

## The Effects of Schema Activation and Reading Strategy Use on L2 Reading Comprehension

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The present study examines the effects of schema activation and reading strategy use on L2 learners' reading comprehension, strategy use, motivation, and learner beliefs. The participants consisted of 89 Korean college students, and they were assigned to one of two reading activity groups—schema building or reading strategy instruction—or to a control group. The study employed a background questionnaire, pre-, post-, and delayed English reading comprehension tests, and also pre- and post-reading strategy use, reading motivation, and general learner belief questionnaires. The results indicate that both the schema building and reading strategy task groups showed significant improvements in terms of immediate learning effects, but the reading strategy group showed an added degree of improvement over the schema building and control groups in terms of long-term reading comprehension. Additionally, the two task groups reported positive responses to their own use of reading strategies, motivation, and positive beliefs. Based on the findings, this study suggests pedagogical implications for L2 reading classrooms.

**Key words:** schema activation, reading strategy, motivation, learner beliefs, L2 instruction

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## 1. INTRODUCTION

Reading is commonly recognized as an interpretative and interactive skill that involves decoding, as well as active, cognitive thinking processes (Grabe, 2006; Qanwal & Karim, 2014). During the complex operations involved in reading comprehension, learners are required to use all their knowledge, such as linguistic knowledge, background knowledge, and knowledge of reading strategies (Kong, 2006). Despite the complex nature surrounding this process, reading is a fundamental skill for both first language (L1) and second language (L2) acquisition. Grounded in this understanding, empirical research has been done to discover the most effective ways of enhancing learners' reading competencies, and a variety of factors have been examined including learners' L1 and L2 proficiencies, different text genres, the learners' own background knowledge, vocabulary levels, use of reading strategies, grammatical competences, interests, motivations, and cognition (Block, 1992; Grabe, 2006; Malcolm, 2009; Pei, 2014; Qanwal & Karim, 2014).

The literature offers several instructional implications, revealing that activating background knowledge and training students to use reading strategies can be potential components in developing successful readers (Grabe, 2006). In general, background knowledge can be understood as schema, which is a "mental representation of a typical instance which helps people to make sense of the world more quickly because people assimilate new experiences by activating relevant schema in their minds" (Cook, 1997, p. 86). A number of studies have reported that schemata play a pivotal role in reading comprehension and provide a better understanding of the topics being discussed in the texts (Huang, 2019; McNeil, 2011; Salbego & Osborne, 2016; Stott, 2001). In addition, researchers have stressed the importance of appropriate strategy use in reading comprehension. Reading strategies help learners interact with written texts and glean more meaning from them, and teaching students these skills can be helpful for learners to reach a higher level of reading comprehension (Matsumoto, Hiromori, & Nakayama, 2013; Qanwal & Karim, 2014). Activating schemata and training students to use reading strategies are both generally effective in reading comprehension skills.

These reading processes make learners construct meaning from the texts by combining their existing knowledge, the information derived from the texts, and the contexts of the reading situations (Hashemi, Mobini, & Karimkhanlooie, 2016). It is nearly impossible for L2 readers to fully interpret the meaning of written texts without direct approaches that help them face unfamiliar content and different types of texts. Even though schema building and reading strategy instruction have been proven to be efficient in boosting learners' reading comprehension, little research has been conducted to investigate the effects of the two variables, schema and reading strategies, together on L2 reading comprehension (McNeil, 2011) and previous studies of schema and reading strategies in

reading skills showed diverse outcomes depending on learners' L2 proficiency levels (Al-Shumaimeri, 2006; Zhang, 2008). Moreover, there were few studies examining to see how schema activation and reading strategies affect both short- and long-term reading performance and also their relation to learners' strategy use, sense of motivation, and their beliefs towards English, particularly with Korean L2 learners. Based on that, this study attempts to answer the following research questions:

1. How do different types of reading instruction, schema activation and reading strategy use, affect L2 learners' short- and long-term reading comprehension?
2. How do different types of reading instruction, schema activation and reading strategy use, affect L2 learners' strategy use, motivation, and learner beliefs?

## **2. LITERATURE REVIEW**

### **2.1. Schema Building Instruction in Reading Comprehension**

Schema is generally referred as previously acquired knowledge or more generally as background knowledge. Researchers have suggested that there are two main types of schema: content and formal schema. Content schema refers to individuals' background knowledge of the world, and it also entails topic familiarity and cultural knowledge. Formal schema also refers to background knowledge but is more related to rhetorical structures and the organizational forms found in different types of texts (Cook, 1997; Omaggio, 1986; Stott, 2001). Additionally, Widdowson (1990) introduced ideational and interpersonal schemata. To elaborate on those more, ideational schema regards a person's knowledge of conceptual topics, while interpersonal schema is related to the mode of communication used to convey that information. In a similar vein, Landry (2002) added content, formal, and abstract schema to the types of schemata found in the academic literature.

