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Metacognitive reading strategies: gender, locality, and age differences among secondary school students

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ABSTRACT

This study ascertained the influence of gender, locality and age on metacognitive reading strategies of secondary school students. The sample size consists of 440 students randomly selected from 23 secondary schools. An adopted questionnaire tagged "metacognitive reading strategies questionnaire," was used as the data gathering instrument, with a logical validity of 0.88 and Cronbach alpha of 0.73 as internal consistency. The data collected were analysed statistically using descriptive statistics and t-tests. Data analysis revealed that females' reading strategies outnumber males'; females' global strategies ranked highest, while females' problem-solving strategies ranked lowest; and students in urban secondary schools tended to utilise metacognitive reading strategies more frequently than their rural counterparts. This study also shows that students with higher age brackets make more use of metacognitive reading strategies than lower-age students. Therefore, it is recommended that educators should be prepared to educate students how to effectively utilise various components of metacognitive reading strategies.

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1. INTRODUCTION

Individuals' metacognitive experiences and views are the foundation of their ability to function at various levels. The acquisition of this experience holds significant significance in advancing cognitive abilities and fundamental skills. Metacognition is the capacity to take an active role in one's own cognitive regulation and monitoring. Controlling one's own learning and one's own thought processes are the crux of the matter [1]. Metacognition involves understanding one's own learning process and tailoring education and training programmes based on this self-awareness [2]. Determining the relationship between a product originating in the mind and its association with either a cognitive activity or a metacognitive process is a considerable challenge [3]. Metacognition encompasses two interconnected forms of knowledge. i.e., Understanding the necessary abilities, strategies, and tools required for a task, and knowing when and how to utilise them effectively to achieve success [4]. It is the skills that enable learning to occur independently, and it is a way of learning to learn.

Metacognition is prominent in facilitating the strategic and efficient utilisation of an individual's cognitive capacity. The significance of metacognition may not be readily apparent to many students unless the process is explicitly elucidated and well-instructed, given that it manifests as an internal dialogue conducted by the individual. Metacognition plays a crucial role in learning and teaching by influencing

several elements like acquisition, comprehension, retention, critical thinking, and problem-solving. The capacity to regulate and oversee cognitive processes is recognised as a metacognitive approach [5]. Additionally, metacognition is suggested as a learning strategy in the context of reading, serving to regulate and monitor the cognitive processes involved [6]. Rastegar *et al*. [7] established that reading comprehension was shown to be higher among participants who employed more metacognitive reading strategies than among those who employed fewer strategies.

Reading techniques are commonly classified as behaviours intended to assist students before, during, and after their reading activities [8]. Lukes [9], the skill of proficient reading is contingent upon the capacity to rapidly and effortlessly identify words. Individuals who possess strong reading skills are more likely to attain higher levels of success due to their ability to rapidly and effortlessly comprehend words as a cohesive textual unit [10]. Ajai *et al*. [11], the primary factors contributing to students' subpar academic achievement are their limited proficiency in reading comprehension and their lack of proficiency in employing appropriate reading strategies.

An overarching approach to acquire meaning from text is provided by reading methods, which include scanning, sampling, predicting, verifying, comprehending, and fixing mistakes as they ensue [12]. According to the research conducted by Al-Melhi [13], there are discernible variations in the use and self-reported awareness of metacognitive reading strategies employed by readers with varying degrees of proficiency. In order to help readers better understand what they read, Mokhtari and Reichard [14] came up with a number of metacognitive reading strategies. One of these is; i) Global reading strategies, which include things like establishing a reading goal, drawing on prior knowledge, determining if the text meets the definition, making predictions about the text's subject matter, checking those predictions, previewing the text for content, choosing what to read closely, and improving comprehension through the use of context cues, text structures, and other language features; ii) Support reading strategies include making mental notes, rephrasing passages, reviewing what you've already read, talking about what you've read with others, and summarising what you've read; and iii) Problem-solving strategies, such as reading more slowly, changing the pace of reading, pausing to think about what you've read, returning to the text and visualising what you've seen, reading aloud, and assuming the meaning of unfamiliar terms.

Engaging pupils' prior knowledge is one strategy to enhance their understanding. Inferring the meaning will be easier for the student because of their previous knowledge. The effect of prior information on reading comprehension was investigated by Recht and Leslie [15]. They found that prior knowledge greatly improves both recall quantity and quality and comprehension.

According to Smith [16], several strategies can be employed to activate previous knowledge before a student engages with a text. These strategies include pre-reading planning, brainstorming, and schema activation. Oral or written brainstorming sessions are equally valid. After coming up with ideas orally, it might be helpful to put them into a visual organiser like a word cloud, a map, or a semantic web. These tools make it easy to classify and categorise related ideas that branch out from a primary topic [17].

