Enhancing EFL Secondary School Students’ Reading Comprehension Through Schema-building Activities

By

Mayada Raafat Khalifa
EFL Teacher
Department of Curriculum & Instruction (English)
Faculty of Education
Tanta University

Volume July 2023
Abstract
Reading is crucial in academic settings as it is connected with knowledge transmission and expansion. However, many EFL learners encounter various reading comprehension problems (e.g. deficits in their background knowledge, difficulties in understanding linguistic complexity and language inaccessibility) that they struggle to overcome. Therefore, this study aimed to enhance Egyptian first year Language Secondary School students’ reading comprehension through schema-building activities. The present study adopted a quasi-experimental design. Two intact classes were selected and randomly assigned to a control and an experimental group, 35 students each. The treatment lasted for three months and the two groups had the same teacher (the current researcher), time, and course book. However, students of the experimental group benefited from schema-building activities before, while and after reading the selected material. To examine the effectiveness of schema-building activities in enhancing the overall reading comprehension and its sub-skills, pre- and post- reading tests were administered to both the control and experimental groups. Then, the t-test for independent samples was used to compare the scores of the experimental and control groups on the posttest of reading comprehension. Results showed that implementing schema-building activities in EFL reading classes had significant effects on students' overall reading comprehension and its sub-skills; literal, inferential and critical skills. In light of these findings, a number of recommendations were suggested for teachers, students and curricula designers.

Key-Words: schema-building activities – reading comprehension- EFL students
Introduction

Reading is crucial in academic settings as it is connected with knowledge transmission and expansion. Reading comprehension is not simply a one-way information-receiving activity or an activity of just comprehending words, sentences, and texts. In the reading comprehension process, the reader interacts dynamically with the text as s/he tries to elicit the meaning and where various kinds of knowledge are being used (Alyousef, 2006). It is believed that the readers’ background knowledge (schema) interacts with the content of the passage they are reading. So, decoding a message more accurately needs not only the reader’s knowledge about the vocabulary and grammar of the target language but it also requires the reader’s background knowledge as well as his/her analyzing, synthesizing and evaluating ability. Therefore, reading is considered a challenging skill by EFL students as well as teachers.

Enabling EFL learners to deeply and adequately understand the written language necessitates teaching them the reading comprehension skills that comprise reading proficiency. However, in reality, there are various reading comprehension problems that may be encountered by students who struggle to overcome them. For example, scholars have listed a number of EFL learners’ reading difficulties such as deficits in background knowledge, problems with grammatical knowledge, difficulties in understanding linguistic complexity including lexical and syntactic knowledge, language inaccessibility and poor reading strategies (Alyousef, 2006; Birch, 2002; Davoudi & Yousefi, 2015; Fitriani, 2014; Rahman, 2004; Samad, Jannah & Fitriani, 2017).

Similarly, Egyptian secondary school students face the same common problems that EFL learners in different contexts have to deal with. This may be due to lack of appropriate background knowledge about the reading material. In other words, these students do not have relevant schemata to comprehend the English reading
texts. In particular, lack of familiarity with the culture-specific content causes students to be unable to comprehend these texts. Accordingly, the present study seeks to explore the effect of schema-building activities; activities to build the reader’s prior linguistic knowledge, background knowledge of the content area of the text and knowledge of the rhetorical structure of the text; on first-year Language Secondary students’ reading comprehension.

**Study Questions**

The current study aims to tackle students’ difficulties by seeking answers to the following questions:

1- What is the effect of schema-building activities on EFL first year Language Secondary School students’ reading comprehension?

Sub-questions:

a) What is the effect of schema-building activities on EFL first year Language Secondary School students’ literal reading comprehension?

b) What is the effect of schema-building activities on EFL first year Language Secondary School students’ inferential reading comprehension?

c) What is the effect of schema-building activities on EFL first year Language Secondary School students’ critical reading comprehension?

**Hypotheses of the Study**

In order to handle the above questions, the following hypotheses will be examined:

1. There would be a statistically significant mean difference between the experimental and control groups posttest mean scores of overall reading comprehension skills in favour of the experimental group.

2. There would be a statistically significant mean difference between the experimental and control groups posttest mean scores of
literal reading comprehension skills in favour of the experimental group.

3. There would be a statistically significant mean difference between the experimental and control groups posttest mean scores of inferential reading comprehension skills in favour of the experimental group.

4. There would be a statistically significant mean difference between the experimental and control groups posttest mean scores of critical reading comprehension skills in favour of the experimental group.

