The Effect of THIEVES Strategy on ESP University Students Reading Comprehension and Inquiry Learning Skills

By

Faten, A Zahran

Associate Professor of ELT & Head of English Language Department at Horus University, New Damietta, Egypt - e-mail: faten_zahran_7@yahoo.com , fzahran@horus.edu.eg

Yousra A. Qoura

An EFL Researcher

The Effect of THIEVES Strategy on ESP University Students Reading Comprehension and Inquiry Learning Skills

Abstract

The goal of the current study is to determine the effect of THIEVES strategy on ESP university students' reading comprehension and inquiry learning skills. It was assumed that students received training on THIEVES strategy would perform better on reading comprehension and inquiry learning skills than their counterparts in the control group. The tools -designed by the researchers- that were used for reaching statistical results included: (reading skills checklist, inquiry learning skills checklist, reading comprehension test and inquiry learning test). Findings showed that THIEVES strategy made a significant difference in enhancing reading comprehension and inquiry learning skills of the experimental group.

Key Words: *Reading Comprehension Skills, Inquiry learning Skills, THIEVES Strategy, ESP University Students.*

1. Introduction

Graduates as well as students are required to cope with new methods in education system, work place, and even in daily life routine. Accordingly, there is a need for a kind of learning that make learners search, investigate, plan and develop their skills. Getting information from different sources become a need. Henceforth, the ability to read, analyze, investigate and comprehend what is conveyed from various materials is crucial. Reading skill has a significant part in one's academic as well as practical life.

Accordingly, examining strategies for developing reading skill is a prerequisite (Meylana, 2019, Olga and Claudia, 2020). Strategies and approaches that are used for developing reading skills differ according to type of materials, students taking into account whether they are ESP, EFL or ESL students, vocabulary and skills that learners need and teaching process as well whether it is online or face to face. Regarding ESP reading development which is the main subject of the current study, a number of studies examined the impact of technology based teaching (Abanomey, 2013), feminist approach (Pavlenko et al., 2011), task based (Romero, 2017) and problem-posing based teaching on the development of reading comprehension skills (Naiditch, 2010). Deciding which technique is more effective for ESP university students has been an open-ended research question.

Since students are the core of learning process, it is crucial to equip them with the tools that make them able to be self-directed learners who can develop their skills, investigate, search, find answers and take responsibility of their learning (Caswell & LaBrie, 2017). Nowadays there is a need to maximize learning in a way that students become able to practice questioning, critical thinking, collaboration and research. A number of researchers (e.g., Alfieri et al., 2011; Avsec, Rihtarisic, & Kocijancic, 2014; Avsec & Kocijancic, 2016 and Gholam, 2019) confirmed that developing inquiry learning skills could enable students think deeply and keep abreast of new advances in the EFL field. As stated by Harlem (2013), inquiry learning skills involve asking questions, making investigations and searching clarifications. A number of researchers (Wang, Guo & Jou, 2015; Aslan, 2015; Chu, Reynolds,

Tavares, Notari, & Lee, 2016) reported the significance of developing students' inquiry learning skills. They stated that inquiry learning skills are the base for 21 century skills that involves asking questions, investigating, making assumptions and providing evidences. Besides, they recommended that improving inquiry learning skills should be a high priority for all educational systems.

There is a rarity of studies, to the researchers' knowledge, that were carried out on exploring the impact of the developing inquiry learning skills among ESP university students in Egypt. Furthermore, dentistry students at Horus university who are the sample of the current study do not practice inquiry learning skills. Besides, they face difficulty in TOFEL reading passages which is a crucial part of their academic course. As stated by (Caswell & LaBrie, 2017; Gholam, 2019), the lack of inquiry activities inside classrooms is the reason behind the low level of inquiry skills. Therefore, Gholam (2019) recommended training both teachers and students how to practice and develop inquiry skills. Likewise, Meylana (2019) and Olga & Claudi (2020) confirmed the significance of developing reading comprehension as it is the base for academic success. Consequently, the researchers suggest exploring the impact of using THIEVES strategy on enhancing students' reading comprehension and inquiry learning skills.

2. The Context of the Problem

Good reading comprehension skills is the base for academic progress as well as life-long learning. However, Students face many problems that include: the lack of using suitable strategy as well as the lack of reading comprehension skills such as inferential, critical, creative and evaluation skills. These problems make it difficult for them to enhance their reading comprehension skills (Priebe, Keenan, & Miller, 2012; Tawalbeh & Ismaiel, 2014). On the other hand, inquiry learning skills enable students to be self-directed learners who are able to search, investigate, reach results and continue their life-long learning (Marks, 2013; Harlen, 2013; Gu et al., 2015; Guido, 2017). Yet, the teaching processes are not based inquiry learning. A number of researchers suggested solutions for problems that students face during improving reading and inquiry skills. For example, Hussein (2019) recommended using suitable strategies that help learners develop their comprehension. Guido (2017) and Yilidiz &

Arseven (2021) confirmed the significance of designing training and teaching processes based inquiry learning skills. Dohrenwend (2010) and Khataee (2019) assured that applying the seven steps of THIEVES strategy helps learners to use prior knowledge, ask and answer questions before going through the text which in turn help develop students reading comprehension skills. Consequently, it is presumed that via training students how to practice THIEVES strategy, they could increase their reading comprehension as well as inquiry learning skills.

