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บทความวิจัย / Research Article

Metacognitive Reading Strategies of Thai EAP University Students: A Case of Electric Program Students in Different Majors

กลวิธีการอ่านด้านอภิปัญญาของผู้เรียนไทยระดับอุดมศึกษาที่ใช้ภาษาอังกฤษเพื่อจุดประสงค์ทางวิชาการ : กรณีศึกษาผู้เรียนทางด้านไฟฟ้าที่มีความแตกต่างด้านสาขาวิชาเอก

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ABSTRACT

The research study aimed to investigate Thai higher education, Electric program students' metacognitive reading strategies in case of different majors in the same field. The sample of the research consisted of 70 second-year electric program students ; 35 Electric Power Engineering students, and 35 Electrical Technical Education students. The research instrument was the Survey of Reading Strategies (SORS), developed by Mokhtari & Sheorey (2001) which was applied for measuring the frequency of metacognitive awareness in reading academic texts. The data were analyzed by the package program in accordance with means, standard deviation, pos-hoc, and One-way ANOVA.

The findings of this study revealed that the problem-solving strategy group was the most frequently used whereas the support strategy was at the least when they read English academic materials. Furthermore, both academic programs in the same field had different statistical significance on global strategy. In conclusion, the difference for student's using reading strategies depended on the nature of their majors.

Keywords: Metacognitive Reading Strategies, Thai University Students, Electric Program, English for Academic Purposes (Eap)

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บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาการใช้กลวิธีการอ่านด้านอภิปัญญาของนักศึกษาไทยที่เรียนทางด้านไฟฟ้าในระดับอุดมศึกษาในประเทศไทย โดยจำแนกตามสาขาวิชาเอกที่มีความแตกต่างทางด้านไฟฟ้า กลุ่มตัวอย่างคือ นักศึกษาชั้นปีที่ 2 จำนวน 70 คน โดยแบ่งออกเป็นสาขาวิชาไฟฟ้ากำลัง 35 คน และสาขาวิชาครุศาสตร์อุตสาหกรรมไฟฟ้า 35 คน เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูลคือแบบสอบถามการใช้กลวิธีการอ่าน ที่พัฒนามาจาก Mokhtari and Sheorey (2001) เพื่อใช้ในการวัดความตระหนักด้านอภิปัญญาในการอ่านของผู้เรียน ข้อมูลที่ได้จะถูกนำมาวิเคราะห์โดยใช้สถิติ ได้แก่ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน pos-hoc และ One-way ANOVA

ผลการวิจัย พบว่านักศึกษาไทยที่เรียนทางด้านไฟฟ้าใช้กลวิธีด้านการแก้ปัญหามากที่สุด และใช้กลวิธีด้านการสนับสนุนน้อยที่สุดในการอ่านเอกสารภาษาอังกฤษทางวิชาการ นอกจากนี้นักศึกษาทั้งสองสาขาวิชาเอกที่เกี่ยวกับไฟฟ้าใช้กลวิธีการอ่านแบบองค์รวมแตกต่างกันอย่างมีนัยสำคัญทางสถิติ กล่าวโดยสรุปได้ว่าความแตกต่างในการใช้กลวิธีการอ่านของนักศึกษาขึ้นอยู่กับธรรมชาติของสาขาวิชาเอกโดยตรง

คำสำคัญ: กลวิธีการอ่านด้านอภิปัญญา, ผู้เรียนไทยระดับอุดมศึกษา, สาขาวิชาเอกทางด้านไฟฟ้า, ภาษาอังกฤษเพื่อจุดประสงค์ทางวิชาการ

Introduction

Under the umbrella of Thai higher education where learners are required to study English for Academic Purposes (EAP), electric program is an interdisciplinary which is connected to both engineering and education areas. That is to say, the future jobs these students can do are mostly concerned electrical engineers, or particularly in electrical instructors in educational contexts. In general speaking, electric students at undergraduate level have to read academic texts and be able to apply this understanding to one's future career and further study. This is because most of technical knowledge gains from various kinds of texts such as operation manuals for tools, equipment, and machinery. However, mastering academic reading is a challenging task which any electric learner encounters when acquiring texts in another language. According to the researcher's teaching experience, Thai electric students tend to have difficulties in reading comprehension as they lack structural and lexical knowledges in reading academic texts and other materials written in English. Another reason why a lot of these students struggle with academic reading is that they do not have appropriate reading strategies. As a result, they cannot apply these strategies to assist them comprehend what they read productively.

