COGNITIVE AND METACOGNITIVE STRATEGIES IN READING SCIENTIFIC TEXTS AMONG ESL SCIENCE UNDERGRADUATES

SAMSIAH ABDUL HAMID

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Synopsis

The present study employed both quantitative and qualitative data collection techniques to investigate the pattern of strategy use of high and low English proficiency science learners and the impact of metacognition, English proficiency and scientific prior knowledge on strategy use and reading comprehension of two scientific texts. Research instruments used include Metacognitive Awareness inventory (Schraw and Dennison, 1994), an 80-item Scientific Text Academic Reading Strategy (STARS) inventory, Scientific Prior Knowledge inventory, two scientific texts of different syntactic difficulty and topic familiarity, and three different measures of reading comprehension of scientific texts. Think-aloud methods and retrospective interviews were utilized to collect the qualitative data of five case studies.

The major findings from the quantitative study indicate that L2 proficiency contributes in the range of 5.2% to 24.3% to the variance in second language reading comprehension of scientific texts, higher cognitive strategies, in particular summarizing and analyzing visual diagrams, contribute another 11%, and the knowledge of scientific terminology contributes some 1.5% to 2.2%. In sum, the findings reveal that the contribution of L2 proficiency to the reading comprehension of scientific texts increases with the increase of readers' proficiency and texts difficulty. The evidence gathered from the quantitative and qualitative data shows that L2 proficiency remains the pre-requisite for reading and understanding L2 scientific texts but it is not the ultimate predictor of good L2 readers of the text.

One surprising finding is the role of metacognitive awareness as a predictor to the reading comprehension of a scientific text. It was found that high metacognitive awareness possessed by ESL readers could be stymied by their low L2 proficiency and lack of independent reading practice, thus render it ineffective. The data of this study also indicated that in reading scientific texts, scientific prior knowledge, as opposed to general prior knowledge, is crucial to reading comprehension and scientific prior knowledge is not vigorously accessed when it exists in abundance but when it does not. Finally the thesis discusses the theoretical and pedagogical significance of the study and provides suggestions for future research.

Sinopsis

Strategi Kognitif dan Metakognitif dalam Pembacaan Teks Saintifik di Kalangan Mahasiswa Jurusan Sains Yang Menggunakan Bahasa Inggeris Sebagai Bahasa Kedua

Kajian ini menggunakan kaedah penyelidikan kuantitatif dan kualitatif untuk menyiasat corak penggunaan strategi pembacaan di kalangan penuntut sains yang fasih dan kurang fasih berbahasa Inggeris dan juga kesan metakognisi, kemahiran berbahasa Inggeris sebagai bahasa kedua, dan pengetahuan saintifik sedia ada terhadap penggunaan strategi pembacaan dan kefahaman. Instrumen kajian yang digunakan termasuk inventori Kesedaran Metakognisi (Schraw and Dennison, 1994), inventori Kesedaran Strategi Pembacaan Teks Akademik Saintifik (STARS), inventori Pengetahuan Saintifik Sedia ada, dua teks saintifik yang berlainan tajuk serta tahap kesukaran dari segi struktur bahasa, dan tiga kaedah pengukuran tahap kefahaman bacaan teks saintifik. Kaedah *think-aloud* dan interview digunakan untuk mengumpul data kualitatif dari lima kajian kes.

Dapat kajian yang utama daripada data kuantitatif mendapati bahawa kemahiran bahasa kedua menyumbang di antara 5.2% dan 24.3% kepada kefahaman bacaan teks saintifik, strategi aras kognitif tinggi seperti strategi meringkas dan memahami gambarajah menyumbang sehingga 11%, dan pengetahuan tentang terma saintifik menyumbang sebanyak 1.5% hingga 2.2%. Secara ringkasnya, dapatan kajian menunjukkan bahawa sumbangan kemahiran bahasa kedua kepada kefahaman bacaan teks saintifik meningkat secara berkadar terus dengan peningkatan kemahiran bahasa kedua pembaca dan juga peningkatan tahap kesukaran teks bacaan. Dapatan daripada kedua-dua data kuantitatif dan kualitatif menunjukkan bahawa kemahiran bahasa kedua

kekal sebagai pra syarat kepada pembacaan dan kefahaman teks saintifik tetapi ianya bukanlah peramal utama dalam menentukan seseorang sebagai pembaca teks saintifik yang baik.

Satu dapatan yang di luar jangkaan adalah peranan kesedaran metakognisi sebagai penentu kepada kefahaman bacaan teks saintifik. Kajian mendapati bahawa tahap kesedaran metakognisi yang tinggi dalam diri pembaca bahasa Inggeris sebagai bahasa kedua mungkin menjadi kurang berkesan jika pembaca tersebut menpunyai kemahiran bahasa Inggeris yang rendah dan juga kurang latihan membaca secara bersendirian/berdikari. Data juga menunjukkan bahawa pengetahuan saintifik adalah amat penting dalam kefahaman bacaan teks saintifik berbanding dengan pengetahuan umum. Pengetahuan saintifik sedia ada yang banyak tidak akan diakses secara sedar dan bersungguh-sungguh oleh pembaca tetapi sebaliknya apabila pengetahuan itu kurang, kadar ianya akan cuba diakses akan bertambah untuk meningkatkan kefahaman. Akhir sekali, tesis ini membincangkan tentang signifikan kajian dari sudut teori dan pedagogi dan seterusnya menyarankan beberapa cadangan untuk kajian akan datang.

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TABLE OF CONTENTS

CHAPTER THREE: THE REVIEW OF RELATED LITERATURE

CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES