

---

Open Access Article

### Impact of Reading Strategies on Reading Comprehension among Students of ESL at a School in Dubai, UAE: Moderated Mediation Regression Model\*

Sheeba Jojo, Varghese Kizhakkacharuvil John, Chanintorn J. NuKoon

*Assumption University, Bangkok, Thailand*

*Received: March 13, 2022 ▪ Reviewed: May 7, 2022*

*▪ Accepted: June 5, 2022 ▪ Published: July 29, 2022*

#### Abstract:

The purpose of the study was to determine the relationship between reading strategies and the Lexile score of the online reading comprehension program 'Literacy Pro'. This would give a clear insight into the impact of the reading strategies on reading comprehension. It was hypothesized that the reading strategies adopted by students and the same recommended by the teachers have a positive intervening effect on student Lexile scores. The findings of the study were not completely supportive as hypothesized. The moderated mediation regression results are not reflecting any significant improvement in the Lexile score of students through the intervention of reading strategies adopted by the students, and training imparted to that effect by the teachers shows no major disparity. Reading comprehension is the product of multiple skills and knowledge sources, and the struggling readers often experience difficulty in multiple reading skills. 'Literacy Pro' is a multi-component online reading skill development program. Skills such as word identification, vocabulary knowledge, reading fluency, literal meaning, inferential meaning and expertise in grammar are necessary to construct the meaning of a text. Further research in these areas will provide clear insights into how reading comprehension may effectively be improved. This paper throws light on improving the sub skills of reading by focusing on reading strategies before, while and after a reading exercise. It further explores how the realm of technology may be effectively used to leverage reading comprehension skills. In the wake of advancement in the use of mobile technology in education, the same may be explored to enhance reading comprehension in a more interesting and entertaining manner for students.

**Keywords:** ESL, Literacy Pro, moderated mediation, online reading, reading comprehension.

阅读策略对阿联酋迪拜一所学校ESL学生阅读理解的影响：调解回归模型

---

\* The materials have been previously published by the authors: <https://www.researchpublish.com/upload/book/Reading%20Strategies-01042022-19.pdf>

This article is an open-access article distributed under the terms and conditions of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>)

## 摘要:

该研究的目的是确定阅读策略与在线阅读理解计划“扫盲计划”的[医]词典分数之间的关系。这将清楚地了解阅读策略对阅读理解的影响。假设学生采用的阅读策略和教师推荐的阅读策略对学生词汇成绩有积极的干预作用。该研究的结果并不像假设的那样完全支持。调解回归结果并没有反映出通过学生采用的阅读策略的干预,学生的词汇评分有任何显著的提高,教师给予的训练也没有显著的差异。阅读理解是多种技能和知识来源的产物,苦苦挣扎的读者往往在多种阅读技能中遇到困难。“扫盲专业”是一个多组成部分的在线阅读技能发展计划。单词识别、词汇知识、阅读流畅性、字面意义、推理意义和语法专业知识等技能是构建文本含义所必需的。这些领域的进一步研究将为如何有效地提高阅读理解能力提供清晰的见解。本文通过关注阅读练习前后的阅读策略来提高阅读的子技能。它进一步探讨了如何有效地利用技术领域来利用阅读理解技能。随着流动科技在教育方面的应用不断发展,我们亦会探讨如何以更有趣和有趣的方式提高学生的阅读理解能力。

**关键词:** ESL, 识字专业, 主持调解, 在线阅读, 阅读理解.

## 1. Introduction

All schools in the United Arab Emirates (U.A.E) are expected to show progress and attainment with respect to student achievement, as mandated by the U.A.E Vision 2021 National Agenda Parameters in Education. The Agenda emphasizes the development of a first-rate education system. According to Richmond (1980), reading literacy programs are considered as crucial to survival both at the individual and national level, so is the case in the U.A.E too. According to U.A.E's National Agenda for 2021, U.A.E is working toward earning itself a position among the highest performing countries in the PISA (Program for International Student Assessment) and among the highest performing countries in the world for TIMSS (Trends in International Mathematics and Science). It has been ascertained that reading comprehension plays a key role in student performance (Masrupi et al., 2020). Hence, schools have been advised to institute reading programs to ensure students' progress in benchmark examinations. Reading Literacy is also closely scrutinized during school audits. In addition to traditional paper-based reading programs, many schools have experimented with online reading literacy programs as a solution to effectively implement inclusive reading programs for all. Intervention might be easier when using an online reading program as all students in a particular grade or at a particular age may not be at the same reading level.

This study aimed to investigate how, in the context of a school in the UAE, an online reading program called 'Literacy Pro' impacts developing students' reading comprehension skills. Furthermore, the study focused on the effectiveness of facilitating personalized reading through an online platform aimed at improving Reading Literacy of individual students based on their Lexile levels (Lexile score is generated by Literacy Pro while students are doing their exercises). Furthermore, it

discussed the impact of reading strategies taught by teachers and those employed by students when engaged in a reading comprehension task. This study explored the possibility of developing/enhancing a digital tool to facilitate better reading comprehension. The research also attempted to address the gap in literature from the U.A.E context regarding how the effectiveness of an online reading literacy program delivered through an online platform can be scaled up. The research additionally throws light on developing robust online reading programs, aimed at improving reading literacy among students as academic performance and achievement are to a large extent dependent on a student's ability to read and comprehend.

This research is significant and intended to help curriculum designers, policy makers, school students, and school teachers. This will in turn help all stakeholders to analyze and evaluate the potential of online reading literacy programs in enabling and improving the standards of Reading Literacy in the U.A.E.

It will also aid educators in defining the right strategies and approaches to train students to read effectively. Subsequently, the data collected and presented during this research may be used as reference to design and develop cheaper, effective online reading literacy courses/tools for schools to enhance the reading skills of students.

## 2. Literature Review

This study is based on earlier research that establishes a link between Reading Literacy skills and student performance in all academic disciplines (Brock, 2013). According to Auphan et al. (2019), effective reading comprehension is the result of a good reading program that can identify students who are at risk in reading. Ho and Lau (2018) promoted the benefits of establishing a positive reading climate and developing good reading habits that may be sustained for future development. Poor reading habits often prove damaging to an individual's

academic output and in turn hamper future prospects of study and career (Ameyaw & Anto, 2018).

### **2.1. Strategies for Teaching Reading Comprehension**

Strategies for teaching reading are the processes used for transferring knowledge to get good reading comprehension and understanding of a text to achieve the goals of the learning process (Muslaini, 2017). SQ3R is a strategy that focuses on surveying prior reading, generating questions, reading to answer those questions, reciting and reviewing information (Huber, 2004). SQ4R is a strategy that employs surveying, questioning, reading, recording, reciting and reviewing of information during a reading comprehension exercise (Yakupoglu, 2012). PQ4R is a revised form of the SQ4R strategy where-in the process of reading involves previewing, questioning, reading, reflecting, reciting and reviewing (Sarimanah, 2016).

### **2.2. Strategies for Effective Reading**

Tavakoli and Koosha (2016) state that proficiency in reading improves with regular instruction of reading strategies. The same idea is further supported by studies of Okkinga et al. (2021) who claim the positive effects of strategy use while practicing reading comprehension. Good readers employ a combination of reading strategies as opposed to underachieving readers (Shih & Reynolds, 2018). Reading comprehension is seen to improve drastically in response to extensive reading coupled with the use of integrated reading strategies (Shih et al., 2018). However, Jaekel (2020) states some proficient readers might have mastered certain reading strategies that work for them but are oblivious about their use as they are not employing them consciously and thus may not report it in a research questionnaire or interview. Research findings by Wu et al. (2021) imply that students who struggle with reading may be supported with reading strategy instruction that involves autonomous reading motivation (ARM) and metacognitive awareness of reading strategies (MARS). However, a contrasting opinion has been put forward by Choi and Zhang (2021) who say that students' knowledge of vocabulary and grammar may enable them to read well to the exclusion of the effect of reading strategies. Also, Shinozuka et al. (2017) found no significant change in student motivation after a three-month reading strategy instruction exercise.

