

Socio-psychological Factors and Strategy Use in Singaporean Schoolchildren's English Literacy Learning

Wengao Gong, Donglan Zhang, Lawrence Jun Zhang, and Tamas Kiss
*English Language and Literature Academic Group, National Institute of Education,
Nanyang Technological University of Singapore*

May Yin Ang-Tay
English Language Institute of Singapore

ABSTRACT

Despite the plethora of literature concerning language learning strategies, there is a paucity of studies pertaining to the influence of social and psychological factors on young English learners' use of literacy learning strategies in the Asian context. As a multilingual and multicultural Asian society that implements a unique bilingual policy of taking English (which is not native to the majority of the local population) as the dominant language, Singapore provides a good scenario for the exploration of such issues. As part of a two-year intervention project aiming at promoting schoolchildren's self-regulated English literacy learning ability, we conducted a preparatory study which was aimed at finding out students' English language learning profile and identifying gaps in their knowledge of literacy learning strategies. We administered a reading survey and a writing survey to 678 Primary 3 pupils from two typical primary schools in Singapore. Results show that our informants did attempt to use different literacy learning strategies, though the average frequency of strategy use was not very high. We also found that learners' gender, motivation, self-efficacy, and out-of-school effort are related to their use of learning strategies, whereas their home languages are not. The findings highlight the necessity of strategy instruction for this group of schoolchildren and the potential importance of gender and psychological factors in literacy strategy instruction programs.

KEYWORDS: *Self-regulated learning; Metacognition; Learner strategies; Strategy-based instruction; English and literacy learning; Learner self-efficacy*

As the major working language for the government, law, and commerce, the primary medium of instruction from pre-school to tertiary education, and the lingua franca for all the ethnic groups in the country, the English language has firmly established itself as the most important language in multilingual Singapore. As a consequence, Singaporean students need strong literacy skills in English to succeed in school and beyond. Students who fail to acquire these skills will find themselves at a serious disadvantage in both social communications and the job

market. Thus, promoting schoolchildren's literacy development in the English language has become a key issue in Singapore's primary school education.

Studies (e.g., Afflerbach, Pearson, & Paris, 2008; Zhang, 2008; Zhang, Gu, & Hu, 2008; see Rubin, Chamot, Harris, & Anderson, 2007, for a systematic review) suggest that explicit strategy instruction is conducive to students' language and literacy development. This kind of instruction is characterized by the following procedures: Teacher explicitly explaining what a strategy is; teacher modeling how to use it; students applying the strategy with teacher help; and students autonomously applying the strategy in new contexts. In order to find out whether and to what extent explicit strategy instruction is helpful to Singaporean schoolchildren's English literacy development, we started a two-year intervention project in two primary schools in 2009. To make the intervention more focused and more suitable for our target students, we conducted a preparatory study to evaluate our subjects' understanding of strategy use in English literacy learning by administering two surveys to the whole cohort of Primary Year 3 (P3) students (the would-be P4 students, with their average age being 8 years) prior to the intervention project. At the same time, we also collected demographic information about our informants and their interest, self-efficacy, and out-of-school study effort in English literacy learning. This paper focuses on reporting students' self-reported strategy use in their English literacy learning before the intervention and whether and to what extent their strategy use is related to social-psychological factors such as their gender, ethnic group, home languages, interest in reading and writing, self-efficacy, and out-of-school learning effort.

Defining language learning strategies

Language learning strategies (also known as learner strategies) have been an important theme of research in the field of language acquisition over the past three decades. However, there is still no consensus about what language learning strategies actually are. For instance, Chamot defines learning strategies as "techniques, approaches or deliberate actions that students take in order to facilitate the learning and recall of both linguistic and content area information" (Chamot, 1987, p. 71), while Oxford (1990) uses the term "learner strategies" and defines it as "specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective and more transferable to new situations" (p. 8). Cohen and Macaro (2007), in reviewing 30 years of research and practice along this line, posit that "there is general agreement that strategies are environment-dependent ... and/or task dependent. There is also general agreement that future research should base itself on task-specific situations or have skill-specific concerns" (p. 278).

Despite the differences in phrasing and focus (sometimes), various descriptions of language learning strategies offered in the literature so far bear considerable resemblance to O'Malley and Chamot's (1990) classification of learning strategies which consists of procedures such as selective attention, analysis of task, choice of decisions, execution of plan, monitoring of progress, modification of plan, and evaluation of result (see Grenfell & Macaro, 2007, for a thorough review). As

language learning comprises different aspects such as listening, speaking, reading, and writing, the actual realizations of these procedures may not be exactly the same (see Cohen, 1998; Cohen & Macaro, 2007; Macaro, 2006; Zhang, 2003). For instance, literacy learning strategies, which are the focus of this paper, may not be exactly the same as the learning strategies used for listening and speaking, due to the different nature of spoken and written language. Nevertheless, the deliberate and strategic nature as reflected in these procedures is inherent in all language learning strategies (Gao, 2010; Goh & Taib, 2006). This is also the case for reading and writing learning strategies (Zhang, 2010b).

Reading and writing as strategic processes

Reading and writing are two basic literacy skills which are of vital importance to people's survival in modern society. Studies suggest that reading, a seemingly automatic and effortless activity in real life situations, is actually a process which involves much strategic behavior on the part of the reader. As comprehension is the ultimate goal of real-life reading activities, when we talk about reading, we are actually referring to reading comprehension. According to Block and Duffy (2008),

Comprehension is a strategic process; that is, good readers proactively search for meaning as they read, using text cues and their background knowledge in combination to generate predictions, to monitor those predictions, to repredict when necessary, and generally to construct a representation of the author's meaning. (p. 21)

Reading strategies are "deliberate, goal-directed attempts to control and modify the reader's efforts to decode text, understand words, and construct meanings of text" (Afflerbach, et al., 2008, p. 368). It is a series of largely metacognitive events in many situations (Zhang, 2001, 2010a), which will enable successful reading comprehension if readers orchestrate clear awareness of what they do and hence chart a definite direction towards success. Writing is also a process which involves various strategic actions. According to Harris, Santangelo, and Graham (2010),

writing is a recursive, strategic, and multidimensional process central to (1) planning what to say and how to say it, (2) translating ideas into written text, and (3) revising what has been written. (p. 226)

As a productive skill, writing invites greater deliberate control and goal-directedness, because

the writer must negotiate the rules and mechanics of writing, while maintaining a focus on factors such as organization, form and features, purposes and goals, audience perspectives and needs, and evaluation of communicative intent and efficacy (Harris, Graham, Brindle, & Sandmel, 2009, p. 132).

