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| **RESEARCH ARTICLE**

Metacognitive Knowledge: The Effect of Strategy Evaluation Matrix on University Students' Reading Comprehension Performance

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| **ABSTRACT**

Understanding written texts is problematic for many university students studying English as a Foreign Language. It is not just about having an extensive vocabulary; students also need tools and strategies to comprehend expository texts. One such tool is the Strategy Evaluation Matrix (SEM), which integrates cognitive strategies and metacognitive knowledge. Research has shown that SEM significantly enhances students' reading comprehension performance. By utilizing SEM, students can improve their understanding of written texts. This study aims to investigate the impact of SEM on students' reading comprehension performance. To achieve this, a post-test-only nonequivalent control group design was used. Two intact groups from the first semester at the Faculty of Languages, Letters, and Arts, Kenitra, Morocco (FLLAK) were selected. The sample consisted of 66 students in both the control and the experimental groups, using a convenient sampling technique. Data for this study were collected using a TOEFL iBT reading comprehension practice test (i.e. the post-test). Results were analyzed using SPSS version 29 and indicated a significant difference between the experimental and the control groups. Students who were instructed to use SEM while reading and answering comprehension questions scored higher compared to those who did not use it. Therefore, employing SEM in reading comprehension indicates that our educational system should consider integrating psychological tools and theories in the teaching and learning of English as a Foreign Language, specifically in the domain of reading comprehension.

1. Introduction

In the fields of educational psychology and ELT, metacognition has undergone significant development and is increasingly recognized as a valuable asset for enhancing learning outcomes. Numerous scholars, including Cohen (2001), Oxford (1990), and Schraw and Dennison (1994), have advocated for the integration of metacognitive tools and strategies into the context of English as a Foreign Language. According to Brown (1987), metacognition comprises two fundamental components: metacognitive knowledge and metacognitive regulation. Metacognitive knowledge entails individuals' conscious understanding of their cognitive processes, while metacognitive regulation involves the management of these cognitive functions.

Metacognitive knowledge can be further divided into declarative knowledge, encompassing factual and conceptual understanding; procedural knowledge, including familiarity with strategies and processes; and conditional knowledge, encompassing the use of when and why to employ specific strategies. The incorporation of metacognitive knowledge tools, such as SEM, into reading comprehension courses is mandatory for fostering students' reading performance and proficiency. This integration is crucial for

educators, students, policymakers, and instructional designers aiming to optimize the learning process and enhance overall educational achievements.

In recent years, a growing body of research has probed into the exploration of metacognitive strategies, metacognitive regulation, and metacognitive awareness as they relate to the teaching of reading comprehension. They have shed light on the potential benefits of incorporating metacognitive strategies into reading instruction. However, while there has been considerable focus on these aspects, there remains a notable gap in the literature concerning the specific impact of the Strategy Evaluation Matrix (SEM) as a metacognitive knowledge tool for guiding students' comprehension of written texts, as originally proposed by Schraw in 1998.

This study seeks to address this gap by investigating the potential effects of utilizing SEM in the context of reading comprehension instruction. Specifically, it aims to examine whether the implementation of SEM has a positive impact on students' reading comprehension performance. By delving into this specific area, the study endeavors to contribute valuable insights into the potential benefits of influencing SEM as a metacognitive tool within the field of EFL reading comprehension instruction at the tertiary level.

2. Literature Review
2.1 Metacognition
Metacognition, the process of reflecting on one's own thinking, can be traced back to ancient Greek philosophers like Plato and Aristotle (Tarricone, 2011). Although the term "metacognition" was formally introduced by Flavell in 1976, the idea itself has been present for centuries. In his initial account, Flavell described metacognition as involving the knowledge of cognition and the regulation or control of cognitive processes, defining it as "knowledge that takes as its object or regulates any aspect of any cognitive endeavor" (Flavell, 1978, p. 30). Building on this, Brown (1987) expanded the definition to include both the knowledge and control of people's cognitive systems (p.66). This concept involves reflecting on and managing one's own cognitive processes.