It is important for instructors to learn what schema is the most essential for their students. This is especially true in L2 classes where students have less background knowledge to draw upon compared to L1 readers. Zarei and Mahmudi (2012) examined whether schema building activities affected Iranian learners' listening and reading skills. Three experimental groups were engaged in three pre-listening and reading schema building tasks; there were content, formal, and linguistic schema groups and one control group which did not receive any kind of schema building task. The results showed that the outcomes of the three schema groups were significantly higher than those of the control group, adding that no differences were found among the three schema building groups.

Zhang (2008) investigated the effects of different types of formal schemata on Chinese college students' reading comprehension by measuring outcomes of cloze tests and recall protocols, quantitatively and qualitatively. Three conditions of formal schemata were employed in the study, description, comparison and contrast, and problem-solution, with identical content given to each group. With the cloze tests, no significant differences were seen in relation to the performance among the three groups, although the problem-solution schema condition did show higher recall than the other groups. Keun (2011) investigated the effects of schema activation on Korean high school students' reading comprehension. The experimental group participated in different kinds of schema activation. They made cards, watched video clips, and discussed specific topics prior to reading. The control group, however, received traditional reading instruction which consisted only of vocabulary and syntactic analysis. The findings of the study demonstrated that schema activating tasks helped learners' reading comprehension, guessing skills, and also positively improved their perceptions towards learning English reading.

## 2.2. Reading Strategy Instruction in Reading Comprehension

Reading strategies have been identified in different ways in the literature. Some researchers divided reading strategies into three phases: before-reading, while-reading, and post-reading (Pressley & Wharton-McDonald, 1997; Rice, 2009). In the before-reading stage, strategies such as setting goals for reading and examining the structure of the text are included, and activating background knowledge, connecting main ideas, taking notes, and resolving comprehension difficulties are contained in the while-reading stage. Re-reading the topic sentences and skimming and summarizing the passages are included in the post-reading phase. Zhang (1993) classified reading strategies into four categories: cognitive, compensation, memory, and test-taking strategies. Cognitive strategies entails activating prior knowledge, previewing, predicting, and self-questioning, while compensation includes vocabulary identification, drawing inferences, and making connections. Memory strategies are made up of visualizing, determining importance, skimming, scanning, summarizing, synthesizing, and evaluating. Test-taking strategies are reading questions and answering and eliminating incorrect choices from a multiple-choice list. Other researchers have classified reading strategies into metacognitive, cognitive, and social and affective categories (Grabe & Stoller, 2002; Oxford, 1990; Pressley, 2000).

Other empirical studies have investigated the effects of reading strategy activities on reading comprehension. Tsai, Ernst, and Talley (2010) investigated the differences between L1 and L2 strategy use on Chinese college students. The participants were divided into two groups, skilled and less skilled. The results demonstrated that the learners' knowledge of the L2, or lack thereof, was a greater determining factor than their L1

reading abilities, adding that skilled readers tended to use more strategies than their less skilled counterparts during the reading process. Matsumoto et al. (2013) examined the effects of teaching reading strategies to Japanese college students' reading performance and also examining their sense of motivation and beliefs. In the study, the types of reading strategy instruction that were measured were identifying the main ideas in the texts, making inferences, organizing ideas, and summarizing the texts. The outcomes indicated that strategy instruction is positively correlated to students using reading strategies effectively, and this increases their sense of self-motivation and positive learning beliefs; additionally, teaching students to identify the main idea of the text was seen as the most important of those skills.

As for the relationship between background knowledge and strategy use in reading comprehension, McNeil (2011) examined the effectiveness of background knowledge and reading comprehension strategies on EFL college students' reading abilities. In the first stage, learners completed a background knowledge questionnaire and then took a reading comprehension test by reading over a preliminary text. After that, they were engaged in a self-questioning instructional session and were asked to create self-questions based on the main text. Finally, they took a reading comprehension test. The findings of the study showed that reading strategy use proved to be a significant contributor to reading comprehension but not for background knowledge.