A few studies have investigated Singaporean schoolchildren's strategy use in English language learning in either listening or literacy learning in recent years (Rao, Gu, Zhang, & Hu, 2007; Zhang, 2004; Zhang & Goh, 2006; Zhang et al., 2008; Zhang, 2010b). For example, Zhang et al. (2008) explored primary

schoolchildren's use of reading strategies when reading different texts in English using think-aloud protocols as the main data source. Although their findings are interesting and valuable, the researchers have not examined factors such as gender, motivation, self-efficacy, and out-of-school effort that are related to their success in language and literacy learning. Zhang and Goh (2006) investigated Singaporean secondary school students' perceived use of listening strategies. Zhang (2010a) examined primary schoolchildren's use of language learning strategies within the framework of sociocultural theory. He found that Singaporean schoolchildren's deployment of language learning and language use strategies in a classroom setting is one way of showing them negotiating their identity and learning of literacy.

Obviously, the perspectives taken by the studies mentioned above are insightful in many ways. But to promote learners' literacy development, it is very important to raise their awareness first about the strategic nature of the reading and writing processes and familiarize them with the strategies that good readers and writers tend to use (Zhang, 2010a). Learner variables such as gender, race, self-efficacy, motivation, and effort and contextual factors such as home languages and culture must be noted as these variables are also found to be closely related to literacy learning and strategy use, as seen in the following two sections.

Gender and literacy learning strategies

Gender differences are a recurrent topic in studies pertaining to literacy learning strategies. Several studies focus on investigating the differences in the use of language learning strategies between male and female ESL students at the college level (e.g., Cohen, 1998; Green & Oxford, 1995; Rebecca, Nyikos, & Erhman, 1988) and find that female students tend to use language learning strategies more often than their male counterparts. As these studies did not focus on reading and writing strategies in particular, they could not tell us much about whether learners of different gender would behave differently in their reading and writing strategy use. Studies about gender differences in the use of reading and writing strategies among pre-teens are scarce, though there are studies concerning gender differences in other aspects of reading and writing learning. For instance, Merisuo-Storm (2006) found that Finnish boys and girls (aged between 10 and 11) are different in their preference for reading materials and their attitudes towards reading and writing, with students' attitudes towards writing "more negative than those regarding reading" and "boys ... significantly more reluctant writers than girls" (p. 111).

While Merisuo-Storm's findings were based on Finnish students, the gender differences in attitudes towards basic literacy skills such as reading and writing may well be a contributing factor to the gap between boys and girls in literacy assessment performance in a wider context. The results of the National Assessment of Educational Progress in the United States over the past 17 years (1992–2009) reveal that girls in grades 4, 8, and 12 consistently performed better than their male counterparts in reading and writing achievements (National Center for Education Statistics, 2010). In Australia, boys' lower achievement in literacy has also attracted the attention of some researchers, who call on educators and

school administrators to pay greater attention to gender differences in children's literacy performance at school (Alloway & Gilbert, 1997). According to the 2006 Progress in International Reading Literacy Study (PIRLS) Report, the average score of Singaporean P4 girls was 567 points whereas that of the boys was 550 points (Mullis, Martin, Kennedy, & Foy, 2007). Although there are no published statistics about gender differences in high-stakes national examinations such as the Primary School Leaving Exam (PSLE), we suspect that there is a gap between boys and girls in literacy performance as measured by the various assessment tools such as high-stakes examinations and tests. Moreover, the consequence of this gap is more serious than that in the United States and Australia due to the high-stakes nature of national examinations in Singapore. This paper, however, will not touch on gender differences in literacy assessment performance; instead, it will focus on the gender issue in literacy learning strategy use.

Self-efficacy, motivation, effort, and literacy learning strategies

Studies suggest that certain learner variables such as self-efficacy, motivation, and effort can also play an important role in literacy learning. Self-efficacy refers to learners' perceived capabilities for learning or performing actions at designated levels (Bandura, 1997). According to Schunk and Zimmerman (2007), learners' level of self-efficacy can influence their choice of activities, effort expenditure, persistence, and achievement. Cole (2002) explains that learners with positive self-efficacies feel a strong sense of control over their learning and believe that they have the power to succeed whereas learners with poor self-efficacies feel just the opposite. Therefore, Cole thinks that it is important for educators to "evaluate students' self-efficacies and provide meaningful, motivational activities that will improve and enhance students' confidence in their abilities" (2002, p. 328).

Apart from self-efficacy, a number of researchers argue that motivation and effort investment are also variables that should not be neglected (e.g., Gao & Zhang, 2011). For example, Zhang and Xiao (2007) reported on the close relationships between English-as-a-foreign-language (EFL) students' motivation and learning strategy use in relation to learning English as a general proficiency-oriented activity, although their study did not delve into the domain of self-efficacy. As Boekaerts and Cascallar (2006) point out, learners must initiate activities that set the scene for learning, assign values to the learning activity, motivate themselves, and persevere. Teachers can teach students reading and writing strategies, but students may never reach their full potential if they do not have the intrinsic motivation to read and write and they do not invest adequate effort (Marinak & Gambrell, 2010). Evidently, the more metacognitive knowledge the students have, the more efficient they are in deploying possible strategies (Zhang, 2001; Zhang & Wu, 2009).

There remain few studies on whether young ESL learners with different linguistic and cultural backgrounds differ in strategy use when they are approaching English literacy learning. More investigation in this regard is needed to develop strategy instruction programs which can better accommodate learner needs.

Methodology

Participants

Six hundred and seventy-eight Primary 3 students from two typical primary schools in Singapore were involved in the preparatory study of our research project. Among them, 362 (or 53.4%) were boys and 316 (or 46.6%) were girls. Ninety-eight percent of the pupils with ages between eight and nine years participated in the study. There were 486 (or 71.7%) ethnic Chinese students, 148 (or 21.8%) ethnic Malay students, 24 (or 3.5%) ethnic Indian students, and 20 (or 2.9%) students from other ethnic groups (e.g., Eurasians, Koreans). As far as home languages are concerned, 67.8% of the participants reported that their home languages included English and their respective mother tongues and 32.2% of them claimed that only one language was spoken in their home. Among those who claimed to speak only one language at home, 9% speak only English, 13.9% speak only Chinese (or Chinese dialects), 7.5% speak Malay, and 1.8% speak Tamil or other languages.