Numerous scholars have embraced Flavell's and Brown's characterization of metacognition as involving both knowledge of cognition and regulation of cognition (Brown, 1987; Flavell, John, 1987; Flavell, 1979; Schraw, 1998; Schraw & Dennison, 1994; Schraw & Moshman, 1995). The current study focuses on the effects of metacognitive knowledge within the context of reading comprehension instruction at the university level. This involves exploring how students can develop an awareness of their own thinking processes and how they can regulate and control these processes to enhance their comprehension skills.

2.2 Metacognitive Knowledge
Brown (1978, 1981) proposed a framework for understanding metacognition, dividing it into two main components: metacognitive knowledge and metacognitive regulation. This study will specifically focus on metacognitive knowledge, aiming to provide a comprehensive definition, explore its various components, and explain its significance in the context of EFL reading. Metacognitive knowledge includes an individual's awareness of their cognitive resources and their ability to adapt to different learning situations (Baker & Brown, 1984, p.353). It can be further classified into declarative knowledge, which involves knowing about cognitive strategies and tasks; procedural knowledge, which pertains to the execution of cognitive strategies; and conditional knowledge, which relates to when and why to use specific strategies (Brown, 1987; Jacobs & Paris, 1987; Pintrich et al., 2000; Schraw, 1998; Schraw & Dennison, 1994).

Declarative knowledge, as the first component of metacognitive knowledge, refers to what people know, what they do not know, and what they are required to know to meet task demands (Jacobs & Paris, 1987; Schraw, 2001; Tarricone, 2011). It is defined as "knowledge about one's skills, intellectual resources, and abilities as a learner" (Schraw & Dennison, 1994, p. 474). Declarative knowledge plays an important role in the teaching of many subjects, including history, English literature, and science (Sharon, 1990). Some scholars suggest the use of questions to implement declarative knowledge in the teaching-learning process (Schraw & Dennison, 1994). In SEM, adopted in the current study, students are explicitly introduced to the cognitive strategies in the first column.

The second component of metacognitive knowledge is procedural knowledge. It refers to "knowledge about how to implement learning procedures (e.g., strategies)" (Schraw & Dennison, 1994, p.474). When people implement procedural knowledge in their learning, they know how to execute these skills (Schraw & Moshman, 1995). When using reading strategies, procedural knowledge is portrayed in the answering of the question "How?" (Annevirta et al., 2007). In SEM, the second column about how to use reading strategies concerns procedural knowledge.

The last component of metacognitive knowledge is conditional knowledge. It is defined as "knowledge about when and why to use learning procedures" (Schraw & Dennison, 1994, p.474). To put it simply, conditional knowledge refers to the knowledge people have about both declarative and procedural knowledge strategies and their usage in different learning tasks (Jacobs & Paris, 1987; Paris et al., 1983; Schraw, 2001). It is simply the "when?" and the "why?" of cognitive strategies, as displayed in SEM below.

2.3 Strategy Evaluation Matrix (SEM)

Schraw (1998) created SEM to enhance students' understanding of metacognitive knowledge. Teachers can use SEM in various ways. They can adapt or adopt it and modify, add, or customize it based on their students' needs, levels, and cultural backgrounds. Each student and teacher is unique, so SEM's adaptability to any context is its key feature.

To effectively incorporate SEM in teaching reading comprehension, a teacher can start by carefully selecting a list of cognitive strategies that align with the learning objectives outlined in the university syllabus or based on their own pedagogical approach. These strategies could encompass a wide range of skills, such as summarizing, paraphrasing, scanning, skimming, and more.

