Reading performance and perceptions of Lao EFL pre-service teachers following a Culture of Thinking implementation

Say Phonekeo
Victoria University of Wellington
New Zealand

John Macalister
Victoria University of Wellington
New Zealand

Abstract

A culture of thinking (CoT) is defined as "a place where a group's collective as well as individual thinking is valued, visible, and actively promoted as the regular, day-to-day experience of all group members" (Ritchhart et al., 2011, p. 219). This study aimed to determine the effects of a CoT implementation on Lao English as a foreign language (EFL) pre-service teachers' reading comprehension development and to investigate their perceptions towards the CoT-based reading instruction. To achieve the objectives, two intact classes of year three EFL pre-service teachers were randomly assigned to implementation and control conditions and measured with pre-, post- and delayed post-reading tests. Focus group interviews were also conducted to obtain in-depth insights into their perceptions of the CoT-based learning. The findings revealed that the implementation class outperformed the control class in terms of reading comprehension development and had a strong effect size (*Cohen's d* = 1.0183). In the focus group interviews, pre-service teachers generally expressed positive views towards the CoT-based reading instruction.

Keywords: Culture of Thinking (CoT), reading comprehension, thinking routines, EFL pre-service teachers, cultural forces, metacognitive reading, critical reading/thinking, Bloom's Taxonomy.

Introduction

Being able to read and construct meaning of a text in a critical fashion is necessary in the era of 'fake news' as people are now exposed to enormous amounts of information, often in digital form, which is not always accurate. In order to help English as a foreign language (EFL) students become critical readers, it is important for reading teachers to train them to interact with a text analytically and effectively. Yet in many EFL contexts, such as Laos, the teaching of reading continues to focus on language items rather than comprehension and critical thinking development.

English teaching in the Lao EFL context remains strongly influenced by the traditional-grammar translation method (Vongxay, 2013). This teaching approach places a major

dependence on the teachers while the students take the passive role of being knowledge recipients (Larsen-Freeman & Anderson, 2011). This method has been widely criticized because it fails to open up an opportunity for students to communicate in the target language and to read critically. As a consequence, most Lao EFL students have a negative attitude towards learning English, including reading, as revealed in a larger study (Phonekeo, 2020). A survey investigating the Lao EFL pre-service teachers' prior experiences of reading and the current state of reading instruction in the Lao EFL pre-service teacher education system, as well as direct classroom observations and semi-structured interviews found that most of the students encountered difficulties in constructing meaning of the text critically. Furthermore, learning reading was mostly a matter of paying attention to discrete language features as opposed to meaning construction and critical reading development (Phonekeo, 2020). This practice not only resulted in passive learning but also hindered the application of an innovative teaching approach into the classroom practices. As these students are being trained to become future teachers, pre-service education reading classrooms are a site for introducing change into this context. As a way of bringing about change, a Culture of Thinking approach was considered for this investigation.

Literature Review

Reading Comprehension and Critical Reading

Reading is a process of constructing meaning which requires not only linguistic knowledge but also cognitive and metacognitive reading strategies (Grabe, 2009; Hudson, 2007). Critical and strategic readers employ various metacognitive reading strategies when approaching a text in order to construct meaning (Grabe & Stoller, 2011; Hudson, 2007; Mokhtari & Reichard, 2002; Nuttall, 1996). This includes using prior knowledge, evaluating the text, making rational judgments of the text being read and applying metacognitive strategies. This notion reflects higher-order thinking dimensions of Bloom's Taxonomy (i.e., application, evaluation) (Bloom et al., 1956). Hudson (2007) defined metacognition as "knowledge of or regulation of cognitive endeavors" (p. 112). In other words, it refers to thinking about thinking. In classroom practices, students need to cultivate these skills and strategies in order to become better and critical readers. Critical reading is considered a higher-order reading ability in the sense that a reader applies rational thinking, evaluates, and makes informed judgments about a text before drawing a conclusion (Flynn, 1989). In brief, critical reading is an active and interactive process of evaluating and analyzing a text before drawing conclusions upon ideas or claims represented in it.

A Culture of Thinking (CoT)

A CoT is defined as "a place where a group's collective as well as individual thinking is valued, visible and actively promoted as part of the regular, day-to-day experience of all group members" (Ritchhart et al., 2011, p. 219). This teaching approach aims to foster critical thinking, social interaction, and cooperative learning where each and every one of the group members is encouraged to participate in order to accomplish the group's learning goals. As Ritchhart (2015) stated, learning is a social endeavor in the sense that every student has an important role to play in the learning process, reflecting the notion of social interdependence (Johnson & Johnson, 1989). It is aligned with constructivist learning theory as it focuses on learners as the sole agents of learning and constructing meaning (Fosnot, 2004). A CoT was developed by a group of educational experts at Harvard College of Education (USA) two decades ago (Ritchhart, 2002). Since then it has received considerable attention in

mainstream education because of its practicality and potential for developing learners to become critical and analytical thinkers (Ritchhart, 2015; Ritchhart et al., 2011).

Cultural Forces and Thinking Routines

One important aspect of the CoT is *cultural forces* and *thinking routines*. Ritchhart (2015) defined cultural forces as "the shapers of classroom cultures" (p. 6). In other words, it refers to the method for transforming school and classroom cultures. The classroom culture can be understood as "a group of people enacting a story. The story concerns the relationship between teachers, students, and the act of learning. Everyone is a player in this story, acting in a way that reinforces the story and makes it reality" (Ritchhart, 2015, p. 21). The eight cultural forces of the CoT include: expectations, language, time, modeling, opportunities, thinking routines, interactions, and environment (Ritchhart, 2015). In the CoT, expectations refer to teachers' expectation for the learners not of the learners (i.e., teacher expects that learning rather than mere completion of work will occur in the classroom). Language refers to classroom language that promotes deep and high-order thinking. Time refers to the allocation of in-class time for in-depth exploration and discussion of the topic. Modeling refers to the teacher's passionate efforts in working with the learners and acting as facilitator. Opportunity refers to purposeful opportunity for collaboration, interaction, and discussions. Thinking routines refer to tools, structures, activities which are used for promoting deep and meaningful learning. Interactions are designed to be deep, meaningful, and collaborative when engaging in working with peers. Environment refers to both mental and physical atmospheres that are conducive to learning the language (Ritchhart, 2015).