By having students consider what caused a connection to form, the pre-reading approach fosters brainstorming. Schema activation is a teaching method that has students talk about the story and make predictions about what might happen next. Working with a group of intermediate-level students for one academic term, Parviz [18] emphasised pre-reading activities anchored in schema theory in her study on schema theory-based pre-reading tasks: an overlooked essential in the reading class. Ajideh was an English as a second language (ESL) reading instructor. Students' views and reactions on the methods covered during the semester led researchers to conclude that most pre-reading exercises focus on clarifying difficult words or complex sentences.

In a study conducted by Dhanapala [19], an examination was carried out on the metacognitive reading of Sri Lankan students. The investigation focused on the students' reading competence levels, categorised into three distinct categories. The study revealed a significant correlation between the proficiency levels of Sri Lankan students and their utilisation of problem-solving methods. In their study, Bang and Zhao [20] investigated the reading methods employed by proficient ESL learner. The findings indicated that readers had shown resilience in utilising dictionaries, employing translation strategies, and drawing upon personal background knowledge to comprehend academic writings. These qualities were regarded as indicative of proficient readers.

In their discovery, Pammu *et al*. [6] highlight the growing demand for a reading strategy that focuses on the comprehensive study of texts and the use of external reference materials. This approach aims to enhance students' metacognitive awareness and ultimately enhance their skills in reading. Ghaith and Sanyoura [21] findings indicate a notable prevalence of problem-solving techniques and a moderate utilisation of global and support strategies.

Gender is another factor that may influence the reading strategies of students. This could be from both psychological and internal processes, cultural and educational factors [22]. In some cultures, people see

literacy practices as gendered-based female activities [23]. Results showed that girls outperformed boys on the reading section of the programme for international student assessment (PISA) [24]. In the same vein, across all nations, boys were more likely than girls to have weak reading skills. Lietz [25] has also shown that, on average, girls perform higher than boys in text comprehension.

Some studies have indicated that school location is vital in metacognitive reading strategies among secondary school students. This could likely be environmental factors and passion for study by students in urban school locations rather than rural students. This is not far from the reality that pupils' actions are dictated by internal experiences that they may or may not choose to communicate, and environmental circumstances, such as the socio-economic status of parents, which can affect students' mental processes [26].

The age of students may also affect metacognitive reading strategies in secondary school schools. Studies have shown that students with higher age brackets develop complex thinking processes such as increased thoughts, produces idealistic views on topics of concern, begin thinking about making career decisions and focus on emerging role in adult society than lower age students.

Even when comprehension failure isn't a problem, many children still don't appear to have reading methods that improve storage and retrieval. In order to read for understanding, students need to develop the ability to self-regulate their reading process. The capacity to correctly foretell one's own performance on a certain activity is an example of metacognition strategies that the reader should be familiar with [27]. Their thought processes, methods of action, problem-solving abilities, system-awareness, and comprehension strategies and procedures are all off-limits to scrutiny [28].

Typical studying strategies encompass the utilisation of techniques such as underlining, outlining, note-taking, summarising, and self-questioning [29]. Several of these tactics exhibit a complexity that individuals with greater age and experience most effectively manage. Hence, when challenges in reading comprehension develop, it becomes necessary to engage regulatory or control mechanisms.

According to Zhussupova and Kazbekova [30], their research indicated that the utilisation of metacognitive reading techniques has the potential to enhance students' comprehension of reading strategies and enhance their ability to critically evaluate the reading process. In summary, the utilisation of the metacognitive reading strategy has proven to be a productive approach for enhancing reading comprehension within the realm of foreign language acquisition [31], [32].

2. LITERATURE REVIEW

2.1. Metacognition

The word "metacognition" refers to the self-regulatory utilisation of cognitive processes. Flavell [33], the pioneer of metacognitive research, defined metacognition at the level of an individual's awareness and comprehension of their own mental operations and the results thereof, or anything connected to it. It pertains to the process of reflecting on one's thoughts. It concerns the self-regulated process of understanding what individuals know and how they effectively apply it to specific activities [34]. It offers teachers new instructional approaches by emphasising the process rather than the reading outcomes. A person's metacognition is their capacity to notice and understand their own thought processes [35]. Through the practice of metacognition, students are able to plan for, track, and assess their own level of task-related awareness and performance [36].

