The Use of Research Articles in an ESP Course for Engineering Undergraduates
－An Investigation into the Effectiveness of a Genre-Specific Rhetorical Approach－

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Research articles (RAs) are often the main reading material for English for Specific Purposes (ESP) courses within engineering. As such, effective reading of the material is important to student's future. Fifty-six Japanese second-year engineering undergraduates were divided into two groups. Only one group was given instruction on the rhetorical features of RAs. The results showed that the intervention group performed slightly better on the post- reading comprehension test than the control group. Additionally, the intervention group reported significantly more frequent use of reading strategies, which showed a positive correlation with their post-test scores. Follow-up interviews revealed that the awareness on the text structure helped the intervention group to read in a strategic manner, however, they also exposed a weak reader's struggles. This paper concludes with a discussion of pedagogical implications of introducing RAs in an ESP classroom.

Key Words : English for Specific Purposes, Genre-Based Instruction, Reading Strategies, English for Engineering Students, Materials Development

1. Introduction

The development of an effective ESP programme is an important issue in university curriculum development. Commercially produced textbooks are widely used in ESP classrooms. They offer organised teaching materials and a structured syllabus focusing on informing learners about language features and providing activities to practice them. However, the contents may not be relevant to a learner group who major in a certain academic discipline and they may not reflect learners' needs[1].

This study examines the use of RAs in an ESP course. RAs can be an effective reading material as they offer up-to-date technical knowledge as well as relevant vocabulary. Nevertheless, potential pitfalls could be the difficulties that derive from their length and specific contents especially for learners at beginner and lower-intermediate levels. To address this concern, this study explores the impact of instruction that aimed to enhance learners' awareness of rhetorical features of RAs. It hypothesises that a genre-specific rhetorical approach can get the students familiarised with the structure of RAs and help enhance their reading performance.

First, this paper reviews relevant literature and raises research questions. Next, it presents the methodology of this study, including a description of classroom materials as well as the three instruments administered for data collection. It then presents the results of the statistical analysis, which is followed by discussion with the interpretation of the qualitative data that addresses the research questions. Finally, this paper concludes by pointing out limitations and pedagogical implications with possible directions for future research.

2. Background of the Study

2.1 ESP Course Development

In order to explore better ESP learning and teaching practice, several needs analyses have been conducted in engineering-related fields. The results revealed a certain type of tasks that was required to carry out in an engineering workplace. These tasks involve reading technical documents, manuals and RAs[2]-[4].

Needs analysis also specified the types of reading skills and activities that need to be incorporated into

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classroom tasks. Engineering students tend to perceive that they lack skills such as skimming, scanning and summarizing texts[5] and reading long, complex and specialized texts[6], and they preferred up-to-date, unsimplified and subject-specific texts[7][8]. These results suggested the increasing demand for a specifically designed ESP course. They also indicated the need for collaboration between subject teachers and English language teachers to integrate the expertise in subject contents into language teaching[7].

RAs can be a suitable reading material for an ESP classroom. They offer state-of-the-art information, which are relevant to a certain learner group who belongs to a specific engineering field. As an increasing number of researchers of multiple nationalities are contributing the creation of professional knowledge[9]-[11], RAs would be the primary source of information in an academic context, where students are required to read and write about their research.

However, the length and the contents of RAs tend to pose a difficulty, especially for learners with weak reading skills. It has been argued that ESP courses are only suitable for learners who have already reached the intermediate level of English language proficiency[6]. Thus, there is a need to address these concerns.

2.2Textual Properties of Research Articles

Swales[9][10] focused on a genre-specific rhetorical structure of RAs in order to help teach and learn academic and research English. He analysed textual properties of RA introductions and developed the Create a Research Space (CARS) model (Fig. 1). In this model, a text segment that performs a communicative function is recognized as a "move". It contributes to account for the rhetorical movement in RA introductions with some obligatory or optional "steps". The CARS model has played a remarkable role in connecting the area of language pedagogy and applied discourse analysis[11].