### **2.3. Research Hypotheses**

The main outcome of the literature review is that students must learn to use various effective reading strategies to comprehend foreign language texts and that higher-proficiency students can use them most effectively. Most of these studies establish a close relationship between language proficiency, attitude to reading and the employment of reading strategies in the samples investigated (Habók & Magyar, 2019; Norouzian &

Mehdizadeh, 2013). Norouzian and Mehdizadeh (2013) classified the strategies into three: pre-reading, while-reading, and post-reading. The same structure was used in this study to measure the reading strategies used by the students while improving the reading literacy through the online literacy program. Hence, the three hypotheses,

*H01:* The online reading program is not significantly effective in developing a 'pre-reading strategy' for improving the reading comprehension skill of the students.

*Ha1:* The online reading program is significantly effective in developing a 'pre-reading strategy' for improving the reading comprehension skill of the students.

*H02:* The online reading program is not significantly effective in developing a 'while-reading' strategy for improving the reading comprehension skill of the students.

*Ha2:* The online reading program is significantly effective in developing a 'while-reading' strategy for improving the reading comprehension skill of the students.

*H03:* The online reading program is not significantly effective in developing a 'post-reading strategy' for improving the reading comprehension skill of the students.

*Ha3:* The online reading program is significantly effective in developing a 'post-reading strategy' for improving the reading comprehension skill of the students.

The teachers are the mediators between the online literacy program and the students in their online training of the 'Literacy Pro', a program which was widely adopted in many international schools. The teachers' role is to promote a learning environment that allows students to work on their strategies, train them to identify these strategies and assist their autonomy (Oxford, 1989). Hence, the hypothesis H04:

*H04:* The training provided by the teachers to assist the students in improving reading skills through the online reading program is not significantly effective in implementing the reading strategies and therefore cannot enhance the reading comprehension skills of the students.

*Ha4:* The training provided by the teachers to assist the students in improving reading skills through the online reading program is significantly effective in implementing the reading strategies and therefore could enhance the reading comprehension skills of the students.

The ultimate impact of adopting suitable reading strategies by the students will improve their reading skills and comprehension. Hence, the hypotheses:

*H05:* The reading strategies adopted by the students do not have a significant impact on improving the reading skills or reading comprehension.

*Ha5:* The reading strategies adopted by the students have a significant impact on improving the reading skills

or reading comprehension.

## 2.4. Conceptual Framework

The reading strategies adopted by students is a combination of three sub-strategies (pre-reading, while-reading, and post-reading) and the training given by teachers to each one of these sub-strategies. The Lexile scores (the scores of Literacy Pro) are assigned to the students at the beginning (Lexile score 1) and at the end (Lexile score 2) by the online reading program 'Literacy

pro' exercise. There would be a gap of 6 months between the two scores. The students are undergoing the training and doing the exercises in the meantime. Therefore, it has been hypothesized that the students' Lexile score 2 depends on Students' reading strategies and the training imparted by teachers to that effect. Hence, 'reading strategies adopted by students are a mediating variable, and 'training given by teachers' has a moderating effect on the mediating variable (Figure 1).

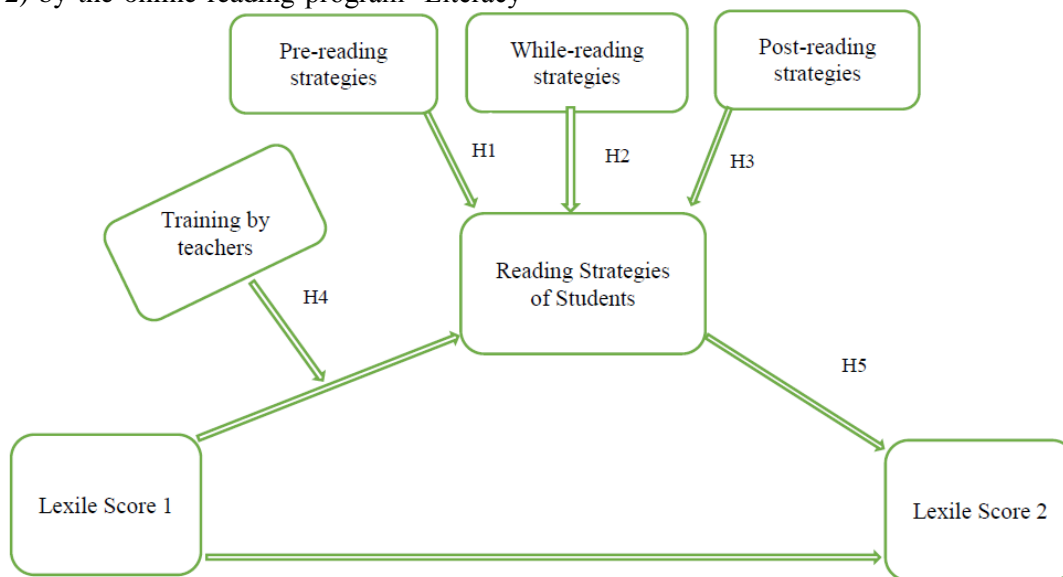


Figure 1. Conceptual framework of the study

## 2.5. Research Design

The study was conducted at the Indian International School in Dubai. The online reading literacy program 'Literacy Pro' has been implemented in the school since 2019. Currently, the students of Grades VII and X are doing this program. The study was conducted during the academic year 2020–21 in the first 6 months, from October to March. A large majority of students belong to the same nationality and therefore a simple random sampling shall be used to obtain a representative sample of the population. The effectiveness of the program was measured using two surveys: one was conducted among the students to measure the extent to which the reading strategies are adopted by the students for improving the reading comprehension skill and the other among the teachers to measure the strategies recommended to the students. The same survey instrument was used for both students and teachers with a difference in the wordings of the response scale.

## 2.6. Population and Sample

In the academic year 2019–2020, students of Grades V and VIII were enrolled in the online reading program Literacy Pro from October through March. In the following academic year, 2020–2021 the same cohort of students moved to the next grades – Grades VI and IX.

Currently, in the academic year 2021–2022, these students are in Grades VII and X, respectively. Thus, the target population was 1519 students spread across Grades VII and X. Grade VII had 23 sections with 35–38 students in each one and Grade X had 20 sections with 31–38 students in each one. The subpopulation in each of the two grades was: Grade VII – 823 and Grade X – 696. The sample size for effective research that is a fair representation of the target population was determined using the Krejcie and Morgan sample size. The numbers of students from each grade that participated in this study are given in Table 1. It is a girls' school from Grades 5 upwards. The respondents are all Indian expat girl students studying in a school in Dubai, UAE that follows the Indian, CBSE curriculum. The medium of instruction is English and all students are second language users of the English language.

Table 1. Sample size and target population

Grades	Population	Sample size
Grade VII	823	288
Grade X	696	249
Total	1519	537

The teachers are those who are engaged with the students selected in the sample for assisting them in their English reading comprehension through 'Literacy Pro',

and their size is 58.

## 2.7. Research Instrument

The survey was conducted through a pre-validated research instrument used in a previous study by Norouzian and Mehdizadeh (2013) comprising four parts: 1. General Reading Behavior (2 items), 2. Pre-Reading (7 items), While-Reading (15 items), and Post-Reading (8 items). In this study, the first part of the questionnaire was excluded. Hence, there are 30 items for the 3 variables in this study. The response from the students was received on a 5-point Likert scale defined as 'never or almost never used' (1), 'generally not used' (2), 'sometimes used' (3), 'usually used' (4), and 'always or almost used' (5).