2.2. Metacognitive strategy

The skill of reading encompasses a fundamental fascination and enthusiasm, as well as the ability to envision and create new ideas. Metacognition necessitates the presence of self-control, which encompasses the ability to engage in self-regulated thought [37]. It is crucial because it enhances techniques and methodologies for accomplishing a task, monitoring personal progress, and reflecting on and evaluating the effects of the completed endeavour. Metacognitive approaches refer to advanced cognitive skills that enable readers to know their comprehension level when reading a book [38]. It methods promote students' ability to introspect on their cognitive processes and systematically organise, supervise, and assess many learning elements [39]. The objective of metacognitive learning strategies is to augment students' consciousness of the factors that give significance to their language acquisition [40].

2.3. Strategies for reading

Reading is an interactive cognitive process where readers engage with text [41]. Utilising reading methods during the reading process is crucial for readers as it enhances their comprehension of the content. It can be inferred that the readers employ reading strategies as approaches to conquer their reading challenges. Reading methods refer to deliberate and explicit actions that assist students in comprehending written text. The techniques of reading involve intentional attempt to improve readers' understanding of the material [42].

2.4. Classifications of reading strategies

These three types of strategy (i.e., global, problem-solving, and support strategies) interact with each other and influence text comprehension [6]. This entails jotting down observations throughout the reading process, rephrasing and condensing specific information from the book, utilising reference materials such as a dictionary, and providing concise summaries of the reading material to others [43].

- Global reading strategies: encompass a collection of reading methods focused on a comprehensive book study. Examples encompass carefully selecting and disregarding reading materials based on personal discretion. It entails deliberate and methodically organised strategies implemented by students to oversee and control their reading. These strategies include utilising prior knowledge, aligning reading objectives with the content preview, making use of contextual clues and the organisation of text, and quickly scanning the text [44].
- Problem solving strategies: refers to the unique actions and procedures readers employ when dealing with a text. Readers or students employ these procedures as focused and deliberate techniques when encountering challenges in comprehending literature. Examples of tactics for overcoming difficulties in reading include reading at a conscious and slow pace, adjusting the speed and rate of reading, re-reading the text while visualising the key information, and using context to make accurate assumptions regarding the meaning of new words [45]. It generally encompasses utilising external reference resources, note-taking, and other practical strategies that can be functional or supportive. Strategies of this nature fulfil a valuable purpose for certain pupils who appear to employ them as necessary [46]. Examples of such mechanisms include the use of reference materials like dictionaries, as well as other support systems.
- Support strategies: seemed to revolve around utilising tactics to resolve difficulties encountered when reading challenging texts. Several tactics can be observed as examples- “I find that rereading helps me understand the material better when it gets tough. "I change the pace at which I read based on the text." By following these steps, readers will be able to traverse material with ease.

2.5. Hypotheses

At the 0.05 significant level, the following hypotheses were examined: i) There is no significant influence of metacognitive reading strategies (global, problem-solving, and support strategies) based on gender among secondary school students; ii) There is no significant influence of metacognitive reading strategies (global, problem-solving, and support strategies) based on locality among secondary school students; iii) There is no significant influence of metacognitive reading strategies (global, problem-solving, and support strategies) based on age among secondary school students.

3. METHOD

3.1. Research design

A descriptive survey research strategy was utilised in this study. This design is deemed appropriate for it allows the researchers to collect data from a representative sample with the view to generalise the findings on the entire population. This design aid data gathering in a standardised manner utilising well-defined study themes and variables, and research instruments that are highly structured. Thus, this research approach was deemed suitable for this investigation.

3.2. Sample and sampling technique

The sample consisted of 440 students randomly selected from secondary schools in the state. Multi-stage sampling procedure was utilised to choose the study sample. Eleven secondary schools were selected from the 23 local government areas of rivers state, using both stratified sampling technique and purposive random sampling techniques; the stratified was based on gender and school type, and the instruments used for data collection were developed by Mokhtari and Reichard [14] tagged “metacognitive reading strategies questionnaire. This instrument is divided into two sections: A-B. Section A sought biographic information from the students, and section B has 12 items for comprehension on a 4-point scale ranging from strongly agree (4), agree (3), disagree (2) and strongly disagree (1). The statistical model used to analyse the data collected was a t-test and descriptive statistics.

4. RESULTS AND DISCUSSION

Hypothesis 1: there is no significant influence of metacognitive reading strategies (global, problem-solving, and support strategies) based on gender among secondary school students. In Table 1, data obtained shows that male and female mean scores on metacognitive reading strategies are 1.209 and 1.572, respectively. This result indicates that females utilise reading strategies more than male students, and the

highest number of strategies utilised by females was global ($M = 14.27$, standard deviation ($S.D$) $= 4.63$). The lowest strategy utilised by females was problem-solving ($M = 9.65$, $S.D. = 3.67$). This result indicates differences in metacognitive reading strategies used by secondary school students gender wise.