Kanoksilapatham[12] specifically analysed the textual organization of RAs in the domain of engineering. She expanded the CARS model and added three moves to each of Methods, Results and Discussion sections (Move 4-12 in Table 1). This model offered thorough understanding of rhetorical organization of published RAs, which would help raise engineering students' awareness of the genre-specific structure and possibly facilitate reading comprehension.

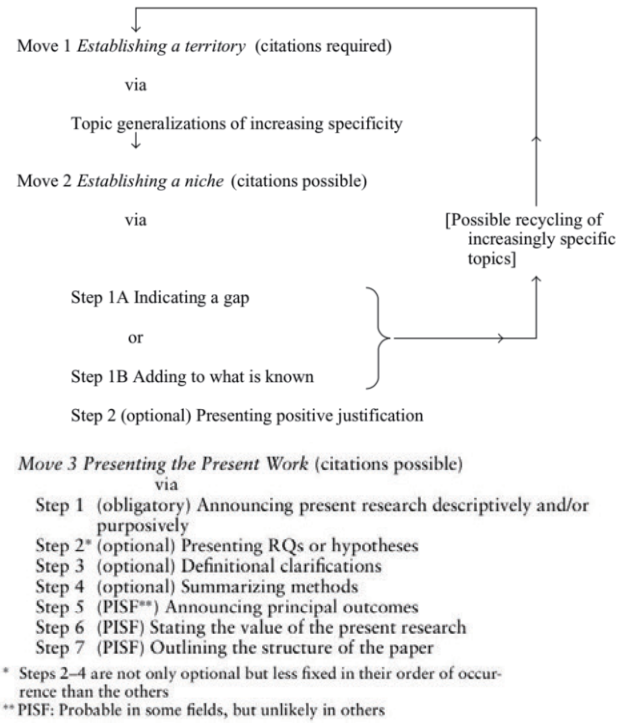

Fig. 1 The CARS model for RA introductions[10]

Table 1 Moves identified in the Methods, the Results and the Discussion sections

Methods	Move 4: Describing procedures
	Move 5: Featuring other methodological issues
	Move 6: Reporting and consolidating findings
Results	Move 7: Summarizing procedures
	Move 8: Reporting results
	Move 9: Commenting results
Discussion	Move 10: Reviewing the present study
	Move 11: Consolidating results
	Move 12: Stating limitations and future research

2.3 Reading Strategies

A growing number of studies have been conducted to explore the impact of strategic reading skills on second language (L2) learners' reading performance. This line of research employs a questionnaire which measures learners' strategy use when reading an L2 text in the hope of making them conscious about their own reading process. Several questionnaires have been developed to assess strategic L2 reading[13]-[15] based on first language (L1) reading literature[16]. These involve strategies used by skilled L1 readers before, during and after reading.

While L2 reading strategy questionnaires do not

generally specify the genre of reading materials, Mokhtari and Sheorey[17] developed a questionnaire that specifically focused on L2 reading strategies on academic materials. The Survey of Reading Strategies (SORS) involves 30 items, which are divided into three subscales: global reading strategies, problem-solving strategies, and support reading strategies. Global reading strategies refer to strategies that are oriented towards a global analysis of a text, problem-solving strategies aim to solve problems when a text becomes difficult, and support reading strategies use outside reference materials as supportive tools.

Previous studies which utilised the SORS have shown some consistency in L2 learners' reading strategy use. In a study with university undergraduates, Alhaqbani and Riazi[18] reported that learners' awareness of global and problem-solving strategies was significantly correlated with their self-rated L2 reading ability, whereas support reading strategies had no correlation. This was in line with the findings by Sheorey and Mokhtari[19], which implied that support reading strategies were used more by learners with lower self-rated reading ability in order to compensate their lack of L2 proficiency. Hong-Nam and Page[20] also confirmed these results, in that, self-rated advanced students reported more frequent use of global and problem-solving strategies. These findings need further investigation in the context of an ESP reading classroom.