Instruments

Drawing on studies on language learning strategies in general (Oxford, 1990; Chamot, Barnhardt, El-Dinary, & Robbins, 1999; Harvey & Goudvis, 2000; Mokhtari & Reichard, 2002; Klingner, Vaughn, & Boardman, 2007), and the findings concerning Singaporean upper primary (from P4 to P6) pupils' English learning strategies in particular (e.g., Gu, Hu, & Zhang, 2005; Rao, Gu, Zhang, & Hu, 2007; Zhang, Gu, & Hu, 2008), we developed two sets of survey forms for the preparatory study: One about reading and the other about writing, both of which were handed out to the participants in English when the subject matter was on learning to read and write in English. A similar version was distributed to the participants in Chinese when the questions focused on reading and writing in Chinese. We hoped that doing so would reduce the chance of confusing the children because they did not have to do the translation from one language to the other. It would also be easier for them to think about the reading and writing in the language of that particular subject. There were 42 items in the first draft of both surveys. The two survey forms were then piloted in a neighborhood primary school with a similar proportion of students from different ethnic groups. During the pilot study, we asked the students to highlight the terms that they could not understand and the language that they found difficult or confusing so that we could subsequently finetune the questionnaire. We allowed the students to ask questions in either English or Chinese inasmuch as the research team comprised four bilinguals who were biliterate in English and Chinese. Code-switching was also expected of these participants. We also noted down students' reactions when they were answering the pilot forms and the amount of time they needed in completing the surveys. We conducted an internal reliability test for the survey items based on the pilot study data and found that the reliability (alpha values) for both surveys was greater than $\alpha > 0.9$ (the benchmark value for good design is $\alpha = 0.8$). We then made some adjustments to the pilot version. We simplified

the language, reduced the number of items, and redesigned the layout of the survey question booklets and the answer sheets.

The final version of the survey forms consists of 40 items each. For each survey, there are two sections. Section One, which consists of 12 questions, gathered information on the students' personal information (age, gender, home languages, interest in reading and writing, preferred language(s) for reading and writing, effort for out-of-school reading and writing). Section Two was meant to collect information concerning their strategy use in reading or writing. In this section, there were 40 statements about what a reader or writer does in their reading or writing process. Under each statement, there were five options (1, 2, 3, 4, and 5) following the scale: 1–*Never*, 2–*Occasionally*, 3–*Sometimes*, 4–*Usually*, and 5–*Always*. The students were asked to read each statement and to think about their own experience and then pick a number which best represents what they did. Appendices 1 and 2 list the strategies employed in reading and writing surveys.

Data collection and analysis

The reading and writing surveys were administered to 678 students in two schools, with the help of the English language teachers. Step-by-step survey administration instructions were provided to the teachers involved and the two surveys were administered on separate days so as not to overwhelm the students.

Data were entered into SPSS. As there were 40 items for each survey, we found it necessary to conduct a factorial analysis for each survey so that we did not have to handle too many variables in other statistical analyses. The KMO and Bartlett's tests for our datasets showed a KMO value of .955 for the reading data and .948 for the writing data, indicating that our data were suitable for factor analysis.

Through factor analysis we extracted five strategy groups for the English reading survey and seven groups for the writing survey. The five reading strategy groups can explain 47.4% of the variance whereas the seven writing strategy groups can account for 47.8% of the variance. For convenience of expression, we renamed all the strategy groups. The reading strategy groups were renamed as (1) *Goal-setting and Planning*, (2) *Comprehension Enhancement*, (3) *Attention Management*, (4) *Coping with Unknown Words*, and (5) *Monitoring and Evaluation*. Table 1 lists the specific strategies which clustered under each of these reading strategy groups. The data were then recoded according to these strategy groups and new values were computed for them as well.

The seven writing strategy groups were renamed as (1) *Activating Prior Knowledge*, (2) *Planning Techniques*, (3) *Global Planning and Monitoring*, (4) *Drafting*, (5) *Vocabulary Strategy*, (6) *Quality Control*, and (7) *Rewarding Self*. Table 2 lists the specific writing strategies under each strategy group. The data were also recoded and new values, computed.

A variety of statistical analyses were subsequently performed based on the values of these clumped strategy groups.

Table 1

Factor Analysis Results for English Reading Survey

Item no.	Coefficient	Specific strategies
RD_Factor 1: Goal Setting & Planning		
RD_Q01	.536	Goal setting
RD_Q02	.553	Determining reading speed
RD_Q03	.542	Determining reading purpose
RD_Q04	.547	Activating prior knowledge (knowledge about the topic)
RD_Factor 2: Comprehension Enhancement		
RD_Q09	.547	Reading back and forth for main ideas
RD_Q10	.547	Differentiating important and less important information
RD_Q13	.521	Predicting by using what has been read so far
RD_Q14	.492	Asking questions while reading
RD_Q17	.456	Restating ideas in own words for better understanding
RD_Factor 3: Attention Management		
RD_Q19	.462	Paying closer attention when facing difficulty
RD_Q20	.700	Concentration management
RD_Factor 4: Coping with Unknown Words		
RD_Q25	.647	Guessing when unsure about the exact meaning
RD_Q26	.581	Applying linguistic knowledge for guessing word meaning
RD_Q27	.566	Using contextual clues in coping with unknown words
RD_Q28	.715	Using dictionaries for coping with unknown words
RD_Q29	.599	Asking for help in coping with unknown words
RD_Factor 5: Monitoring & Evaluation		
RD_Q32	.527	Checking whether reading goals achieved
RD_Q33	.516	Checking understanding through discussion with peers
RD_Q35	.477	Checking level of understanding after reading
RD_Q36	.567	Thinking about writer intention after reading
RD_Q37	.595	Thinking about text types
RD_Q38	.648	Noting down good words/phrases for future use
RD_Q39	.568	Evaluating writer opinions
RD_Q40	.564	Evaluating text quality

Table 2

Results of Factor Analysis for English Writing Survey

Item no.	Coefficient	Specific strategies
WR_Factor 1: Activating Prior Knowledge		
WR_Q01	.539	Reading for modeling
WR_Q06	.547	Gathering information about the topic
WR_Q10	.516	Activating prior knowledge (text type)
WR_Q16	.453	Activating prior knowledge (words or phrases read before)
WR_Q17	.448	Activating prior knowledge (ideas read before)
WR_Factor 2: Planning Techniques		
WR_Q04	.502	Understanding task requirements
WR_Q08	.653	Planning by listing ideas
WR_Q11	.481	Making an outline
WR_Q12	.469	Using graphic organizers for planning

Table 2
Results of Factor Analysis for English Writing Survey (*continued*)