In order for a classroom culture to be a culture of thinking, these forces must be incorporated into teaching, and this can be achieved through the integration of *thinking routines*. The foundation of the CoT lies upon the idea that different cultural forces provide different affordances for meaning construction and meaningful learning. Each force has its own distinctive feature in fostering specific reading skills and meaning making in reading (Ritchhart, 2015). The interplay between each force provides opportunities for meaningful and critical reading to occur.

As stated earlier, the cultural forces can be fostered through the integration of *thinking routines* into classroom practices. Thinking routines are defined as "the tools, structures, and patterns of behavior" (Ritchhart et al., 2011, p. 45). Thinking routines are regarded as *tools* because they can be applied and integrated directly into classroom practices. They are also understood as the selection of the right tool for the right job, meaning that any one teaching method does not meet all learners' needs or suit every topic and these thinking routines serve different instructional purposes and topics to be taught. Taking this into account when planning a lesson might have a notable impact on learners' performance and learning outcomes. Thinking routines as *structures* refer to the procedures or steps taken to deliver a lesson. These structures act as "natural scaffolds that can lead students' thinking to higher and more sophisticated levels" (Ritchhart, 2015, p. 47). Additionally, they become a learning pattern for the whole class or small group discussions if used repeatedly. Thinking routines as *patterns of behavior* refer to the regular employment of these routines in the classroom practices. Through this, students internalize key messages about how real learning is taking place. Thinking routines are not designed to elicit specific answers but to uncover students' nascent thinking about the topic being learned. In this respect, learning involves both absorbing others' ideas and uncovering one's own ideas as the starting point to understand the subject content knowledge. The integration of thinking routines into instructional

pedagogy provides the opportunity for students to interact, exchange ideas, and reflect on their learning. The framework for the integration is displayed in Figure 2 below.

Previous Studies of a CoT in ESL and EFL Contexts

Previous studies were conducted to determine the effects of the CoT intervention on English as a second language (ESL) and EFL learners' language proficiency and thinking development using thinking routines.

First, Salmon (2008) examined the language development of young English learners through using thinking routines. Data were collected through videotaping, teachers' documentation and discussions. The findings revealed that learners were more confident to express themselves naturally in both English and Spanish than in the past.

In a similar vein, Hooper (2016) conducted a study to investigate the effects of thinking routines' implementation on students' academic writing ability in supporting arguments with evidence. Data were collected through a pre- and posttest essay writing task. The results indicated a large increase in the number of participants who were able to support their arguments with evidence in essay writing after the intervention.

Finally, Dajani (2016) conducted a qualitative study to examine the impact of the CoT (thinking routines) implementation on ESL students' engagement, inquiry skills development, and their English development. Data were collected through direct classroom observations, videotaping, students' and teachers' written and oral reflections. The results showed that the implementation of thinking routines increased students' participation, engagement, and interaction. The findings also revealed that classroom activities were more interactive, meaningful, and learner-driven than in the past.

One potential weakness of these studies, however, was that they did not include a control class. This weakness is addressed in the current study. Another weakness was that there was no delayed posttest in some of studies. This was also addressed in this investigation.

Purposes and Research Questions

The main purposes of this study were to determine the effects of the CoT (thinking routines) implementation on Lao EFL pre-service teachers' reading comprehension compared to a control class and to investigate their perceptions towards the CoT-based reading learning. It aimed to seek answers to the following research questions:

1. To what extent does the CoT implementation affect Lao EFL pre-service teachers' reading comprehension compared to a control class?

2. What are Lao EFL pre-service teachers' perceptions towards the CoT-based reading instruction?

## Methodology

Research Context

This investigation was conducted in an EFL pre-service education programme at a public university in Lao PDR. The course being focused on was Essential English Reading 2, which is considered intermediate level. The principal purpose of this course is to teach critical reading skills and to foster comprehension development.

Research Design and Participants

To answer the research questions posed above, this study adopted a quasi-experimental, mixed methods design. The main purposes were to determine the effects of the CoT implementation on reading proficiency development and perceptions. Therefore, the independent variable was the teaching of reading through the CoT (thinking routines) integration and the dependent variable was pre-service teachers' reading comprehension and perceptions. Figure 1 visualizes the research design.

Figure 1

The Design of the Study
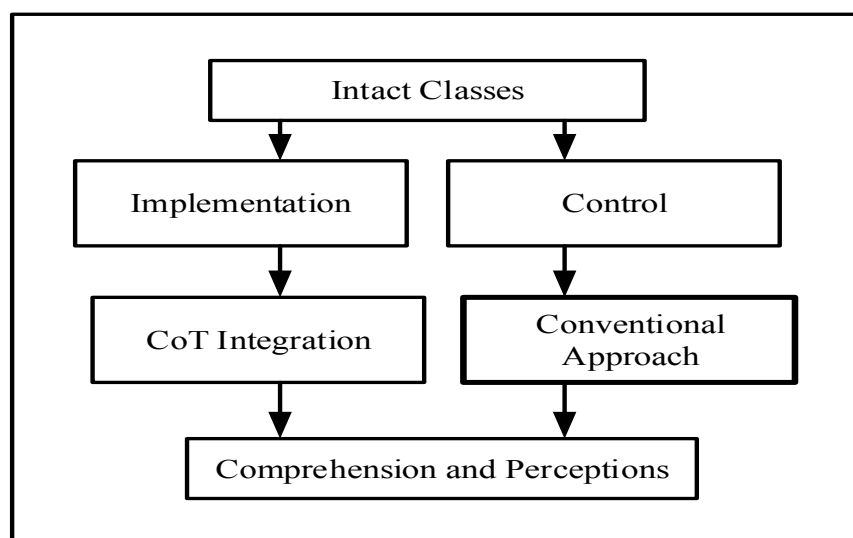
This study included the two intact classes of year three Lao EFL pre-service teachers at a large urban university in the capital city of Laos (there were only two classes in the programme). They had had more than ten years of general education and were in the third year of English training in the programme. Their English proficiency level was pre-intermediate. One class was randomly assigned to be the implementation class while the other was the control class. The two classes studied the same reading material, Essential Reading 2, which is a commercial publication (McAvoy, 2008) prescribed in the curriculum.