2.4 Genre-Specific Instruction on the Text Structure of RAs

The CARS model[10][12] could be incorporated into ESP course instruction. The framework has been commonly used as an effective model for writing RA introductions across many disciplines including engineering-related fields[21]. It could work as an instructional framework for English language teachers to familiarise learners with the target discourse[22]. The awareness of genre-specific text structures could also help learners build confidence when they read RAs[23].

Little research has been done into the effectiveness of text structure instruction on L2 learners' reading performance. In the context of L1 reading classrooms, such instruction has been widely reported to be effective in facilitating reading comprehension[24]. With regard to an investigation into L2 readers, a case study indicated a possibility that language teachers could facilitate reading comprehension through the exploration of genre-specific features of RAs[25]. However, there has been very little research conducted into the specific impact of such instruction in an ESP context using RAs. Thus, this present study was an attempt to fill this gap.

2.5 Research Questions

1. Does genre-specific instruction on the textual structure of RAs have a positive impact on learners' reading performance?
2. Does the instruction facilitate learners' self-reported reading strategy use on RAs?
3. Is there any relationship between reading performance and self-reported reading strategy use?

3. Methodology

3.1 Participants

A total of 56 second-year undergraduates who were taking a compulsory ESP course participated in this study. They were divided into two groups and taught the same contents in different classrooms. According to a background questionnaire, which was administered prior to data collection, all participants were Japanese nationals and their self-evaluated English reading skills were beginner to lower-intermediate. The questionnaire further indicated that they had little experience with real-life English texts other than language learning materials. The whole classroom atmosphere could be viewed as unmotivated or uninterested, which is often described as a typical learning context in university English language classrooms[26].

3.2 Classroom Materials

Classroom reading materials were chosen from a journal issued by the International Council on Large Electric Systems (CIGRÉ) which is a global organization in the field of power systems. The journal aims to keep

Table 2 RAs used in ESP classes

Class 2	TB579 "Green Field Network, Designing Future Networks Ignoring Existing Constraint" (2014)
Class 3	TB598 "Guidelines for the Management of Risk Associated with Severe Climatic Events and Climate Change on Overload Lines" (2015)
Class 4	TB583 "Guide for the conversion of existing AC lines to DC operation" (2014)
Class 5	TB601 "Guide for thermal calculations of overhead lines" (2015)

engineers informed about the results or progress of the work performed by the study committees. Table 2 shows the titles of RAs used in the four reading classes from Class 2 to Class 5.

Reading tasks were given in a separate worksheet (Fig. 2). Comprehension questions were created with regard to the moves in the CARS model. They asked the students' understanding of the rhetorical movement in RA introductions, methods, results and discussions. Some questions could be used as generic questions for all RAs, such as "What is the problem?" and "What are the values and outcomes of this study?", which were accompanied by text-specific questions according to the contents of the RAs.