The above hypotheses will be examined on the 0.01 significance level.

**Study Delimitations**

This study is delimited to:

1. First year Language Secondary School students of Sadiq El Rafeay Language School, Tanta, Egypt
2. Enhancing reading comprehension in relation to the three skills of comprehension (literal, inferential and critical) through linguistic, formal and cultural schemata-building activities.
3. One academic term.

**Literature Review**

Relevant literature to the study variables is presented in the following section. To be specific, the major concepts and underpinnings of both schema-building and reading comprehension will be presented.

**Definition and Nature of Schema**

A schema is abstract cognitive constructs of the prior knowledge gained through experiences where knowledge is processed, stored and activated in one’s mind (Al Salmi, 2011; Hui, 2005). Schemata (plural of schema) are packets of information stored in memory representing general knowledge about objects, situations, events or actions. The whole lot of experiences acquired
in life no matter how they came about, form the reader’s schemata (Bransford, 2004). Furthermore, schemata state that knowledge stored in our minds is well-organized rather than randomly organized. Finally, schemata provide the mental scaffolding that readers use to make sense of incoming information and trigger the cues used in the systematic searching of memory when the information must be recalled (Alshammari, 2017).

Generally, schemata are activated in one of two ways: 1) New information from the outside world can be cognitively received and related to already known information stored in the memory through retrieval or remembering. Thus, new concepts are built into existing schemata that can be modified or extended. 2) New information can be represented by a new mental structure. In other words, in the absence of already existing schemata, new knowledge builds up new schemata (Alhaisoni, 2017).

**Types of Schemata**
Generally, there are three major types of schemata; linguistic schemata, formal schemata and cultural schemata.

**Linguistic Schemata**
Linguistic schemata refer to readers’ existing language proficiency in vocabulary, grammar and idioms. They are the foundation of other schemata (Xiao-hui, Jun, & Wei-hua, 2007).

**Formal Schemata**
Formal schemata are the organisational forms and rhetorical structures of written texts. They include knowledge of different text types and genres, and also include the knowledge that different types of texts use text organisation, language structures, vocabulary, grammar and level of formality differently (Zhao & Zhu, 2012).

**Cultural Schemata**
Cultural schemata refer to the background knowledge of the content area of a text or the topic a text talks about; topic familiarity and previous experience with a particular field which is the key to
comprehend texts. Cultural schemata help readers to relate what is being read to their socio-cultural settings (Agwu, 2011).

**Schema Building Activities**

Schema building includes pre-reading activities, while-reading activities and post-reading activities (Alyousef, 2006; Gilakjani & Ahmadi, 2011). Pre-reading activities, which Chia (2001) called enabling activities, are supposed to prepare readers for reading and to motivate them to read. Teachers can build students’ schemata before reading a text through appropriate pre-reading activities such as setting purpose for reading, building text-specific knowledge, pre-teaching of key vocabulary, and making predictions (Chen, 2003). By asking questions at the pre-reading stage, teachers can create an active classroom atmosphere and arouse students’ reading interest which makes them prone to using their previous knowledge (Zhao & Zhu, 2012). Moreover, teachers should provide their students with the appropriate schemata that they lack, and also help them build a bridge between their existing and new knowledge (Abraham, 2002).

More suggested activities used in the reading classrooms to build students’ prior knowledge are: Brainstorming (giving the class a particular key word or key concept, a newspaper headline or book title), previewing, class discussion about the topic, semantic mapping, advance organizers, anticipation guide, audiovisual aids, linking the topic to students’ culture, and Know-Want to Know-Learned (KWL) chart (Ajideh, 2006; Alhaisoni, 2017; Alshammari, 2017; Labiod, 2007; Rao, 2007; Shen, 2008). Students can also be given topics to search out, i.e. on the web, and then discuss the topics in the class as part of the pre-reading activity. This helps to ignite the students’ prior knowledge thereby enhancing their schema (Bransford, 2004).
While reading, teacher’s guidance and peer discussions are effective on-class activities which benefit the development of students' reading abilities. Teachers should cultivate students' prediction skills in order to make students experience how the schema plays a predictive part. It is not necessary for readers to predict all the details. The point is that prediction can guide readers to find the key information and detect the interferential details; therefore, it is very possible that their reading speed increase (Alyousef, 2006; Erten & Karakaş, 2007). In many cases, authors make omissions which they assume readers understand. More often, authors' intentions can only be found between the lines. This requires students develop their ability to infer information from the text. To achieve this, class discussions serve as an effective technique to discover more about what students bring to their reading.