As learners have different individual characteristics and perceptions toward reading process, metacognitive awareness of reading strategies is another factor that impacts successful reading comprehension. The strength of these reading approaches can facilitate leaners to reflect on their tentative planning, monitoring comprehension of textual information, and handing potential barriers in reading systematically (Efklides, 2014; Saricoban & Behjoo, 2017; Lukes, 2021; Thampradit, 2022). Thus, it can be said that learners may be able to maximize comprehension and reading efficiency in academic context to become the proficient readers. Due to few researchers studied on electric students' reading strategies, most of the previous studies focused on metacognitive reading strategies of university students in different fields of study. However, the strategies used among students majoring differently in the same field did not exist. To the researcher's knowledge, it is believed that learners in different learning contexts may apply various reading strategies. For this reason, it is worthwhile to conduct a study which takes this variable into consideration.

The results can provide beneficial guidance for both EAP instructors and learners for the development of teaching reading methods, reading materials through using appropriate reading strategies in academic context.

Purposes of the Study

1. To identify the overall metacognitive reading strategies used by Thai electric program students of the different majors.

2. To examine the differences in using metacognitive reading strategies of the electric program students regarding their majors.

Research Methodology

Subjects

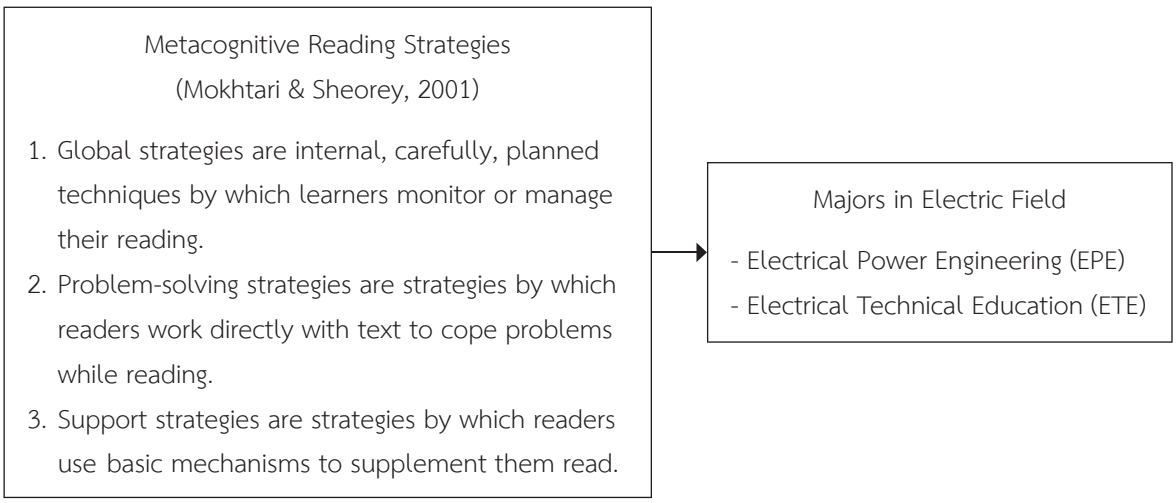
The pilot study

There were 20 second-year electric program students randomly chosen from each two major relating electric field: 10 Electrical Power Engineering major students, the Faculty of Engineering, and 10 Electrical Technical Education major students, the Faculty of Technical Education. They are studying at Rajamangala University of Technology Isan, Khon Kaen Campus. The pilot study group was definitely separated from the sample group.