On the whole, although schema activation and reading strategy use play important roles in reading comprehension, few studies have been conducted to investigate the relative effects of these two variables on reading performance, strategy use, motivation, and also learner beliefs.

### 3. METHOD

#### 3.1. Participants

A total of 89 first-year college students, 9 males and 80 females, participated in the current study at a university in southwestern Korea (ages:  $M = 19.99$ ,  $SD = .554$ ). They were enrolled in a required College English 2 course in the second semester. The course was intended to teach them the four language skills – that is, listening, reading, writing, and speaking – and lasted for 15 sessions over a 15-week period, 90 minutes a week. The participants were selected from three classes of two different majors, nursing science and early childhood education, and were randomly assigned to one of two experimental groups, reading strategy instruction (henceforth RI) ( $N = 32$ ) or schema building instruction (henceforth SI) ( $N = 28$ ), or they were assigned to a control group where they received

traditional reading instruction (henceforth TI) ( $N = 29$ ). In order to identify the homogeneity within the groups, a pre-reading test, as well as a pre-Questionnaire for Reading Strategy Use, Reading Motivation, and General Learner Beliefs (QRSUMB) were administered, and the results showed that the three groups were comparable in terms of initial English reading comprehension ( $p = .963$ ), as well as their use of reading strategies, reading motivation, and beliefs towards learning English reading ( $p = .173$ ).

In terms of the years they had studied English, 11 students (12.4%) had studied less than 5 years, 57 students (64.0%) had studied 6-10 years, and 21 students (23.6%) had studied more than 11 years. Most of the students had no experience abroad studying English, except for one student. As for the participants' self-evaluated English proficiency levels, 45 students rated themselves as intermediate (50.6%), 28 students as low level (31.4%), and 16 students as high-intermediate (18.0%). Regarding English reading competence, 7 students rated themselves as low (7.8%), 46 students as intermediate (51.7%), and 36 students as high-intermediate level (40.5%). Considering those assessments, the participants in the study appeared to range from low to high-intermediate.

### 3.2. Instruments

As mentioned, three major instruments were used in this study: a background questionnaire; pre-, post-, and delayed reading comprehension tests; and pre- and post-Questionnaires for Reading Strategy Use, Reading Motivation, and General Learner Beliefs (QRSUMB). First of all, the background questionnaire consisted of six question-items that asked about the participants' gender, age, major, years spent studying English, experiences studying abroad, and their self-reported overall English proficiency and English reading competency levels.

To evaluate their English reading abilities, the pre-, post-, and delayed reading comprehension tests were used. The pretest was designed to identify how similar the three groups' reading abilities were at the outset of the study. The pretest contained a total of 24 question-items which consisted of three descriptive reading passages along with 8 question-items, extracted from *Bricks Intensive Reading 1* (Bricks, 2009). The reading passages were about nature, geography, and archaeology. The question-items were a mix of true/false and multiple-choice questions. The passages' grade level on the Flesch-Kincaid scale ranged between 8.76, 9.06, and 9.12, and had between 328-338 words. The delayed tests were implemented to clarify the long-term effects of the different types of reading instruction; thus, it contained the same question-items as the pretest. The posttests were intended to examine the influence of different reading tasks on the groups' short-term learning. Each posttest was made up of seven true/false question-items, based on the course book, *Network: Get Connected 3* (Oxford, 2012). The expository reading texts were

extracted from units 1 to 7, and the passages' topics were about introducing oneself, things happenings, buildings in town, seeing old friends, offering congratulations, living healthily, and expressing ailments. All question-items used on the tests were worth one point each.

The pre- and post-QRSUMB were adapted from Matsumoto et al.'s (2013) study to investigate the three groups' perceptions and behaviors towards studying English reading before and after treatment sessions. Initially, the questionnaire was made up of three domains with 40 items. The reading strategy scale contained questions about the adjusting strategy (5 items), reasoning strategy (6 items), monitoring strategy (3 items), and main idea strategy (10 items). The reading motivation scale included extrinsic motivation (5 items), intrinsic motivation (5 items), and reading efficacy (3 items). The learners' belief scale had environment orientation (2 items), strategy orientation (2 items), and effort orientation (2 items). As for the reliability coefficients, the QRSUMB was .924, ranging from .590 to .853 for the 10 factors. All items used a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

### 3.3. Procedure

First of all, the participants completed the background questionnaire, the pre-QRSUMB and the pre-reading test. After that, the three groups took part in the different reading tasks, which were given once a week for seven successive weeks. To recap, the experimental groups were RI who received reading strategy instruction prior to reading, SI who received schema prior to reading, and the control group was TI who received traditional reading instruction that involved no strategy instruction or schema. A total of 7 sessions lasted approximately 35–40 minutes for each group.