Finally, it is necessary to do the post-reading activities to consolidate and expand students' schemata. Outlining and summarization are effective in this stage to check students’ comprehension. Outlining helps students understand the text organization which aids students to predict how the information is developed in the passage. Also, students can summarize a passage with their own words at the end of the reading session. This can allow students detect the crucial details and the subordinate ones. At the same time they will keep a clear idea about the overall structure of the text (Zhao & Zhu, 2012). Thus, schema promotes students' reading interest and boosts their reading speed. It can also enable students fulfill their tasks more successfully as it has an important impact on reading comprehension.
Reading Comprehension

Reading is best considered as an interactive process between the reader and the text in a sociocultural context where the reader reconstructs the text information based on the knowledge drawn from both the text and the prior knowledge available to the reader. Reading as an interactive process refers to the interaction of many component skills potentially in a simultaneous operation; the interaction of some cognitive skills leads to fluent reading comprehension. Generally, reading includes both low-level rapid automatic identification skills and high-level comprehension or interpretation skills (Gilakjani & Ahmadi, 2011).

Facilitating EFL learners’ deep and adequate understanding of the written language necessitates teaching them the reading comprehension skills that comprises reading proficiency. However, there are different factors influencing the reading comprehension performance of students. Some of these are metacognitive awareness, knowledge of grammar, syntactic knowledge (Koda, 2005), students’ reading attitudes or motivation, breadth and depth of engagement in reading, effective instruction on comprehension techniques, rich world knowledge, fluency, text genre, and awareness of different reading strategies (Trehearne & Doctorow, 2005). In addition, sensitivity to text structure, inference making, comprehension monitoring (Perfetti et al., 2004), socio economic factors in the family, collaboration of a student and family, student’s reading outside the school, and student’s reading at school emerged as significant factors affecting comprehension (Geske & Ozola, 2008).

Therefore, it can be concluded that reading comprehension is not by any means an easy task or process for EFL students. It has many factors that affect students’ performance and determine their success or failure in understanding the message of the texts they are reading. Thus, students have to be patient, welling to learn, exert
effort, carry out different tasks, participate in various activities and cooperate with their classmates or colleagues and teachers to achieve this ultimate goal of reading comprehension.

Reading Comprehension Skills

An analysis of the various taxonomies tackling reading comprehension skills (Brassell & Rasinski, 2008; Hudson, 2007; Koda, 2005; Paz, 2018; Saadatnia et al., 2016) reveals three underlying skills: Literal comprehension, inferential or interpretive comprehension and critical comprehension. According to these taxonomies, while literal comprehension focuses on decoding explicit information from the text by recognizing or recalling of its details, inferential skills include the use of these details for analyzing, synthesizing and classifying the text-based information to help the reader access additional information by mapping the text. At the higher levels of cognitive processes (critical comprehension), anticipations and hypotheses are inferred by the reader beyond the explicit meaning and opinions are formed about the quality and accuracy of the text (Ismail et al., 2015). Readers use parts of all these skills to some extent beginning with an understanding of the literal meaning of the text and go beyond this to develop an understanding of the context in which the passage was written, its genre, its purpose, and its relationship to other knowledge about the world and the specific situation addressed in the text.

All in all, the relationship between prior knowledge and reading is obviously reciprocal. Prior knowledge enhances comprehension by enabling readers to comprehend the text better, to make connections, to predict, and to develop inferences as they are reading. The reading comprehension process is guided by the principle that every input is mapped against some existing schema and that all aspects of that schema must be compatible with the input
information (Zhao & Zhu, 2012). When students become familiar with the topic of the text they are reading (content schema), understand the discourse level and structure of text genres (formal schema) and skillful in decoding the features needed to identify words and realize how they fit together in a sentence (language schema), they are well prepared for comprehension to take place in reading (Pulido 2004; Shen 2008). In any reading process, it is expected that the reader relates the new information with his/her schemata for comprehension to take place. Thus, schema importance in reading comprehension cannot be overstated.

Method
Participants

Participants in the present study were first year Language Secondary School students. Two intact classes at El Rafeay Language School in Tanta, El-Gharbia Governorate were assigned at random to an experimental group and a control group, 35 students each. Students of the experimental group were 19 males and 16 females while the control group were 20 males and 15 females. The students of both groups have been studying English for almost eleven years. The age of those students ranged from 15 to 16 years.