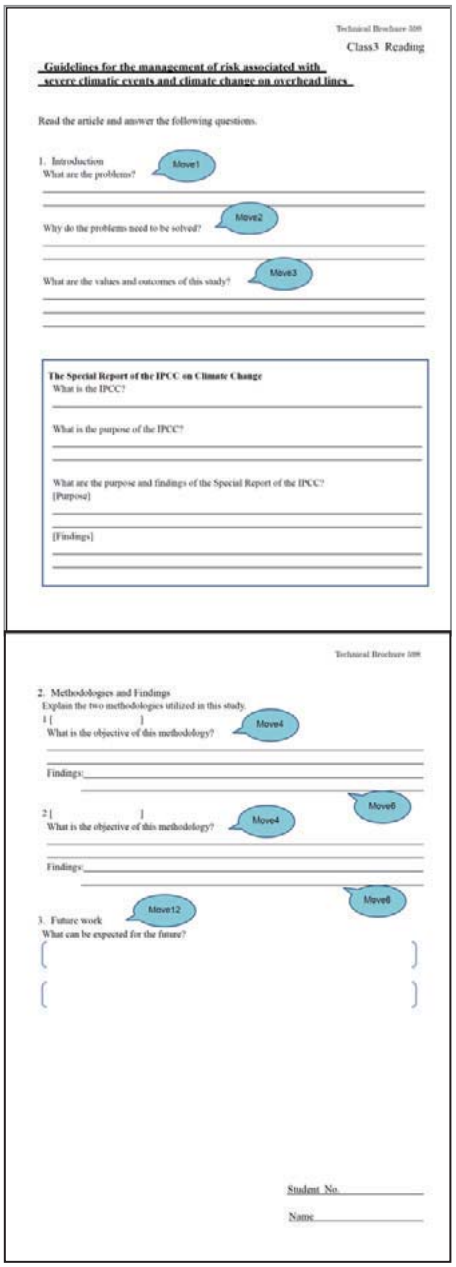

Fig. 2 Reading comprehension worksheet

3.3 Assessment Materials

Three instruments were employed in application of a mixed methods approach. Quantitative data was collected using pre- and post- reading comprehension tests and a reading strategy questionnaire. Qualitative data was collected from follow-up interviews.

3.3.1 Pre- and Post-Reading Comprehension Tests

The participants' reading performance was measured by pre- and post- reading tests. Both tests also utilised RAs in the same journal of power systems (Table 3). Similar to the worksheet prepared for the classroom use, reading tasks were created to ask students' understanding of the rhetorical structure of the RAs. The participants were allowed to use a dictionary during the tests. The maximum scores were 20 and testing time was 30 minutes for both pre- and post- tests.

Table 3 RAs used in pre- and post- tests

Pre-test	TB523 "System Complexity and Dynamic Performance" (2013)
Post-test	TB557 "Market Design for Large Scale Integration of Intermittent Renewable Energy Sources" (2013)

3.3.2 Reading Strategy Questionnaire

A reading strategy questionnaire based on the SORS[17] was administered to assess the participants' awareness and perceived use of reading strategies (Table 4). It utilised 5-point Likert-type scale ranging from 1 (I never or almost never do this) to 5 (I always or almost always do this) to rate how frequently each strategy was used. The responses for the 30 items were counted using scoring guidelines and the averages for all and for each subscale, global (GLOB), problem-solving (PROB) and support reading strategies (SUP), were calculated. The overall reliability (Cronbach's alpha) of the questionnaire was .89. This indicated the instrument's reasonable degree of consistency in measuring the participants' reading strategy awareness. The alpha values for the subscales were .81 for GLOB, .77 for PROB, and .67 for SUP.

3.3.3 Follow-Up Interviews

Semi-structured interviews were conducted to explore the students' perceptions on the reading materials and the genre-based instruction. They asked the following items based on the previous study that investigated the effects

Table 4 Items in the reading strategy questionnaire

	Reading strategy item	Subscale
1	I have a purpose in mind when I read.	GLOB
2	I take notes while reading to help me understand what I read.	SUP
3	I think about what I already know to help me understand what I read.	GLOB
4	I take an overall view of the text to see what it is about before reading it.	GLOB
5	When text becomes difficult, I read aloud to myself to help me understand what I read.	SUP
6	I think about whether the content of the text fit my reading purpose.	GLOB
7	I read slowly and carefully to make sure I understand what I am reading.	PROB
8	I review the text first by noting its characteristics like length and	GLOB
9	I try to refocus when I lose concentration.	PROB
10	I underline or circle information in the text to help me remember it.	SUP
11	I adjust my reading speed according to what I am reading.	PROB
12	When reading, I decide what to read closely and what to ignore.	GLOB
13	I use reference materials (e.g. a dictionary) to help me understand what I	SUP
14	When text becomes difficult, I pay closer attention to what I am reading.	PROB
15	I use tables and figures in text to increase my understanding.	GLOB
16	I stop from time to time and think about what I am reading.	PROB
17	I use context clues to help me better understand what I am reading.	GLOB
18	I paraphrase (restate ideas in my own words) to better understand what I	SUP
19	I try to picture or visualize information to help remember what I read.	PROB
20	I use text structures like headings and paragraphs to identify key	GLOB
21	I critically analyze and evaluate the information presented in the text.	GLOB
22	I go back and forth in the text to find relationships among ideas in it.	SUP
23	I check my understanding when I come across new information.	GLOB
24	I try to guess what the content of the text is about when I read.	GLOB
25	When text becomes difficult, I re-read it to increase my understanding.	PROB
26	I ask myself questions and try to answer them as I read.	SUP
27	I check to see if my guesses about the text are right or wrong.	GLOB
28	When I read, I guess the meaning of unknown words or phrases.	PROB
29	When reading, I translate from English into my native language.	SUP
30	When reading, I think about information in both English and my mother tongue.	SUP