During each treatment phase, the learners in the RI group were briefly taught the different types of reading strategies, such as looking for main ideas, summarizing, and inferring meaning, which were taught to them via PowerPoint. After that, they were given a worksheet designed to direct them to practice the strategies they had just learned. The learners then read the reading passages and summarized the main ideas on the worksheet in four sessions, and they also made five sentences that made inferences from the content in three sessions. After completing the tasks, the learners were asked to have a group discussion to talk about their work. Then the learners were given the posttest which contained seven true/false question-items. Finally, the instructor interpreted the passages and gave some final thoughts on the students' work and also gave them feedback.

The learners in the SI group viewed YouTube videos or brainstormed with mapping their ideas on a worksheet. The YouTube videos were utilized to help the students build familiarity with the given contents of each text unit, and then the learners had time to discuss the stories they watched with their peers. To elaborate on the brainstorming and

mapping, the learners were told to write their ideas about the text and discuss what they wrote with their classmates. After that, learners in this group also took the posttest. Finally, the instructor interpreted the texts and similarly gave a few final thoughts about learners' work and also some feedback. In case of the learners in the TI group, they took part in what could be considered traditional reading instruction where the instructor explained the meaning of the new vocabulary and interpreted the content of the text. Then learners received a worksheet that contained reading comprehension questions. After completing the tasks, they took the posttest and were given feedback on their performance.

Each group took the posttest, and at the end, they all also took the delayed test and post-QRSUMB. These examined the groups' perceptions towards learning English reading, as well as the long-term outcomes of the experiment two weeks later.

### 3.4. Data Analysis

The background questionnaire was analyzed by an analysis of frequency. The Questionnaires for QRSUMB were calculated using Cronbach's alpha coefficients, descriptive statistics, and a MANOVA. The pre- and delayed reading comprehension tests were rated by descriptive statistics and an ANOVA, and the results were illustrated as learners' long-term performance. In addition, repeated-measures ANOVAs were employed in the seven posttests in order to interpret as learners' short-term outcomes. Post-hoc pairwise comparisons were carried out to examine the significant differences among groups' performance. All data analyses were administered using SPSS 20.0.

## 4. RESULTS AND DISCUSSION

### 4.1. Different Reading Instruction and Reading Comprehension Performance

The first research question dealt with whether the different types of reading instruction affect learners' short- and long-term reading comprehension. First of all, to verify the homogeneity of the three groups before the treatment, outcomes of the pretests were analyzed using descriptive statistics and an ANOVA (see Table 1). The mean scores for the RI were 11.75, the SI were 11.64, and TI were 11.86 out of the 24 points, showing that there was no significant difference among groups on the pretest ( $p = .963$ ).

**TABLE 1**  
**Group Comparison on the Reading Pretest ( $K=24$ )**

Group	<i>N</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>	<i>ES</i>
RI	32	11.75	2.771	.038	.963	.000
SI	28	11.64	3.380			
TI	29	11.86	2.863			
Total	89	11.75	2.971			

*ES*= Effect Size, *K*= the number of items

Next, to compare the immediate effects on the groups' performance from the different reading instruction, the mean scores of the seven posttests were calculated by descriptive statistics. Table 2 demonstrates the outcomes of the descriptive statistics on the posttests. The performance of the RI ( $M = 33.94$ ) and SI ( $M = 34.04$ ) were numerically higher than those of the TI ( $M = 29.48$ ) across all the tests, indicating that the learners in the reading strategy and schema building groups outperformed the control group.

**TABLE 2**  
**Descriptive Statistics on the Posttests ( $K=7$  for each test)**

Group	Test 1		Test 2		Test 3		Test 4		
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
RI	32	5.06	1.243	5.25	1.136	4.59	1.434	5.25	1.047
SI	28	4.75	1.206	5.46	1.036	4.32	1.219	5.32	.863
TI	29	4.59	.983	4.86	1.093	4.03	1.117	4.52	1.405
Total	89	4.81	1.157	5.19	1.107	4.33	1.277	5.03	1.172
Group	Test 5		Test 6		Test 7		Total		
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
RI	32	4.31	1.061	4.78	1.184	4.69	1.281	33.94	3.29
SI	28	4.75	1.295	4.75	1.076	4.68	.863	34.04	3.63
TI	29	4.14	1.125	3.55	1.270	3.79	1.292	29.48	4.24
Total	89	4.39	1.174	4.37	1.300	4.39	1.230	32.52	4.25