In order to mitigate subjectivity and bias during the implementation, two reading teachers who had similar characteristics and profiles were invited to participate in the study. Both had a master degree in teaching English and had been teaching English for more than ten years, with five years' experience of teaching reading. Their English proficiency was advanced. One

of the teachers was invited to implement the CoT-based lesson plans designed by the first author while the other teacher taught following the textbook. These two participating teachers were recruited on a voluntary basis.

During the implementation the first author acted as an outsider, designing lesson plans, observing classes and working with the implementation class teacher to assure smooth implementation and delivery. The differences between the two classes were the methods of teaching reading. The implementation class participants ($n = 30$) were taught using thinking routines approaches while the control class participants ($n = 31$) were following the textbook. In order to measure reading comprehension, a reading test taken from the IELTS general reading sample module was administered to both classes prior to and after the implementation. The IELTS general reading module is internationally recognized in terms of its validity and merits in measuring test takers' ability to read in English (IELTS, 2017).

Integration of thinking routines and Implementation

Thinking routines were integrated into the three stages of reading instruction: pre-, while- and post-reading (Grabe, 2009). Pre-reading routines aimed at activating students' prior knowledge, developing vocabulary knowledge, and making students think about the topic to be read. While-reading routines helped the students summarize, evaluate, analyze, and construct meaning of a text. Post-reading routines were intended to help students make connections, extend and challenge ideas and reflect on what was learned. Figure 2 below illustrates the integration of thinking routines.

Figure 2

CoT Thinking Routines Integration
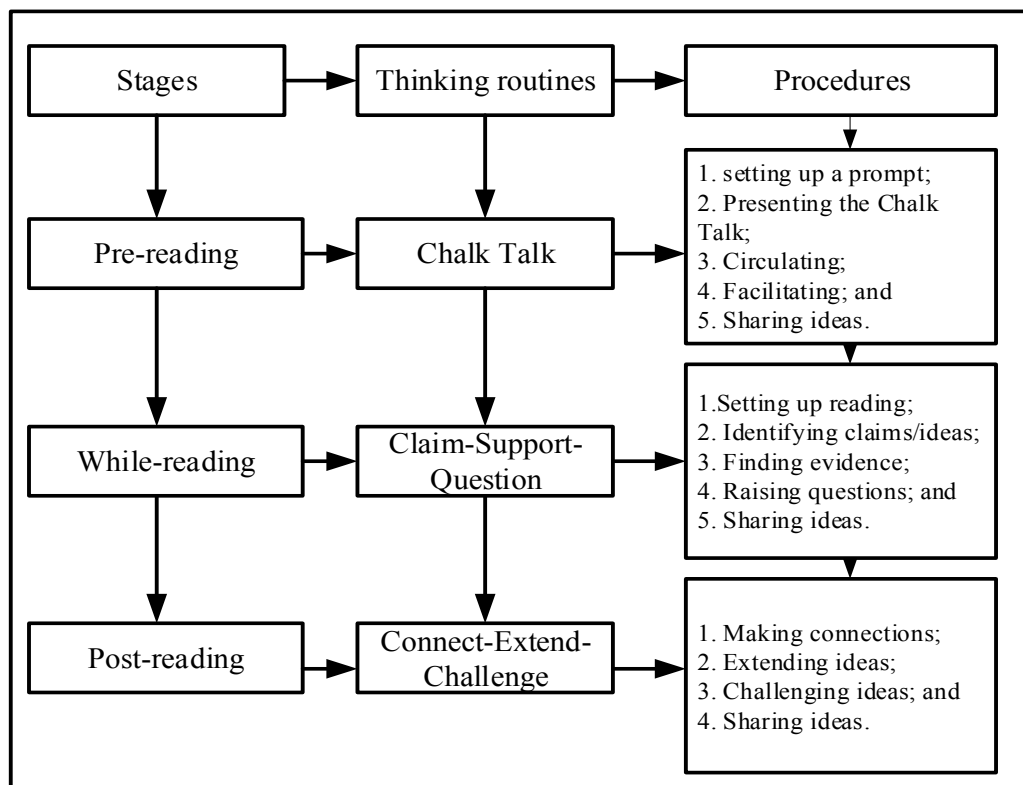
The CoT-based reading instructional procedure (Figure 2) was used as a template for designing 26 lesson plans. The framework was to scaffold the students' reading comprehension, foster critical reading, and shape perceptions of learning reading. For the 13-week intervention, thinking routines were integrated into three stages of reading instruction. In terms of pre-reading, thinking routines such as Chalk Talk (35%), See-Think-Wonder (23%), Think-Puzzle-Explore (19%), 3-2-1 (19%), and Generate-Sort-Connect-Elaborate: Concept Map (4%) were integrated in order to help students establish and activate background knowledge of the topic to be read. In terms of while-reading, thinking routines such as Claim-Support-Question (96%) and Compass Point (4%) were used to help students evaluate, analyze, and construct meaning of a text. Concerning post-reading, thinking routines such as Connect-Extend-Challenge (46%), Sentence-Phrase-Word (35%), I used to think…Now I think….(15%), and Headline (4%) were integrated to help students extend ideas, make connections, and reinforce understanding of a text being studied (Ritchhart, 2015; Ritchhart et al., 2011). This also empowers them to think beyond their current knowledge and what was learned (See Appendix A for a sample CoT-based lesson plan).