3. Statement of the Problem

ESP university students lack the ability to comprehend TOFEL reading passages. Moreover, they face difficulties in investigating, analyzing and interpreting findings. Accordingly, the researchers propose using THIEVES strategy as technique that might improve students' reading comprehension and inquiry learning skills.

4. Questions

The problem of this study can be addressed in the subsequent investigations:

1- What are the characteristics of the THIEVES strategy based treatment that help in developing reading comprehension and inquiry learning skills?

2- What is the effect of using THIEVES strategy in enhancing reading comprehension skills?

3- What is the effect of using THIEVES strategy in increasing inquiry learning skills?

5. Significance

The study gains its significance from the following:

1. Giving directions to students for practicing new strategy for developing reading comprehension skills.
2. Guiding students to practice new strategy for developing inquiry learning skills.
3. Directing English language curricula designers to the significance of using THIEVES strategy.

6. Delimitations

The study is delimited to:

1. A sample of the first year students from faculty of Pharmacy at Horus University.
2. Four reading comprehension skills (inferential, critical, creative and evaluation skills).
3.Three inquiry skills (choosing a good question, investigating questions and analyzing findings).
4. Reading TOFEL passages.

7. Review of Literature

Reading Comprehension Strategies

The access to the wealth of information as well as the capability to comprehend the academic texts that is a priority to university students require good reading comprehension skills. Nevertheless, university students face difficulty concerning developing reading skills. It was proved that they need to practice strategy that enable them to enhance their comprehension (Hussein, 2019 Riadil, 2020). The most common reading comprehension strategies that were examined and proved to be effective are scanning, skimming, predicting, inferencing and summarizing. Yet according to (Babaiba, 2015; Dara, 2019), learners face many difficulties that are summarized in lack of; background knowledge, motivation, strategies and decoding capability. A number of researchers (e.g., Nergis, 2013; Azeroual, 2014; Sanford, 2015; Shehu, 2015; Dara, 2019) investigated reading problems and added that difficulty of texts, syntax, anxiety and motivation are among the factors that affect reading comprehension. The results of those studies suggests that learners need a strategy that trigger their interest, motivations, critical thinking and inquiry. Safitri (2018) and Khataee (2019) investigated the impact of using THIEVES strategy on reading skills. It was found that THIEVES strategy is helpful in overcoming the comprehension problems that face readers. THIEVES strategy is based on seven steps. Each step requires asking and exploring a number of questions in order to reach a comprehensible knowledge about the reading part.

Good Reader

According to Pressley (2002), good readers are the ones who have purpose while reading, make predictions before reading, guess the meaning of new vocabulary, make use of their background knowledge, ask questions, seek answers and interact with the text. These skills make learning efficient and enable learners to develop their reading comprehension skills (Grabe & Stoller, 2002). Tompkins (2011) and Gilakjani & Sabouri (2016) defined reading comprehension as making use of vocabulary knowledge, structure and semantic in comprehending the text. Reading comprehension operationally defined as applying the seven steps of THIEVES strategy to practice questioning in order to comprehend the written text. It is anticipated that applying THIEVES strategy might enable students to be good readers who are able to ask questions, search, reach answers and comprehend the reading passages.

Reading Comprehension Challenges

Since TOFEL test measures EFL students' ability to comprehend academic texts, a number of local universities use TOFEL test as an admission requirement for their students especially in scientific specializations. Moreover, it is a significant prerequisite for joining an international scholarship (Aliponga, 2013). TOFEL course is a crucial part of the current participants' academic program. Yet, getting a good score in this test needs training. Abboud and Hussein (2011) along with Samad, et al (2017) advocated that lack of reading strategies that enable learners comprehend the reading text is the primary cause behind the low score students get in TOFEL reading part test. Febriani et.al., (2019) analyze students' problems concerning TOFEL reading part test, they found that length of reading part, the reading material, the difficulty of the text, prior knowledge and the lack of reading strategies were the reasons behind students' low proficiency in the reading part. Besides, difficulty of the written text, word decoding, language fluency, anxiety, interest and motivation are among students' problems in reading that affect their comprehension as confirmed by (Hollowell, 2013; Medjahdi, 2015; Gilakjani & Sabouri, 2016). Samad, Jannah & Fitriani (2017) and Dara (2019) added that the absence of reading strategies led to reading comprehension problems.

Inquiry Learning Skills

Inquiry as defined by Alberta (2004) is an active practice of curiosity and investigation in order to comprehend things. Lance (2001) advocated that the learning process which is based on inquiry enable students to find answer to questions or improve a solution for a problem. Consequently, students construct new knowledge formed by search and investigation. Inquiry learning skills operationally defined as a process of questioning, exploring and investigation in order to comprehend the reading passages.