In order to more precisely investigate if there were any significant differences between groups, repeated-measures ANOVAs were administered with the posttests. The results showed that there was a significant main effect for the tests ( $F = 9.268$ ,  $p = .000$ ,  $ES = .097$ ) and groups ( $F = 14.266$ ,  $p = .000$ ,  $ES = .249$ ). Table 3 illustrates the outcomes of the post-hoc pairwise comparisons on the posttests. The findings proved that performance in the RI and SI was higher than that of the TI on reading comprehension competence in the short-term, adding that the former two groups did not show any significant difference.

**TABLE 3**  
**Post-hoc Pairwise Comparisons on the Posttests**

		Group	<i>MD</i>	Std. Error	<i>p</i>
Posttests	RI	SI	-.014	.138	1.000
		TI	.636*	.136	.000
	SI	TI	.650*	.141	.000

The effects of reading strategies and schema building instruction on reading comprehension observed in the current study are similar to findings of other empirical studies. In terms of schema building activation in reading comprehension, the activation of specific background knowledge relevant to the text led to significantly better comprehension of the given texts (Zhang, 2008) because when learners have opportunities to be familiar with the topic, they can understand the assigned reading passages better. In addition, the present study employed YouTube and brainstorming schema activating approaches, and the effects of those methods can be explained well by the literature. That is, studies on schema theory have suggested that visual aids and brainstorming are used as efficient activities for building up learners' schema (Carrell, 1988; Stott, 2001). Plus, brainstorming techniques are a well-known type of pre-reading task in that learners can bring their prior knowledge to a particular subject and organize their ideas, which leads to higher achievement (Ajideh, 2006; Rao, 2007; Wallace, 1992).

Qanwal and Karim (2014) mentioned that learners' proficiency in reading comprehension is strongly related to reading strategy instruction. In the current study, instruction designed to explicitly train learners to look for main ideas, summarize, and infer can be positively effective in helping them comprehend reading texts. Reading comprehension strategies can be teachable and such strategies can help learners to more efficiently understand the meaning of the written texts they encounter (Tsai et al., 2010). In sum, the two different types of reading instruction, reading strategy use and schema activation, can be helpful for learners to reach satisfactory comprehension of the texts compared to traditional reading instruction.

Next, outcomes of the delayed test, which was conducted two weeks later after completing all the treatment sessions, were analyzed using descriptive statistics and an ANOVA and Table 4 indicates the results of the delayed test. The mean scores for the RI were 15.09, the SI were 13.43, and the TI were 11.10, revealing that the performance of the RI was numerically the highest in terms of long-term learning, followed by those of the SI and then the TI. The results also showed that there was a significant difference among groups on the delayed test with a great effect size ( $p = .000$ ,  $ES = .372$ ).

**TABLE 4**  
**Group Comparison on the Delayed Test (K=24)**

Group	<i>N</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>	<i>ES</i>
RI	32	15.09	1.653	25.496	.000	.372
SI	28	13.43	2.395			
TI	29	11.10	2.469			
Total	89	13.27	2.725			

*ES*= Effect Size, *K*= the number of items

Table 5 summarizes the outcomes of the post-hoc pairwise comparisons on the delayed test, showing that reading strategy instruction was the most effective method for improving the students' reading comprehension. Also, while schema building is more effective than traditional methods of teaching, reading strategy instruction appears to be more effective in improving students' long-term gains.

**TABLE 5**  
**Post-hoc Pairwise Comparisons on the Delayed Test**

	Group		MD	Std. Error	<i>p</i>
Delayed test	RI	SI	1.665*	.565	.012
		TI	3.990*	.560	.000
	SI	TI	2.325*	.579	.000

The findings of the study are partially in line with Matsumoto et al.'s (2013) study, meaning that reading strategy instruction, namely having the students search for main ideas, can play a pivotal role in enhancing students' reading comprehension. The significantly different outcomes between the two reading instruction in the delayed test can be viewed in different ways. Possibly, the observed discrepancy could be attributed to learners' levels of English proficiency. The participants in the study were low and intermediate learners. In this respect, this study is partially supported by empirical studies (Fung, Wilkinson, & Moore, 2003; Taylor, Stevens, & Asher, 2006), adding that explicitly teaching students reading strategies benefits low and intermediate readers more. Besides, as mentioned in the literature, even though schema relevant to the topic of the reading passages can positively relate to reading comprehension ability, learners with low L2 knowledge tend to be text-bound and have difficulty in activating their background knowledge (McNeil, 2011). That is, reading strategy and schema building tasks in the present study are more effective than traditional instruction in the short- and long-term effects, however, reading strategy use appeared to be more helpful than schema building to increase reading skills in the long-term perspective. In addition, the relationship between schema activating instruction and L2 proficiency levels needs to be considered for future studies.