Item No.	Coefficient	Specific strategies
WR_Factor 3: Global Planning & Monitoring		
WR_Q02	.536	Psychological preparation 1 (self-encouragement)
WR_Q03	.462	Psychological preparation 2 (reducing anxiety)
WR_Q07	.518	Thinking about audience
WR_Q27	.664	Quality monitoring (assessing possible reader response)
WR_Q33	.528	Thinking about readability
WR_Q34	.527	Self-evaluation (strengths & weaknesses)
WR_Q38	.594	Progress monitoring (writing quality)
WR_Q39	.629	Progress monitoring (writing ability)
WR_Factor 4: Drafting		
WR_Q15	.424	Prioritizing ideas over language while drafting
WR_Q23	.491	Coining words as compensation strategy
WR_Q24	.427	Meeting task requirements
WR_Q28	.680	Revising (ideas)
WR_Q29	.629	Revising (re-organizing ideas)
WR_Q32	.552	Revising (words/phrases)
WR_Factor 5: Vocabulary Strategy		
WR_Q18	.555	Using details to support main ideas
WR_Q21	.453	Consulting dictionaries for unfamiliar words
WR_Q22	.654	Using circumlocution as compensation strategy
WR_Factor 6: Quality Control		
WR_Q19	.451	Ensuring coherence
WR_Q20	.528	Ensuring cohesion
WR_Q25	.598	Ensuring completeness of text structure
WR_Q26	.633	Ensuring correctness of grammar
WR_Q31	.675	Mechanics (spelling & punctuation)
WR_Q37	.588	Trying to learn from teacher feedback
WR_Factor 7: Rewarding Self		
WR_Q36	.733	Rewarding self for completion of writing tasks

Results

Overall results for reading and writing

As we can see from Tables 3 and 4, students did not report a very frequent use of the reading and writing strategies listed in our surveys, as the mean scores for all the reading strategy groups are not very high. If we take a closer look at Table 3, we find that only one reading strategy group (*Attention Management*) scored slightly above 3.5 on a five-point Likert scale, suggesting that students tried to use attention management strategies to fix their reading problems more often than other strategies.

Table 4 shows that students' reported use of writing strategies was not very frequent, either. The mean scores for five out of the seven strategy groups fared below 3.1. Despite that, students did report more frequent use of strategies related

Table 3

Mean Scores for Reading Strategies

Reading factors	N	Minimum	Maximum	Mean	Std. deviation
Goal-setting & Planning	659	1.00	5.00	2.7508	.97839
Comprehension Enhancement	659	1.00	5.00	2.8200	1.00725
Attention Management	658	1.00	5.00	3.5304	1.14337
Coping with Unknown Words	655	1.00	5.00	3.0791	.89854
Monitoring & Evaluation	656	1.00	5.00	2.8742	.96509

Table 4

Mean Scores for Writing Strategies

Writing factors	N	Minimum	Maximum	Mean	Std. deviation
Activating Prior Knowledge	657	1.00	5.00	3.4259	.91844
Planning Techniques	654	1.00	5.00	3.1044	.96438
Global Planning & Monitoring	639	1.00	5.00	3.0430	.96501
Drafting	651	1.00	5.00	2.9411	.90904
Vocabulary Strategy	657	1.00	5.00	2.9254	1.04263
Quality Control	652	1.00	5.00	3.6639	.90927
Rewarding Self	660	1.00	5.00	2.8788	1.60060

to writing quality control. If we recall the specific strategies of quality control (see Table 2), we may find it not too hard to determine why this was the case. Issues such as cohesion, coherence, completeness of text structure, correctness of grammar, spelling, and punctuation are features English teachers will repeatedly emphasize to their students.

Presenting the mean scores of students' reported strategy use can only suggest whether our informants attempted to use strategies and how often they did so. As the focus of this paper is on exploring the relationship between students' use of reading and writing strategies and social and psychological factors such as their gender, ethnic groups, home languages, interest in reading and writing, self-efficacy, and other factors, further tests were performed. The following sections present the results in this regard. The reading and the writing results are presented separately in order to avoid confusion.

Reading strategy use

Social factors and reading strategy use

A multivariate analysis of variance (MANOVA) was performed to investigate whether students' self-reported reading strategy use will differ if they are grouped according to their gender, ethnic groups, and family language backgrounds. Results show that boys and girls were different only in one reading strategy group

(*Coping with Unknown Words*) ($F(1,649) = 11.45, p = .001, \text{partial } \eta^2 = .017$), using a Bonferroni adjusted alpha level of .01(0.05/5). Girls reported more frequent use of strategies related to coping with unknown words ($M = 3.21, SD = .87$) than boys ($M = 2.97, SD = .91$). For the rest of the reading strategy groups, no gender differences were found. Students from different ethnic groups did not show significant differences in their self-reported use of reading strategies. No difference was found among students from different home language backgrounds in their self-reported use of reading strategies, either.

Psychological factors and reading strategy use

MANOVA tests were also conducted to determine whether students with different levels of interest in reading in English, different degrees of self-efficacy, and different out-of-school learning effort performed differently in their self-reported strategy use.

As can be seen from Table 5, the mean scores of students with the highest self-rated reading interest are significantly higher than the scores of students with fair and low reading interest. This can be observed in all the five strategy groups. In other words, students with high reading interest tended to use strategies more often.

As revealed in Table 6, students with the highest self-rated reading ability (or self-efficacy) reported more frequent use of strategies than those with fair and low abilities. The differences between high ability students and fair and low ability students are statistically significant in four out of the five reading factors. The only exception is the use of strategies related to coping with unknown words, which shows no differences. What we can deduce from this finding is that students with

Table 5
Reading Interest and Reading Strategy Use

Dependent variable	(I) Interest in reading English	(J) Interest in reading English	Mean difference (I-J)	SE	Sig.	95% confidence interval	
						Lower bound	Upper bound
Goal-setting & Planning	Strong	Fair	.2792*	.07831	.001	.0952	.4631
		Low	.7321*	.16634	.000	.3414	1.1229
Comprehension Enhancement	Strong	Fair	.2967*	.08084	.001	.1068	.4866
		Low	.7842*	.17170	.000	.3809	1.1876
Attention Management	Strong	Fair	.5299*	.08875	.000	.3214	.7384
		Low	1.3947*	.18850	.000	.9519	1.8375
Coping with Unknown Words	Strong	Fair	.2377*	.07191	.003	.0687	.4066
		Low	.7271*	.15273	.000	.3683	1.0859
Monitoring & Evaluation	Strong	Fair	.3396*	.07688	.000	.1590	.5202
		Low	.8851*	.16330	.000	.5015	1.2688

*. The mean difference is significant at the .05 level

Table 6

Reading Ability and Reading Strategy Use

Dependent variable	(I) English reading ability	(J) English reading ability	Mean difference (I-J)	SE	Sig.	95% confidence interval	
						Lower bound	Upper bound
Goal-setting & Planning	Very good	Fair	.2522*	.08171	.006	.0603	.4442
		Low	.4659*	.18848	.036	.0231	.9087
Comprehension Enhancement	Very good	Fair	.2679*	.08406	.004	.0704	.4654
		Low	.7118*	.19390	.001	.2563	1.1673
Attention Management	Very good	Fair	.3923*	.09395	.000	.1716	.6130
		Low	1.1492*	.21672	.000	.6401	1.6583
Coping with Unknown Words	Very good	Fair	.0990	.07519	.386	-.0776	.2757
		Low	.6178*	.17344	.001	.2104	1.0253
Monitoring & Evaluation	Very good	Fair	.2499*	.08086	.006	.0600	.4399
		Low	.6662*	.18652	.001	.2281	1.1044

*. The mean difference is significant at the .05 level

high self-rated reading ability tended to use reading strategies more frequently than students with low self-rated reading ability.