Table 1. Summary of mean, standard deviation and t-test on metacognitive reading strategies of male and female secondary school students

Metacognitive strategies	Male	Female	T	Sig (2-tailed)
Mean	14.27	4.63	64.52	.00
S.D	12.38	4.47	58.03	.00
Global reading strategies	9.65	3.67	55.09	.00
Support reading strategies	1.209	.428	59.13	.00
Problem-solving strategies	1.572	.499	66.00	.00

Hypothesis 2: there is no significant influence of metacognitive reading strategies (global, problem-solving, and support strategies) based on locality among secondary school students. Table 2 shows that urban and rural mean scores on metacognitive reading strategies are 1.49 and 1.00, respectively. This result indicates that students schooling in urban secondary schools make more use of metacognitive reading strategies than rural students, and the highest number of strategies used by urban students was global ($M = 14.27$, $S.D = 4.63$), and the lowest strategy used by rural students was problem-solving ($M = 9.65$, $S.D = 3.67$). This result indicates a significant difference between location and metacognitive reading strategies of secondary school students.

Table 2. Summary of mean, standard deviation and t-test on metacognitive reading strategies of urban and rural secondary school students

Reading strategies	Locality		t	p-value (2-tailed)
	Urban	Rural		
Mean	1.49	.500	62.76	.01
S.D	1.00	.09	22.76	.03
Global reading strategies	14.27	4.63	64.522	.00
Support reading strategies	12.38	4.47	58.033	.00
Problem-solving strategies	9.65	3.67	55.099	.00

Hypothesis 3: there is no significant influence of metacognitive reading strategies (global, problem-solving, and support strategies) based on age among secondary school students. Table 3 shows that 10-15 years and 15 years above mean scores on metacognitive reading strategies are 1.106 and .1.395, respectively. This result indicates that students with higher age brackets make use of metacognitive reading strategies than lower students, and the highest number of strategies used by higher age students was global ($M = 14.27$, $S.D = 4.63$), and the lowest strategy used by their counterpart was problem-solving ($M = 9.65$, $S.D = 3.67$). This result indicates a significant difference between age and metacognitive reading strategies of secondary school students.

Table 3. Summary of mean, standard deviation and t-test analysis between metacognitive reading strategies and age of secondary school students

Reading strategies	Age bracket		t	p-value (2-tailed)
	10-15years	15 years above		
Mean	1.106	.309	59.798	.02
S.D	1.395	.489	75.079	.00
Global reading strategies	14.270	4.639	64.522	.00
Support reading strategies	12.388	4.477	58.033	.00
Problem-solving strategies	9.652	3.674	55.099	.00

4.1. Discussion of findings

Our findings showed that there are statistical differences in metacognitive reading strategies used by secondary school students based on gender. The result indicates that females use reading strategies more than male students, and the highest number of strategies used by females was global ($M = 14.27$, $S.D = 4.63$); there are plausible reasons for these differences. The first reason could be from both psychological and internal processes. Another possible explanation is that, due to a shortage of male role models in the

classroom and in the home, more and more boys are learning to read on their own. Another reason is that of cultural and educational factors. This result is in line with the results of Lietz [25], Ahmed [28], Dianti [39], Do and Pham [47], who have shown that girls, on average perform higher than boys in text comprehension Ahmed [48], who also discovered gender differences Okyar [49], Kolić-Vehovec and Bajšanski [50].

Hypothesis 2 result indicates a significant difference between urban and rural secondary school students using metacognitive reading strategies. This could likely be environmental factors and passion for study by students in urban school locations. This result aligns with Kolić-Vehovec and Bajšanski [50], who found a notable disparity in metacognitive understanding and knowledge.

Hypothesis 3 result states that there is a significant difference between age and metacognitive reading strategies of secondary school students. This result shows that students with higher age brackets developed complex thinking processes such as increased thoughts, developed idealistic views on topics of concern, beginning to give serious consideration to future job choices and the responsibilities that will be expected of them as adults more than lower age students. This result aligns with Kolić-Vehovec and Bajšanski [51], who found that older students scored higher than lower students in the perceived reading strategy use.

5. CONCLUSION

It is concluded from the study that students' usage of reading methods varied significantly by gender, age, and socioeconomic status in secondary school, with the majority of students favouring global reading strategies. It is suggested that educators who are skilled in guiding students through the many components of metacognitive reading strategies be employed and supported. Secondary school students should be encouraged to develop the skills of using reading strategies that can help to improve their academic performance.

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