Data Collection Tools

This study employed both quantitative and qualitative data collection instruments. The quantitative data collection tools included a reading comprehension test, comprising 34 questions. These questions focused on the ability to identify key points, make inferences, locate information, and draw logical conclusions. As well as being important features of learning and teaching reading (Ritchhart, 2015; Grabe, 2009), these reflected important qualities of the CoT. Prior to its actual use, the lexical demands of the test were investigated using LexTutor (https://www.lextutor.ca/vp/eng/). Previous research pointed out that in order for readers to fully comprehend a text, they must have 95% to 98% lexical coverage in a text (Laufer, 1989; Nation, 2006; Schmitt et al., 2011). On the assumption that the participants would on average have mastery at the 2000-word level, the results indicated that the test was challenging with five of the six reading texts falling below 95%. Additionally, the mean score ($M = 11.69$ out of 34) of the test confirmed that the test was quite challenging for the participants. This, however, did not pose any internal threat to its reliability. Even though the test was challenging, it was hypothesized that reading comprehension would improve after the 13-week CoT implementation.

In addition, the test was piloted with a group of students who had similar characteristics to the participants of the main study. The test scores were analyzed using SPSS version 25 (Bachman & Palmer, 1996; Woodrow, 2014). As a criterion, the Skewness and Kurtosis values should be somewhere in the span of -1.96 to +1.96. The Shapiro-Wilk test p-value (Shapiro & Wilk, 1965) should be above .05. In addition, the histogram, normal Q-Q plot and Box plot should visually indicate that the test scores are approximately normally distributed (David & Lori, 2011). However, it does not have to be perfectly normally distributed. Applying these criteria, the analysis revealed a normal distribution as the Skewness, Shapiro-Wilk, and Kurtosis values fell into the criteria set. The histogram, the normal Q-Q plot, and the boxplot also showed that there was an approximate distribution.

In terms of the qualitative data, focus group interviews (see Appendix B for interview questions) were used to investigate students' perceptions and insights of a CoT-based reading learning. In addition, the implementation class teacher was invited to participate in a one-on-one interview to seek his views of the CoT-based reading instruction.

Data Collection Procedure

To seek answers to the research questions, data collection procedures were divided into three phases: pre-implementation, during-implementation, and post-implementation.

For the pre-intervention, a pretest was administered to measure the participants' English reading proficiency before the CoT implementation.

During the intervention, the implementation class participants received the treatment that required them to participate in a CoT-based learning (thinking routines) while the control class was taught as normal.

After the implementation, the participants were given a post- and delayed posttest (same as the pretest) to measure their comprehension development and retention. Additionally, the participants of the implementation class were invited to participate in focus group interviews. Twenty-six participants out of 30 voluntarily agreed to participate in the focus group interview. Each interview session took around 50 to 60 minutes. To avoid any language problems that might have affected comprehension, the native language of the participants was used. Furthermore, the implementation class teacher was invited to participate in semi-structured interviews in order to obtain in-depth perceptions of the CoT implementation and to triangulate the data.

Table 1

Data Collection Procedures

Type of data	Duration	Instrument
Quantitative	Pre-post intervention	• Pretest • Posttest • Delayed posttest
Qualitative	Post-intervention	• Focus group interview with the implementation class • Implementation class teacher interview

Data Analysis

The two sets of data were first analyzed separately before being integrated for triangulation in order to increase the trustworthiness of the findings. Regarding the quantitative data (reading test), descriptive statistics was used to compare the means and standard deviations (*SD*) and an inferential statistic package (independent samples *t* tests) and the test of effect size were run to test whether there were any significant differences. Prior to running the test on the immediate post- and delayed posttests, a number of assumptions (i.e., normality, independence of observations) were checked and the assumptions were met, suggesting that the use of the independent samples *t* tests was appropriate (Hu & Plonsky, 2019). For the qualitative part, the data were transcribed and analyzed using a content and thematic method (i.e., familiarizing with data, assigning codes, searching for patterns or themes, defining and

naming themes, and producing report). This allowed the authors to reach the six themes which will be presented in the following section.

Findings

Since this study involved two sets of data, the report on the findings is divided into two parts. The first part presents the quantitative findings. The second part elaborates on the qualitative results of students' perceptions of learning reading with the CoT-based instruction.

RQ1: To what extent does the CoT implementation affect Lao EFL pre-service teachers' reading comprehension compared to a control class?

Based on the analysis of the pre-, post- and delayed posttests, it was found that the CoT implementation improved students' reading comprehension. As can be seen in Table 2, the participants of the two intact classes were at the same level of reading proficiency on the pre-test. The independent sample *t*-test results indicated that there was no significant difference in terms of the pre-test scores at .05 level (*sig.* = .438), suggesting that both classes were roughly equivalent in terms of their reading proficiency prior to the CoT implementation.

Table 2

The comparison of reading comprehension pre-test scores

Class	N	M	SD	T	Sig. (2-tailed)
Control	31	14.03	4.23	0.78	0.438
Experiment	30	13.17	4.42		

Note. *p* < .05

After the implementation, the posttest was administered. An independent samples *t* test showed that the implementation class outperformed the control class (See Table 3 below). This difference was also maintained on the delayed-posttest analysis (*sig.* = .000) as indicated in Table 4 below.

Table 3

Comparison of reading comprehension posttest scores

Class	N	M	SD	T	Sig. (2-tailed)
Control	31	15.56	5.11	3.894	0.000
Experiment	30	20.30	4.15		

Note. *p* < .05

In addition, the difference of the mean values of the posttest scores between the two classes was analyzed in order to determine the magnitude of the implementation effects on reading comprehension. The effect size (Cohen's *d* = 1.0183) of the CoT on reading comprehension between the classes indicated a large effect of the implementation (Morris, 2008).

