

The Moderating Role of Gender on The Relationship Between Primary School Students' Reading Attitudes and Reading Comprehension

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Abstract

Reading comprehension is fundamental to academic progress as it underpins learning across all school subjects. While academic achievement has traditionally been linked to students' cognitive abilities, it is also crucial to consider non-cognitive factors, such as the gender of students. Research has shown gender differences may have influence various aspects of education for students. Therefore, this study investigates gender of student as moderator between students' reading efficacy and reading comprehension. It is a quantitative study using a cross-sectional survey approach. A total of fifteen primary schools in Kelantan involving 393 year five pupils included for the study sample. The participants were identified utilizing a multi-level random sampling procedure. The design of the research includes descriptive tests as well as inferential analysis using structural equation modelling. The data obtained were analysed using structural path analysis within Structural Equation Modelling. The structural path analysis revealed that students' reading efficacy significantly influences their reading comprehension. The moderation analysis indicated a partial moderator effect as there is significant regression coefficients for gender of students, demonstrating that students' reading efficacy on reading comprehension depends on the gender. Therefore, it is crucial to carefully consider gender differences of students when planning educational programs. Gaining a deeper understanding of how students' reading efficacy impacts reading comprehension in relation to their gender can help develop more effective and comprehensive educational strategies for students.

Keywords: Students' Reading Self-Efficacy, Reading Comprehension, Gender Differences.

Introduction

Reading is not restricted to the ability to read words, phrases, or passages, as the primary goal of reading is to extract and construct meaning from any form of written work (Smith et al., 2021). Reading comprehension is crucial for educational attainment because it promotes learning content across all fields of study. Reading is an interaction between the reader's ability, cognitive processes, and the linguistic components of a text (Smith et al., 2021). Without understanding what is being read, students' potential to acquire knowledge may be compromised, thus disrupting the academic learning process in schools (Balanadam & Jamaluddin, 2021; Rahman, 2018). Therefore, research related to reading comprehension is essential to ensure that school students can comprehend reading materials and consequently understand classroom learning better.

Student self-efficacy, attitude engagement, and emotional engagement are key factors for students' academic achievement (Olivier et al., 2019). Students with self-efficacy are capable of self-directed learning, planning systematically, striving to achieve desired goals (Dzul et al., 2021), and setting learning targets (Lee & Amat, 2022). Consequently, students with high self-efficacy tend to achieve impressive academic performance (Meng & Zhang, 2023). Conversely, Guthrie et al (2007); Zimmerman (2000) found that students with low self-efficacy in reading tend to avoid challenging reading tasks and are likely to withdraw from tasks they find difficult. When students are confident in their abilities, they become more motivated and enthusiastic about enhancing their learning (Jungert & Rosander, 2010). Therefore, self-efficacy is an important factor in improving students' learning abilities and should be given attention.

Self-efficacy in reading corresponds to the extent of one's desire of doing reading activities efficiently (Schiefele et al., 2012). Self-efficacy is crucial for developing reading skills due to the self-regulation mechanisms it engages in the reading process. Successfully decoding printed words enables students to automatically recognize those words in the future (Peura et al., 2019). Consequently, this experience is essential for improving vocabulary, fluency, and reading comprehension (Peura et al., 2022).

Developmental reading intervention research have shown the significance of self-efficacy in reading activities (Lepola et al., 2000). Previous studies have demonstrated a robust correlation between reading comprehension and self-efficacy. (Guthrie et al., 2007; Lee & Jonson-Reid, 2016; Taboada et al., 2009). However, there are also studies that have found self-efficacy is essential for progression of word reading abilities. among students aged between eight and eleven years old, but no correlation was found with students' reading comprehension (Carroll & Fox, 2017).

Solheim (2011) found that students' self-efficacy in reading is linked to their reading strategies, with those lacking self-efficacy exhibiting lower reading performance (Mucherah & Yoder, 2008). Similarly, Zimmerman (2000); Guthrie et al (2007) observed that students with low reading self-efficacy tend to avoid challenging reading tasks and difficult homework. Conversely, when students believe in their abilities, they become more motivated and enthusiastic about improving their learning (Jungert & Rosander, 2010). Therefore, self-efficacy is a crucial factor in enhancing students' learning capacities and should be carefully considered.