of the genre-based reading instruction.

(1) What did you do first when you were given the text?
(2) What percentage of the text do you think you understood?
(3) What were the most difficult aspects?
(4) What did you do when you found a difficult sentence?
(5) Do you think you have learned anything through this course?
(6) Do you think you have applied what you learned to help you read the text? What are the things you do now that you didn't do before?
(7) Are there any kinds of reading strategies that you think you need to improve?
(8) How do you evaluate your overall reading skills?

3.4 Procedure

The data was collected in the ESP course over six weeks (Class 1-6). In Class 1, pre- reading test was conducted. Class 2 through Class 5 were devoted to reading practice using four different RAs. Only one group was given the genre-based instruction. The intervention group (n=26) received instruction at the beginning of the four classes. The control group (n=30) received no instruction on the text structure of RAs. In Class 6, the post- reading test and the reading strategy questionnaire were administered. Twelve students in the intervention group and nine in the control group participated in a follow-up interview after completing the post-test and the questionnaire.

3.5 Data Analysis

Data from the reading strategy questionnaire and pre- and post- reading tests was analysed using descriptive statistics, t-tests and correlation coefficients. To examine the impact of the genre-specific instruction on reading performance, pre- and post- reading test scores were investigated. Then, similar procedures were carried out to determine whether there was any significance in the differences in self-reported strategy use. Finally, a correlation analysis was conducted for each participant in order to explore the relationship between self-reported strategy use and reading performance.

The interview transcripts were analysed qualitatively in order to enhance the understanding of quantitative results. Some items of the reading strategy questionnaire were also investigated qualitatively for the meanings. This helped understand the phenomenon in the specific context of this present study and capture the students' complex mental processes.

4. Results

The quantitative data obtained from the pre- and post-reading tests and the reading strategy questionnaire was statistically analysed with regard to the three research questions. The results showed the differences between the intervention (Int) and control (Ctrl) groups in terms of the pre- and post- reading test performance and self-reported strategy use. They also suggested the correlations between self-reported strategy use and the performance on the post- reading test.

4.1 Performance on the Reading Tests

Table 5 shows the descriptive statistics for the mean scores on the pre- and post- reading tests. While the mean pre-test score of the intervention group (M=7.74) was 0.71 points lower than that of the control group (M=8.45), the mean post-test score of the intervention group (M=11.77) was higher than that of the control

group (*M*=10.83) by 0.94 points. The paired two-sample *t*-test indicated that both groups increased the scores from the pre-test to the post-test with a great statistical significance ($p < .001$).