Table 4

Comparison of reading comprehension delayed-posttest scores

Class	N	M	SD	T	Sig. (2-tailed)
Control	31	14.74	5.42	4.687	0.000
Experiment	30	20.57	4.17		

Note. *p* <.05

Finally, the mean score on the delayed-posttest of the implementation class remained relatively stable compared to the immediate posttest while the control class's delayed-test mean score was slightly lower. To determine whether the mean scores of the two groups were statistically significant, the analysis of an independent sample t test was performed, and the result showed a significant difference $t(59) = 4.4687$, $p = .000 < .05$ and the effect size was (Cohen's $d = 1.19$), indicating a strong effect size of the implementation.

In summary, this study concluded that the CoT implementation had a positive impact on improving Lao EFL students' reading comprehension.

RQ2: What are Lao EFL pre-service teachers' perceptions towards the CoT-based reading instruction?

The findings revealed that students expressed positive views towards CoT-based reading learning. Six themes emerged, and these will be presented below: overall impressions on the CoT-based reading learning, enhancing reading comprehension, shifting a reading learning focus, increasing social interaction and meaningful engagement, raising critical reading awareness, and fostering reading skills and strategies. The following themes and extracts came from the results of group interviews conducted with the implementation class after the intervention. The group interviews were conducted in the L1 and all extracts are translated.

Theme 1: Overall impressions on the CoT-based reading learning. The findings showed that the students generally had a good impression of learning reading through the CoT-based instruction as it was no longer boring and passive. Rather, they perceived the CoT-based reading learning as fun, interesting, interactive, and engaging. Extract 1 below depicts this point.

Extract 1

S1   Uh. In the past reading was not my favorite subject because learning activities were not interesting. Now, I like to learn it because it is more interesting and interactive. We share a lot of ideas…

S2   Yeah. I agree with you. I feel that learning reading in this term is more interesting than last term because there are many interesting activities for students to think about the topic. We think a lot…

S3   And the teacher focuses students on meaning of the text and sharing ideas instead of reading aloud and translating…

S4   I agree with everyone. I like Chalk Talk because it is a good way of preparing students before reading and I learn many new ideas from the group members…

S1   We have a lot of opportunities to exchange our thinking and ideas. I like the way the teacher conducts the lessons…

It is apparent that the students were in favor of this type of learning interaction and environment as it benefited them and shifted their attitudes toward learning reading. Through this, they no longer felt reading learning was boring but were willing to make full use of learning opportunities with fellow classmates. This also indicates that the students found this teaching approach to be meaningful and interactive and worth participating in it. Their positive perception of reading is important for their effort and commitment may result in greater in-class participation which in turn may lead to increased comprehension and the development of critical reading skills.

Theme 2: Enhancing reading comprehension. As indicated in the quantitative findings, the CoT implementation improved students' reading comprehension. The CoT-based reading learning improved their reading comprehension as this teaching approach shifted away from rote memorization and learning discrete language features. The participants pointed out that this teaching method focused their attention on fluency development, the identification of main points, and the development of interpretation skills crucial for increased comprehension. Extract 2 below illustrates this aspect.

Extract 2

S1   I think my reading comprehension improves a lot compared to last semester because when answering comprehension questions, I feel more confident than before. I spend less time…uh answering the questions and most of my answers are correct. When I first took the pre-test, it was really hard to understand the text but when taking the posttest, I was more confident in it…

S2   I agree with you. I think my reading comprehension improves a lot too. When reading in the past, I could not understand the main point of the text. Now I try to focus on meaning instead of translating vocabulary…

S3   I agree… and I think my reading comprehension improves a lot too…

S4   …and my reading fluency and speed reading get better because I am able to read faster and understand better…

These responses were echoed by the participating teacher's comments in terms of comprehension development.

Of course, it helps a lot in terms of their comprehension development because they are encouraged to think and learn independently through sharing, brainstorming, cooperating, and meaning construction. The teacher acts as a facilitator for them. This is a new method of reading instruction. I am very satisfied with their learning outcomes and comprehension (98% of the students improved their reading comprehension) because when they first started this course, they could not summarize the main point of the text and their comprehension was very low. However, after being exposed to this they have become more confident in summarizing, analyzing and evaluating the main point of the text which is crucial for enhanced understanding

Theme 3: Shifting a reading learning focus. Prior to the CoT intervention, the students of the implementation class perceived the main focus of reading learning as discrete language skills learning (e.g., pronunciation and vocabulary) (Phonekeo, 2020). However, after the 13-week CoT implementation, their perceptions differed considerably. They now perceived reading learning as meaning construction, summarizing the main point, evaluating the main idea, developing reading skills, answering meaningful comprehension questions, and developing vocabulary knowledge. In other words, students' perceptions shifted from a

"bottom-up" to "top-down" model and this tendency is associated with higher-order reading skills development (Grabe, 2009; Hudson, 2007). Extract 3 below is an example of this aspect.

Extract 3

S1   I think the main focus of reading should be evaluating the main idea because it is a way of checking our understanding of what we read…if we can do this it means we understand the text…

S2   I agree. It should be the main point of the text because reading is about…uh understanding…

S3   Yeah. You are right. It should be the main point of the text or paragraph…

S4   Same as everyone. It should be the main point of the text because reading is about understanding…

S5   …reading is a process of summarizing the main point of the text…and developing reading skills…

Theme 4: Increasing social interaction and meaningful engagement. The students stated that the CoT-based reading instruction fostered social interactions and facilitated meaningful and interactive engagement in the course of reading learning. The CoT-based instruction focused their attention on exploring ideas, summarizing the main point, asking critical questions, giving reasons, and group work learning. This led to the development of reading comprehension and critical reading skills. It is depicted in Extract 4.

Extract 4

S1   I think … there is a lot of engagement in learning reading because the teacher uses many activities to encourage students in learning. Some activities encourage us to skim and summarize the main point of the text ...

S2   For me uh this reading subject engages students more in learning compared to other subjects. We are encouraged to work in groups and share ideas and each individual group member has a chance to talk …

S3   Yeah. A lot of engagement in thinking and answering the peers and teacher's questions. We explore or search more information which broadens our knowledge a lot …

S4   It also allows students to express ideas, develop their self-confidence, and new knowledge because the teacher does not focus on being right or wrong when sharing ideas. It is just perspective-taking.