Gender differences are found to impact students' academic achievements; where female students demonstrate better performance compared to male students (Herve et al., 2021). Similarly, reading motivation tends to vary by gender; with female students being more positively motivated to read than male students (Wigfield et al., 2016). The findings from the

Programme for International Student Assessment (PISA) in 2018 showed that female students significantly outperformed male students in reading, by nearly 30 points (Organisation for Economic Co-operation and Development (OECD), 2020; Schleicher, 2019). However, male students outperformed female students in mathematics, but only by five points. Herve et al. (2021) also found that the gender gap among students is not only present in cognitive skills but also in non-cognitive skills; and varies across high-income countries compared to low and middle-income countries. Therefore, gender factors must also be considered when planning to improve reading skills among primary school students.

Elementary school students with stronger reading abilities generally achieve more academically than those with weaker skills (Epçaçan, 2018). Bradley (2016) suggests that the reading comprehension skills developed during elementary school can impact lifelong learning experiences. Therefore, this study focuses on the influence of students' reading self-efficacy and gender differences on reading comprehension achievement among elementary school students.

The Study

The study hypothesises that there will be a significant moderating effect of gender on the relationship between students' reading self-efficacy on reading comprehension. Figure 1 shows the model testing students' gender as a moderator for the relationship between students' reading efficacy and reading comprehension. The specific objectives of the study are as follows:

1. To examine whether students' reading efficacy has an effect on students' reading comprehension.
2. To determine gender differences as a moderator on the relationship between students' reading self-efficacy and students' reading comprehension.

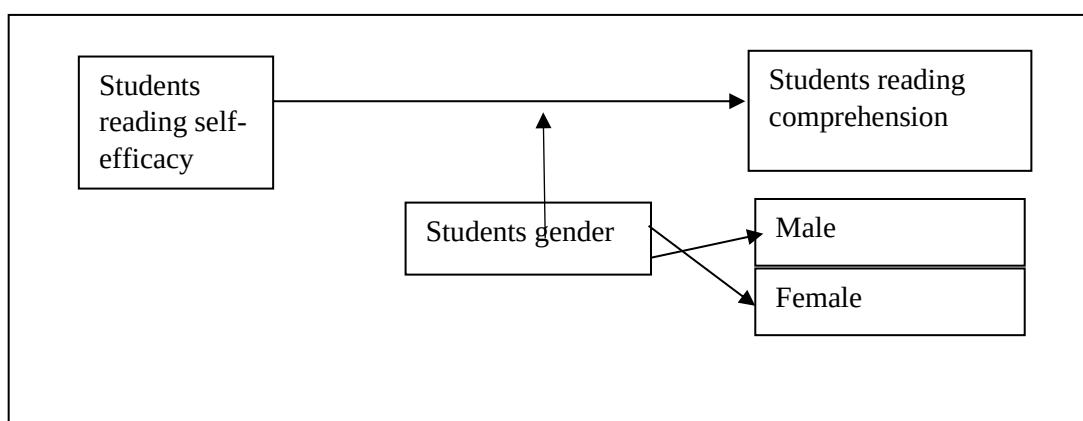


Figure 1: The model testing students' gender as a moderator for the relationship between students' reading efficacy and reading comprehension.

Methodology

Participants and Procedure

This study employed a quantitative approach with a correlational research design. Data collection was carried out using a cross-sectional survey method, allowing for the collection of data at a single point in time from a population sample. Fifth-grade students from 10 districts in Kelantan, Malaysia participated. According to the Kelantan State Education Department in 2022, there were 28,953 fifth-grade students in Kelantan. Using Cochran's

formula Cochran (1977) the minimum required sample size was calculated to be 264. Additionally, following recommendation by Salkind (1997) to increase the sample size by 40% to 50%, 50% of the initial sample size was added ($264 * 50\% = 132$). Therefore, the total minimum sample size needed was 396, which included the 132 additional samples recommended by Salkind. Thus, the researcher decided on a total sample size of 396 for this study.

The sample selection process used a multistage random sampling technique, with stratified random sampling to ensure representativeness. Kelantan's ten districts were divided into four geographic zones. Fifteen schools were randomly selected proportionally from each zone, and thirty students were randomly chosen from each selected school. After reviewing and analysing the returned questionnaires, 393 complete questionnaires were obtained. Descriptive analysis was conducted using IBM SPSS 26.0, and inferential analysis was performed using Structural Equation Modelling (SEM) with AMOS 26.0 software.

Instrumentation

Data were collected using specific items from the Progress in International Reading Literacy Study (PIRLS) 2016 Learning to Read Survey for Student Questionnaire and the Malay Language reading comprehension assessment. The instrument includes a formative construct, the Reading Comprehension Test, which has actual values and does not require measurement error analysis. In contrast, students' reading self-efficacy is a reflective construct measured on an interval scale from 1 to 5. Completing the questionnaire takes approximately 50 to 60 minutes for students.