Among the 678 informants, 397 (59%) reported that they spent extra time reading in English after school, whereas the other 41% reported that they did not do so. A MANOVA test reveals a significant difference in the reading strategy use between students who read after school and those who did not: $F(5, 632) = 5.31, p = .000; \lambda = .96; \text{partial } \eta^2 = .04$. Students who read after school tended to use reading strategies more often than those who did not.

Writing strategy use

Social factors and writing strategy use

We conducted the same kind of tests as we did with the reading survey to determine whether students' writing strategy use differs when they are grouped by gender, ethnic groups, and home language backgrounds. Results show that boys and girls were different in their reported use of four groups of strategies, using a Bonferroni adjusted alpha level of .007 (0.05/7). They are: *Activating Prior Knowledge* ($F(1, 602) = 11.22, p = .001, \text{partial } \eta^2 = .018$), *Vocabulary Strategy* ($F(1, 602) = 9.01, p = .003, \text{partial } \eta^2 = .015$), *Quality Control* ($F(1, 602) = 7.43, p = .007, \text{partial } \eta^2 = .012$), and *Rewarding Self* ($F(1, 602) = 11.31, p = .001, \text{partial } \eta^2 = .018$). Among these four factors, girls' mean scores of the first three factors ($M = 3.56, SD = .89; M = 3.06, SD = 1.06; M = 3.80, SD = 3.61$) are higher than boys' ($M = 3.31, SD = .93; M = 2.81, SD = 1.02; M = 3.61, SD = .91$). In other words, girls tended to use strategies related to activating prior knowledge, coping

with vocabulary problems, and quality enhancement more frequently than boys whereas boys tended to use the strategy of self-rewarding more often than girls. A MANOVA test shows that ethnic Malay students reported significantly greater use of strategies related to *Global Planning and Monitoring* than ethnic Chinese students, using a Bonferroni adjusted alpha level of .007: $F(2, 601) = 5.08$, $p = 0.006$, and partial $\eta^2 = .017$. In other words, our Malay informants tended to use strategies related to global planning and monitoring more often than their Chinese counterparts. No significant differences were observed in all the other factors among students from different ethnic groups. Students from different home language backgrounds did not show any significant difference in their reported use of writing strategies.

Psychological factors and writing strategy use

Our MANOVA test results show that students with the highest self-rated writing interest reported more frequent use of six out of the seven groups of writing strategies than those students with fair or low interests (see Table 7). No significant difference was observed in the use of *Rewarding Self* among students with different levels of interest. What we can conclude from this finding is that students' interest in English writing appears to be related to their use of writing strategies.

As Table 8 illustrates, students with high self-rated writing abilities outperformed those with fair and low writing abilities for six out of the seven writing strategy groups. The only exception is *Rewarding Self*. In other words,

Table 7
Writing Interest and Writing Strategy Use

Dependent variable	(I) Interest in English writing	(J) Interest in English writing	Mean difference (I-J)	SE	Sig.	95% confidence interval	
						Lower bound	Upper bound
Activating Prior Knowledge	Strong	Fair	.4990*	.07338	.000	.3266	.6714
		Low	1.2170*	.15391	.000	.8554	1.5787
Planning Techniques	Strong	Fair	.5092*	.07892	.000	.3238	.6947
		Low	.9224*	.16553	.000	.5335	1.3114
Global Planning & Monitoring	Strong	Fair	.5142*	.07886	.000	.3289	.6995
		Low	1.0428*	.16542	.000	.6541	1.4315
Drafting	Strong	Fair	.4645*	.07421	.000	.2901	.6388
		Low	1.0398*	.15565	.000	.6741	1.4056
Vocabulary Strategy	Strong	Fair	.4577*	.08671	.000	.2540	.6614
		Low	.8223*	.18188	.000	.3950	1.2496
Quality Control	Strong	Fair	.3482*	.07355	.000	.1754	.5210
		Low	1.0816*	.15426	.000	.7191	1.4440

*. The mean difference is significant at the .05 level

Table 8

Writing Ability and Writing Strategy Use

Dependent variable	(I) Interest in English writing	(J) Interest in English writing	Mean difference (I-J)	SE	Sig.	95% confidence interval	
						Lower bound	Upper bound
Activating Prior Knowledge	Very Good	Fair	.4170*	.08400	.000	.2196	.6144
		Low	.9667*	.17709	.000	.5506	1.3828
Planning Techniques	Very Good	Fair	.6017*	.08749	.000	.3961	.8072
		Low	.9129*	.18445	.000	.4795	1.3463
Global Planning & Monitoring	Very Good	Fair	.5800*	.08796	.000	.3733	.7867
		Low	1.0696*	.18544	.000	.6339	1.5054
Drafting	Very Good	Fair	.4960*	.08315	.000	.3006	.6913
		Low	.8876*	.17529	.000	.4758	1.2995
Vocabulary Strategy	Very Good	Fair	.5357*	.09565	.000	.3109	.7604
		Low	1.0326*	.20165	.000	.5588	1.5064
Quality Control	Very Good	Fair	.2746*	.08297	.003	.0796	.4695
		Low	1.0964*	.17491	.000	.6854	1.5074
Rewarding Self	Very Good	Fair	.3178	.15076	.089	-.0364	.6721
		Low	-.0097	.31783	.999	-.7565	.7371

students with high self-efficacy tended to use writing strategies more frequently than students with low self-efficacy in English writing.

Among the 678 students, 62% claimed that they did spend time on writing in English after school whereas the other 38% said they did not do so. MANOVA test results show that students who wrote after school demonstrated significant difference in their use of four out of the seven groups of writing strategies from those who did not do so, using a Bonferroni adjusted alpha level of .007. These strategy groups include: *Activating Prior Knowledge* ($F(1, 602) = 25.89, p = .000$, partial $\eta^2 = .041$), *Global Planning and Monitoring* ($F(1, 602) = 19.44, p = .000$, partial $\eta^2 = .031$), *Vocabulary Strategy* ($F(1, 602) = 21.64, p = .000$, partial $\eta^2 = .035$), and *Quality Control* ($F(1, 602) = 7.82, p = .005$, partial $\eta^2 = .013$). Students who wrote after school tended to use these four groups of writing strategies more often than those who did not. They did not show significant differences in their use of strategies related to *Drafting* and *Rewarding Self*.