Table 5 Descriptive statistics for pre- and post- reading tests

Group	*N*	Test	Minimum	Maximum	Mean	Mean Gain	SD	Significance
Int	26	Pre-test	0	14	7.74	-	3.48	$p < .001$
		Post-test	2	18	11.77	4.04	4.2	
Ctrl	30	Pre-test	0	16	8.45	-	4.24	$p < .001$
		Post-test	2	18	10.83	2.38	4.44	

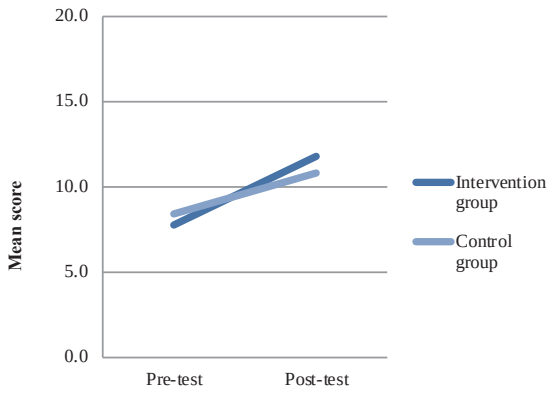

Fig. 3 Mean scores of pre- and post- test

As shown in Fig. 3, the intervention group demonstrated a greater increase than the control group by 1.66 points. However, the results of the independent two-sample *t*-test showed no significant difference in gain scores between the two groups. The difference in the post-test scores also did not reach statistical significance.

4.2 Reading Strategy Use

Table 6 shows descriptive statistics for the scores on the reading strategy questionnaire. The means indicate that the intervention group reported higher frequency (*M*=3.02; 2.99; 3.15) in use of strategies than the control group (*M*=2.74; 2.68; 2.80) for all three subscales. The independent two-sample *t*-test revealed that these differences were statistically significant ($p < .05$) except for support reading strategies.

Each individual thirty item in the questionnaire was investigated for the differences in means between the two groups. Table 7 shows eight items with a high absolute value of *t*-statistics, which indicated significantly more frequent use by the intervention group than the control group. Specifically, two items (#1 & #9) showed a great significant difference in the means of the frequency in reported strategy use ($p < .01$).

Table 6 Descriptive statistics for the reading strategy questionnaire

	Group	Mean	SD	|*t* statistic|	Significance
Overall 30 items	Int	3.02	0.47	1.766	$p < .05$
	Ctrl	2.74	0.66		
Global reading strategies	Int	2.99	0.54	1.822	$p < .05$
	Ctrl	2.68	0.69		
Problem-solving strategies	Int	3.15	0.66	1.738	$p < .05$
	Ctrl	2.8	0.81		
Support reading strategies	Int	2.94	0.44	1.120	-
	Ctrl	2.77	0.69		

Table 7 Strategies showed a significant difference in use between two groups

item # (subscale)	Reading Strategy	Group	Mean	SD	|*t* statistic|	Signifi-cance
#1 (GLOB)	I have a purpose in mind when I read.	Int	3.12	1.05	2.545	$p < .01$
		Ctrl	2.43	0.92		
#9 (PROB)	I try to refocus when I lose concentration.	Int	3.62	1.11	2.414	$p < .01$
		Ctrl	2.93	0.96		
#10 (SUP)	I underline or circle information in the text to help me remember it.	Int	3.85	1.17	2.248	$p < .05$
		Ctrl	3.03	1.45		
#11 (PROB)	I adjust my reading speed according to what I am reading.	Int	3.38	1.39	2.137	$p < .05$
		Ctrl	2.60	1.31		
#17 (GLOB)	I use context clues to help me better understand what I am reading.	Int	3.35	1.00	1.857	$p < .05$
		Ctrl	2.77	1.26		
#3 (GLOB)	I think about what I already know to help me understand what I read.	Int	3.27	1.06	1.744	$p < .05$
		Ctrl	2.77	1.05		
#12 (GLOB)	When reading, I decide what to read closely and what to ignore.	Int	3.5	1.28	1.692	$p < .05$
		Ctrl	2.93	1.18		
#25 (PROB)	When text becomes difficult, I re-read it to increase my understanding.	Int	3.77	0.97	1.677	$p < .05$
		Ctrl	3.30	1.07		