The PIRLS Learning to Read Survey for Student questionnaire

Selected items from the PIRLS 2016 Learning to Read Survey for Student (IEA, 2016) were adapted for this study to assess students' self-efficacy in reading activities. The questionnaire demonstrated high reliability, with a coefficient of .81 (Chen et al., 2021). This study included four questions, and the selected items were approved by the International Association for the Evaluation of Educational Achievement (IEA) for adaptation and translation from English to Malay. The questionnaire measures students' self-efficacy using a response scale with images (e.g., a smiling face to indicate agreement) on a scale from 1 (very sad), 2 (sad), 3 (uncertain), 4 (happy), to 5 (very happy). The use of images was intended to help students better understand and accurately complete the questionnaire, as suggested by (Reynolds and Johnson, 2019).

Reading Comprehension Assessment

The Malay Reading Comprehension Test for Primary School Students, known as Ujian Kefahaman Bacaan Bahasa Melayu Murid Sekolah Rendah, was developed by Hashim et al (2006) to assess reading comprehension in Malay among primary school students in grades four, five, and six. The original instrument consists of 50 questions. For this study, 34 questions were adapted to evaluate students' abilities in literal, inferential, and critical-creative comprehension. The test includes reading passages, questions, and answer options. The reliability of the original 50-item test is 0.815 (Hashim et al., 2006).

Data Collection Process

Before the study commenced, approval was obtained from the Ethics Committee at the University of Putra Malaysia. Additionally, permission to conduct the study was granted by the Planning and Research Division of the Ministry of Education Malaysia, the Kelantan State Education Department, and the headmasters of the participating schools.

Prior to data collection, parents were informed about the study through an informed consent form, and only students with parental approval were included. Students were briefed on the study's objectives and assured of the confidentiality of their responses. Data collection took place in classroom settings, and students were allowed to withdraw from the study at any time if they chose not to participate.

Results

In the beginning, a confirmatory factor analysis (CFA) was performed to determine quantitative measures for evaluating the validity and reliability of the students' self-efficacy questionnaire. Table 1 shows the reliability analysis and convergent validity analysis of students' reading self-efficacy [$\alpha = 0.778$, CR = 0.794, AVE = 0.566] are all significantly above their threshold levels. One item is dropped due to low factor loading. Thus, the validity and reliability of the questionnaire utilized in the present study have been established.

Table 1

CFA result of the for students' reading self-efficacy construct.

Construct	Cronbach alpha (>0.7)	CR (>0.6)	AVE (>0.5)
Students reading self-efficacy	.778	.794	.566

Figure 2 displays the direct effect model for relationship between students' reading self-efficacy and reading comprehension. The finding indicates the influence of students' reading attitudes on their reading comprehension with a beta coefficient value of ($\beta = .338$, CR=5.978, $p=0.000$); that is illustrated in Table 2. Thus, there is significant direct influence of students' reading attitudes on their reading comprehension. In other words, students with a more positive reading attitude have better reading comprehension.

Table 2

The relationship between students' reading self-efficacy and reading comprehension.

DV		IV	Beta	Estimate	S.E.	C.R	p
SKORKM	<---	EMM	0.338	2.144	.359	5.978	0.000

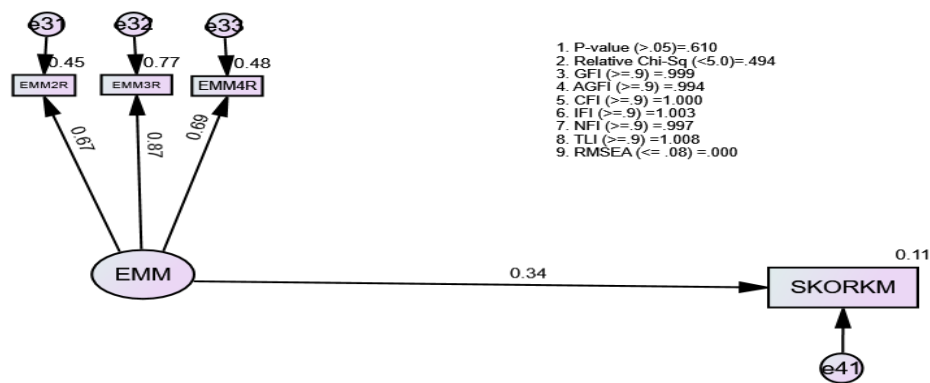


Figure 2: The direct effect model for parents' reading attitude on pupils' reading comprehension.

Note: EMM: students' reading self-efficacy; SKORKM: reading comprehension.