Alberta (2004) concluded that inquiry learning skills aid students to internalize the process of questioning, finding solutions and making use of founded knowledge outside the schoolrooms. That is why they recommended depending inquiry based learning starting primary stage in order to be their way of thinking and solving problems that last with them till high school and university. In a study that examined inquiry learning skills from both students and teachers' perspectives, Guido (2017) affirmed that inquiry main benefit to students is search and investigations where as its benefit to teachers is helping them develop students critical thinking and understanding. Both Duran & Dokme (2016) and Mackenzie (2016) indicated that developing inquiry learning skills requires improving the four kinds of students' inquiry starting with structured, controlled and moving to guided that lead to ending up with free inquiry in which students decide the topic and questions and produce the solution.

Benefits of Inquiry-Based Learning

The benefits of developing inquiry learning skills as stated by a number of studies (e.g., Marks, 2013; Harlen, 2013; Guido, 2017) include reinforcing search, exploring and reaching new knowledge since students work on a problem that need intellectual capacity. They added that inquiry learning skills enable students to be responsible for their learning, become self-directed learners, make evaluation and judgments and build profound comprehension. Moreover, Marks (2013) added that practicing inquiry aid students to get used to practicing inquiry as a habit of mind and extend these skills outside schoolrooms. Furthermore, in an experimental study, Gu et al. (2015) proved that inquiry learning skills facilitate achieving advanced levels of academic self-efficacy. The priority of developing inquiry skills was suggested by Science professors as a method for offering a new educational experience and improving learning the scientific subjects (Aslan, 2017). Since proficient use of technology,

deduce and combine information are indispensable in the field of digital literacy, a number of researchers (e.g., Aslan, 2015; Chu et al., 2016; Guido, 2017) argued that inquiry skills pave the way to digital literacy.

Due to the importance of improving inquiry learning skills, many researchers competed in searching and exploring strategies that could enhance inquiry learning skills. For example, Yazgan (2013) recommended using outclass activities based inquiry. While Cheng, Yang, Chang & Kuo (2016) suggested using 5E mobile approach. Inquiry based learning was investigated and recommended by Jeskova, Lukac, Hancova, Snajder, Gunis, Balogova & Kires (2016). Learning by teaching proved to give students opportunities to take responsibility of their learning. Therefore, it was endorsed by a number of scholars (e.g., Duran & Topping, 2017; Goto & Schneider, 2010; Roscoe, 2014). The idea behind inquiry based learning was helping students construct a complete comprehension through teachers' guidance and cooperation with their peers rather than transforming the academic content to students (Harrison, 2014). Besides, inquiry learning skills enable learners to be self-directed who are able to categorize what they need and make reasonable interpretations. Being involved in a dynamic learning process as stated Abrahams et al, (2012) equip learners with skills required for lifelong learning. Engaging students in scientific process that starts with observation and investigation and ends with reaching new knowledge or finding solutions requires practice and training inside classrooms. It also requires practicing and improving inquiry skills. Therefore, in the field of developing language skills as well as the learning process, it was recommended that designing curriculum and the teaching process should be based inquiry (Guido, 2017, Yilidiz and Arseven, 2021).

To sum up, the benefits of inquiry based learning that were emphasized by many scholars encouraged the current researchers to make use of inquiry learning skills in the field of developing EFL. Consequently, the researchers suggest investigating the impact of THIEVES strategy that include steps of searching, questioning and inquiry on learners reading comprehension and inquiry learning skills.

THIEVES Strategy

Amongst the probing strategies used by EFL learners, THIEVES strategy enjoys a high rank. According to Manz (2002), THIEVES is pre-

reading strategy in which students learn how to get information from text before reading it. A number of scholar (Gear, 2008; Triarina, 2012; Indrawati and Widiana, 2019) argued that THIEVES strategy enable students to identify the significant information in the text, construct a comprehensive knowledge, link the text with previous knowledge that they have, enhance their comprehension and improve their learning. According to Manz (2002), each letter in the word THIEVES is an abbreviation of the 7 steps of THIEVES strategy that are: (1) title in which students relate the topic with what they already know about it, (2) headings in which they make guesses about the ideas followed that heading, (3) introduction in which students realize the main ideas of the text, (4) every first sentence in a paragraph in which student comprehend the main clue of each paragraph, (5) visuals and vocabulary in which students make a link between the photos or keywords included in the text and the knowledge behind these photos and keywords, (6) end of chapter questions in which students highlight the important information that the questions incite, and (7) summary in which students make a summary with the main ideas that the topic discuss in order to comprehend the text before going. THIEVES is a strategy that triggers prior knowledge and teaches students how to steal information before going through the whole text (Manz, 2002). Margot (2007) defined THIEVES strategy as a method for comprehending the text and finding the most important information. THIEVES strategy is operationally defined as a process of organized steps based questioning for developing comprehension.

Practicing THIEVES strategy necessitates questioning and examining answers. Using this strategy helps students to identify key ideas of before reading the text. Safitri (2018) examined the impact of THIEVES strategy on students reading comprehension. The researcher found that the strategy improved students' comprehension and encouraged them to cooperate and participate in the learning process. Students reading performance is reflected through their ability to build a meaning for the written text. The process of building a complete comprehension requires teacher assistance in identifying reading difficulties. Therefore, the intellectual procedure followed by readers in order to comprehend the text and construct a meaning is significant and should be developed by training.