Discussion

From what has been presented above, we can see that Singaporean schoolchildren's self-reported use of literacy learning strategies seems to be influenced by certain social and psychological factors.

Our results show that girls reported more frequent use of strategies related to dealing with unknown words in their reading than boys. In writing, girls reported

more frequent use of three groups of writing strategies than boys: *Activating Prior Knowledge*, *Vocabulary Strategy*, and *Quality Control*. Boys only outperformed girls in one strategy group, that is, *Rewarding Self*. What we can conclude from these results is that boys and girls may have different preferences in strategy use, especially when it comes to learning writing. If we recall Merisuo-Storm's (2006) comments about boys' more negative attitude towards writing and their greater reluctance in writing activities, we may not find the differences between girls and boys in their use of writing strategies very surprising. What is noteworthy here is that language educators may need to encourage boys to pay more attention to strategies which are related to prior knowledge activation, dealing with vocabulary problems, and writing quality enhancement. This is especially important and should be taken into serious consideration if lower-primary English language teachers decide to introduce strategy instruction into their teaching practice. Despite the fact that gender differences tend to be developmental and the gap between males and females will eventually level off, it is still worth bearing in mind that boys, especially lower-primary schoolboys, may need more help in their language learning in general and development of writing skills in particular.

Due to research design differences, we realize the challenges in comparing our findings with those reported in the literature on Singaporean learners of English (e.g., Rao et al., 2007; Zhang et al., 2008). However, in a multi-racial society like Singapore, it is quite possible for students from different ethnic groups to have differing understanding about literacy learning and approaches to literacy learning in more strategic ways. The finding that ethnic Chinese and Malay students reported significantly different uses of writing strategies related to *Global Planning and Monitoring* seems to indicate that ethnicity might be related to students' strategy use in English learning. We also noticed that ethnic group may not be a key variable in Singapore schoolchildren's use of English literacy learning strategies, as our statistical results did not reveal any other differences among students from different ethnic groups. More investigation should be carried out if we want to have a clearer picture about the exact role of ethnicity in students' literacy learning strategy use.

As increasingly more families in Singapore choose to use English as their home language, the influence of students' mother tongue languages on their English literacy learning may become an issue of lesser importance. The finding that students with different home language backgrounds did not show significant differences in their strategy use in learning reading and writing in English seems to support such a sentiment. Nevertheless, as Singapore remains a predominantly multilingual environment, English language educators should take this scenario into account when they are conducting strategy-based reading and writing instruction.

Similar to the findings in other learning strategy studies, our findings also show that learners' interest in literacy learning, their self-rated reading and writing abilities, and their out-of-school effort in literacy learning are all closely related to their strategy use. Language educators need to consider strengthening the bilateral ties between motivation, self-efficacy, and effort expenditure and the more frequent use of learning strategies. By increasing learners' intrinsic interest

in reading and writing in English, helping them to develop their self-efficacy, and boosting their voluntary effort expenditure on literacy practice, language teachers can encourage students to further develop their strategic behaviors in literacy learning. Incorporating explicit strategy instruction into daily literacy teaching practices can raise learners' awareness of learning strategies and build up their self-efficacy, which will in turn promote students' interest and greater effort in literacy learning.

Conclusion and recommendation

The results of the preparatory study of our research project show that our informants did attempt to use different literacy learning strategies, though the average frequency of strategy use was not very high. We also found that learners' gender, motivation, self-efficacy, and out-of-school effort are related to their use of learning strategies (cf. Gao & Zhang, 2011). Students' ethnic and cultural backgrounds may be able to exert influence on the use of certain literacy learning strategies. However, the influence of home languages on students' strategy use is not validated by our data. Our findings reveal the necessity of strategy instruction for this group of schoolchildren and the potential importance of social and psychological factors in literacy strategy instruction (see e.g., Cohen, 1998; Macaro & Cohen, 2007; Zhang, 2008). One prerequisite is that teachers need to be well-acquainted with the useful strategies that can potentially raise the level of student awareness of the utility of a strategy-based approach. As scholars argue (see e.g., Goodwyn, 2010; Limbrick, Buchanan, Goodwin, & Schwarcz, 2010; Limbrick & Parr, 2010), teacher expertise is an extremely important factor in successful pedagogical practice, and we can suggest that it is equally, if not more, significant in implementing an innovative pedagogical intervention such as ours as reported in this paper. Evidently, awareness of strategy use requires a degree of sophistication and takes time. Therefore, it is recommended that in any follow-up study it would be useful to present students with actual tasks from which they could report strategy use so that the dynamic nature of strategy use can be better understood.

ACKNOWLEDGEMENTS

This research is financially supported by a research grant (Grant 25/08/OER/LZ) awarded to the Principal Investigator, Lawrence Jun Zhang, by the Singapore Ministry of Education through the Office of Education Research, NIE, Singapore. The authors thank the funding agency and the two collaborating schools, whose teachers' and students' participation has made the research possible. We declare that official consent was obtained from the Ministry of Education and the respective schools for the participant data to be published anonymously. Any of the views expressed in this paper are those of the authors and should not be construed to represent the funding agency or the approving authority. The authors also appreciate the two reviewers and the editors for their constructive comments. Any remaining errors rest with the authors.

THE AUTHORS

Wengao Gong, PhD, was a post-doctoral research fellow at the National Institute of Education (NIE), Nanyang Technological University (NTU) and is currently associate professor in education at Knowledge Universe, a multinational education company in Singapore. He has published in areas such as internet-based communication, corpus linguistics, lexicography, English-Chinese biliteracy learning, and other second-language acquisition-related topics.

Donglan Zhang lectures in academic and professional writing, pedagogical grammar, introduction to linguistics, and communication skills at NIE-NTU, Singapore. Her research interests lie in learner metacognition and strategy use, particularly second language listening. She has published in international and local journals such as *Asian Englishes*, *Language Awareness*, and *Review of Educational Research for Classroom Teachers*. She is co-principal investigator of two research projects funded by NIE and NIE-MOE of Singapore, respectively.

Lawrence Jun Zhang, PhD, is associate professor at NIE-NTU, Singapore. He is particularly interested in metacognitive instruction in reading and writing biliteracy development. He has published extensively on related topics in the *Journal of Second Language Writing*, *Journal of Psycholinguistic Research*, and *Reading in a Foreign Language*. He is on the editorial advisory boards of *Chinese Journal of Applied Linguistics*, *TESOL Quarterly*, and *Metacognition and Learning*. A post-doctoral fellow at Oxford University Department of Education, he was the 2010 recipient of the TESOL Award for Distinguished Research.