The same instrument was used among the teachers to record the recommendations of the teachers regarding reading strategies. Hence, the 5-point Likert scale was never or almost never recommended (1), generally not recommended (2), sometimes recommended (3), usually recommended (4), and always or almost recommended (5). In the survey instrument, three items (Item No. 9, 17, and 19) are negative statements, and, therefore, the scores of those items are reversed for mean and data analysis (Table 2).

Table 2. The survey instrument

<b>I Pre-Reading: Before reading a text in English, I do the following</b>					
1	I read the topic or heading of the text	1	2	3	4 5
2	I look at the pictures or graphs of the text				
3	I think about the reasons why I am reading the text				
4	I read the first sentence of the text				
5	I try to predict what the text will be about				
6	I ask myself about the author's purpose in writing the text				
7	I read the provided questions (if any) before I read the text				
<b>II While reading a text in English, I do the following</b>					
8	I read the whole text quickly to understand the main idea				
9	I translate the sentences into my native language for the main idea of the text				
10	I check my predictions about the text while reading				
11	I use the vocabulary and structure to help me understand the main idea of the text				
12	I must understand every word in the text to get the main idea				
13	I split (break) sentences into phrases or words for my understanding of the text				
14	I take notes, highlight or underline the important points while I am reading the text				
15	I use my background (world) knowledge to help me understand the text				
16	I scan (read quickly) for the answers to some questions provided with reading				
17	I skip words if I don't know the meaning				
18	I assume the meaning of some words from the context clues				

Continuation of Table 2

19	I use a bi-lingual dictionary (translating from English to my native language) whenever I should get the meaning of an unknown word
20	I use an English-English dictionary if I should know the meaning of an unknown word.
21	I predict what will happen next while reading
22	I read the text in detail
<b>III Post-Reading (After reading), I do the following</b>	
23	I make inferences after reading the text
24	I summarize the text after I finish reading it
25	I discuss what I understand with my friends or teacher
26	I go back to read the details of the text for the answers to understand questions on it
27	I use a dictionary after I understand the main idea of the text
28	I take notes on all new words and phrases for my vocabulary bank
29	I apply the knowledge from some text in my everyday activities
30	I give myself a reward when I have finished

## 2.8. Descriptive Analysis of Student and Teacher Survey Data

The descriptive statistics tables for Grades VII and X suggest that, on a scale of 1–5, the mean score of all 'pre-reading strategies' for both grades is greater than 3; the students either 'always/almost' or 'usually' apply the pre-reading strategies before reading a text with a mean score of 4.08 for grade VII and 4.03 for grade X, which are almost similar. The highest score is for Item No. 1 (4.76 for Gr. VII and Gr. X) that indicates that almost all students read the title or heading of the text and try to understand the key idea of the text. The lowest score is for Item No. 6 (3.48 and 3.29 for Gr. VII and Gr. X, respectively) which shows that the students have a lower aptitude for self-evaluating the article.

Figure 2 shows that the items in the pre-reading strategy for both grades VII and X show the same pattern of movement, which states that the students in the sample have the same opinion regarding pre-reading strategies, irrespective of their age group or the grade in which they study.

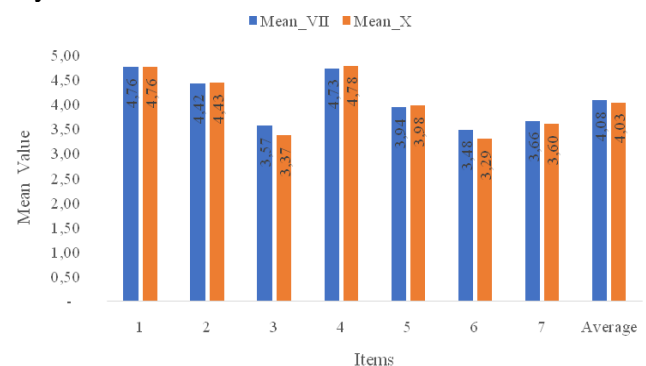


Figure 2. Comparison of mean between Gr. VII and Gr. X – pre-reading strategy



The descriptive statistics tables for Grades VII and X suggest that, on a scale of 1–5, the mean score of ‘while-reading strategies’ for both grades is greater than 3; the students ‘usually’ apply the ‘while-reading strategies’ when reading a text. The mean scores of items 9, 17, and 19 for Grade VII, which are negative statements (the scores were reversed for calculating the mean score of the variable ‘while-reading strategy’), are as expected, but it is not the same for Grade X for item No. 17. The highest score is for Item No. 22 (4.49 for both Gr. VII and Gr. X), which indicates that almost all students read the text in detail and comprehend the main idea of the text.

Figure 3 shows that the items in the ‘while-reading strategy’ for both grades VII and X show the same pattern of movement, which states that the students in the sample have the same opinion regarding while-reading strategies, irrespective of their age group or the grade in which they study.

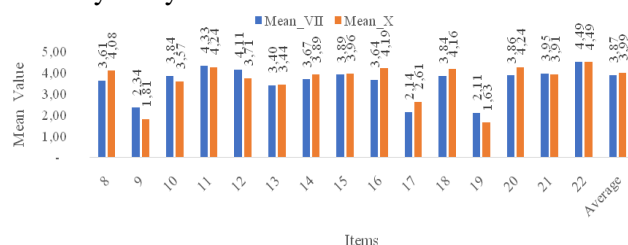


Figure 3. Comparison of mean between Gr. VII and Gr. X – while-reading strategy

The descriptive statistics tables for Grades VII and X suggest that, on a scale of 1–5, the mean score of ‘post-reading strategies’ for both grades is greater than 3; the students ‘usually’ apply the ‘post-reading strategies’ after reading a text in both grades with the mean score of 3.82 for Grade VII and 3.69 for Grade X. The highest score is for Item No. 26 (4.32 and 4.49 for Gr. VII and Gr. X, respectively), which indicates that almost all students go back to read the text in detail to answer the questions on it. The lowest score is for Item No. 27 for Gr. VII (mean = 3.17), which indicates that the students ‘sometimes’ use dictionary to understand the main idea of the text. The lowest score is for Item No. 30 for Gr. X (mean = 2.73), which indicates that the students rarely give a reward for themselves once they finished reading the text.

Figure 4 shows that the items in the ‘post-reading strategy’ for both grades VII and X show the same pattern of movement, which states that the students in the sample have the same opinion regarding post-reading strategies, irrespective of their age group or the grade in which they study.

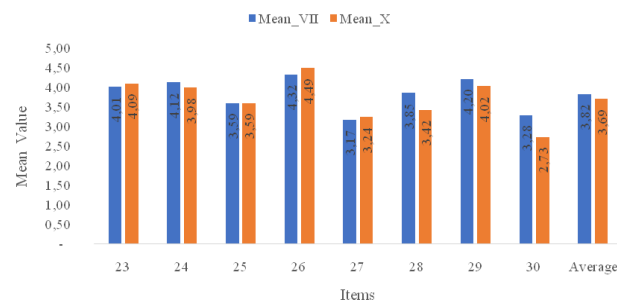


Figure 4. Comparison of mean between Gr. VII and Gr. X – post-reading strategy

The descriptive statistics tables for the teachers’ survey suggest that, on a scale of 1–5, the mean score of all ‘pre-reading strategies’ for teachers is greater than 3; the teachers’ mean score of rating is 4.36, which suggests that teachers ‘always/almost always’ recommend that students use the pre-reading strategies before reading a text. However, students’ mean scores for ratings are slightly lower at 4.06, suggesting that teachers must lay greater stress on the practice of most pre-reading strategies.