At the beginning of the semester, the teacher should introduce and explain each cognitive strategy in detail, dedicating individual sessions to the explanation and practice of each strategy. Next, the teacher should familiarize the students with SEM and demonstrate how to fill it out effectively. The teacher should encourage active discussion among the students, providing opportunities for them to share their completed SEM with their peers. In addition, using online platforms such as Schoology or Google Classroom can facilitate the sharing of these mini-portfolios and create a collaborative learning environment.

Throughout the semester, students should be encouraged to regularly update and fill out their SEM mini-portfolios, reflecting their understanding and application of the cognitive strategies. This continuous engagement with SEM will allow students to track their progress and development in reading comprehension. By the end of the term, students will have compiled a mini-portfolio showing their growth and proficiency in utilizing cognitive strategies.

Teachers have the flexibility to incorporate SEM in various creative ways to engage their students. For example, they can assign it as a school project, allowing a group of four students to collaboratively analyze and complete it. Alternatively, teachers can integrate it into a presentation format, encouraging students to present their self-assessment findings. Another approach could involve turning the completion of it into a friendly competition among students to foster a sense of motivation and achievement. The decision on which approach to take should be informed by the age of the learners, their level of motivation, and their diverse cultural backgrounds to ensure an inclusive and effective learning experience.

Figure 1: A sample of the Strategy Evaluation Matrix (SEM) (Schraw, 1998, p.120)

Strategy	How to Use	When to Use	Why to Use
Skim	Search for headings, highlighted words, previews, summaries	Prior to reading an extended text	Provides conceptual overview, helps to focus one's attention
Slow down	Stop, read, and think about information	When information seems especially important	Enhances focus of one's attention
Activate prior knowledge	Pause and think about what you already know. Ask what you don't know	Prior to reading or an unfamiliar task	Makes new information easier to learn and remember
Mental integration	Relate main ideas. Use these to construct a theme or conclusion.	When learning complex information or a deeper understanding is needed.	Reduces memory load. Promotes deeper level of understanding.
Diagrams	Identify main ideas, connect them, list supporting details under main ideas, connect supporting details	When there is a lot of interrelated factual info	Helps identify main ideas, organize them into categories. Reduces memory load.

2.4 Reading Comprehension

Many scholars throughout history have made efforts to provide a comprehensive definition of reading comprehension. One notable example is Snow (2002), who defines reading comprehension as "the process of simultaneously extracting and constructing meaning through interaction and involvement with written language" (p.11). This definition implies that reading comprehension is a dynamic process rather than a static outcome, emphasizing the time and effort required to achieve it. Snow's choice of the words "extracting" and "constructing" highlights the nuanced nature of reading comprehension.

Snow identifies three fundamental elements of reading comprehension: the reader, the text, and the reading activity (Snow, 2002, p.11). By recognizing these key components, Snow demonstrates the complex interplay between the reader's cognitive processes,

the characteristics of the text, and the strategies employed during the reading activity. She emphasizes the crucial role of strategy instruction in facilitating reading comprehension. Effective strategies not only aid in decoding and understanding the text but also contribute to creating an optimal reading environment for EFL readers.

According to Woolley (2011), reading comprehension is the process of deriving meaning from text. Woolley, similar to Snow (2002), defines reading comprehension as the process of grasping the overall idea of the text. Reading comprehension aims to equip learners with the ability to understand the meaning of texts as a whole rather than just understanding isolated words and sentences. Woolley also identifies four key elements for effective reading comprehension: the text, the task, the reader's characteristics, and the purpose of the activity (Woolley, 2011, p.34). Like Snow (2002), Woolley emphasizes the importance of the reading activity in achieving reading comprehension. Therefore, reading tasks should adhere to specific methodologies to ensure that students comprehend the text thoroughly and can answer questions on the reading material.

Oakhill et al. (2015) define reading comprehension as a complex task that requires the coordination of various cognitive skills and abilities. They describe it as a cognitive task that necessitates the use of cognitive strategies. They differentiate language comprehension from reading individual words, stating that language comprehension involves understanding words, sentences, and text (Oakhill et al., 2015, p.2). However, they stress that reading words and language comprehension are closely linked, with language comprehension beginning with reading and understanding words.