Tamas Kiss, PhD, has been involved with language teacher education programmes in Europe, the Middle East, South Asia, Latin America, and Southeast Asia. His main interests include SLTE, school-based teacher education, mentoring, the educational values of teachers and trainers. He is currently assistant professor at the English Language and Literature Academic group of NIE-NTU, Singapore.

Ang-Tay May Yin is Programme Director of the English Language Institute of Singapore. Her experience includes teaching English language, literature and the general paper at the secondary and pre-university levels. A senior curriculum

specialist in the Curriculum Planning and Development Division (CPDD), MOE, she has been Assistant Director/English Language and Literature, and Assistant Director/Curriculum Policy and Pedagogy. She has authored, co-authored, and co-edited various publications. In 2011, she was appointed Principal Master Teacher. Her research interests include language pedagogy, school-based curriculum development, and innovation and change in ELT.

Correspondence concerning this article should be addressed to A/P Lawrence Jun Zhang, English Language & Literature Academic Group, National Institute of Education/Nanyang Technological University, 1 Nanyang Walk, Singapore 637616; email: lawrence.zhang@nie.edu.sg.

References

- Alloway, N., & Gilbert, P. (1997). Boys and Literacy: Lessons from Australia. *Gender & Education, 9*, 49-60.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Longman.
- Block, C.C., & Duffy, G.G. (2008). Research on teaching comprehension: Where we've been and where we're going. In C.C. Block & S.R. Parris (Eds.), *Comprehension instruction: Research-based best practices* (2nd ed., pp. 19-37). New York: The Guilford Press.
- Boekaerts, M., & Cascallar, E. (2006). How far have we moved toward the integration of theory and practice in self-regulation? *Educational Psychology Review, 18*, 199-210.
- Chamot, A.U. (1987). The learning strategies of ESL students. In A. Wenden & J. Rubin (Eds.), *Learner strategies in language learning* (pp. 71-85). Hemel Hempstead: Prentice-Hall.
- Chamot, A.U., Barnhardt, S., El-Dinary, P.B., & Robbins, J. (1999). *The learning strategies handbook*. White Plains, NY: Pearson Education.
- Cohen, A.D. (1998). *Strategies in learning and using a second language*. New York: Longman.
- Cohen, A.D., & Macaro, E. (2007). Conclusions. In A.D. Cohen & E. Macaro (Eds.), *Language learner strategies: Thirty years of research and practice* (pp. 275-284). Oxford: Oxford University Press.
- Cole, J.E. (2002). What motivates students to read? Four literacy personalities. *The Reading Teacher, 56*, 326-336.
- Gao, X.S. (2010). *Strategic language learning: The roles of agency and context*. Bristol, UK: Multilingual Matters.
- Gao, X.S., & Zhang, L.J. (2011). Joining forces for synergy: Agency and metacognition as interrelated theoretical perspectives on learner autonomy. In Murray, G., Gao, X., & Lamb, T. (Eds.), *Identity, motivation and autonomy: Exploring the links* (pp. 25-41). Bristol: Multilingual Matters.
- Goh, C., & Taib, Y. (2006). Metacognitive instruction in listening for young learners. *ELT Journal, 60*, 222-232.
- Goodwyn, A. (2010). *The expert teacher of English*. London: Routledge.
- Green, J.M., & Oxford, R.L. (1995). A closer look at learning strategies, L2 proficiency, and gender. *TESOL Quarterly, 29*, 261-297.
- Grenfell, M., & Macaro, E. (2007). Claims and critiques. In A.D. Cohen & E. Macaro (Eds.), *Language learner strategies: Thirty years of research and practice* (pp. 9-28). Oxford: Oxford University Press.
- Gu, P.Y., Hu, G., & Zhang, L.J. (2005). Investigating language learner strategies among lower primary school pupils in Singapore. *Language and Education, 19*, 281-303.
- Harris, K.R., Graham, S., Brindle, M., & Sandmel, K. (2009). Metacognition and children's writing. In D.J. Hacker, J. Dunlosky, & A.C. Graesser (Eds.), *Handbook of metacognition in education* (pp. 131-153). London: Routledge.
- Harris, K.R., Santangelo, T., & Graham, S. (2010). Metacognition and strategies instruction in writing. In H.S. Waters & W. Schneider (Eds.), *Metacognition, strategy use, and instruction* (pp. 226-256). London: Guilford Press.

- Harvey, S., & Goudvis, A. (2000). *Strategies that work: Teaching comprehension to enhance understanding*. Markham, Ontario: Pembroke Publishers.
- Klingner, J.K., Vaughn, S., & Boardman, A. (2007). *Teaching reading comprehension to students with learning difficulties*. New York: Guilford Press.
- Limbrick, L., Buchanan, P., Goodwin, M., & Schwarcz, H. (2010). Doing things differently: The outcomes of teachers researching their own practice in teaching writing. *Canadian Journal of Education*, 33, 897-924.
- Limbrick, L., & Parr, J. (2010). Contextualising practice: Hallmarks of effective teachers of writing. *Teaching and Teacher Education*, 26, 583-590.
- Macaro, E. (2006). Strategies for language learning and for language use: Revising the theoretical framework. *Modern Language Journal*, 90, 320-337.
- Macaro, E., & Cohen, A.D. (2007). Introduction. In A.D. Cohen & E. Macaro (Eds.), *Language learner strategies: Thirty years of research and practice* (pp. 1-5). Oxford: Oxford University Press.
- Marinak, B.A., & Gambrell, L.B. (2010). Reading motivation: Exploring the elementary gender gap. *Literacy Research & Instruction*, 49, 129-141.
- Merisuo-Storm, T. (2006). Girls and boys like to read and write different texts. *Scandinavian Journal of Educational Research*, 50, 111-125.
- Mokhtari, K., & Reichard, C.A. (2002). Assessing students' metacognitive awareness of reading strategies. *Journal of Educational Psychology*, 94, 249-259.
- Mullis, I.V.S., Martin, M.O., Kennedy, A.M., & Foy, P. (2007). *PIRLS 2006 International Report*. Boston, MA: TIMSS & PIRLS International Study Center, Lynch School of Education, Boston College.
- National Center for Education Statistics. (2010). *Reading 2009: National assessment of education progress at grades 4 and 8* (No. NCES 2010-458). Alexandria, VA: Institute of Education Sciences, U.S. Department of Education.
- Oxford, R.L. (1990). *Language learning strategies: What every teacher should know*. Boston: Heinle & Heinle Publishers.
- Rao, Z., Gu, P.Y., Zhang, L.J., & Hu, G. (2007). Reading strategies and approaches to learning of bilingual primary school pupils. *Language Awareness*, 16, 243-262.
- Rebecca, R.L., Nyikos, M., & Ehrman, M. (1988). Vive la difference? Reflections on sex differences in use of language learning strategies. *Foreign Language Annals*, 21, 321-329.
- Rubin, J., Chamot, A.U., Harris, V., & Anderson, N. J. (2007). Intervening in the use of strategies. In A.D. Cohen & E. Macaro (Eds.), *Language learner strategies: Thirty years of research and practice* (pp. 141-160). Oxford: Oxford University Press.
- Schunk, D.H., & Zimmerman, B.J. (2007). Influencing children's self-efficacy and self-regulation of reading and writing through modeling. *Reading & Writing Quarterly*, 23(1), 7-25.
- Zhang, D.L. (2004). Your English is too 'cheem'! Singaporean student listening difficulties and tackling strategies. *Asian Englishes: An International Journal of the Sociolinguistics of English in Asia/Pacific*, 7, 74-91.
- Zhang, D.L., & Goh, C.C.M. (2006). Strategy knowledge and perceived strategy use: Singaporean students' awareness of listening and speaking strategies. *Language Awareness*, 15, 199-219.