THIEVES Strategy for Improving Reading Comprehension and Inquiry Learning Skills

Experience and previous knowledge enable readers to build a meaning from the written text. In their studies, a number of researchers (e.g., Snellings et.al., 2009; Silva & Capellini, 2010; Riadil, 2020) examined the reasons behind reading comprehension difficulties. The lack of vocabulary knowledge as well as the ability to inference are mentioned among the reasons that cause reading comprehension problems. Furthermore, several studies (e.g., Alptekin, 2006; Lee, 2007; Priebe, Keenan, & Miller, 2012) confirmed that the lack of background knowledge cause reading comprehension problems especially for the low proficiency students. Finally, Tawalbeh & Ismaiel (2014) added that the absence of using suitable strategy is among the reasons that cause reading comprehension problems. Over and above, Marks (2013) indicated that the kind of learning which give priority to inquiry learning skills is the required type of learning that enable students to develop comprehension, problem solving, critical thinking and collaboration. Dohrenwend (2010) applied THEIVES strategy as a technique that activates background knowledge. Besides, BC UDL Wiki (2010) applied Thieves as a previewing strategy. Both studies assured that it is beneficial at developing reading comprehension skills. Khataee (2019) examined the impact of THIEVES strategy on students' comprehension. The researcher found that the experimental group outperformed the control group. Furthermore, it was found that THEIVES strategy helped students to overcome reading comprehension problems that include: difficult vocabulary, unfamiliar topics, lack of background knowledge and insufficiency of time. According to the recommendations of a number of scholars (e.g., Hussein, 2019; Guido, 2017; Riadil, 2020; Yilidiz & Arseven, 2021) concerning improving inquiry learning and reading comprehension, learning processes that is based on inquiry enable learners to practice questioning which in turn develop their comprehension and critical thinking. They also indicated that by using a suitable strategy, students can develop their reading comprehension skills.

As a final point, THIEVES strategy is based on questioning that enable learners to trigger their previous information, ask and examine questions

in order to reach comprehensible knowledge. Hence, it is supposed to enhance students' inquiry learning skills as well as reading comprehension. It could be established that using THEIVES strategy in the current study might improve inquiry and reading comprehension skills.

8. Method

Participants

A sample of students from faculty of pharmacy at Horus university was chosen. Students were assigned randomly to an experimental group (N =37), and a control one (N =37). Learners' age was between eighteen and nineteen years. The researchers have chosen that university to implement their experiment because they offered some facilities and support by the university management as one of them works there.

Design

Adopting the quasi-experimental design, the control and experimental group were pre-tested on their reading comprehension and inquiry learning sub-skills. The experimental group was trained based THEIVES strategy. In contrast, the control group was taught the regular course. Both groups were post-tested in reading comprehension and inquiry learning skills to measure their performance.

Instruments

To achieve the purposes of the study, the researchers prepared the following instruments:

1)- Reading comprehension checklist, see Appendix (A).
2)- Reading comprehension test, see Appendix (B).
3)- Inquiry learning skills checklist, see Appendix (C).
4)- Inquiry learning skills test, see Appendix (D).

Validity and reliability of the instruments were established through jury validation. Alpha Cronbach was used to measure the internal consistency for the reading comprehension skills test and inquiry learning skills test. The value of alpha coefficient for the reading test was 0.703, which means that the test is reliable. The value of alpha coefficient of the inquiry learning skills test was 0.742, which indicates a high value of the test reliability.

The Treatment: THIEVES Strategy for Developing ESP University Students' Reading Comprehension and Inquiry Learning Skills Objectives

Based on reviewing related literature, reading comprehension and inquiry learning skills checklist, the treatment was designed in order to increase students' reading comprehension and inquiry learning skills (see Appendix (E)). The treatment purposes at enhancing the following skills:

1- Developing ESP university students' reading comprehension skills.
2- Developing ESP university students' inquiry learning skills.

Description, Duration and Content

The treatment was designed based on THEIVES strategy for the experimental group. In contrast, the control group received regular training. The treatment consisted of seven themes that were divided into nine sessions (two meetings for explaining THEIVES strategy and seven for the reading passages). Each session was 90 minutes. The treatment lasted for one semester. Teaching to the experimental group took place over a period of 11 weeks (October, November and December) during the academic year 2021/2022 from 20/10/2021 till 28/12/2021.

9. Results and Discussion

Results of the study are reported according to the study hypotheses. The t-test was used to verify the first hypothesis that states there is a statistically significant difference at the ≤ 0.05 level between the mean score of experimental group and the control group on the post-administration of reading comprehension skills test favoring the experimental one. Table 1 reports the differences between the mean scores of students in the experimental and control group regarding the reading comprehension skills test.