Taken together, based on the findings of the study, instruction that teaches students

reading strategy use and schema building could be effective methods for learners to improve their reading comprehension skills in the intermediate- and long-term learning. Yet, considering a significant difference between two variables in the delayed test, extra drills in the schema building may sustain learners' comprehension capacity. For instance, after completing schema activating tasks, instructors can ask learners to make questions and discuss differences or similarities related to the reading topic.

#### 4.2. Different Reading Instruction and Strategy Use, Motivation, and Learners' Beliefs

The second research question was concerned with how different types of reading instruction affect learners' use of reading strategies, reading motivation, and beliefs towards readings after the treatment. Table 6 presents the three groups' mean scores for the pre- and post-QRSUMB.

First, with regard to the findings on the pre-QRSUMB, the mean scores for the RI were 3.531, the SI were 3.467, and the TI were 3.482. More specifically, the effort orientation factor in the general learner beliefs had the highest mean scores ( $M = 3.747$ ). The extrinsic-motivation factor had the second highest mean scores ( $M = 3.697$ ), while the intrinsic motivation had the lowest mean scores ( $M = 2.933$ ) regarding reading motivation. Findings from the MANOVA on the pre-QRSUMB showed that there were no significant differences among groups ( $p = .173$ ). Therefore, it can be assumed that the learners in the study had similar perceptions and behaviors towards studying English reading before the treatment.

**TABLE 6**  
**Descriptive Statistics on the Pre- and Post-QRSUMB**

Categories	Subcategories	Group	Pre-QRSUMB		Post-QRSUMB	
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Reading strategy use	Adjusting strategy	RI	3.663	.682	3.956	.389
		SI	3.721	.582	4.093	.450
		TI	3.607	.533	3.490	.704
		Total	3.663	.600	3.847	.582
	Reasoning strategy	RI	3.333	.515	3.662	.519
		SI	3.411	.594	3.488	.519
		TI	3.328	.524	3.305	.611
		Total	3.356	.539	3.491	.564
	Monitoring strategy	RI	3.260	.492	3.521	.555
		SI	3.262	.618	3.393	.642
		TI	3.517	.575	3.264	.681
		Total	3.345	.567	3.397	.627

	Main idea strategy	RI	3.422	.438	3.678	.398
		SI	3.454	.399	3.668	.361
		TI	3.455	.529	3.669	.744
		Total	3.443	.454	3.672	.521
	Extrinsic motivation	RI	3.800	.477	4.006	.475
		SI	3.579	.426	3.779	.463
		TI	3.697	.517	3.359	.644
		Total	3.697	.479	3.724	.593
Reading motivation	Intrinsic motivation	RI	3.000	.672	3.031	.695
		SI	2.786	.535	3.071	.539
		TI	3.000	.567	3.052	.699
		Total	2.933	.599	3.051	.644
	Reading efficacy	RI	3.698	.601	3.688	.508
		SI	3.333	.654	3.643	.594
		TI	3.471	.508	3.414	.653
		Total	3.509	.603	3.584	.591
	Environment orientation	RI	3.875	.741	3.703	.607
		SI	3.571	.539	3.804	.614
		TI	3.552	.506	3.379	.677
		Total	3.674	.622	3.629	.651
General learner beliefs	Strategy orientation	RI	3.734	.609	3.875	.596
		SI	3.536	.489	3.804	.657
		TI	3.448	.632	3.379	.607
		Total	3.579	.588	3.691	.651
	Effort orientation	RI	3.797	.521	4.016	.615
		SI	3.804	.533	4.250	.616
		TI	3.638	.693	3.431	.637
		Total	3.747	.584	3.899	.704
Sub-total	RI (N=32)	3.531	.337	3.736	.320	
	SI (N=28)	3.467	.345	3.698	.305	
	TI (N=29)	3.482	.404	3.432	.516	
Total	Total(N=89)	3.495	.360	3.625	.409	