4.3 Correlations between the Strategy Use and the Performance on the Post-Test

Correlation coefficients were calculated in order to investigate the degree of association between self-reported strategy use and reading test performance. Table 8 and 9 demonstrate remarkable differences between the two groups, in which one star * attached indicates $p < .05$ and two stars ** indicate $p < .01$. Table 8 shows that intervention group reported significantly higher frequency in overall use of the strategies than the control group. Table 9 indicates that different reading strategy items marked a significant correlation between the two groups. The post-test scores of the intervention group showed a significant positive correlation with the

use of seven items (#4, #8, #11, #12, #25 & #30) and a significant negative correlation with one item (#6). Of these items, #8, #11 and #30 indicated a great statistical significance at $p < .01$. In contrast, the post-test scores of the control group correlated with a different item (#28).

Table 8 Correlations between post-test scores and the frequency in use of strategies

Group	*N*	All	GLOB	PROB	SUP
Int	26	0.35*	0.26	0.33	0.34*
Ctrl	30	0.14	0.14	0.05	0.18

Table 9 Significant correlations between post-test scores and frequency in use of individual strategy items

Group	#4	#6	#8	#11	#12	#25	#28	#30
Int	0.44*	-0.41*	0.52**	0.55**	0.41*	0.38*	0.16	0.48**
Ctrl	0.11	-0.22	0.10	-0.02	0.25	-0.13	0.36*	0.03

The degree of association between score gains and self-reported reading strategy use was further examined. Table 10 indicates that the same but fewer items showed a significant positive correlation with score gains of the intervention group (#4, #6, #11, #12 & #30) with #11 showed a great statistical significance at $p < .01$. With regard to the control group, a different item (#1) was revealed to have a significant negative correlation with score gains.

Table 10 Correlations between score gains and the frequency of strategy use

Group	All	GLOB	PROB	SUP	#1	#4	#6	#11	#12	#30
Int	0.21	0.14	0.21	0.24	0.13	0.38*	-0.36*	0.48**	0.44*	0.34*
Ctrl	-0.09	-0.13	-0.09	0.00	-0.39*	0.03	-0.20	-0.18	-0.03	-0.03

5. Discussion

In this section, the results are discussed with the interpretation of the qualitative data. The three research questions are answered with the analysis of the transcribed data from the follow-up interviews as well as the meaning of reading strategy items that showed a statistical significance. The interview extracts are an English translation from the original Japanese, which are accompanied by the interviewee's pre- and post-test scores indicated in parentheses.

5.1 Research Question 1

The first research question asked whether instruction on rhetorical features of RAs improved reading performance. The quantitative analysis of the pre- and post-test indicated a positive impact, however, there was no statistically significant differences in the improvement between the two groups (Table 5). This generally supported the literature that reported the effectiveness of text structure instruction in L1 and L2 contexts [24] [25], but not at a significant level.

The follow-up interviews implied the effectiveness of the instruction. One student in the intervention group demonstrated his own strategy to make sense of the RA as a meaningful text:

> First, I read the title and subtitles. Next, I overviewed the whole text, pictures and images. Then I started to read. (Int3: Pre 3/Post 12)

In contrast, a student in the control group revealed his tactics mainly to hunt for answers to the comprehension questions regardless of the whole meaning of the text:

> I didn't even read the title. After reading the questions, I tried to identify the parts where I could find the answers. I focused on conjunctions, such as "however", in order to figure out the context and to tell where the important part was. (Ctrl4: Pre 5/Post 5)

The genre-specific instruction could have raised learners' awareness of the text structure of RAs, which possibly helped them capture the organisation of the text and read in a meaningful way.

5.2 Research Question 2

With regard to the second research question, the results revealed significantly more frequent use of global and problem-solving strategies by the intervention group (Table 6). This also echoed with the previous studies[18]-[20], which could suggest that the intervention group gained a certain level of confidence when reading RAs[23].

Strategy items #1 and #9 that showed a great statistical significance (Table 7) implied a positive influence of the instruction. The strategy #1 refers to purposeful reading and #9 involves efforts to keep concentration, both of which would require a specific reading goal. The genre-specific instruction could possibly enhance

learners' awareness and sensitivity when they read RAs[22].