Design of the Study

The present study is a quasi-experimental one including an experimental group and a control group. A pre-test and a post-test were administered before and after the experiment.

Instruments

The Pre- and Post- Reading Tests

Two parallel reading test forms were prepared by the researcher to evaluate students’ performance. Each test form included three reading passages followed by closed questions to assess students’ literal, inferential and critical reading skills. The topics of the reading passages were chosen on the basis of the
students' familiarity with the topics and the linguistic difficulty and length. One test form was administered as a pre-test and the other as a post-test for both the control and experimental groups in the first term of the school year (2021/2022).

The Treatment

The treatment lasted for 12 weeks. It consisted of 15 lessons, 30 sessions, (45) minutes each. Students were asked to read a new topic every lesson. Then, formative assessment techniques were used to evaluate students’ gained knowledge after finishing each reading task and throughout the treatment. The researcher as an English teacher provided direct instruction, modeling, guidance, and face-to-face assistance to maintain students' active participation and interactions in the reading classes.

Based on intensive reviewing of the literature, especially related studies that dealt with various instructional models (e.g. El-Esery & Radwan, 2015; Salameh et al., 2019; Walqui, 2006; Xu, 2015), the following model was developed to build and activate Language Secondary School students’ background knowledge to enhance their reading comprehension. This instructional model was applied in each reading session and consisted of four main stages as follows:

1. **Introductory stage**: The teacher engaged students in a number of pre-reading activities (e.g. brainstorming, questioning, discussions, etc.) and used some interactive materials (posters, maps, charts, drawings, Powerpoint presentations, videos, etc.) to show students examples of how they recall stored information to cope with the three types of schemata. This enabled students to notice where and when they were missing some information. Also, students realized the gaps that they needed to fill related to certain topics.
2. **Instructional guidance stage**: The teacher guided and trained students on using their background knowledge to build and activate each type of schemata. The teacher used models, e.g. connection sheets, to show students how to link their previous knowledge to the new learning situations. Then, students decided the connection between them and the texts they were about to read. For example, from where you got this information; from personal situations, from other books, or generally from the real world (e.g. newspaper/TV).

3. **Practice stage**: Students used the reading passages in their textbooks to apply what they had learned in the guidance stage. They built and activated their background knowledge in the while reading and post reading phases using a number of activities in each phase (e.g. checking prediction and finding answers to questions while reading, retelling and summarizing information after reading, etc.). Also, students kept answering the connection sheet whenever they found any new connections while reading.

4. **Assessment stage**: The teacher used both formative and summative assessments to check students’ comprehension. Formative assessment assisted students to get comments and feedback from their classmates and the teacher. Students exchanged their points of view related to the activities and the process of using their background knowledge in comprehending reading passages. In addition, students discussed with each other and with the teacher the benefits of building and activating their background knowledge as well as the difficulties they met and how they managed to overcome them. This enabled students to assess their strengths and helped the teacher gain insights on how to modify or change the way of instruction and the activities used in teaching reading.

Examples of formative assessment were reflection sheets, class discussions, teacher-student dialogues, self- and peer-assessments, quizzes, presentations, etc. On the other hand,
the purpose of summative assessment was to evaluate student’s achievements by assigning grades. It focused on the learning outcomes rather than the process of learning. Examples of summative assessments were end-of-unit or chapter tests, final projects or papers and scores used for accountability for schools and students.

Some of the schema activities were done individually to give participants the chance to feel autonomous and responsible for their own learning. Furthermore, some other cooperative and interactive activities were performed in pairs or teams to consolidate the concept of group learning.

Results

By the end of the treatment, the experimental and control students’ posttest scores were analyzed and compared using the independent samples t-test. Table 1 presents t-test data.

**Table 1.** The *t*-values of the participants on the posttest of the reading comprehension skills

<table>
<thead>
<tr>
<th>Reading comprehension skills</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>df.</th>
<th>t</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall reading comprehension</td>
<td>Exp.</td>
<td>35</td>
<td>24.00</td>
<td>1.766</td>
<td>68</td>
<td>13.090</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Con.</td>
<td>35</td>
<td>16.37</td>
<td>2.961</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literal level</td>
<td>Exp.</td>
<td>35</td>
<td>9.91</td>
<td>0.284</td>
<td>68</td>
<td>5.890</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Con.</td>
<td>35</td>
<td>8.89</td>
<td>0.993</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inferential level</td>
<td>Exp.</td>
<td>35</td>
<td>6.91</td>
<td>0.853</td>
<td>68</td>
<td>7.669</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Con.</td>
<td>35</td>
<td>4.77</td>
<td>1.416</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critical level</td>
<td>Exp.</td>
<td>35</td>
<td>7.17</td>
<td>1.485</td>
<td>68</td>
<td>12.385</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Con.</td>
<td>35</td>
<td>2.71</td>
<td>1.526</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As shown in Table (1), results of the independent samples t-test reveal that there was a statistically significant difference between the experimental and control groups’ mean scores on the overall reading comprehension posttest and its sub-skills (i.e., literal, inferential and critical comprehension skills) in favor of the experimental group. This shows that schema-building activities positively affected students’ reading comprehension.