Next, in terms of the groups' mean scores for the post-QRSUMB after engaging in reading instruction, the mean scores for the RI were 3.736, the SI were 3.698, and the TI were 3.432, revealing that the overall mean scores on the post-QRSUMB ( $M = 3.625$ ) were numerically higher than those on the pre-QRSUMB ( $M = 3.459$ ). Regarding learner beliefs, the effort orientation factor had the highest mean scores ( $M = 3.899$ ). In terms of the reading strategy use, the adjusting strategy factor showed the second highest mean scores ( $M = 3.847$ ), while intrinsic motivation had the lowest mean scores ( $M = 3.051$ ). Also, regarding reading motivation, the extrinsic motivation factor had the second highest mean

scores ( $M = 3.697$ ), while the intrinsic motivation had the lowest mean scores ( $M = 3.051$ ).

The results of the MANOVA on the post-QRSUMB show that there is a significant difference among groups ( $p = .000$ ) (see Table 7).

**TABLE 7**  
**MANOVA Results on the Post-QRSUMB**

Effect		Value	<i>F</i>	Hypothesis <i>df</i>	<i>df</i>	<i>p</i>	<i>ES</i>
Intercept	Wilks' Lambda	.010	735.041	10	77	.000	.990
Group	Wilks' Lambda	.525	2.924	20	154	.000	.275

*ES*= Effect Size

Table 8 shows the group comparison results on the post-QRSUMB. The findings reveal that there were significant differences among groups in terms of adjusting strategy ( $p = .000$ ), reasoning strategy ( $p = .046$ ), extrinsic motivation ( $p = .000$ ), environment orientation ( $p = .033$ ), strategy orientation ( $p = .005$ ), and effort orientation factors ( $p = .000$ ).

**TABLE 8**  
**Group Comparison on the Post-QRSUMB**

Subcategories	Source	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>	<i>ES</i>
Adjusting strategy	Between Groups	5.778	2	2.889	10.324	.000	.194
	Within Groups	24.064	86	.280			
	Total	29.842	88				
Reasoning strategy	Between Groups	1.938	2	.969	3.194	.046	.069
	Within Groups	26.082	86	.303			
	Total	28.020	88				
Monitoring strategy	Between Groups	1.001	2	.501	1.280	.283	.029
	Within Groups	33.638	86	.391			
	Total	34.639	88				
Main idea strategy	Between Groups	.002	2	.001	.004	.997	.000
	Within Groups	23.918	86	.278			
	Total	23.920	88				
Extrinsic motivation	Between Groups	6.504	2	3.252	11.455	.000	.210
	Within Groups	24.416	86	.284			
	Total	30.920	88				
Intrinsic motivation	Between Groups	.024	2	.012	.028	.972	.001
	Within Groups	36.498	86	.424			
	Total	36.522	88				
Reading efficacy	Between Groups	1.280	2	.640	1.869	.161	.042
	Within Groups	29.449	86	.342			
	Total	30.729	88				

Environment orientation	Between Groups	2.837	2	1.419	3.544	.033	.076
	Within Groups	34.427	86	.400			
	Total	37.264	88				
Strategy orientation	Between Groups	4.256	2	2.128	5.546	.005	.114
	Within Groups	32.997	86	.384			
	Total	37.253	88				
Effort orientation	Between Groups	10.236	2	5.118	13.196	.000	.235
	Within Groups	33.354	86	.388			
	Total	43.590	88				

ES= Effect Size

In order closely to ascertain where any difference laid, post-hoc pairwise comparisons were conducted, and Table 9 suggests the outcomes. The performance of the RI and SI were shown to be significantly higher than that of the TI in terms of adjusting strategy, extrinsic motivation, strategy orientation, and effort orientation factors. On the other hand, the outcomes of the RI were significantly greater than those of TI in the reasoning-strategy factor. In addition, the performance of the SI was significantly higher than that of the TI in the environment orientation factor.

**TABLE 9**  
**Post-hoc Pairwise Comparisons on the Post-QRSUMB**

Subcategories	Group		MD	Std. Error	<i>p</i>
Adjusting strategy	RI	SI	-.1366	.13689	.963
		TI	.4666*	.13562	.003
	SI	TI	.6032*	.14015	.000
Reasoning strategy	RI	SI	.1734	.14251	.681
		TI	.3569*	.14119	.040
	SI	TI	.1835	.14591	.636
Extrinsic motivation	RI	SI	.2277	.13788	.307
		TI	.6476*	.13661	.000
	SI	TI	.4200*	.14117	.011
Environment orientation	RI	SI	-.1004	.16373	1.000
		TI	.3238	.16221	.147
	SI	TI	.4243*	.16763	.040
Strategy orientation	RI	SI	.0714	.16029	1.000
		TI	.4957*	.15881	.007
	SI	TI	.4243*	.16412	.034
Effort orientation	RI	SI	-.2344	.16116	.448
		TI	.5846*	.15967	.001
	SI	TI	.8190*	.16500	.000