A comparison of the mean values of pre-reading strategies (Figure 5) adopted by students (Grade VII and X combined) with the corresponding items recommended by teachers indicates that they are showing almost the same pattern except for items 3, 5, and 6. The above said items of pre-reading strategies are specifically intended for enhancing the analytical capability of the students to understand the theme of the text systematically. The teachers must give more attention to these items to improve the reading skill of the students since their values are much below the expectations of the teachers. However, the overall pre-reading strategies adopted by students and recommended by teachers are in the range of ‘usually’ and ‘almost/always’ respectively.

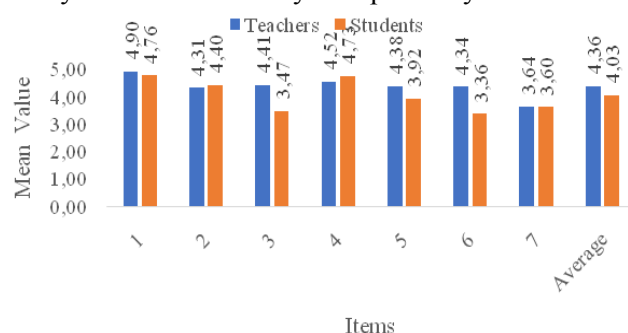


Figure 5. Comparison of mean between teachers and students – pre-reading strategy

The descriptive statistics table for the teachers’ survey suggests that, on a scale of 1–5, the mean score of all ‘while-reading strategies’ for teachers is greater than 3; the teachers mean score of rating is 4.08, which is slightly higher than the mean score of rating given by the students. The mean score of items 9, 17, and 19, which

are negative statements (the scores were reversed for calculating the mean score of the variable while-reading strategy), are as expected.

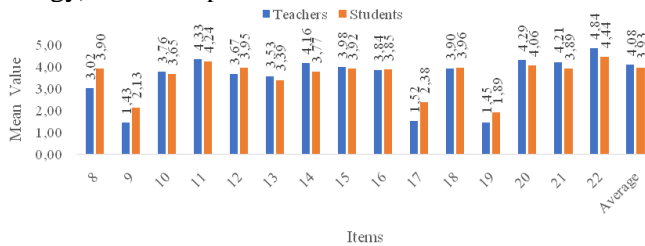


Figure 6. Comparison of mean between teachers and students – while-reading strategy

On comparison of the mean values of while-reading strategies (Figure 6) adopted by students (Grade VII and X combined) with the corresponding items recommended by teachers shows that they are showing almost the same pattern except for items 8, 9, and 17. The teachers must give more attention to these items to improve the reading skill of the students since their values are quite different from the expectations of the teachers. However, the overall while-reading strategies adopted by students and recommended by teachers are in the same range of ‘usually’.

The descriptive statistics tables for the teachers’ survey suggest that, on a scale of 1–5, the mean score of all ‘post-reading strategies’ for teachers is greater than 3; the teachers mean score of rating is 4.30, which is significantly higher than the mean score of rating given by the students and suggests that teachers ‘always’ recommend that students use the post-reading strategies when they read a text.

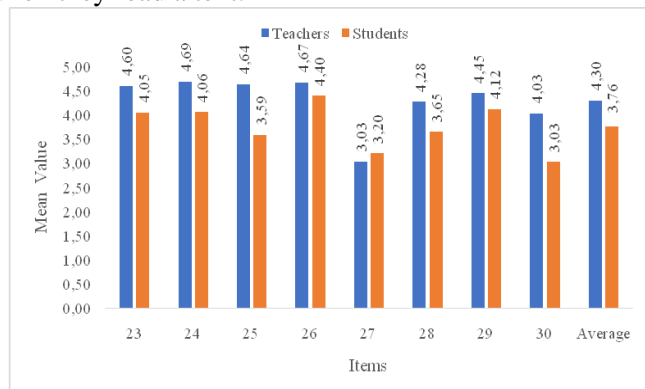


Figure 7. Comparison of mean between teachers and students – post-reading strategy

A comparison of the mean values of the post-reading strategies (Figure 7) adopted by students (Grade VII and X combined) with the corresponding items recommended by teachers shows their wide difference except for Item 26. The teachers must give more attention to these items to improve the reading skill of the students since their values are quite different from the expectations of the teachers. The overall post-reading strategies adopted by students and recommended by teachers are not in the

same range that is ‘almost/always’ for teachers and ‘usually’ for students.

## 2.9. Inferential Statistics

One-sample t-test was conducted using the survey data received from 537 students and 58 teachers to determine trends in the use of pre-reading, while-reading, and post-reading strategies by studying whether the mean of the responses is equal to 3. It was found that, in all three cases, both the students and teachers were significantly on the same page as the mean values were greater than 3, indicating that, for all parameters on the survey, both groups had marked a score greater than 3 on the scale of 1–5. However, a significant variation has been identified in the responses of students and teachers to statements under post-reading strategies. Teachers’ expectations of students regarding post-reading strategies are quite high, which is definitely desirable. However, the mean of student responses suggests that students do not take post-reading strategies too seriously either because: 1) Teachers do not insist on them practicing the post-reading strategies, or 2) Students do not have sufficient time at the end of a reading session to practice post-reading.

Table 3. Descriptive statistics - students and teachers

Groups	Reading Strategies	N	Mean	Std. Deviation	Std. Error Mean
Students	Pre-Reading	537	4.056	0.522	0.023
	While-Reading	537	3.925	0.445	0.019
	Post-Reading	537	3.761	0.683	0.029
Teachers	Pre-Reading	58	4.357	0.435	0.057
	While-Reading	58	4.076	0.439	0.058
	Post-Reading	58	4.300	0.513	0.067

Table 4. Results of one-sample t-test (test value = 3)

Groups	Reading Strategies	T	df	Sig. (2-tailed)	Mean Difference
Students	Pre-Reading	46.87	536	0.000	1.056
	While-Reading	48.19	536	0.000	0.925
	Post-Reading	25.84	536	0.000	0.761
Teachers	Pre-Reading	23.76	57	0.000	1.357
	While-Reading	18.65	57	0.000	1.076
	Post-Reading	19.29	57	0.000	1.300

## 2.10. A Moderated Mediation Regression Model

Statistical mediation and moderation analysis are applied to prove hypotheses H04 and H05. Increasingly, these methods are being integrated in the form of ‘moderated mediation’ or ‘mediated moderation’ or what Hayes and Preacher called ‘conditional process modeling’ (Hayes, 2012). The goal of mediation analysis is to establish the extent to which some commonly recognized causal variable influences some outcome variable through one or more moderator variables. Such a model allows the direct and/or indirect effects of an independent

variable (X) on a dependent (Y) one through one or more mediators (M) to be moderated (W). Such a process is often called moderated mediation. The proposed model gets its output through an application developed by Hayes (2012), called 'PROCESSv3.4', which could be integrated into IBMSPSS. The model number 7 in 'PROCESSv3.4' is selected for the data analysis. The notations and their corresponding variables used in the model are - Independent variable (X) is 'Lexile Score 1', Moderating variable (W) is 'Teachers' Training on Reading Strategies', Mediating variable (M) is 'Students' Adoption of Reading Strategies', and Dependent Variable (Y) is 'Lexile Score 2'.

In statistical form, this model is represented with two linear models, one with M (mediating variable) as the outcome and the other with Y (dependent variable) as the

outcome:

$$M = \alpha_M + b_1X + b_2W + b_3XW + e_M \quad (1)$$

$$Y = \alpha_Y + c_1X + c_2M + e_Y \quad (2)$$

In equation (1),  $\alpha_M$  is the constant,  $b_1$ ,  $b_2$ , and  $b_3$  are coefficients of X, W, and XW, respectively, and  $e_M$  is the error term. In equation (2),  $\alpha_Y$  is the constant,  $c_1$  and  $c_2$  are coefficients of X and M, respectively, and  $e_Y$  is the error term.