Table 1: *Comparing the reading comprehension skills of the control and experimental group on the post test.*

Reading Comprehension Skills	Groups	Test	Mean	SD	t value	Sig.
Inferential	Experimental	Post-test	15.06	1.32	14.1	0.05
	Control	Post-test	10.84	1.69		
Critical	Experimental	Post-test	14.30	1.29	13.3	
	Control	Post-test	9.21	1.80		
Creative	Experimental	Post-test	12.42	1.69	12.7	
	Control	Post-test	8.78	1.59		
Evaluation	Experimental	Post-test	14.89	1.50	14.9	
	Control	Post-test	8.89	1.79		
Total	Experimental	Post-test	66.23	17.15	16.9	
	Control	Post-test	40.13	8.23		

Results in table 1 shows that the mean score of the experimental group post-test is higher than that of the control group's mean score. The increase in students' level is due to the use of THIEVES strategy which enable them to explore, use background knowledge, ask and find answers and build a comprehensive meaning for the reading passages which in turn enable them to develop their reading comprehension skills.

For the second hypothesis that states there is statistically significant difference statistically significant difference at the ≤ 0.05 level between the mean score of experimental group on the pre- and post- administration of reading comprehension skills test favoring the post administration scores, t test was used to compare the differences between the mean scores of students in the reading pre and post-test as presented in table 2.

Table 2: *Comparing the reading comprehension skills of experimental group on the pre and post-test.*

Reading Comprehension Skills	Groups	Test	Mean	SD	t value	Sig.
Inferential	Experimental	Pre-test	8.67	2.46	20.5	0.05
		Post-test	15.06	1.32		
Critical	Experimental	Pre-test	7.94	2.31	19.7	
		Post-test	14.30	1.29		
Creative		Pre-test	5.89	2.51	16.2	

	Experimental	Post-test	12.42	1.69	
Evaluation		Pre-test	8.93	2.49	19.6
	Experimental	Post-test	14.89	1.50	
Total		Pre-test	40.12	11.13	27.5
	Experimental	Post-test	66.23	17.15	

Results in table 2 shows that the mean score of the experimental group post-test is higher than pre-test. The increase in students' level is due to students' training through THIEVES strategy to get information about the text before reading it which in turn helped them to seek understanding. Unlike control group, the experimental group learners target was gaining and building meaningful knowledge not just answering the TOFEL reading passage questions.

Table 3: *Effect size of THIEVES strategy on improving reading comprehension skills of the experimental group students.*

Reading Comprehension Skills	**t value**	**η2**	**Effect size**
Inferential	20.5	0.90	high
Critical	19.7	0.89	
Creative	16.2	0.86	
Evaluation	19.6	0.89	
Total	27.5	0.96	

Table 3 clarifies the effect size of THIEVES strategy on experimental group students reading comprehension skills. All values exceeded 0.50 that points to a high effect size for all reading comprehension skills. This result is similar to results of many studies (e.g., Triarina, 2012; Safitri, 2018; Indrawati and Widiana, 2019) which confirmed the positive relation between the use of Thieves strategy and improving reading comprehension skills.

The third hypothesis states that there is statistically significant difference statistically significant difference at the ≤ 0.05 level between the mean score of experimental group and the control group on the post-administration of inquiry learning skills test favoring the experimental one. t-test was used to compare the differences between the mean scores of students in inquiry skills test in the experimental and control group as shown in table 4.

Table 4: *Comparing the inquiry learning skills of the control and experimental group on the post test.*

Inquiry Learning Skills	Groups	Test	Mean	SD	t value	Sig.
Choosing a good question	Experimental	Post-test	14.33	1.54	15.5	0.05
	Control	Post-test	9.92	1.82		
Investigating questions	Experimental	Post-test	16.78	1.31	15.2	
	Control	Post-test	10.24	1.77		
Analyzing findings	Experimental	Post-test	18.21	1.80	17.9	
	Control	Post-test	9.98	1.60		
Total	Experimental	Post-test	63.82	14.90	19.8	
	Control	Post-test	38.15	8.32		

Results in table 4 shows that the higher mean score is for the post administration of the experimental group post-test. The improvement in students' level in the experimental group could be attributed to students' use of THIEVES strategy that helps them to ask, search and investigate. The achieved outcome is reinforced by Khataee (2019) who confirmed that THEIVES strategy helps learners to make use of previous knowledge and builds a comprehensive meaning based on the main idea of the strategy which is stealing information from the text. In order for learners to be able to steal information from the text, they ask, search and investigate the main ideas of the text.

Finally, it was hypothesized that there is statistically significant difference statistically significant difference at the ≤ 0.05 level between the mean score of experimental group on the pre- and post- administration of inquiry learning skills test favoring the post administration scores. t-test was used to compare the differences between the mean scores of students in the inquiry learning skills pre and post-test in the experimental group as presented in table 5.

Table 5: *Discriminating the inquiry skills of experimental group on the pre and post-test.*

Inquiry Learning Skills	Groups	Test	Mean	SD	t value	Sig.
Choosing a good question	Experimental	Pre-test	9.89	2.46	19.3	0.05
		Post-test	14.33	1.54		
Investigating questions	Experimental	Pre-test	8.34	2.31	20.1	
		Post-test	16.78	1.31		
Analyzing findings		Pre-test	8.45	2.51	21.4	

	Experimental	Post-test	18.21	1.80	
Total		Pre-test	39.12	2.49	39.7
	Experimental	Post-test	63.82	14.90	

Results in table 5 indicates that the higher mean score is for the post administration of the inquiry learning skills test. To be involved in an organized process of investigation through practicing THEIVES strategy that starts with exploring the title of the reading passage and ends with finding answers to the reading questions force learners to practice and enhance their inquiry learning skills. This result is confirmed by both Guido (2017) and Yilidiz & Arseven (2021) who assured the importance of designing academic courses based inquiry learning skills. They added that inquiry learning skills enable learners to be critical thinkers and to be responsible for their own learning.