S5   I think there is a lot of engagement because the teacher encourages us to think and elicit ideas before, during and after reading which is good …

S2   I enjoy learning it because it is interactive and engaging as I have more opportunities to share ideas with classmates …

What students commented on above was also congruent with the participating teacher's observation when asked to comment on the CoT implementation:

I think there is a lot of engagement because it is a student-centered method of instruction. They have a lot of opportunities to share ideas and work in groups. They are also encouraged to think beyond what they are learning and use their smartphones to explore or search information. Another thing is that because of the lesson design

and implementation, students are stimulated to activate their prior knowledge and construct the meaning or content of the text. Because of this, they feel more confident in sharing ideas and interacting with peers, although it is new to them.

Theme 5: Raising critical reading awareness. As pointed out previously, promoting critical reading in students is important for the development of strategic and analytical readers (Flynn, 1989). As a reminder, critical reading refers to the ability to analyze, synthesize, and evaluate ideas represented in the text before drawing a conclusion on them (Bloom et al., 1956; Wallace, 2003). The findings indicated that the CoT-based reading teaching orientation raised students' critical reading awareness and strategies. These include evaluating ideas of the text, thinking beyond what was learned, imagining about the topic, synthesizing ideas, and judging the main point (Halim, 2011). Extract 5 depicts this point.

Extract 5

S1   I think this course makes us wonder and uh think about ideas presented in the text and the teacher always asks the 'why'. When we read, we are encouraged to think about ideas or claims through a Claim-Support-Question thinking routine.

S2   Yeah. I agree. I think this reading class makes me think about the main claim or idea of the text. My thinking skills are getting better when reading because I always think about the 'what' and 'why'…

S3   …my reasoning and wondering skills have developed…what I am reading is true or not because this course fosters me to think about what I am reading. I sometimes feel like having a headache because I think too much… [LAUGH].

S4   Yeah, what I learn most in terms of thinking is from a See-Think-Wonder thinking routine. This activity encourages us to think about the topic in terms of the 'what, how, and why' as you said. In brief, this allows me or us to observe, evaluate, and apply. I like it.

S5   And evaluating the main claim of the text or paragraph … which is important. We can use this in the future, I think.

S2   …I agree with everyone that this course helps a lot in terms of developing thinking. In the past we learn reading by reading aloud and translating without being encouraged to think. However, this reading course stimulates us to think about what we are reading…I think this is useful because we can develop our thinking skills…

The above comments were also congruent with the participating teacher's observation:

I think they have developed a lot in terms of critical reading. Yes, a lot. The activities help students a lot in terms of stimulating them to think because they participate in expressing ideas and the teacher does not focus on seeking specific answers or right or wrong answers from the students. In the past they learned through the grammar translation or traditional method ... they translate word by word. However, after using this method, the students learn meaningfully because they are able to better identify main ideas of the texts or paragraphs through collaborating with their peers. They know how to read faster, which saves their time and helps develop their reading fluency.

The teacher acknowledges that the CoT implementation was beneficial for raising students' critical reading awareness, which plays a central role in the development of better and critical

readers (Anuar & Sidhu, 2017). What is interesting to note here is that the teacher acknowledges the impact of the CoT on reading fluency.

Theme 6: Fostering reading skills and metacognitive reading strategies. The EFL pre-service teachers felt more confident in applying reading strategies than in the past. They were able to guess, generate questions, summarize the main point, skim, scan, make connections, and evaluate ideas represented in the text. As they gained a sense of confidence and accomplishment in reading, their reading interest and participation increased. Examples can be seen in Extract 6 below.

Extract 6

S1   I think my reading skills are getting better than before because…er…I am able to skim and scan and summarize the main point of the text faster. We have practiced this a lot in this class.

S2   Yeah, I agree with you. The teacher engages us in summarizing meaning of the text rather than reading aloud and translating texts. We also engage in thinking and evaluating the text which is very useful although it is hard to do.

S3   And it is not necessary to translate every word like before, only focusing on the main point of the text and using guessing skills…

S4   I use summarizing skills when identifying the main claim of the text. When reading and encountering unknown words, I try to predict meaning from the context first instead of directly using a dictionary. This helps a lot in terms of time and effort invested.

S5   Yeah. My skimming and scanning skills have developed a lot. In the past, I found it hard to get the main point of the text because I did not know how to skim and scan for the main point. This reading term helps me a lot.

S6   Hmm….my summarizing skills also are getting better too. I try focus on the main point of the text and when having difficulty understanding I skim the text again.

The comments above reveal that after the CoT implementation, the participants gained control of their English reading management. The CoT raised their metacognitive reading strategies awareness crucial for reading comprehension development. They also said that reading was no longer as challenging and boring as in the past. In addition, they were able to read flexibly using skills and strategies appropriately. Also, a change in thinking from translating every word to focusing on the main idea of the text is mentioned (S3). This change is crucial for the development of critical and better readers.

Discussion

The quantitative findings revealed that the reading comprehension performance of Lao EFL pre-service teachers increased significantly after being exposed to the CoT-based reading instruction. This result was also supported by the qualitative findings.

The qualitative data provide students' perceptions of the CoT effects on their improved reading comprehension performance. Their perceptions of changes in their own reading practice may illuminate the processes at work. Drawing from these perceptions, a number of important issues can be discussed to help us better understand how reading comprehension development and critical reading can be fostered through CoT-based instruction.