### 2.11. Regression Results and Hypothesis Testing

The moderated regression results corresponding to equation (1) are tabulated in Table 5. The results were to prove or disprove the hypotheses H04 and H05. The model is proved as significant at the 5% level since the F-value (3,533) is 2.62,  $p = 0.05$ .

Table 5. Moderated regression results (the Hayes model No. 7)

N = 537		R = 0.1205		
F (3, 533) = 2.62		R-sq = 0.0145		
p = 0.0502		MSE = 1.9466		
Students' Reading Strategies (M)	Coeff.	S.Er.	t-value	p-value
Constant	12.7361	2.041	6.24	0.000
Lexile Score 1 (X)	0.0007	0.0023	0.295	0.768
Teachers' Training on Reading Strategies (W)	(0.1009)	0.16	(0.630)	0.529
Interaction (XW)	0.0000	0.0002	(0.142)	0.887

The explanatory power of the model is very low (R-sq = 0.0145) and there is a positive correlation (R = 0.12) between Students' Reading Strategies (M) and the independent variables. The predictor variable 'Lexile score 1' (X) has no significant direct influence on the predicted variable 'Students' Reading Strategies' (b-value = 0.0007,  $p = 0.768$ ) at the 5% level, similarly, the moderating variable 'Teachers' Training on Reading Strategies' (W) has no significant direct influence on the predicted variable 'Students' Reading Strategies' (b-value = -0.1009,  $p = 0.529$ ) at the 5% level. Hence, the null hypothesis H04 is accepted (The training provided by the teachers to assist the students to improve reading skills through the online reading program 'Literacy Pro' is not

significantly effective in implementing the reading strategies). The interactive effect of 'Lexile score 1 by 'Teachers' training on reading strategies' (XW) has no significant influence on the predicted variable 'Students' reading strategies' (b-value = 0.000,  $p = 0.887$ ), and hence, the null hypothesis H04 is accepted at the 5% level for the target population. Hence, the indirect effect of Teachers' training on reading strategies is not present on the students' reading adoption strategies.

The mediating regression results corresponding to equation (2) are tabulated in Table 6. The results are to prove or disprove Hypothesis H05. The model is proved as significant at less than 1% level since the F-value (2, 534) is 4428.69,  $p < 0.01$ .

Table 6. Mediated regression results (the Hayes model No. 7)

N = 537		R = 0.9712		
F (2, 534) = 4428.69		R-sq = 0.9431		
p = 0.0000		MSE = 5532.91		
Lexile Score 2 (Y)	Coeff.	S.Er.	t-value	p-value
Constant	19.11	27.88	0.6855	0.493
Lexile Score 1 (X)	0.9942	0.0106	93.78	0.000
Students' Reading Strategies (M)	0.8968	2.2998	0.390	0.697

The explanatory power of the model is 94.31 percent (R-sq = 0.9431) and there is a high degree of positive correlation (R = 0.97) between Lexile Score 2 (Y) and the independent variables. The predictor variable 'Lexile Score 1' (X) has a significant direct influence on the predicted variable 'Lexile score 2' (b-value = 0.9942,  $p = 0.000$ ) at less than 1% level, and, the mediating variable

'Students' reading strategies' (M) has no significant direct influence on the predicted variable 'Lexile score 2' (b-value= 0.8968,  $p = 0.697$ ) at less than 5% level. Hence, the indirect effect of 'Lexile score 1'(X) is not significant on 'Lexile score 2' through the mediating variable 'Students' reading strategies' (M). Hence, the null hypothesis H05 is accepted (The reading strategies



adopted by the students do not have significant impact on improving the reading skills or reading comprehension).

### 3. Discussion

Using a simple random sample data from one school and two grades (Grade VII and X), it was hypothesized that the reading strategy interventions play a significant role in improving the reading comprehension of L2 students of English. The hypothesis was partially supported. The survey results on a 5-point scale state that the students have a high positive attitude toward adopting the reading strategies (average score 3.9) and the teachers' recommendations (average score 4.2) for the same were highly positive. There is no mismatch between the strategies adopted by students and those recommended by the concerned teachers, or, in other words, the students' uptake of the strategy was not negative in any case as contrary to the findings of Norouzian and Mehdizadeh (2013). However, the moderated mediation regression results are not reflecting any significant improvement in the Lexile score of students through the intervention of reading strategies adopted by the students and training imparted to that effect by the teachers. Lexile score 2 is exclusively a dependent variable of Lexile score 1, and the intervention of reading strategies adopted by students and the training to that effect by teachers are insignificant as the data analysis proved. The paired t-statistic of Lexile score 1 and Lexile score 2 is statistically significant at less than one percent level with a mean difference score of 24.87 (SD 74.27) between Lexile 1 and Lexile 2. The moderated mediation regression results show that there is only a direct effect of Lexile 1 on Lexile 2 and the beta coefficient is 0.9942 and it is statistically significant at < 0.01 level. Hence, it could be inferred that there are some other intervening causes for the increase in the Lexile scores of students. Among the three reading strategies, students give least priority to post-reading strategies and most priority to pre-reading strategies, and while-reading strategies stand between the two. This might have a serious implication for the reading comprehension score of the students. The technology oriented 'Literacy Pro' is a multi-component reading skill development program. Reading comprehension is the product of multiple skills and knowledge sources, and the struggling readers often experience difficulty in multiple reading skills (Al-Ameedi et al., 2019). The foundational skills, such as word identification, vocabulary knowledge, and reading fluency in addition to strategies, are necessary to construct the meaning of the text and reading comprehension. This study concludes that, as rightly pointed out by Swanson et al. (2014), standardized instructions mediated through electronic media can create additional learning opportunities to the students, and teachers were expected to act as facilitators by monitoring students, promoting text discussions, prompting and

clarifying student responses, providing real-time vocabulary instructions, and extending students' understanding.

### 4. Conclusion

The results of the one sample t-test applied for H4, H5, and H6 proved that the pre-reading, while-reading, and post-reading strategies are being adopted by the students as per the guidelines given by the concerned teachers. Hence, all the reading strategies are highly relevant and useful for online reading skill programs, and there were no mismatches between students' strategy adoption and that of teachers' recommendations, as found in the study of Norouzian and Mehdizadeh (2013). Thus, the conclusion is that there is no major disparity in the use of reading strategies used by the students and those recommended by the teachers.

Moderated mediation regression was applied to test H7 and H8 and proved as not significant at the 5% level. The Lexile score (Lex2) of the students at the end of the intervention program did not significantly improve through the mediation of reading strategies adopted by the students or through the moderation effect of training provided by teachers to that effect. Therefore, it has been concluded that the change in Lexile score 2 from Lexile score 1 is independent of the reading strategies and the recommendations of the teachers. With respect to learning strategies, Richards and Schmidt (2010, p. 331) have implied that there "are ways in which learners attempt to work out the meanings and use of words, grammatical rules and other aspects of the language they are learning". It is also surmised that learning strategies have a direct effect on comprehension and learning (Rubin, 1988). Other researchers have categorized learning strategies as "behavior" and "conscious actions" adopted by learners (Oxford, 1989; Anderson, 2005). Furthermore, many researchers also advocate the benefits of explicit instruction on strategy (Anderson, 2005; Lam, 2009; Rubin & McCoy, 2008). Mohammadi et al. (2015) focus on the effect of teaching learning strategies to learners and its impact on their reading comprehension and have come to the conclusion that "strategy-rich classrooms can enrich the students' beliefs and develop their cognition about language learning." In the research, it may be concluded that though the current research has not found any correlation between teaching reading strategies to learners and its impact on their Lexile score, it may have some effect, which is not captured in moderated mediation regression.