Table 6: *Effect size of THIEVES strategy on improving inquiry learning skills of the experimental group students.*

Inquiry Learning Skills	**t value**	**η2**	**Effect size**
Inferential	19.3	0.89	high
Critical	20.1	0.90	
Creative	21.4	0.91	
Total	39.7	0.97	

Table 6 clarifies the effect size of THIEVES strategy on experimental group students' inquiry learning skills. All values are greater than 0.50 which indicates a high effect size for all inquiry learning skills. THIEVES strategy reinforces exploring and analyzing abilities which in turn improves inquiry learning skills. This result is consistent with Hussein (2019), Riadil, (2020) and Yilidiz & Arseven (2021) who revealed that the use of background information, investigation, analyzing and searching develop inquiry learning skills.

10. Conclusion

As revealed by related studies, THEIVES strategy proved to improve understanding of the reading passages. Practicing the seven steps of the strategy require the capability of using critical thinking, questioning, understanding and reaching an outcome. Consequently, the relation between THEIVES strategy and the improvement of reading comprehension and inquiry learning skills is confirmed in the current study. It was found that training students how to practice the seven steps

of THEIVES strategy enabled them to build a meaningful knowledge to the reading passage through inquiry. The seven steps of THEIVES strategy include asking and answering questions concerning title, introduction, every first sentence of each paragraph, key words and making summary after reading the passage questions. Forming questions in each step and investigating these questions developed students' inquiry learning skills. Practicing and developing inquiry learning helped students to take the authority of their learning, practice critical thinking, search and investigate and read in order to understand rather than finding an answer to the TOFEL reading passage questions. As anticipated, it is found that THIEVES strategy enhanced reading comprehension and inquiry learning skills. It is found also after just 3 sessions of training using THIEVES strategy that students become able to ask and answer questions related to the reading passages without the lecturer guidance. Furthermore, students become able to think critically that in turn helped them in comprehending the passages. By the end of the treatment it was found that THEIVES strategy helped students develop inquiry learning skills and reading comprehension skills. Hence, with regard to this result, the academic programs should be designed based on inquiry learning skills as it maximizes comprehension. Likewise, future research is needed to explore the effect of THEIVES strategy on critical thinking and self-efficacy as well.

References

Abanomey, A. (2013). Do EFL Saudi Learners Perform Differently with Online Reading? An Exploratory Study. *Journal of King Saud University - Languages and Translation, 25*(1). https://doi.org/10.1016/j.jksult.2012.12.001

Abboud, Z.A.R., & Hussein, N.J. (2011). The Difficulties Faced by Advanced Iraqi Foreign Learners in Passing ITP TOEFL Test. *Journal of Basrah Researches* (Humanities series): 36 (4), 110- 138.

Abrahams, I., Sharpe, R. & Reiss, M. (2012). *Getting Practical: Improving practical work in science.* Association for Science Education: Hatfield

Alberta. (2004). Focus on inquiry: a teacher's guide to implementing inquiry-based learning. Learning Resources Centre. Edmonton, Canada. Available at:

http://www.learning.gov.ab.ca/k_12/curriculum/bySubject/focusoninquiry.pdf

Alfieri, L., Brooks, P. J., Aldrich, N. J., & Tenenbaum, H. R. (2011). Does discovery-based instruction enhance learning? *Journal of Educational Psychology*, *103*(1), 1–18.

Aliponga, J. (2013). Reading journal: its benefits for extensive reading. *International Journal of Humanities and Social Science*, 3(12), 73-80.

Alptekin, C. (2006). Cultural familiarity in inferential and literal comprehension in L2 reading. *System*, *34*(4), 494-508.

Aslan, S. (2015). Is learning by teaching effective in gaining 21st century skills? The views of pre-service science teachers. *Educational Sciences: Theory & Practice*, *15*(6), 1441-1457. https://doi.org/10.12738/estp.2016.1.0019

Aslan, S. (2017). Learning by Teaching: Can It Be Utilized to Develop Inquiry Skills. Journal of Education and Training Studies, Vol. 5, No. 12. PP.190-198.

Avsec, S. & Kocijancic, S. (2016). A path model of effective technology-intensive inquiry based learning. *Journal of Educational Technology & Society*, *19*(1), 308.

Avsec, S. Rihtaršic, D., & Kocijancic, S. (2014). A Predictive study of learner attitudes toward open learning in a robotics class. *Journal of Science Education and Technology*, *23*(5), 692–704.

Azeroual, D. (2014). Investigating the Reading Difficulties of Magister Students of Physics vis-a-vis Their General English knowledge, University of Constantine. *Revue Sciences Humans* (41), 89-98.