Doake (1976) defines reading comprehension as a complex cognitive process. It involves the use of confirmational, transformational, and predictive strategies when attending to the syntactic (sentence structure) and semantic (meaning) clues of printed material (p.131). The reader's goal is to encode and understand the information and ideas expressed by the author. This process requires the reader to actively engage with the text, making use of various cognitive strategies to extract meaning and create a coherent understanding of the author's message.

3. Methodology
3.1 Research Design
The current study utilizes a quasi-experimental design, meaning that participants were not randomly assigned to either the control or experimental group. The study involves two groups to measure the impact of a specific treatment, SEM, as a metacognitive knowledge tool on reading comprehension performance. Since participants were not randomly assigned, the study employs a post-test-only nonequivalent control group design (Creswell, 2012). Table 1 illustrates the design used in the study. The experimental group received the treatment (explicit instruction of metacognitive knowledge and the use of SEM), while the control group did not receive any instruction. At the end of the experiment, both groups were tested using the TOEFL iBT reading comprehension practice test.

Table 1: *Post-test only nonequivalent design* **(**Creswell, 2012)

Control group	No treatment	Posttest (Reading test)
Experimental group	Experimental treatment (SEM)	Posttest (Reading test)

3.2 Research Objective
The current study aims to determine the impact of SEM (metacognitive knowledge) on reading comprehension performance among Moroccan EFL students at Ibn Tofail University.

3.3 Research Question and Hypotheses
This study seeks to answer the following research question:

RQ: To what extent does SEM impact Moroccan EFL university students' reading comprehension performance?

The following alternative and Null hypotheses have been devised to answer the above research question:

H_a: Explicit instruction of SEM positively impacts Moroccan EFL University students' reading comprehension performance.
H_0: Explicit instruction of SEM does not impact Moroccan EFL University students' reading comprehension performance.

3.4 Participants
Participants in this study included N=66 undergraduate first-semester students studying English at the Faculty of Languages, Letters, and Arts (FLLA) at Ibn Tofail University in Kenitra, Morocco. Both groups of participants were similar in terms of age, belonging to the same generation, and racial makeup (Creswell, 2012). Since it was not possible to randomly assign participants to either group, the intact groups were maintained. Therefore, the control group comprised N=33 participants, and the experimental group consisted of N=33 participants.

3.5 Data Collection Instrument

In the current study, one research instrument was used. The TOEFL iBT test was adopted as a post-test (Educational Testing Service, 2021) to test both groups. The reading comprehension test covered a topic familiar to all students and was tailored to the students' English proficiency level (semester one). It consisted of 10 multiple-choice questions, including both literal and inferential questions.

3.6 Data Collection Procedure

Data was collected over a seven-week intervention. Both the control and experimental groups were given instructions over the course of seven weeks. Both groups studied Reading Comprehension and Precis 1 using the same syllabus, texts, and materials. The only difference was that the experimental group received SEM instruction while the control group did not. The experimental group's course included the following sessions:

Session 1: In the first session, the researcher/course instructor took the time to introduce students to the concept of metacognition, which involves understanding one's own thinking processes. She began by providing a detailed definition of metacognition and followed up with real-life examples to illustrate its application in academic settings. The instructor then delved into how students can actively incorporate metacognitive strategies to enhance their reading comprehension and overall learning experience. Throughout the session, students actively engaged with the researcher/course instructor by asking a variety of questions, indicating a strong interest in the topic. Some students openly admitted that they had not encountered the term "metacognition" before and expressed curiosity about its relevance in educational contexts. As such, they displayed enthusiasm and willingness to integrate metacognitive practices into their study routines, recognizing their potential to positively impact their academic performance.