#### 4.1. Findings

The descriptive statistics tables for the students' and teachers' surveys suggest that, on a scale of 1–5, the mean score of 'pre-reading strategy', 'while-reading strategy' and 'post-reading strategy' in both cases is greater than 3, that is, the overall reading strategies

adopted by the students and recommended by the teachers are in the range of 'usually' and 'almost/always' respectively. In a few strands, there is a discrepancy and calls for attention. Hence, it may be concluded that the online reading program 'Literacy Pro' is significantly effective in developing pre-reading, while-reading, and post-reading strategies.

The opinion survey among the students regarding reading strategies shows similar opinions about pre-reading strategies in the subpopulation of Grades VII and X, while there are different opinions on while-reading and post-reading strategies. However, both the groups are on the upper end of the 5-point scale (all the averages are above 3) as far as the reading strategies are concerned.

The analytical skill improvement was given least importance by the students while adopting the while-reading strategies and this must be seriously considered by the teachers to improve the students' reading comprehension. This is particularly important for students who are learning English as a Second Language.

It is imperative for the students to use dictionaries to understand the text and learn the vocabulary. The survey results show that the students use dictionaries only sometimes, and this would definitely reduce their comprehension ability. Therefore, the teachers must initiate the practice of reading with dictionaries among the students to improve their reading skills and comprehension.

Since the expectations of the teachers have been much higher than that of students regarding the post-reading strategies, the teachers must give more emphasis to practice these strategies by the students for improving their reading comprehension.

The teachers' intervention in 'Literacy pro' for implementing reading strategies in general was not so effective in improving the online reading skills and reading comprehension of the students using the program.

The results of the statistical mediation and moderation analysis prove that there is no significant influence of Teachers; training on students' adoption of reading strategies. It is also proved that the reading strategies adopted by students have no significant impact on improving students' reading skills or comprehension.

#### 4.2. Recommendations for Further Studies

Considering the current study, there is much scope for further study in the following areas:

1. To further explore the efficacy of online reading programs to enhance its benefit for students;
2. Strategies to make online reading programs more effective;
3. Strategies that might help readers be self-motivated to read online;
4. What subskill intervention must be a program focus;

5. Identifying subskills that students are weak in and providing strategies for targeted intervention to improve those;

6. The scope and efficacy of mobile apps to improve reading comprehension skills;

7. Emerging trends in learning technologies, including ironing out the challenges of gamification.

As reported by Barzillai and Thomson (2018), the use of digital technology in the classroom has seen exponential growth and children are adept at reading from their digital devices. Özer Şanal (2020) surmises that a marked improvement in reading comprehension was observed with the use of eBooks during his research. This is further supported by Chang et al. (2019) who promoted the idea that eBooks improve student performance in reading. Furthermore, eBooks have increased student interest and willingness to read and subsequently establish a positive reading culture (Öztürk, 2021). Moreover, complete focus and engagement from students will make them able to identify the context of a text and master its meaning as well (Ho & Lau, 2018). Morford et al. (2014) advocate the benefits of gaming elements that motivate students and keep them absorbed in online reading activities through competition and reward systems. The use of gaming components has been further promoted for being student-centered as it provides flexibility and intrinsic motivation to the students and in turn results in greater productivity (Tsay et al., 2020). Gaming features, such as a real-time leaderboard that reports students' progress, are also highly recommended (Jo et al., 2018). However, up to now, the volume of studies focusing on the impact of the reading medium on the skill of reading comprehension is rather limited (Halamish & Elbaz, 2020). Thus, there is a growing sense of disillusionment among educators regarding web-based learning as its role in literacy achievement by students remains questionable. Hence, there is a need for further research to ascertain the effectiveness of web-based reading literacy programs and their impact on student achievement.

#### 4.3. Limitations of the Study

The limitations of this study are as follows:

1. This being a case study based on a particular school in the U.A.E, generalization of the result is limited to other schools with a similar infrastructure and teacher quality;
2. With respect to the result of the survey, some level of bias may be expected as the mode of administration was online;
3. The normality of the sample data was assumed as the sample size is random and large;
4. A comprehensive analysis of the variables was impossible in this study;
5. There is a lack of sufficient literature to survey

that might help give a proper sense of direction and insight into the intricacies of online reading programs, their efficacy and possibilities of further enhancing the use of tech-tools/devices to improve reading comprehension among students.

## Acknowledgments

No financial support has been provided to fund this study.

All data for the study were provided following all data sharing protocols by the data manager of Our Own English High School, Dubai, with the permission from the principal of the school.

## Authors' Contributions

The paper was written by Dr. Sheeba Jojo, with inputs from Dr. Varughese John and guidance from Dr. Chanintorn.

## References

- [1] AL-AMEEDI, R.T., IBRAHIM, E.R., & NAYEF, K.J. (2019). Language Laboratory and Developing Skills in an Iraqi Secondary School. *Journal of Southwest Jiaotong University*, 54(5). <https://doi.org/10.35741/issn.0258-2724.54.5.46>
- [2] AMEYAW, S.K., & ANTO, S.K. (2018). Read or Perish: Reading Habits among Students and its Effect on Academic Performance: A Case Study of Eastbank Senior High School - Accra. *Library Philosophy and Practice*, 1748. Retrieved from <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=4948&context=libphilprac>
- [3] ANDERSON, M.J. (2005). *Permutational Multivariate Analysis of Variance*. Auckland: Department of Statistics, University of Auckland.
- [4] AUPHAN, P., ECALLE, J., & MAGNAN, A. (2019). Computer-based assessment of reading ability and subtypes of readers with reading comprehension difficulties: a study in French children from G2 to G9. *European Journal of Psychology of Education*, 34(3), 641-663. <https://doi.org/10.1007/s10212-018-0396-7>
- [5] BARZILLAI, M., & THOMSON, J.M. (2018). Children learning to read in a digital world. *First Monday*, 23(10). <https://doi.org/10.5210/fm.v23i10.9437>
- [6] BROCK, K. (2013). *The Effect of High School Literacy Programs on Standardized Test Scores*. Ann Arbor, Michigan: ProQuest LLC.
- [7] CHANG, W.H., HUANG, T.H., & LIU, Y.C. (2019). Influence of an interactive e-book on the reading comprehension of different ethnic groups using indigenous culture as content. *International Journal of Human-Computer Interaction*, 35(4-5), 323-332. <https://doi.org/10.1080/10447318.2018.1543079>
- [8] CHOI, Y., & ZHANG, D. (2021). The relative role of vocabulary and grammatical knowledge in L2 reading comprehension: A systematic review of literature. *International Review of Applied Linguistics in Language Teaching*, 59(1), 1-30. <https://doi.org/10.1515/iral-2017-0033>
- [9] HABÓK, A., & MAGYAR, A. (2019). The effects of EFL reading comprehension and certain learning-related factors on EFL learners' reading strategy use. *Cogent Education*, 6(1), 1-19. <https://doi.org/10.1080/2331186X.2019.1616522>
- [10] HALAMISH, V., & ELBAZ, E. (2020). Children's reading comprehension and metacomprehension on screen versus on paper. *Computers & Education*, 145, 103737. <https://doi.org/10.1016/j.compedu.2019.103737>
- [11] HAYES, A.F. (2012). *PROCESS: A Versatile Computational Tool for Observed Variable Mediation, Moderation, and Conditional Process Modeling*. Retrieved from <http://www.afhayes.com/public/process2012.pdf>
- [12] HO, E.S.C., & LAU, K.L. (2018). Reading engagement and reading literacy performance: Effective policy and practices at home and in school. *Journal of Research in Reading*, 41(4), 657-679. <https://doi.org/10.1111/1467-9817.12246>
- [13] HUBER, J.A. (2004). A closer look at SQ3R. *Reading Improvement*, 41(2), 108-112.
- [14] JAEKEL, N. (2020). Language learning strategy use in context: the effects of self-efficacy and CLIL on language proficiency. *International Review of Applied Linguistics in Language Teaching*, 58(2), 195-220. <https://doi.org/10.1515/iral-2016-0102>
- [15] JO, J., JUN, H., & LIM, H. (2018). A comparative study on gamification of the flipped classroom in engineering education to enhance the effects of learning. *Computer Applications in Engineering Education*, 26(5), 1626-1640. <https://doi.org/10.1002/cae.21992>
- [16] LAM, W.Y. (2009). Examining the effects of metacognitive strategy instruction on ESL group discussions: A synthesis of approaches. *Language Teaching Research*, 13(2), 129-150. <https://doi.org/10.1177/1362168809103445>
- [17] MASRUPI, FAHAMZAH, J., GAILEA, N., BAIHAKI, A., & USMAN, M. (2020). Reading Comprehension Strategies Effectiveness in Completing Test of English as a Foreign Language. *Journal of Southwest Jiaotong University*, 55(6). <https://doi.org/10.35741/issn.0258-2724.55.6.36>
- [18] MOHAMMADI, M., BIRJANDI, P., & MAFTOON, P. (2015). Learning strategy training and the shift in learners' beliefs about language learning: A reading comprehension context. *SAGE Open*, 5(2).
- [19] MORFORD, Z.H., WITTS, B.N., KILLINGSWORTH, K.J., & ALAVOSIUS, M.P. (2014). Gamification: The intersection between