Babaiba, W. (2015). Reading Comprehension Difficulties among EFL Learners: The Case of Third-Year Learners at Nehali Mohamed Secondary School.

BC UDL Wiki. (2010, August 7). *BC Universal Design for Learning Project Wiki*. Available at: http://bcudl.pbworks.com/w/file/25947706/THIEVES.doc

Caswell, C. J., & LaBrie, D. J. (2017). Inquiry-based Learning from the Learner's Point of View: A Teacher Candidate's Success Story. *Journal of Humanistic Mathematics*, *7*(2), 161-186.

Cheng, P., Yang, Y. C., Chang, S. G., & Kuo, F. R. (2016). 5E mobile inquiry learning approach for enhancing learning motivation and scientific inquiry ability of university students. *UEEE Transactions on Education*, *59*(2), 147-153.

Chu, W., Reynolds, B., Tavares, J., Notari, M., & Lee, Y. (2016). *21st century skills development through inquiry-based learning: From theory to practice*. Singapore: Springer.

Dara, D. (2019). Investigating English Reading Comprehension Problems of Cambodian High School Students. *American International Journal of Social Science. Vol. 8, No. 3. doi:10.30845/aijss.v8*

Dohrenwend, P. (2010). Annotated reading. *Science Scope*, 54-57.

Duran, M., & Dökme, I. (2016). The effect of the inquiry-based learning approach on student's critical-thinking skills. *Eurasia Journal of Mathematics, Science & Technology Education*, *12*(12), 2887-2908.

Duran, D., & Topping, K. (2017). *Learning by teaching: Evidence-based strategies to enhance learning in the classroom*. New York, NY: Routledge.

Febriani, D, Elfrida and Jayanti, F (2019). Reading Comprehension Problems in Reading Section of TOFEL Test. *Journal of Applied Linguistic and Literacy,* Vol. 3 No.2. https://jurnal.unigal.ac.id/index.php/jall/index

Gear, A. (2008). *Nonfiction Reading Power, An Educational Therapist and Instructor at Nassau Community College in Garden City, NY. The Reading Teacher.* Vol, 55 N. 5

Gholam, A. (2019). Inquiry-Based Learning: Student Teachers' Challenges and Perceptions. *Journal of Inquiry & Action in Education, 10(2), P.112-133*

Gilakjani, P & Sabouri, B (2016), A Study of Factors Affecting EFL Learners' Reading Comprehension Skill and the Strategies for Improvement, *International Journal of English Linguistics*, 6(5): 180-187.

Goto, K., & Schneider, J. (2010). Learning through teaching: Challenges and opportunities in facilitating student learning in food science and nutrition by using the inter-teaching approach. *Journal of Food Science Education, 9*, 31-35. https://doi.org/10.1111/j.1541-4329.2009.00087.x

Grabe, W. & Stoller, F. L. (2002). *Teaching and Researching Reading.* London: Pearson Education Longman. Hollowell, K, (2013). Factors Affecting Poor Reading Comprehension Skills. e-How Contributor. Available at: http://www.ehow.com/info_8423949_factors-poor-reading-comprehension-skills.html

Gu, X., Chen, S., Zhu, W., & Lin, L. (2015). An intervention framework designed to develop the collaborative problem-solving skills of primary school students. *Educational Technology Research & Development*, *63*(1), 143-159.

Guido, M. (2017). Inquiry-Based Learning Definition, Benefits & Strategies. Available at: htttps://www.prodigygame.com/blog/inquiry-basedl-learning-defintiion benefits-strategies/

Harlen, W. (2013). Inquiry-based learning in science and mathematics. *Review of science, mathematics and ICT education*, *7*(2), 9-33.

Harrison, C. (2014). Assessment of Inquiry Skills in the SAILS Project. *Science Education International.* Vol. 25, Issue 1, Pp.112-122

Hollowell, K, (2013). Factors Affecting Poor Reading Comprehension Skills. e-How Contributor. Available at: http://www.ehow.com/info_8423949_factors-poor-reading-comprehension-skills.html

Hussein, F. (2019). The Effect of Text Types on Reading Acquisition; Problems and Solutions. International Journal of Multidisciplinary Research Review · Available at: https://www.researchgate.net/publication/340492421

Indrawati, F and Widiana, A. (2019). Improving Students' Reading Comprehension in Narrative Text Through Thieves Strategy to The 10th Grade Students of MAN 1 Pangkalpinang. *Scientia: Journal of Hasil Penelitian.* Vol. 4, No. 2, Pp. 225 – 242. DOI: https://doi.org/10.32923/sci.v4i2.1016

Jeskova, Z., Lukac, S., Hancova, M., Snajder, L., Gunis, J., Balogova, B., & Kires, M. (2016). Efficacy of inquiry-based learning in mathematics, physics and informatics in relation to the development of students' inquiry skills. *Journal of Baltic Science Education*, *15*(5), 559-574.

Khataee, E. (2019). The Effect of THIEVES Strategy on EFL Learners' Reading Comprehension. *International Journal of Instruction*, 12(2), 667-682.

