief that they are now safe.
4. Is there a part of you that have changed after doing all three phases?	Yes, related to me being a student leader I told my points more in the meeting, I have some suggestion and then we discuss about it then I also tell them the pro and cons about my idea. This helps me being a confident student leader to put my idea and opinion out there.
5. You have additional question here. What is I am in their shoe? Can you do what they do?	We are living in Malaysia, so our skin is not suitable for that cold temperature so I think, I will be the one staying back because I have no general survival skill and I cannot stand the cold temperature
6. Is there anything else you want to add on?	No.

<u>Understanding of the Task and Approach to Learning</u>

FE's structured interview responses revealed that she primarily approached the task by focusing on the factual aspects of the content. She explained that she first tried to understand the text, which aligned with her earlier reflection that comprehension was her main concern. When asked about the key takeaways from the task, she emphasised the importance of perseverance and the idea that one should not give up quickly. This reinforces the concept from her reflective journal that she is inclined to learn about survival strategies and apply them to her own educational journey.

AD's interview responses demonstrated a more reflective and inquisitive approach to learning. He stated that investigating survival in extreme conditions helped him appreciate the importance of perseverance, particularly as a science student. This aligns with his journal entry, where he noted that perseverance is key to survival. During the interview, AD also expressed a strong curiosity about the human aspect of survival, including the emotions and mental resilience of survivors, which was not as evident in FE's responses.

Critical Thinking and Application to Daily Life

FE's understanding of critical thinking involved engaging with the material at a deeper level by connecting it to personal attitudes. She reported that learning about survival tactics reinforced the value of persistence for her. Her approach to critical thinking appeared more focused on summarising and drawing conclusions than on analysing or questioning the assumptions behind the information. This aligns with her reflective journal, where she explored how not giving up is an essential life lesson.

AD demonstrated more advanced critical thinking by discussing how knowledge of survival could be applied in real-world situations, particularly regarding mental strength. He emphasised that his learning extended beyond academic knowledge, integrating the lesson into his identity as a science student who values determination and resilience. His responses in the structured interview also revealed a strong interest in exploring the psychological and emotional dimensions of the survivors' experiences, which were briefly mentioned in the think-aloud protocol but explored more fully in his journal entries.

Challenges in Applying Critical Thinking

While FE demonstrated a solid understanding of the subject matter, she reported challenges in consistently applying critical thinking throughout the reading process. She found it difficult to connect the material with broader questions about laws and governance, as reflected in her journal, where she expressed a desire to know more about the laws preventing rescue operations. In the interview, she explained that although she tried to stay focused, she sometimes struggled to engage with the material critically and analytically, preferring to take the information at face value.

AD encountered similar challenges, particularly regarding the emotional and psychological aspects of survival. In the interview, he shared that although he was able to analyse the survival strategies, he still felt the emotional experiences of the survivors were underexplored. His interest in the psychological effects of survival was not fully addressed in the materials provided, which led him to ask further questions about how survivors felt during the ordeal. This deeper level of inquiry reflects his strong inclination towards understanding human behaviour, a theme that appeared in both his journal and the interview.

Future Inquiry and Further Exploration

In the interview, FE expressed a clear desire to continue exploring topics related to laws and governance, particularly the constraints on rescue operations. This interest in legal aspects aligns with her journal entry, where she questioned why certain laws prevented rescue efforts. Her curiosity indicates an interest in understanding the societal structures that influence decision-making during crises.

AD's future inquiry focused more on personal reflection. He questioned how he might respond if placed in the survivors' situation and whether he would give up, demonstrating his deep empathy and curiosity about human resilience. This inquiry connects to his earlier journal reflection, where he considered alternative outcomes (e.g., "What if they gave up?"). His questions indicate that he is interested not only in the factual aspects of survival but also in understanding the human experience behind these events.

These findings illustrate how both FE and AD applied critical thinking in different ways, as shown in their interviews. FE's focus on factual comprehension and personal perseverance contrasts with AD's more emotionally driven inquiry and deep analysis of human resilience. The interviews revealed that, while both participants demonstrated curiosity and reflective thinking, their engagement with critical thinking was shaped by their personal learning styles and interests, with FE leaning more towards structured, fact-based inquiry and AD exploring the psychological and emotional aspects of the topic.

CONCLUSION

The contrast between the two participants – FE, who focused more on factual understanding and perseverance, and AD, who demonstrated deeper emotional inquiry and hypothetical thinking – highlights the diverse ways in

which learners engage critically with texts. This study confirms that critical thinking in reading is multidimensional, shaped by personal learning preferences, emotional involvement, and reflective practice. The study was limited to two participants, which restricts generalisability. Their responses, although rich in insight, may not reflect broader trends across different proficiency levels, backgrounds, or classroom environments. This limitation can be overcome by expanding the study with a larger and more diverse sample that includes L2 learners from different proficiency levels. The study is also limited by using just one narrative text. Further study can include diverse textual input, which can extract more comparative data.

The absence of Stage 5 (revising one's idea) in the think-aloud protocols may result from methodological limitations rather than a lack of deeper thinking. The short time frame may not have permitted observable conceptual change. Future studies should expand the participant pool to include learners with varying proficiency levels and educational backgrounds to better understand developmental trends. A longitudinal approach could track the evolution of critical thinking skills over time, particularly how learners begin to revise their perspectives after sustained engagement with reading tasks.

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