First, the students' perceptions towards learning and teaching reading changed. It may be recalled that, at the beginning of this paper, we noted that most Lao EFL students had negative attitudes toward learning English, including reading. They shifted their views from seeing reading learning as focusing on discrete language items to meaning construction, comprehension development, and critical thinking. This shift is important because, drawing on insights about the role language teacher cognition (LTC) (Borg, 2003) plays in language teaching, these students are potential agents of change in the Lao education system. LTC is defined as "the unobservable cognitive dimension of teaching – what language teachers think, know, and believe and the relationships of these mental constructs to what teachers do in the language classroom" (Borg, 2003, p. 81). The experience of the CoT implementation challenged existing perceptions of learning reading formed during the apprenticeship of observation (Lortie, 1975). Their experiences and positive views towards learning reading shaped and formed during the CoT implementation may influence future classroom practices (Borg, 2006).

Second, the findings revealed that summarizing practices or strategies to which students were exposed through a Claim-Support-Question activity helped them construct meaning of the text more effectively. As Cordero-Ponce (2000, p. 330) posited, "Summarization is perhaps one of the most significant and encompassing of all reading strategies available to the learner for effective studying and comprehension." In this vein, when students were encouraged to summarize content of the text, they needed to generate mental connections between ideas represented within the text and their prior knowledge. This generation and connection, in turn, fostered their reading comprehension and memorization of the main point. This claim is consistent with previous studies (Cordero-Ponce, 2000; Khoshsima & Tiyar, 2014) in that summarization practices helped students better construct meaning of the text.

Third, the findings also revealed that reading comprehension is fostered when students are encouraged to apply "generative strategies (e.g., to summarize and to relate paragraphs to their experience) and metacognitive techniques to enhance their reading comprehension." It has been noted that "attention, motivation, and prior knowledge" (Wittrock, 1991, p. 170) help facilitate comprehension. In the present study, students were motivated to pay attention, summarize, and activate their background knowledge of the topic with the aim of fostering meaning construction ability in students. These aspects helped raise metacognitive reading awareness beneficial for comprehension development to emerge (Lin et al., 2012; Pintrich & Groot, 1990; Wigfield et al., 2016) while lacking motivation might result in passive learning.

Fourth, the findings, in addition to the cognitive and metacognitive processes, also showed that reading strategies awareness was raised. In this sense, students were encouraged to skim, scan, construct meaning, raise questions, make connections, monitor comprehension, and evaluate information through various integrated thinking routines. These reading comprehension strategies are important for students to mentally interpret meaning of the text. As Hardebeck (2006, p. 12) states, reading comprehension strategies are "mental operations, tools or plans used by readers for facilitating and extending their comprehension". By applying both linguistic knowledge and cognitive operations, reading comprehension can be fostered more successfully. In addition, the implementation of the CoT also raised students' critical reading skills. In other words, they were more critical when interacting with the text than before in the sense that they were able to support their claims or reasons with evidence when encouraged to identify the main point of the text (Flynn, 1989).

Fifth, the findings also showed that students meaningfully engaged in learning reading. Specifically, the students and the participating teacher pointed out several features of social and cognitive engagement (Philp & Duchesne, 2016) that the students were encouraged to foster during the CoT-based implementation. These include working in groups and sharing ideas, thinking about the topic, searching information, activating prior knowledge, and extracting meaning of the text. This meaningful engagement links to the change in pre-service teachers' attitudes toward learning reading after the CoT implementation. Positive feelings have an important impact on meaningful participation and reading performance.

Finally, the main and consistent pictures discussed above reflect higher-order thinking in Bloom's taxonomy and cognitive dimensions of student engagement. The students stated that the CoT integration encouraged them to think about the answer to the 'why and how' questions rather than the 'what' when approaching the text. This is important for developing critical thinking skills in the course of reading. The findings also reflect the application of the evaluation, analysis, and observation skills of the Bloom's taxonomy framework (Bloom et al., 1956). These cognitive domains are important for the development of metacognitive reading strategies and better readers.

Pedagogical Implications and Future Directions

This study has demonstrated the possibility of introducing change into EFL classrooms where grammar-translation remains the dominant model. For reading teachers who are considering using the CoT into their classroom practices, the following suggestions are worth considering when it comes to teaching reading.

First, they should discuss how this teaching approach could be effectively integrated so that students will benefit the most. In this regard, the teachers should communicate to students about the benefits and important role of this method in developing language proficiency, social interaction, and meaningful learning. After all, students play a very important part in using this approach. In order for this to be beneficial and meaningful, students should cooperate and participate in learning. In getting students on board, teachers may need to adopt a partly-negotiated syllabus approach (Macalister & Nation, 2020).

Second, they should plan their lessons carefully based on the framework shown in Figure 2. Resistance to change in educational settings often comes from concerns about the work involved. While this approach requires initial commitment and effort from the teachers in terms of lesson preparation in order for meaningful learning to emerge, the establishing of a set format has multiple advantages (Macalister & Nation, 2020) and once the format is established the workload issue is addressed.

In terms of future directions, we acknowledge that a limitation of this study is that it was conducted using intact classes where it was difficult to control what happened in the classrooms. Future studies could use a more tightly controlled experimental design in order to determine the effects of the CoT on reading performance and critical reading development. Another possible limitation of this study was the use of a multiple-choice reading test as a measurement of reading performance. Future studies could deepen understanding of reading comprehension processes by including think-aloud as a data generation tool. A third future direction could be a tracer study of the participants in this study to determine whether the experience of the CoT influenced their classroom teaching.

Conclusion

The present study was carried out to determine the effects of a 13-week CoT implementation on reading comprehension development and to investigate pre-service teachers' perceptions of learning reading. To achieve the objectives, both quantitative and qualitative methods were employed to collect and analyze the data. The statistical results indicated a significant difference between the classes in terms of reading comprehension development, suggesting that the CoT-based implementation improved pre-service teachers' reading comprehension. This was also confirmed in the delayed posttest results and in the qualitative findings. Specifically, they expressed positive views towards CoT-based reading learning. What strongly emerged from the analysis was that the CoT implementation fostered reading comprehension, social interactions, and raised metacognitive reading skills or strategies awareness. Additionally, the findings also illustrated that the CoT-based instruction helped transform a passive classroom culture into a more active and engaging learning environment beneficial for collaborative learning to occur and reading comprehension to develop.