- behavior analysis and game design technologies. *The Behavior*, 37(1), 25-40.  
<https://doi.org/10.1007/s40614-014-0006-1>
- [20] MUSLAINI. (2017). Strategies for Teaching Reading Comprehension. *English Education Journal*, 8(1), 67-78. Retrieved from <http://www.jurnal.unsyiah.ac.id/EEJ/article/view/6129>
- [21] NOROUZIAN, R., & MEHDIZADEH, M. (2013). Reading Strategy Repertoires in EAP Contexts: Students and Teachers in Academic Reading Strategy Use. *The International Journal of Language Learning and Applied Linguistics World*, 3(1), 5-12.
- [22] OKKINGA, M., VAN GELDEREN, A.J.S., VAN SCHOOTEN, E., VAN STEENSEL, R., & SLEEGERS, P.J.C. (2021). Implementation quality of principles of reciprocal teaching in whole-classroom settings: a two-year study with low-achieving adolescents. *Reading Psychology*, 42(4), 323-363.  
<https://doi.org/10.1080/02702711.2021.1887019>
- [23] OXFORD, R. (1989). *The Role of Styles and Strategies in Second Language Learning*. *ERIC Digest*. Retrieved from <https://www.ericdigests.org/pre-9214/styles.htm>
- [24] ÖZER ŞANAL, S. (2020). *Fabl animasyon içerikli işbirlikli e-kitabın özel öğrenme güçlüğü olan öğrencilerin okuma performansına etkisi*. Doctoral thesis, Hacettepe Üniversitesi.
- [25] ÖZTÜRK, B.K. (2021). Digital reading and the concept of ebook: Metaphorical analysis of preservice teachers' perceptions regarding the concept of ebook. *SAGE Open*, 11(2).  
<https://doi.org/10.1177/21582440211016841>
- [26] RICHARDS, J.C., & SCHMIDT, R. (2010). *Longman dictionary of language teaching and applied linguistics*. Harlow: Longman.
- [27] RICHMOND, E.B. (1980). Literacy and Language Teaching in the Gambia. *The Modern Language Journal*, 64(4), 416-421.  
<https://doi.org/10.1111/j.1540-4781.1980.tb05214.x>
- [28] RUBIN, D.B. (1988). An overview of multiple imputation. In: *Proceedings of the Survey Research Methods Section of the American Statistical Association*. Citeseer, pp. 79-84. Retrieved from [http://www.asasrms.org/Proceedings/papers/1988\\_016.pdf](http://www.asasrms.org/Proceedings/papers/1988_016.pdf)
- [29] RUBIN, J., & MCCOY, P. (2008). Tasks and good language learners. In: GRIFFITHS, C. (ed.) *Lessons from good language learners*. Cambridge: Cambridge University Press, pp. 294-305.
- [30] SARIMANAH, E. (2016). Effectiveness of PQ4R Metacognitive Strategy Based Reading Learning Models in Junior High School. *International Journal of Language Education and Culture Review*, 2(1), 74-81.  
<https://doi.org/10.21009/IJLECR.021.08>
- [31] SHIH, Y.C., & REYNOLDS, B.L. (2018). The effects of integrating goal setting and reading strategy instruction on English reading proficiency and learning motivation: A quasi-experimental study. *Applied Linguistics Review*, 9(1), 35-62.  
<https://doi.org/10.1515/applirev-2016-1022>
- [32] SHIH, Y.C., CHERN, C.L., & REYNOLD, B.L. (2018). Bringing extensive reading and reading strategies into the Taiwanese junior college classroom. *Reading in a Foreign Language*, 30(1), 130-151. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1176299.pdf>
- [33] SHINOZUKA, K., SHIBATA, S., & MIZUSAWA, Y. (2017). Effectiveness of Read-Aloud Instruction on Motivation and Learning Strategy among Japanese College EFL Students. *English Language Teaching*, 10(4), 1-14.  
<https://doi.org/10.5539/elt.v10n4p1>
- [34] SWANSON, E., HAIRRELL, A., KENT, S., CIULLO, S., WANZEK, J.A., & VAUGHN, S. (2014). A synthesis and meta-analysis of reading interventions using social studies content for students with learning disabilities. *Journal of Learning Disabilities*, 47(2), 178-195.  
<https://doi.org/10.1177/0022219412451131>
- [35] TAVAKOLI, H., & KOOSHA, M. (2016). The Effect of Explicit Metacognitive Strategy Instruction on Reading Comprehension and Self-Efficacy Beliefs: The Case of Iranian University EFL Students. *Porta Linguarum*, 25, 119-133.  
<http://dx.doi.org/10.30827/Digibug.53893>
- [36] TSAY, C.H.H., KOFINAS, A.K., TRIVEDI, S.K., & YANG, Y. (2020). Overcoming the novelty effect in online gamified learning systems: An empirical evaluation of student engagement and performance. *Journal of Computer Assisted Learning*, 36(2), 128-146.  
<https://doi.org/10.1111/jcal.12385>
- [37] WU, L., VALCKE, M., & VAN KEER, H. (2021). Supporting struggling readers at secondary school: an intervention of reading strategy instruction. *Reading and Writing*, 34(8), 2175-2201.  
<https://doi.org/10.1007/S11145-021-10144-7>
- [38] YAKUPOGLU, F. (2012). The effects of cognitive and metacognitive strategy training on the reading performance of Turkish students. *Practice and Theory in Systems of Education*, 7(3), 353-358.