The moderation effect of students' gender on the relationship between students reading self-efficacy and reading comprehension

To test the moderator effect, the researcher uses a method of categorizing the moderator variable into subgroups. The moderator data need to be divided into two levels (i.e., male and female) before it can be tested as a moderator in a model. Before testing the moderator effect, the researcher needs to test the direct effect first. Table 3 displays the frequency of students included in this study based on gender.

Table 3
Frequency of students by gender

Gender	Frequency	Percent
Male	177	45.0
Female	216	55.0
Total	393	100

As an initial step to assess the presence of a moderator effect, a comparison between the unconstrained model (variance-group) and the measurement residuals model (invariant-group) should be conducted (Azim & Hassan, 2020). These two models are evaluated to identify the extent of structural parameter differences between the two groups. If there is a significant change in the chi-square value (CMIN) between the unconstrained model and the measurement residuals model, this indicates a substantial difference that supports the existence of a moderator effect in general.

Table 4 shows the output findings for the moderator effect of student gender. Based on the results, the chi-square (CMIN) value for the unconstrained model is 1.351, which is smaller than the CMIN value for the measurement residuals, 15.099. This indicates a general moderator effect on the analyzed model.

Table 4

Results of the moderator test in AMOS output for student gender

Model	NPAR	CMIN	DF	P	CMIN/DF
Unconstrained	16	1.351	4	.853	.338
Measurement residuals	8	15.099	12	.236	1.258

However, to ensure that a moderator effect occurs, a more detailed examination is needed to determine whether there is a moderator effect through the difference between the two groups. Table 5 shows the findings for male and female groups for the student gender.

Table 5

Moderator finding (student gender) for male and female groups

Hypothesis	Group 1 (Male)	Group 2 (Female)	Indicator
The influence of students' reading self-efficacy on reading comprehension depends on student gender.	BETA p 0.456 0.000	BETA p 0.274 0.000	Partial moderator

Reviewing the beta values, the male group shows $\beta = 0.456$ and $p = 0.000$, indicating significance. For the female group, the beta value is $\beta = 0.274$ and $p = 0.000$, also indicating significance. The standardized regression coefficient estimate for the male student gender group is 0.456, while the standardized regression coefficient estimate for the female student gender group is 0.274. Therefore, the researcher can conclude that the effect of students' reading self-efficacy on reading comprehension is more pronounced in the male student gender group compared to the female student gender group. Since both beta regression coefficients for male and female students are significant, the type of moderator effect occurring is a partial moderator (Awang, 2018)

Overall, the testing of moderator effect found that student gender shows a partial moderator effect on the influence of students' reading self-efficacy on reading comprehension.

Discussion

The result indicates that students' reading efficacy is a significant predictor of their reading comprehension ($\beta = .232$, $p < .000$). These findings are consistent with previous studies that have shown a strong relationship between self-concept and reading comprehension (Guthrie et al., 2007; Lee & Jonson-Reid, 2016; Taboada et al., 2009). This study finding reinforces the fact that students' reading efficacy has an impact on their reading comprehension.

Student gender has acted as a moderator in this study and shows a partial moderator effect because the regression coefficients (beta) for both male and female genders are significant. These findings demonstrate that the influence of students' reading self-efficacy on reading comprehension depends on student gender, aligning with Herve et al (2021) who found that gender differences impact students' academic achievements, with female students showing better performance compared to male students (Herve et al., 2021).

Therefore, the education level gender differences of the students need to be carefully considered in planning educational programs. A deeper understanding of how students' reading self-efficacy impacts reading comprehension differently based on student gender can help in developing more effective and comprehensive educational strategies for students.

Limitations and Suggestion for Further Study

While this study contributes valuable insights to the literature on students' reading comprehension, it has certain limitations. The research was conducted on a specific population and sample of fifth-grade students, aged 11, in government primary schools. Consequently, the results may not be generalizable to the entire population of primary school students due to the specific characteristics of the sample. Future research should consider replicating the study with students of different ages, such as third graders aged nine, to enhance the generalizability across various age groups and validate the findings.

This study was conducted exclusively in the state of Kelantan, which limits its geographical scope. Future research could apply the same model in different states to improve the generalizability of the findings. Overall, while the study offers promising insights, there is potential for further research to investigate larger populations and achieve more accurate generalizations.

Conclusion

This study provides practical implications for stakeholders in education including policy makers, school administrators, teachers, as well as parents or guardians, to enhance students' reading comprehension abilities through reading self-efficacy. Furthermore, this study highlights the need for tailored educational strategies that consider gender differences to enhance reading comprehension among students. Educational programs might benefit from incorporating gender-specific approaches to support both male and female students effectively.

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