Relevant interpretations of these findings are offered in the next section.

**Discussion**

As indicated above, schema-building activities yielded significant effects on students’ overall reading comprehension and its sub-skills: Literal, inferential, and critical skills. These differences are illustrated in figure (1).
Figure 1. Participants’ mean scores on the posttest of the overall reading comprehension and its sub-skills

These findings are in line with those of Che (2014), Mohammed (2018), Lailiyah, Wediyantoro and Yustisia (2019) and Cho and Ma (2020) who reported that fostering text comprehension with the use of students’ prior knowledge mainly by asking questions before, during and after reading provided students with the knowledge they lacked and enabled them to comprehend EFL reading passages better.

Likewise, the experimental group students’ progress in their abilities to identify the main idea of the reading passages, read for specific information and sequence events (literal comprehension skills) agrees with Gürkan’s (2012) who stated that the use of pre-reading activities (brainstorming, pre-questioning, scanning, skimming, clarifying, asking and answering questions) facilitated for better literal understanding of the original texts.

Besides, results of the study showed significant improvement in all inferential reading skills: Inferring meaning of unknown words, inferring reference of pronouns, identifying cause and effect relationship, comparing and contrasting ideas, and predicting outcomes. This finding is consistent with Al Adl’s (2008) who used previewing, prediction and questioning to improve EFL students’ inferential skills. These activities enabled students to achieve sufficient competence to comprehend the implied meanings of the narrative texts.

Finally, the results showed that schema activities were effective in enhancing students’ critical comprehension skills: Distinguishing facts and opinions, forming judgments and evaluation, and identifying the author’s purpose. This finding is in harmony with Mohamed’s (2002) who recommended that teachers
should motivate students to use their schemata and ask questions about the reading passages through using pictures, titles, subheadings and so on as a means of developing students’ critical reading skills. In addition, Tseng (2017) concluded that reading various authentic texts, viewing movies and video clips, discussing in groups, and accomplishing a group project were beneficial in enhancing critical thinking and boosting confidence in the target language use as was reported by the learners.

Therefore, it can be concluded that students’ improvement in reading comprehension may be attributed to participating in pre, while and post reading activities as well as connecting students’ background knowledge with the reading passages. In addition, students’ reflection on their learning and assessment of their comprehension of the discussed topics enabled them to figure out the gap(s) in their knowledge and work on their weaknesses. Furthermore, the use of online authentic material, the cooperative learning environment, students' positive attitudes towards schema activities, the supportive role of the researcher and the choice of relevant and interesting topics played a vital role in the current study results. Thus, students' sense of accomplishment and ownership increased and the level of their comprehension improved.

**Recommendations**

Based on the findings of the present study, several recommendations are offered. Most importantly, schema activities are recommended as they make the reading text more meaningful by connecting the reader’s prior knowledge with the new concepts. In addition, schema activities like making prediction, note-taking, inferring information, analysing and synthesising the text and summarizing enable readers to develop their higher order and critical thinking skills. Moreover, more professional development
through in-service teachers’ training is needed to assist teachers successfully implement a variety of background knowledge activities. Besides, students are recommended to read extensively on a variety of topics to build their global prior knowledge. This will be reflected in their abilities to recall information easily from their background knowledge and to make connections between their personal experiences and the new information in the reading passages.

Furthermore, students should be encouraged to reflect on their learning process as this helps self-assessment. When students are trained to continually reflect on their learning, they become autonomous learners who know their strengths and evaluate their missing knowledge. This in return gives them a sense of ownership and accomplishment. Finally, curriculum designers should take into consideration that the application of interactive schema activities is vital to develop students’ cognitive, social and affective skills. Therefore, incorporating thought-provoking topics in the English curriculum and assigning thorough time to connect the new information with students’ previous background knowledge may enhance students’ higher order thinking skills and achieve their academic success.
References