These were illustrated in the follow-up interviews. A student in the intervention group shared his strategies to read the text purposefully that enabled him to decide where to read closely:

> I read the title and then moved on to the Introduction, because I knew the Introduction contained key information for the whole text. I paid less attention to the Description section as its contents are often too much in detail. (Int16: Pre 6/Post 18)

Students in the control group seem to have struggled from developing own reading strategies. Without explicit explanation of the genre-specific text structure, they relied on the comprehension questions as a clue:

> I started to read the text without reading the title, because I knew the pattern of the questions. I referred to the text to identify information that was asked in the questions. I found that there are important contents at the beginning and the last parts of the text. (Ctrl11: Pre 0/Post 11)

These suggested that the students' enhanced awareness of the rhetorical organization of RAs could help them read RAs with confidence.

5.3 Research Question 3

The results from the correlation analysis revealed that the students who obtained a high score on the post-test read the text strategically drawing on the rhetorical knowledge gained through the instruction (Table 8). These students overviewed the text (#4 & #8) and decided where to read closely (#11, #12 & #25) (Table 9 & 10).

A positive correlation with the strategy #30 indicated that such students thought about the meaning of the text. This would be related to a negative correlation with #6 which refers to the behaviour that consciously considers whether the text fits the purpose of reading. This implied that they read the RA not exclusively for transferring information from the text to the answer sheet but for understanding the meaning to a certain extent.

In contrast, the control group showed a positive correlation with #28, taking a guess of the meaning of words or phrases. This could imply that high scorers in the control group tended to focus on detailed elements rather than the overall meaning of the text.

The interview with a student in the intervention group raised an important issue about the effectiveness of the genre-specific instruction as well as the reading practice using RAs. His post-test score fell remarkably from 14 to 7. In the interview, he repeatedly self-evaluated his L2 proficiency as very low and mentioned his struggles throughout the reading process:

> I read the title and overviewed the structure of the text to see if this RA was structured in the same way as what we were taught in class. … I think I could roughly tell the context flow of the text using conjunctions as a clue, but I was not sure if I was on the right track. I used a dictionary only once or twice as I knew using a dictionary didn't help me anyway. There were so many unknown words. From the beginning, I don't deserve to read this type of texts. (Int1: Pre 14/Post 7)

The results indicated that the genre-specific instruction could successfully enhance the students' strategic reading. However, the instruction would have little impact on those who perceived their L2 proficiency as very low, which was suggested in the literature[6].

6. Conclusion

This paper has explored the use of RAs in an ESP course with an investigation into the effectiveness of genre-specific instruction on learners' reading performance. The findings emphasised that raised awareness of the rhetorical features of RAs could give learners confidence in reading the texts in a meaningful way. This would possibly help enhance their reading performance. Nevertheless, attention should be paid to learners who have not obtained a certain level of L2 proficiency. A lack of L2 knowledge could hinder the effectiveness of the use of RAs as a classroom reading material.

There are several limitations of this study. First, the sample size is small as this study was conducted in a real classroom setting. Next, the one-shot self-report questionnaire would have been insufficient to address the actual use of reading strategies. Finally, the standardised assessment style of pre- and post- reading tests might have been inadequate to measure the students' reading

performance, in that the texts could be read for assessment not for academic reading purposes. Thus, these issues need to be addressed by future research.

Notwithstanding, there are two pedagogical implications drawn from this study. Firstly, RAs could be used as an effective reading material in university ESP classrooms. The texts did pose a challenge for the students who tended to show unmotivated or uninterested attitudes towards English language learning. However, they were capable enough to handle the reading tasks.

Secondly, supplemental activities would be preferable in order to address weak readers' struggles. Activities such as vocabulary preview and review could enhance their knowledge of subject specific terms as well as general academic vocabulary. Hopefully, engineering students will have a positive perception towards academic reading and spend more time reading subject-related professional texts so as to expand their engineering expertise.

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