Session 2: In the second session, the instructor provided an explanation of the two fundamental components of metacognition: metacognitive knowledge and metacognitive regulation. She drew a clear distinction between the two and then proceeded to guide the students through practical applications of these concepts in their reading comprehension tasks. The session placed a strong emphasis on the three key components of metacognitive knowledge: declarative knowledge, procedural knowledge, and conditional knowledge. To provide a hands-on learning experience, students were given the opportunity to actively practice using these three categories while engaging with a text from the Hot Topics 2 Textbook (Pavlik, n.d.). Subsequently, the students participated in meaningful discussions and shared their personal experiences with their peers.

Session 3: During the third session, the instructor explained the first column of SEM, which presents the reading strategies to be emphasized throughout the semester. She meticulously shared a list of cognitive strategies that were supposed to be addressed during the semester. This specific SEM column is linked to the declarative knowledge component of metacognitive knowledge. In addition, the instructor explained that each session will be dedicated to a single strategy, and these strategies will be put into practice using a variety of expository texts.

Session 4: During the fourth session, the instructor dealt with the second column of SEM, which is centered on the application of cognitive strategies in reading. This column specifically addresses the procedural knowledge component of metacognitive knowledge. The researcher elaborated on the practical uses of these strategies in enhancing reading comprehension. To reinforce students understanding, they were engaged in exercises using one of the reading comprehension texts and applied the cognitive reading strategies that have been covered in the course.

Session 5: In the fifth session, the focus was shifted to the third and fourth columns of SEM, which cover the "when" and "why" of using cognitive strategies. This relates to the conditional knowledge aspect of metacognitive knowledge. The instructor explained how these strategies are used in reading comprehension. Students then practiced using these strategies with a reading comprehension text and the cognitive reading strategies they have learned in the course.

Session 6: In the sixth session, students practiced using SEM for different reading strategies using a text from Hot Topics 2. Figure 2 illustrates a sample of SEM as a mini-portfolio.

Session 7: During the final session, students were given the opportunity to make final remarks, and then they took the post-test.

Figure 2
A sample of a student's SEM mini-portfolio

Course Instructor: Prof. Islam EL KASSIMI   **Institution:** FLLA-Kenitra
Student's Full name: ▮▮▮▮▮▮▮▮▮   **School year:** 2023-2024

Strategy Evaluation Matrix (SEM)

Strategy	How to use	When to use	Why to use
1. Skimming	- Read the title, the introduction or the first paragraph. - Check the headings and sub-headings, source of the text, and sections. - Read the first sentence in each paragraph. , the summary or last paragraph.	When you want to read something quickly to get a general idea.	It helps to identify quickly the general ideas in a text and the purpose of the writer, without going to details.
2. Scanning	- State the specific information you are looking for - Selectively read and scan through sections of the passage. - Look for key words.	To quickly locate specific information from a large quantity of written material.	It helps to find specific information
3. Previewing	-Start with the title. -Skim the introduction. -Read the heading or sub headings. -Look for bold or italicized words. -Scan the final paragraph or the chapter summary.	-To help you decide whether a book or a journal is useful for your purpose. -To get a general sense of the article structure. -To help you locate relevant information.	To get an idea of what it is about without reading the main body of the text.
4. Predicting	Before reading: -Look at the title and the pictures to help you make predicting During the reading: -Stop in every few pages to make a prediction about will happen next After reading : Think: Did I make accurate predictions?	To make predictions about contents.	It allows students to use information from the text, such as titles, headings, pictures and diagrams to anticipate what will happen in the story.