The sample group

The samples consisted of 70 second-year students studying at Rajamangala University of Technology Isan, Khon Kaen Campus, Thailand, comprising 35 Electrical Power Engineering major students (EPE) from the Faculty of Engineering, and 35 Electrical Technical Education major students from the Faculty of Technical Education, which all randomly used by simple random sampling from the total population of 240 students enrolled in the English Reading for Academic Purposes course in the second semester of the academic year 2023. All of the subjects were required to pass at least two prerequisite English courses before they are allowed to enroll in the English for Academic Purposes required by their academic programs. Therefore, it is believed that the subjects all learned fundamental English to the stage that they were able to point out their reading skill when reading academic texts.

Theoretical Framework for the Present Study



Research Instruments

1. Survey of Reading Strategies Questionnaire (SORS)

The quantitative data were collected through the metacognitive strategy questionnaire adapted from the Survey of Reading Strategies (SORS) generated by Mokhtari & Sheorey (2001) for assessing metacognitive awareness of EFL readers. This instrument can assist to identify the reader's strategies in reading text and thus it can exhibit which skills of readers should be developed. There are three main categories: global strategy, problem-solving strategy, and support strategy. The inventory questionnaire contained 30 subcategories in each three main categories including 13 global strategies, 8 problem-solving strategies, and 9 support strategies. Respondents of the SORS use a Likert scale of 1-5, 1 as 'never or almost never true of me' and 5 as 'always or almost always true of me', to report their use of each strategy description. The questionnaire was translated from English into Thai in order to avoid misunderstanding the content of the items. However, the questions in this questionnaire had to be checked and proofread for validity by two experts and for reliability with the Cronbach's alpha. As a result, the reliability estimated on 20 students in the pilot study was .90, which is considered to be high in comparison with the acceptable level coefficient of .70.

2. Semi-structured interview

The focus-group interview was applied as the qualitative instrument to discover metacognitive reading strategies used by Thai electric students of the sample group. The interview questions were translated from English to Thai in order to check that the samples did not to be misinterpreted the purposes of interview questions correctly. The 12 participants were selected through a purposive sampling method regarding the different majors. Data was collected through an appointment with the researchers on the basis of students convenience to participate the interview phase. The interview questions were mainly concentrated on asking the participants' perceptions about their reading strategies in order to comprehend what they read, reading problems occurred while reading academic texts, and how they solved the problems.

Data Collection

Data collection took place during the second semester of the academic year 2023 with 70 second-year electric students. Basically, the participants were requested to respond the SORS questionnaire. All of the participants were informed of the objectives and requirements of the data collection and of the fact that there were neither right or wrong answers, and were to express their honest opinions of each item in the questionnaire. After the completion of the quantitative data, the returned questionnaires were used for statistical analysis. More than week after the SORS,12 students out of the participants were joined to interview. All of the qualitive data were recorded with the interviewees' permissions. Afterwards, the interview records were kept for further analysis.

Data Analysis

The data from returned questionnaires were analyzed by the Statistical Package for Social Sciences (SPSS) software and presented as descriptive statistics in terms of the percentage, mean, standard deviation (S.D.). The average scores were interpreted using the interpretation key recommended by Mokhtari & Reichard (2002) for reading strategy usage : (1) high (mean of 3.5 or higher), (2) moderate (mean of 2.5 to 3.4), and (3) low (mean of 2.4 or lower). In addition, One-way ANOVA and Fisher LSD pos-hoc test were performed to examine the statistically significant differences and similarities between metacognitive reading

strategies used among the students from two different academic programs in electric field. Meanwhile, the transcribed data from the semi-structured interview was interpreted by the researcher to describe why the electric students use each strategy for reading in academic context.

Results

Table 1 Thai Electric Program Students 'Overall Metacognitive Reading Strategies Used

Rank order	Strategy Group	Descriptive Statistics		Level of Interpretation
		Mean	S.D.	
1	Problem-solving	3.22	.744	moderate level
2	Global	3.07	1.155	moderate level
3	Support	2.93	.921	moderate level
Overall		3.07	.798	moderate level

Key to averages: 3.5 or higher = high, 2.5-3.4 = moderate, 2.4 or lower = low

Table 1 showed that the overall reading strategy category of the electric program students was at a moderate level. Based on the three main metacognitive reading strategies, the problem-solving strategies were accepted as the most frequently used (3.22) among the participants, followed by the global strategies (3.07), whereas the support strategies were ranked in the last order respectively (2.93).