## 参考文献:

- [1] AL-AMEEDI, R.T., IBRAHIM, E.R., & NAYEF, K.J. (2019)。语言实验室和发展技能在伊拉克中学。  
西南交通大学学报，54（5）。<https://doi.org/10.35741/issn.0258-2724.54.5.46>

- [2] AMEYAW, S.K., & ANTO, S.K. (2018)。阅读或灭亡：学生的阅读习惯及其对学习成绩的影响：以阿克拉东岸高中为例。图书馆哲学与实践，1748年。检索自<https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=4948&context=libphilprac>
- [3] ANDERSON, M.J. (2005)。排列多变量方差分析。奥克兰：奥克兰大学统计系。
- [4] AUPHAN, P., ECALLE, J., & MAGNAN, A. (2019)。基于计算机的阅读能力评估和阅读理解困难读者的亚型：法国儿童从G2到G9的研究。欧洲教育心理学杂志，34 (3)，64 1-663。https://doi.org/10.1007/s10212-018-0396-7
- [5] BARZILLAI, M., & THOMSON, J.M. (2018)。孩子们在数字世界中学习阅读。第一个星期一，23 (10)。https://doi.org/10.5210/fm.v23i10.9437
- [6] BROCK, K. (2013)。高中扫盲计划对标准化考试成绩的影响。密歇根州安娜堡：请求,请求有限责任公司。
- [7] CHANG, W.H., HUANG, T.H., & LIU, Y.C. (2019)。以土着文化为内容的互动电子书对不同民族阅读理解的影响。国际人机交互杂志，35 (4-5)，323-332。https://doi.org/10.1080/10447318.2018.1543079
- [8] CHOI, Y., & ZHANG, D. (2021)。词汇和语法知识在L2阅读理解中的相对作用：文献的系统综述。语言教学中的应用语言学国际评论，59 (1)，1-30。https://doi.org/10.1515/iral-2017-0033
- [9] HABÓK, A., & MAGYAR, A. (2019)。EFL阅读理解和某些学习相关因素对efl学习者阅读策略使用的影响。有说服力的教育，6 (1)，1-19。https://doi.org/10.1080/2331186X.2019.1616522
- [10] HALAMISH, V., & ELBAZ, E. (2020)。儿童在屏幕上与纸上的阅读理解和元理解。计算机与教育，145，103737。https://doi.org/10.1016/j.compedu.2019.103737
- [11] HAYES, A.F. (2012)。过程：用于观察变量调解、适度和条件过程建模的多功能计算工具。检索自<http://www.afhayes.com/public/process2012.pdf>
- [12] HO, E.S.C., & LAU, K.L. (2018)。阅读参与和阅读素养表现：在家庭和学校的有效政策和实践。阅读研究杂志，41 (4)，657-679。https://doi.org/10.1111/1467-9817.12246
- [13] HUBER, J.A. (2004)。仔细看看SQ3R。阅读改进，41(2)，108-112。
- [14] JAEKEL, N. (2020)。语言学习策略在语境中的应用：自我效能感和克利尔对语言能力的影响。语言教学中的应用语言学国际评论，58 (2)，195-220。https://doi.org/10.1515/iral-2016-0102
- [15] JO, J., JUN, H., & LIM, H. (2018)。工程教育中翻转课堂游戏化增强学习效果的比较研究。工程教育中的计算机应用，26 (5)，1626-1640。https://doi.org/10.1002/cae.21992
- [16] LAM, W.Y. (2009)。研究元认知策略教学对ESL小组讨论的影响:方法的综合。语言教学研究，13 (2)，129-150。https://doi.org/10.1177/1362168809103445
- [17] MASRUPI, FAHAMZAH, J., GAILEA, N., B AIHAKI, A., & USMAN, M. (2020)。阅读理解策略在完成英语作为外语的测试中的有效性。西南交通大学学报，55 (6)。https://doi.org/10.35741/issn.0258-2724.55.6.36
- [18] MOHAMMADI, M., BIRJANDI, P., & MAFTOON, P. (2015)。学习策略训练和学习者对语言学习信念的转变：阅读理解语境。鼠尾草开放，5 (2)。
- [19] MORFORD, Z.H., WITTS, B.N., KILLINGSWORTH, K.J., & ALAVOSIUS, M.P. (2014)。游戏化：行为分析和游戏设计技术之间的交集。的行为，37 (1)，2 5-40。https://doi.org/10.1007/s40614-014-0006-1
- [20] MUSLAINI. (2017)。教学阅读理解的策略。英语教育杂志，8 (1)，67 - 78。检索自<http://www.jurnal.unsyiah.ac.id/EEJ/article/view/6129>
- [21] NOROUZIAN, R., & MEHDIZADEH, M. (2013)。阅读策略在EAP背景下的影响:学生和教师在学术阅读策略的使用。国际语言学习和应用语言学杂志世界，3 (1)，5-12。
- [22] OKKINGA, M., VAN GELDEREN, A.J.S., VAN SCHOOTEN, E., VAN STEENSEL, R., & SLEEGERS, P.J.C. (2021)。全教室环境中互惠教学原则的实施质量：对低成就青少年进行为期两年的研究。阅读心理学，42 (4)，323-363。https://doi.org/10.1080/02702711.2021.1887019
- [23] OXFORD, R. (1989)。风格和策略在第二语言学习中的作用。埃里克\*文摘。检索自<https://www.ericdigests.org/pre-9214/styles.htm>
- [24] ÖZER



- ŞANAL, S. (2020)。具有寓言动画内容的合作电子书对特殊学习障碍学生阅读穿孔的影响。博士论文，哈西特佩大学。
- [25]ÖZTÜRK, B.K. (2021)。数字阅读与电子书的概念：对教师对电子书概念的理解的隐喻分析。贤者开放, 11 (2)。https://doi.org/10.1177/215824402111016841
- [26]RICHARDS, J.C., & SCHMIDT, R. (2010)。朗文语言教学与应用语言学词典. 朗曼。
- [27]RICHMOND, E.B. (1980)。冈比亚的识字和语言教学。现代语言杂志, 64 (4), 416-421。https://doi.org/10.1111/j.1540-4781.1980.tb05214.x
- [28]RUBIN, D.B. (1988)。多重归因的概述。在：美国统计协会调查研究方法部分的论文集。城市人, 第79-84页。检索自http://www.asasrms.org/Proceedings/papers/1988\_016.pdf
- [29]RUBIN, J., & MCCOY, P. (2008)。任务和良好的语言学习者。在：格里菲斯, C.) 好的语言学习者的教训。剑桥：剑桥大学出版社，第294-305页。
- [30]SARIMANAH, E. (2016)。基于PQ4R元认知策略的初中阅读学习模型的有效性。国际语言教育与文化评论杂志, 2 (1), 74-81。https://doi.org/10.21009/IJLECR.021.08
- [31]SHIH, Y.C., & REYNOLDS, B.L. (2018)。目标设定与阅读策略教学相结合对英语阅读能力和学习动机的影响：一个准实验研究。应用语言学评论, 9 (1), 35-62。https://doi.org/10.1515/applirev-2016-1022
- [32]SHIH, Y.C., CHERN, C.L., & REYNOLD, B.L. (2018)。将广泛的阅读和阅读策略带入台湾大专课堂。阅读外语, 30 (1), 130-151。检索自https://files.eric.ed.gov/fulltext/EJ1176299.pdf
- [33]SHINOZUKA, K., SHIBATA, S., & MIZUSAWA, Y. (2017)。日本学院学生的动机和学习策略朗读教学的有效性。英语教学, 10 (4), 1-14。https://doi.org/10.5539/elt.v10n4p1
- [34]SWANSON, E., HAIRRELL, A., KENT, S., CIULLO, S., WANZEK, J.A., & VAUGHN, S. (2014)。综合和荟萃分析阅读干预使用社会研究内容为学习障碍学生。学习障碍杂志, 47 (2), 178-195。https://doi.org/10.1177/0022219412451131
- [35]TAVAKOLI, H., & KOOSHA, M. (2016)。显式元认知策略教学对阅读理解和自我效能信念的影响：伊朗大学EFL学生的案例。语言之门, 25, 119-133。http://dx.doi.org/10.30827/Digibug.53893
- [36]TSAY, C.H.H., KOFINAS, A.K., TRIVEDI, S. K., & YANG, Y. (2020)。克服在线游戏学习系统中的新奇效应：对学生参与度和表现的实证评估。计算机辅助学习杂志, 36 (2), 128-146。https://doi.org/10.1111/jcal.12385
- [37]WU, L., VALCKE, M., & VAN KEER, H. (2021)。支持中学挣扎的读者:阅读策略教学的干预。阅读和写作, 34 (8), 2175-2201。https://doi.org/10.1007/S11145-021-10144-7
- [38]YAKUPOGLU, F. (2012)。认知和元认知策略训练对土耳其学生阅读表现的影响。教育系统的实践与理论, 7 (3), 353-358。