Lance, K. C. (2001). Proof of the power: Quality library media programs affect academic achievement. Multimedia Schools, 8(4), 14–16, 18, 20.

Mackenzie, T. (2016). *Dive into inquiry*: *Amplify learning and empower student voice*. California: Ed Tech Team Press.

Marks, D. B. (2013). Inquiry-based Learning: What's your question? *National Teacher Education Journal*, *6*(2), 21-25.

Manz, S. L. (2002). A strategy for previewing textbooks: Teaching readers to become THIEVES. *The Reading Teacher*, *55(5)*, 434.

Margot, Kinberg. 2007.Teaching Reading in The Content Areas for Elementary Teachers. USA: shell educational publishing the story.

Medjahdi, W. B. (2015). *Reading Comprehension Difficulties among EFL Learners: The Case of Third-Year Learners at Nehali Mohamed Secondary School*, Master Thesis. University of Tlemcen, Algeria.

Meylana, A. (2019). Students' Reading Comprehension Ability and Problems in an Advanced Reading Comprehension Class. M.A thesis, Faculty of Arts. Negeri Semarang University- UNNES-. Available at: http://lib.unnes.ac.id/35817/1/2201414110_Optimized.pdf

Naiditch, F. (2010). Critical Pedagogy and Teaching Reading for Social Action. *Critical Questions in Education, 1*(2), Pp. 94-107.

Nergis, A. (2013). Exploring the factors that affect reading comprehension of EAP learners. *Journal of English for Academic Purposes, 12*(1), 1-9.

Olga, C and Claudia, G. (2020). Efficient ways to develop reading comprehension skills. *Educational 21 Journal, (19) 13. doi: 10.24193/ed21.2020.19.13*

Pavlenko, A., Blackledge, A., Piller, I., & Teutsch-Dwyer, M. (Eds.). (2011). *Multilingualism, second language learning, and gender,*Vol. 6.

Pressley, M. (2002). *Reading instruction that works: The case for balanced teaching,* (2nd Ed.). New York: Guilford.

Priebe, S. J., Keenan, J. M., & Miller, A. C. (2012). How prior knowledge affects word identification and comprehension. *Reading and Writing*, 25(1), 131-149.

Riadil, I. (2020). Investigating EFL Learners' Reading Comprehension Problems and Strategies in Tidar University. *JELLT, Vol.4, No.1,* DOI: 10.36597/jellt.v4i1.7690.

Romero, G. (2017). Developing Reading Comprehension Skills in an ESP Course through a Theme and Task Based Learning Model. *Advances in Engineering Education, 14*, 136-146.

Roscoe, R. D. (2014). Self-monitoring and Knowledge-Building in Learning by Teaching. *Instructional Science, 42*, 327–351.

Samad, I. A. Jannah, M. Fitriani, S. S. (2017). *EFL* Students' Strategies Dealing with Common Difficulties in TOEFL Reading Comprehension Section. *International Journal of Language Education.* Vol. 1 No. 1, Pp. 29-36.

Sanford, K. L. (2015). *Factors affecting the reading comprehension of secondary students with disabilities.* University of San Francisco.

Shehu, I. (2015). Reading Comprehension Problems Encountered by Foreign Language Students, Case Study: Albania, Croatia. *Academic Journal of Interdisciplinary Studies, 4*(1 S1), 91.

Safitri, A. (2018). Improving Tenth Grade Students' Reading Comprehension of Narrative Text by Using THIEVES Strategy. Published M.A thesis. Available at: http://repository.unmuhjember.ac.id/7616/1/Artikel.pdf

Silva, C., & Capellini, S. A. (2010). Efficacy of the phonological remediation program and reading in the learning disorder, *Pro-Fono, 22*(2), 131-139.

Snellings, P., van der Leij, A., de Jong, P. F., & Blok, H. (2009). Enhancing the reading fluency and comprehension of children with reading disabilities in an orthographically transparent language. *Journal of Learning Disabilities*, *42*(4), 291-305.

Tawalbeh, T., & Ismaiel, N. (2014). Effectiveness of a Metacognitive Reading Strategies Program for Improving Low Achieving EFL Readers. *International Education Studies*, 8(1), 43-56.

Tompkins, G. E. (2011). *Literacy in the Early Grades: A Successful Start for Prek-4 Readers*, (3rd ed.), Boston: Pearson.

Triarina, D. (2012). *Using THIEVES Strategy to Increase Students Reading Comprehension at Junior High School, Journal of English Language Teaching*, Vol ,1 no 1

Wang, J., Guo, D., & Jou, M. (2015). A study on the effects of model-based inquiry pedagogy on students' inquiry skills in a virtual physics lab. *Computers in Human Behavior, 49*, 658-669.

Yazgan, B. S. (2013). The effect of inquiry based outdoor laboratory activities on students' inquiry skills and their attitudes towards the environment (doctoral dissertation). Marmara University, Istanbul.

Yilidiz, A and Arseven, A. (2021). The Relationship between Secondary Education Students' Digital Addiction Levels and their Inquiry Skills. *Research in Pedagogy*, Vol.11, No.1, pp. 151-164. DOI: 10.5937/IstrPed2101151Y