Table 2 Differences in Thai Electric Program Students' Perceived Use of Metacognitive Reading Strategies between Electrical Power Engineering Students and Electrical Technical Education Students

Strategy Category	Electrical Technical Education			Electrical Power Engineering				
	Mean	S.D.	Rank	Mean	S.D.	Rank	F	Sig.
Global	3.10	.676	1	3.17	.756	2	1.531	.029*
Problem-solving	3.00	1.195	2	3.25	.886	1	3.122	.094
Support	2.82	.717	3	2.98	.724	3	1.272	.274

Remark: * the means differences is significant at the .05 level.

Table 2 indicated that the overall use of reading strategies of the electric program students from the two different majors was at a moderate level. In regard to overall metacognitive reading strategy use, the results from the analysis of variance (One-way ANOVA) demonstrated that, between the two major groups of electric students, there were statistically significant difference of the use overall global strategies at the 0.05 level ($P<0.05$), whereas no significant variation was found in the use of overall problem-solving and support strategies. Through the Fisher LSD pos hoc test analysis, the results demonstrated that the Electrical Power Engineering major students (EPE) employed a greater frequency of reading strategies than those in Electrical Technical Education (ETE) because the mean score of the Electrical Power Engineering major students' reading strategy use was always higher that of the Electrical Technical Education major students.

Discussion

1. Thai Electric Students 'Metacognitive Reading Strategies Used in Academic Context

In the present investigation, Electric students reported the overall metacognitive reading strategy category at the moderate level. Thai electric students participating in this study reveal that the problem-solving strategy group is the most frequently used, followed by global strategy group. Support strategy group is found to be the least often used. This phenomenon can be explained by both Electric Power Engineering (EPE) and Electrical Technical Education (ETE) students preferring to deal with problems in the real act of reading text while the text becomes difficult to understand through using basic mechanism planned to supplement their reading. The results are somewhat correspondent with many other previous studies on reading strategies (Suharni, 2017; Boyraz & Altinsoy, 2017; Chumworatayee, 2017; Roomy & Alhaswi, 2019; Toomnan, 2022), which indicated that problem-solving strategies accepted to be the highest employed strategy by ESL and EFL learners. For this reason, the electric students would actually apply problem-solving strategies which can assist them when encounter reading obstacles by themselves in the studying or testing environment. The use of problem-solving strategies was also reported in the semi-structured interview, as illustrated in the following excerpts:

"I try to read each sentence slowly in order not to miss any important ideas in the text. I will reread and look for the meanings of unknown words in order to understand the text better" (ETE student 2)

"While reading, I read in a quiet place to understand the text well. When encountering across the important information, I stopped for a moment in order to remember it." (ETE student 4)

"When reading the text, I sometimes try to link this mental picture of a situation in which the story might be used or happened. For example, when I read the passage about the Asian elephants, I link it to the memory picture of Thai elephants lived in my hometown, Surin. This is a very helpful way for remember the meaning of words and comprehend the text easily." (EPE student 3)

"When I come across new words while reading the text, I usually try to guess the meaning in memory by grouping words that share common features, such as, increase, add, rise, peak." (EPE student 6)

As pointed out earlier, support strategies were reported used as the lowest order among Thai electric students. The possible explanation for the least used of this strategy group might be that the participants have not emphasized on the support mechanism aimed at sustaining responses to reading and made them pay less attention and awareness on the use of external reference materials and other support sources. That is to say, the participants knew that support strategies were necessary in classroom, but they did not realize that they are beneficial in reading at all time. The finding lends support to the previous study by Yuksel & Yuksel (2012) in that when facing comprehension problems, EFL Turkish learners were likely to apply other strategies to understand the whole meaning in the text instead of using support strategies, which could lead to time-consuming effect. As described in the qualitative results, the minority of participants agreed that they used note-taking and discussing reading with others infrequently as they spend much time on reading. Examples are:

"In contrast, I seldom ask my classmates because I think they don't know the meaning of all words." (ETE student 1)