- Zhang, L.J. (2001). Awareness in reading: EFL students' metacognitive knowledge of reading strategies in an acquisition-poor environment. *Language Awareness, 10*, 268-288.
- Zhang, L.J. (2003). Research into Chinese EFL learner strategies: Methods, findings and instructional issues. *RELC Journal, 34*, 284-322.
- Zhang, L.J. (2008). Constructivist pedagogy in strategic reading instruction: Exploring pathways to learner development in the English as a second language (ESL) classroom. *Instructional Science: An International Journal of the Learning Sciences, 36*, 89-116.
- Zhang, L.J. (2010a). Negotiating language, literacy and identity: A sociocultural perspective on children's language learning strategies in a multilingual ESL classroom in Singapore. *The Applied Linguistics Review, 1*, 247-270.
- Zhang, L.J. (2010b). A dynamic metacognitive systems account of Chinese university students' knowledge about EFL reading. *TESOL Quarterly, 44*, 320-353.
- Zhang, L.J., Gu, P.Y., & Hu, G. (2008). A cognitive perspective on Singaporean primary school pupils' use of reading strategies in learning to read in English. *British Journal of Educational Psychology, 78*, 245-271.
- Zhang, L.J., & Wu, A. (2009). Chinese senior high school EFL students' metacognitive awareness and use of reading strategies. *Reading in a Foreign Language, 21*, 37-59.
- Zhang, L.J., & Xiao, Y.H. (2006). Language learning strategies, motivation and EFL proficiency: A study of Chinese tertiary-level non-English majors. *Asian Englishes: An International Journal of the Sociolinguistics of English in Asia/Pacific, 9*, 20-47.

Appendix 1

Inventory of reading strategies

Item No.	Strategy	Item No.	Strategy
RD_Q01	Setting a goal for reading	RD_Q21	Applying linguistic knowledge for understanding
RD_Q02	Determining reading speed	RD_Q22	Reading difficult parts aloud for understanding
RD_Q03	Determining reading purpose	RD_Q23	Re-reading difficult parts
RD_Q04	Activating prior knowledge (knowledge about the topic)	RD_Q24	Ignoring unimportant unknown words
RD_Q05	Predicting (via title/pictures)	RD_Q25	Guessing when unsure about the exact meaning
RD_Q06	Predicting (via common knowledge)	RD_Q26	Applying linguistic knowledge for guessing word meaning
RD_Q07	Using text knowledge for understanding	RD_Q27	Using contextual clues in coping with unknown words
RD_Q08	Paying attention to every word	RD_Q28	Using dictionaries for coping with unknown words
RD_Q09	Reading back and forth for main ideas	RD_Q29	Asking for help in coping with unknown words
RD_Q10	Differentiating important and and less important information	RD_Q30	Chunking long and difficult sentences for understanding
RD_Q11	Highlighting important information for better understanding	RD_Q31	Using knowledge of grammar for understanding difficult sentences
RD_Q12	Checking understanding while reading	RD_Q32	Checking whether reading goals achieved
RD_Q13	Predicting by using what has been read so far	RD_Q33	Checking understanding through discussion with peers
RD_Q14	Asking questions while reading	RD_Q34	Summarizing important information read
RD_Q15	Pause and think for better understanding	RD_Q35	Checking level of understanding after reading
RD_Q16	Visualizing	RD_Q36	Thinking about writer intention after reading
RD_Q17	Restating ideas in own words for better understanding	RD_Q37	Thinking about text types
RD_Q18	Reducing anxiety when facing difficulty	RD_Q38	Noting down good words/phrases for future use
RD_Q19	Paying closer attention when facing difficulty	RD_Q39	Evaluating writer opinions
RD_Q20	Concentration management	RD_Q40	Evaluating text quality

Appendix 2

Inventory of writing strategies

Item No.	Strategy	Item No.	Strategy
WR_Q01	Reading for modeling	WR_Q21	Consulting dictionaries for unfamiliar words
WR_Q02	Psychological preparation 1 (self-encouragement)	WR_Q22	Using circumlocution as compensation strategy
WR_Q03	Psychological preparation 2 (reducing anxiety)	WR_Q23	Coining words as compensation strategy
WR_Q04	Understanding task requirements	WR_Q24	Meeting task requirements
WR_Q05	Thinking about purpose	WR_Q25	Ensuring completeness of text structure (beginning, body, and ending)
WR_Q06	Gathering information about the topic	WR_Q26	Ensuring correctness of grammar
WR_Q07	Thinking about audience	WR_Q27	Quality monitoring (assessing possible reader response)
WR_Q08	Planning by listing ideas	WR_Q28	Revising (ideas)
WR_Q09	Planning about what language to use	WR_Q29	Revising (re-organizing ideas)
WR_Q10	Activating prior knowledge (text type)	WR_Q30	Revising (reading aloud for problems)
WR_Q11	Making an outline	WR_Q31	Mechanics (spelling & punctuation)
WR_Q12	Using graphic organizers for planning	WR_Q32	Revising (words/phrases)
WR_Q13	Planning by thinking about how to write	WR_Q33	Thinking about readability
WR_Q14	Planning by selecting a focus	WR_Q34	Self-evaluation (strengths & weaknesses)
WR_Q15	Prioritizing ideas over language while drafting	WR_Q35	Other-evaluation (seeking peer feedback)
WR_Q16	Activating prior knowledge (words or phrases read before)	WR_Q36	Rewarding self for completion of writing tasks
WR_Q17	Activating prior knowledge (ideas read before)	WR_Q37	Trying to learn from teacher feedback
WR_Q18	Using details to support main ideas	WR_Q38	Progress monitoring (writing quality)
WR_Q19	Ensuring coherence	WR_Q39	Progress monitoring (writing ability)
WR_Q20	Ensuring cohesion	WR_Q40	Effort monitoring (looking out for writing opportunities)