According to Matsumoto et al. (2013), adjusting strategies pertains to changing the speed of reading texts, depending on the reading difficulty and the time needed to re-read

and search for the necessary information. Reasoning strategies is related to checking, predicting, and inferring the contents of the texts. In addition, learners can use their knowledge to interpret the texts. The factor of extrinsic motivation is concerned with learners becoming more proficient readers and attaining higher scores on reading tests than others. Environment orientation is about the importance of the learning environment and the role of good teachers play in improving students' reading abilities. Strategy orientation deals with the methods of learning effectively and voluntarily, and effort orientation is about the effects of continuous learning attitudes and learning hours.

The findings of the study can be interpreted that learners in the RI and SI groups could adjust and change their learning styles when encountering unfamiliar contents or words of reading materials. That is, during the reading process, they checked their understanding for content of the text and also tried to predict the unfamiliar words and meanings of difficult parts. In addition, they seemed to infer content based on their existing knowledge. Their attitudes can be attributed to them engaging more in the reading instruction because the schema and explicit reading training helped them become more aware of the necessity for effectiveness and strategic learning habits. In other words, learners in the two experimental groups had a specific goal for learning English and showed increases in their extrinsic motivation completing a given task. The outcomes of the present study are consistent with Matsumoto et al.'s (2013) study, which means that reading strategy instruction is positively beneficial for enhancing learners' motivation and their beliefs in L2 contexts.

As for learners' affective aspects, schema building and reading strategy instruction facilitated learners' extrinsic motivation, environment orientation, strategy orientation, and effort orientation. In particular, the activating schema would be related to learners' positive beliefs towards learning English. Learners in the SI showed significantly higher than those in the TI in terms of environment orientation, strategy orientation, and effort orientation. That is, through reading instruction, learners could be motivated and found efficient approaches to learning English reading. The reading instruction can encourage learners to pay attention to their language learning styles and change their perceptions to be more active and productive. Therefore, teachers need to provide learners with a variety of tasks which can make them practice more useful approaches to enhance their reading skills, as well as improve their motivation and learner beliefs. As mentioned in the results of the current study, activating schema and training reading strategies could be employed as an effective teaching method in facilitating learners' reading competence, cognitive and affective variables.

## 5. CONCLUSION

The present study was intended to identify the effects of schema activation and reading strategy use on L2 learners' reading comprehension performance, strategy use, motivation, and learner beliefs. The findings show that both schema building and reading strategy instruction significantly increased learners' reading performance in terms of short- and long-term effects while reading strategy instruction most positively influenced learners' long-term reading knowledge gains. This study also found that the two reading instruction had significantly higher effects on learners' reading strategy use, motivation, and positive beliefs.

It is quite true that L2 readers experience limitations in activating their schema because of their cultural and social background knowledge, especially when encountering unfamiliar topics in texts. To build new background knowledge, readers' schema deficiencies should be supported by suitable and topic-specific schema activities. This can be done by manipulating text materials in which learners use schema they hold and infer new schema. As an example way to help students build their own new schema, they could do a web search to find YouTube videos about a given topic, watch them as a class, discuss them, and then do a reading.

As for reading comprehension abilities, Beckman (2002) mentioned the importance of strategy instruction. To make readers interact more successfully with the written texts, the teacher should lead them to employ reading strategies efficiently and automatically, whereby the role and model of strategies are presented with ample practice and time to promote continued use. Explicit reading strategy instruction should be implemented in L2 classes, as well, so that learners can be consciously aware of the effectiveness of strategy building and can apply those skills to various phrases and tasks they encounter and can become more independent readers (Qanwal & Karim, 2014).

This study has several recommendations for further studies. The diverse participants' levels of proficiency need to be analyzed more to investigate the effects of reading instruction in L2 classroom. In terms of methodologies, YouTube viewing used as a schema activation method can be regarded as an additional mode of visual aid. Therefore, pre-reading activities for experimental groups need to be considered with caution. In addition, since this study was administered using quantitative methods, in-depth interviewing, open-ended questionnaires, and recording videos are suggested to more closely investigate the learners' perception towards English learning instruction.

Applicable levels: Tertiary

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