"However, I don't like to take and review the notes in testing situation because it wastes my time and there is no need to do so." (EPE student 5)

2. Metacognitive Reading Strategies Use in Relation to Electric Program students' Majors

When considering with metacognitive reading strategies used by the two majors in electric field, the findings show that the Electrical Technical Education major students (ETE) had the highest use in global strategies, followed by problem-solving strategies, and support strategies. While strategies employed by Electrical Power Engineering major students (EPE) can be ordered from the most often used to the least used as follows: problem-solving, global, and support strategies. Similarly, both the two majors reported all strategies at the moderate level. Additionally, a one-way ANOVA examined that the use of global strategies was significantly different between the electric students in two academic majors. Apparently, it is noticeable that the utilization of metacognitive reading strategies in the Electrical Power Engineering major students (EPE) were predominant from the Electrical Technical Education major students (ETE). These results are in line with the previous research study, which displayed that Malayalee undergraduate students' academic major was significantly related to their choice of strategy use (Harish, 2014). When taking closer consideration, one possible explanation for such significant difference is the individual characteristic of academic major. The likely consideration is that, although all students from each major similarly studied the foundation of the technical skills relating electric and electronic knowledges such as electric circuits, electrical system design, electrical machines, the Electrical Power Engineering major students (EPE) took more variety of electrical courses in terms of practical project works such as developing electrical plans for workplaces and facilities. Additionally, they would be more experienced in reading technical English because most of engineering reference materials are written in English such as safety instructions, electrical manuals, and booklets. Meanwhile, for the Electrical Technical Education major students (ETE), the majority of their courses focused on educational theories and classroom-related areas of electric and electronics which were taught in Thai. This is because the focal point was on the concept of education and teaching in vocational college rather than industrial employment. Thus, they might not have had to use metacognitive reading strategies to help them master various type of academic texts as frequently as the Electrical Power Engineering major students (EPE) did.

Conclusion of the Study

By analyzing the electric students' responses to the inventory questionnaire of SORS, the results conclude that the students reported overall reading strategies use at the moderate level, as Oxford (1990) advised that using a strategy at a moderate level reflects the learners are aware of the strategies, but they need to be stimulated to employ them more in their reading process. Moreover, the results of this study also revealed that Electrical Power Engineering participants (EPE) employed a wider range of metacognitive reading strategies, and to a better extent of strategy use compared to Electrical Technical Education participants (ETE) because of the contexts of academic major. To sum up, the use of metacognitive reading strategies depends on the disparity between the learning context of the two majors.

Recommendations of the Study

Pedagogical Implications of the Study

The implications drawn from this investigation are that the English language instructors should promote all metacognitive reading strategies and raise awareness of the significance role of metacognitive

reading strategies. With more emphasis on strategy training, EAP instructors can also stimulate the students to use strategies more fruitfully. Concerning the results in this study, strategy training should be provided by the awareness of different learning programs. Moreover, all reading strategies should be stressed because the students of this study reported the use of strategies at a moderate level. To implement strategies, EAP instructors should be instructed as an integration of multiple strategies rather than emphasizing on a specific strategy when reading academic texts. In terms of strategy instruction, Oxford & Leaver (1996) claimed that language teachers should train students on how to use and evaluate each strategy and how to transfer and apply them to other related tasks and situations productively.

Recommendations for Further Study

1. Since this research was carried out by using a written questionnaire and a semi-structured interview, it is necessary to triangulate whether undergraduate students actually use particular metacognitive reading strategies. Because of the short time frame in this study, case studies with a long term of observation in reading process would be worthwhile in order to examine the validity of the results. Apart from that, it is significant to clarify the effectiveness of particular metacognitive reading strategies through experimental study in order to enhance students' reading proficiency which may lead to better reading comprehension when reading academic texts.

2. Due to the fact that this investigation only focused on a small number of electric program students in Thai university, the subjects of this study could not represent the whole populations of Thai EFL undergraduate students in other majors. For this reason, increasing the number of subjects from other majors or programs in either public or private universities in Thailand could enlarge the results because different samples from other universities may reflect different findings. Consequently, further study is requisite in order to exemplify an obvious understanding in this issue.

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