Course Instructor: Prof. Islam EL KASSIMI
Student's Full name: ▮▮▮▮▮▮▮▮▮▮
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5. Inferencing	-Make a guess about what you do not know based on the information available. - Read between the lines - Use your prior knowledge and textual information to draw conclusions. - Make critical judgments. - Form interpretations of the texts.	When : - The text starts with a question. - The text compares or contrasts two or more things. - Every sentence in the piece of the text contains equally specific information. - The text is a satirical piece, or the author uses an ironic tone of voice.	To make a logical conclusion based on the facts or opinions from the text.
6. Diagrams (main idea, supporting ideas, purpose etc)	Main idea: - Visually represent the framework of any paragraph graph text by outlining its main idea and related details. Supporting ideas : - Sentences that tell more about, describe or support the main idea.	Useful when we want to convey information quickly.	They allow users to represent and visualize ideas, making it easier to communicate and understand them.
7. Paraphrasing	-Read the original source carefully and understand it. - Identify the main points and keywords. - Rewrite the text in your words using your own style.	-We use it as an alternative of direct quotations with short sections of text such as phrases and sentences. - For note taking and explaining information. - To rewrite and express someone else's ideas without changing the meaning. - To support claims in or provide evidence for your writing.	- It allows you to integrate evidence. - Used for notes taking and to explain information in tables, charts and diagrams.
8. Summarizing	- Start by reading a short text and make notes of the main points. - Read the text and make notes of the main points. - Rewrite your notes in your own words and restate the main idea at the beginning plus all major points.	- To outline the main ideas and the major supporting points. - To include an authors ideas using fewer words than the original text. - To briefly give examples of several differing points of view on a topic.	- To reduce or condense a text to its most important ideas. - It's a useful skill for making notes, writing an abstract / synopsis.

Note: The student's SEM was not corrected by the instructor.

4. Results

4.1 Checking Assumptions for a Parametric Test

Data were analyzed using SPSS version 29. Before analyzing the data, assumptions for using a parametric test were checked. The following were found concerning normality and homogeneity. The Shapiro-Wilk normality test indicated that the data were normally distributed (sig. value >0.05) (see Table 2). This finding was further confirmed by visual methods such as histograms and Q-Q plots. Regarding the homogeneity of variance assumption, the variance of both groups was found to be the same despite differences in students' scores. Therefore, none of these assumptions were violated. Consequently, an independent-samples t-test was used to compare the means of both groups in order to check for differences, as we were comparing two independent groups (experimental and control) (Larson-Hall, 2010).

Table 2: *Tests of Normality*

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Experimental group	.176	33	.011	.960	33	**.264**
Control group	.159	33	.033	.930	33	**.054**
a. Lilliefors Significance Correction						

4.2 Descriptive Statistics

The current study seeks to investigate the impact of SEM on Moroccan EFL University students' reading comprehension performance. Thus, two groups were utilized: a treatment group that was instructed in using SEM while reading written texts and answering comprehension questions and a control group that did not receive any instruction.

Table 3 presents the descriptive statistics for each of the following groups: experimental and control. The experimental group consists of 33 participants (N=33) with a mean score of (M=8.88), which is clearly higher than the mean score of the control group (M=5.06), which involves 33 participants, as well (N=33). As for the standard deviations of both groups, they were very close for both groups: the control group (SD=3.30) and the experimental group (SD=3.45). This means that the spread of scores in both groups was closely related.

Table 3: *Descriptive statistics of the experimental and control groups on the impact of SEM on reading comprehension performance*

Descriptive Statistics

	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Control group	33	0	13	**5.06**	.576	3.307
Experimental group	33	3	17	**8.88**	.601	3.453
Valid N (listwise)	33					

4.4 Inferential Statistics

This study aims to determine if there is a significant difference in reading comprehension performance between the control and the experimental groups after SEM treatment. The experimental group received a seven-week intervention on using SEM as a metacognitive knowledge tool, while the control group received no intervention. It was hypothesized that the experimental group would achieve higher scores than the control group in reading comprehension. An independent samples t-test was conducted to test this hypothesis.