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About the Authors

Say Phonekeo is a full-time English lecturer at the Department of Foreign Languages, Faculty of Education, National University of Laos; Lao PDR. He was also a Ph.D student in the School of Linguistics and Applied Language Studies at Victoria University of Wellington, New Zealand. His research interests include EFL reading, critical thinking development, EFL pre-service education development, and language teaching methodology.
E-mail: phoneksaykeo2020@gmail.com

John Macalister is Professor of Applied Linguistics at Victoria University of Wellington, New Zealand. His interests include the design of English language curricula, teaching methodology, ELT projects, reading and vocabulary research.
E-mail: john.macalister@vuw.ac.nz

Appendix A

A sample CoT-based lesson plan

Time Duration: 90 minutes
Topic: Sport and Leisure (Unit 11)
Objectives: This lesson focuses students' attention on:
1.   Activating prior knowledge and thinking about the topic (Chalk Talk)
2.   Identifying the main point, evaluating it, seeking evidence, and raising about the topic (Claim-Support-Question)
3.   Identifying facts, making inferences, and answering comprehension questions (True, false, not given and multi-choice questions)
4.   Making sense of the text by focusing on the substance through 'Sentence, Phrase-Word'

Processes	CoT/Thinking routines Integration	Time	Teaching aids

Pre-reading	**I. Chalk Talk**
	1. T shows the phrase 'Sport and Leisure' on a slide and writes it down on large pieces of papers and assigns Ss to work in groups to brainstorm ideas or words related to the topic and write them on the papers.
	2. T asks Ss to circulate around the classroom to read, add comments, ask questions, and discuss issues written on the papers.
	3. T asks Ss to return to their original seats to connect ideas, elaborate on the comments, and group them into themes.
	4. T encourages Ss to share ideas by asking:
	    a. Where did you see common issues or reactions?
	    b. What questions or ideas surprise you? Why?
	    c. What did you learn from the Chalk Talk papers?
		35mns	• A projector
			• Markers
			• Large papers
			• Textbook
			• Whiteboard

During-reading	**II. Claim-Support-Question**
	1. T asks Ss to skim and scan the text and identify the main point.
	2. T asks Ss to evaluate and analyze the text by identifying supporting evidence for critical judgments of the main point by following the questions:
	    a. What is the main point of the text?
	    b. What makes you say that?
	    c. Could you explain the key supporting evidence?
	3. T asks Ss to raise questions or issues they have about the text and consider what might make them curious by asking:
	    a. Is there evidence on the other side?
		35mns	• Textbook
			• Slides
			• Worksheets

	b. What questions do we need to raise about the text? c. What more might we need to examine? 4. T asks Ss to share ideas from points 1-3 in groups and answer true, false, not given and multi- choice questions and goes over the answers by asking them to justify their answers.		
Post-reading	**III. Sentence-Phrase-Word** 1. T asks Ss to skim the text again select a sentence, a phrase, and a word that is meaningful and helps them gain a deeper understanding of the text. 2. T asks invites Ss to share their selection in groups and give reasons for their selections. 3. T asks each group to reflect on their conversation and responses each one has provided, focusing on common themes. 4. Finally, T asks Ss to share ideas with the whole class to reinforce their understanding of the text.	20mns	• Worksheets • Pens • A projector • Markers

Note. **T** = teachers, **Ss** = students

Comprehension questions
True, False, Not given comprehension questions
According to the passage, decide the following ideas by writing:
- **TRUE/ T** if the statement agrees with the information in the text.
- **FALSE/F** if the statement disagrees with the information in the text.
- **NOT GIVEN** if the statement is not discussed in the text.

1. People of all ages practice alternative sports ………………………
2. Paul's daughter has been skateboarding for over ten years. ………………….
3. Fear discourages people from doing extreme sports ………………………
4. Over 2 million people practice extreme sport in the US…………………
5. Safety was a problem when practicing extreme sports in the past……………..
6. Alternative sports produce better athlete than tradition sports ……………
7. Price to go bungee jumping vary from place to place …………………….
8. Extreme sports sometimes require more training than traditional sports…………
9. Not all extreme sports involve danger…………………..
10. Alternative sports are not suitable for children…………………

Multiple choice questions: select the correct answer
1.   Why does Patrick practice snowboarding?
   a. He enjoys the excitement.
   b. It builds endurance.
   c. He finds it physically challenging
   d. It helps develop self-confidence

2.   According to Paul, what is true about skateboarding?
   a. It is easier than soccer.
   b. It does not require physical strength.
   c. It is not expensive to do.
   d. It takes a lot of practice.

3.   How can risks be reduced?
   a. By meeting with experts.
   b. By training with an expert.
   c. By using appropriate equipment.
   d. By practicing in groups.

4.   What can be inferred about the writer of this passage?
   a. He has tried extreme sports in the past.
   b. He believes children should not take part in extreme sports.
   c. He thinks extreme sports are not worth the cost.
   d. He is in favor of extreme sports.

Appendix B:

Focus Group Interview Questions

Any question before we start?
1.   Perceptions of reading
   - As a student, do like to learn reading? Why? Why not?
   - In your opinion, what should be the main focus of learning reading? Why?

2.   Perceptions of participation or engagement
   - Do you think the reading activities conducted in your reading class promoted engagement or participation? If yes, to what extent? If no, why?
   - Can you name types of activities/routines you were engaged in and what do you think about them?

3.   Perceptions of learning outcomes/development
   - Do you think your reading comprehension has improved as a result of the reading class? Why? Why not?
   - Do you think your critical reading skills have improved as a result of the reading class? Why? Why not?
   - Do you think your reading skills or strategies have developed or improved as a result of the reading class? Why? Why not?
   - When you're reading and you come to something you don't know, what do you do?
   - How would you help someone having difficulty reading? Why?
   - What would a/your teacher do to help that person?

4.   Difficulties or challenges in learning English reading
   - What do you think the main difficulties are in learning English reading? Why?