Results, as shown in Table 4, demonstrate that there was a statistically significant difference between the experimental group and the control group. This is supported by the sig. two-sided level p=.001, which is lower than the p-value p=0.05. Also, this difference is obvious, as shown in the mean of both groups (M=5.06) for the control group and M=8.88 for the experimental group. Therefore, the alternative hypothesis stating that there is a difference between both groups is supported, and the null hypothesis is rejected. That is, SEM has a positive impact on Moroccan EFL University students' reading comprehension performance.

Table 4: *Results of the Independent samples t-test*

		Levene's Test for Equality of Variances		t-test for Equality of Means							
							Significance				95% Confidence Interval of the Difference
							One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	
		F	Sig.	t	df						Lower	Upper
Reading comprehension performance	Equal variances assumed	.549	.461	-4.588	64		**<.001**	**<.001**	-3.81818	.83223	-5.48075	-2.15561
	Equal variances not assumed			-4.588	63.880		<.001	<.001	-3.81818	.83223	-5.48081	-2.15555

5. Discussion

An independent samples t-test was conducted to compare the reading comprehension performance of the experimental and the control groups. Results showed significant differences (t66 (df)=64, p=.001) in the scores, with the mean score for the experimental group (M=8.88, SD= 3.45) higher than the mean score for the control group (M=5.06, SD=3.30). Therefore, the Null hypothesis was rejected, and the alternative hypothesis was confirmed that the use of SEM impacted Moroccan EFL University students' reading comprehension performance.

The integration of the three components of metacognitive knowledge - declarative knowledge, procedural knowledge, and conditional knowledge - within a tool such as SEM has been shown to improve students' reading comprehension skills. Students require a set of skills and techniques (declarative knowledge), a simplified and organized approach to using these strategies (procedural knowledge), and an understanding of when and why to utilize them (conditional knowledge) in order to effectively process and comprehend expository texts. The results of the current study confirm that incorporating metacognitive knowledge has a positive impact on students' reading performance. Previous research by Schraw (1998, 2001) also demonstrated positive outcomes when using SEM in reading comprehension. Similar positive results were found in studies utilizing other tools to enhance metacognitive awareness (e.g., Mokhtari & Sheorey, 2002; O. Alsheikh & Mokhtari, 2011).

Metacognitive awareness among EFL students has been found to significantly enhance their active engagement with the course material. This engagement is attributed to students' understanding that they are required to complete SEM and subsequently engage in discussions with both their peers and teachers. This aims to transform learners from passive readers of expository texts to active participants who critically analyze and comprehend the material. The act of actively engaging with written texts has been shown to result in improved comprehension and emotional, social, behavioral, and academic involvement among students.

Students can apply the strategies they have learned from SEM to enhance their understanding and problem-solving skills in various subjects and modules, including but not limited to mathematics, science, social studies, and language arts. Metacognitive knowledge, practiced using SEM, plays a crucial role not only in improving reading comprehension but also in developing effective writing techniques, engaging in guided reading practices, and analyzing complex literary works. These metacognitive knowledge components are different and can be transferred across different academic disciplines and real-world contexts, empowering students to approach challenges with a deeper understanding and strategic thinking. By applying this knowledge to their everyday lives, students can further grasp concepts and make meaningful connections between academic learning and real-world problem-solving.

They also play a crucial role in developing critical thinking and encouraging independent learning. By encouraging self-reflection, these methods help students develop critical thinking skills and become independent learners. The use of a mini-portfolio, known as SEM, allows students to regularly reflect on their learning practices. They can document and analyze what has worked well, what has not been effective, and areas where improvement is needed. Through this process, students gain valuable insights into their learning journey. Students are empowered to engage in independent reading at home, using the acquired strategies and techniques to comprehend texts effectively.

6. Conclusion

SEM impacts students' reading comprehension performance in various ways. It helps students comprehend, analyze, and interpret written texts. Incorporating the three metacognitive components can significantly benefit students. It can enhance their reading comprehension skills, promote active engagement, facilitate knowledge transfer to other fields of study, and develop critical thinking and independent learning.

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