

**Project Title** : Enhancing Academic Career Success: Developing Information Processing Skills Across Multiple Texts in Chinese Language Education Discipline for Undergraduate Students

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# Enhancing Academic Career Success: Developing Information Processing Skills Across Multiple Texts in Chinese Language Education Discipline for Undergraduate Students

**Abstract:** The project aimed to explore the effects of discourse synthesis skills on academic writing performance of undergraduate students and provide information of the transition of Chinese literacy level from secondary to tertiary education. The project comprised two distinct phases. In Phase One, 103 essays from Year Two undergraduate students were collected and analyzed to assess their use of sources in academic writing. Additionally, 20 students participated in semi-structured interviews focusing on their perspectives on citation and the challenges they faced as inexperienced academic writers. In Phase Two, a longitudinal study was conducted with 51 Year One undergraduate students. This involved three rounds of writing tests, questionnaire responses, interview statements, workshops, and learner portfolio records to investigate how their literacy skills transitioned from secondary school to university. The study's findings contributed to the development of discourse synthesis skills theory and identify patterns in the transition of each skill. The results indicated that students excel in organizing and planning, building on their prior writing skills from high school. However, there is a need to foster the development of skills in selecting, connecting, and evaluating. Suggestions were provided, and self-learning videos were produced for teaching and learning multiple-text reading comprehension and writing skills to educators at both secondary and tertiary education levels, aiming to bridge the gap between the two educational stages.

**Keywords:** Multiple-texts information processing; Discourse synthesis skills; Chinese education discipline; Undergraduate students

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## **1. Introduction**

The ability to achieve communicative competence in writing is essential to language development and academic success at all educational levels. In the education context of Hong Kong, previous studies as well as examination reports found that students are facing difficulties in academic writing despite years of intensive training in secondary schools (HKEAA, 2018; Lau, 2019) and the students generally produced a composite of disconnected parts in their Diploma of Secondary Education (DSE) integrated writing paper (Li, Zhu, & Cheong, 2020). Although the curriculum included multiple-texts reading and integrated writing components, both teachers and students had approached these higher-order thinking tasks in a formulaic way and neglected the development of the essential skills involved in these learning and assessment tasks. Particularly for integrated writing, there has been discourse among the teaching profession to remove the assessment format in DSE examination. These phenomena prove that there have been misconceptions on the purpose of these integrated skills at the secondary levels.

Moving on to tertiary education, it is reasonable to assume that challenges emerged as students enter universities with underdeveloped skills. The most challenging aspect of academic writing is the synthesis of similar and contrasting views and ideas from multiple sources to present an integrated view of a research topic. Many students rely on merely summarizing ideas and adopting the single perspective style in their literature reviews (Cisco, 2014; Hart, 1998). Moreover, instructors seemed to focus more on linguistic features and format when teaching academic writing (Lea & Street, 1998) and render less support to the higher-order thinking and writing skills. Improvement in the teaching of academic writing requires more research to uncover the skills that are essential in the writing processes to inform the development of instructional strategies (Zorn & Campbell, 2006).

Considering the situation mentioned above, it appears particularly imperative to identify ways for enhancing the integrated writing abilities of both secondary and college students. Previous studies proved that using of discourse synthesis skills (i.e., organizing, selecting, connecting; Spivey & King, 1989) enhanced the performance of integrated writing tasks in both oral and written form (Cheong, Zhu, Li, & Wen, 2019; Zhu, Liao, & Cheong, 2019). In addition, the study conducted by Cheong et al. (2018) revealed that apart from independent language skills, integrated writing skills are significantly linked to the ability to elaborate, evaluate, and create in the context of reading. However, the existing research is not adequate to provide a comprehensive understanding of the specific skills required for the development of academic writing abilities and how these skills transition from secondary school to college. Therefore, the current project aimed to achieve four objectives: (1) to investigate the effects of discourse synthesis skills on academic writing performance of undergraduate students; (2) to further validate the theoretical framework of discourse synthesis skills; (3) to provide information of the transition of Chinese literacy level from secondary to tertiary education; (4) to propose suggestions for teaching multiple-text reading comprehension and writing skills to both secondary and tertiary education teachers, so as to bridge the gap between the two educational levels. Based on the above objectives, two research questions were asked:

- (1) What are the effects of information processing skills in academic writing of undergraduate students?
- (2) To what extent is the transition from secondary education to tertiary education successful, from the perspective of literacy development?

## **2. Review of literature**

To provide the theoretical underpinnings of the current study, we reviewed related literature and organized into three sub-sections as (1) Academic Writing as Required in Tertiary Education, (2) Processing during Multiple-text Comprehension, as well as (3) Discourse Synthesis during Reading and Writing.

### ***2.1. Academic Writing as Required in Tertiary Education***

Academic writing can be a process that involve struggle for many, especially when fresh undergraduate students first encounter specific disciplinary needs. Essentially, all disciplines require a showcase of knowledge of what has been done and what needs to be done in the topic area, by synthesizing earlier work while providing new perspectives on the relevant variables of the field (Gall, Borg, & Gall, 1996; Hart, 1998; Jaidka, Khoo, & Na, 2013). Therefore, academic writing can be seen as a representation of integrated writing competence, which has attracted considerable attention in the field of language development and language assessment over the past few decades. When attempting academic writing, the writer also acts as reader. They are required not only to comprehend information from multiple sources but also to integrate the information into their written products, to base their arguments soundly in research. The reciprocal and constant interaction between reading and writing makes the composing process very demanding cognitively, particularly in terms of multiple-text comprehension and discourse synthesis (Segev-Miller, 2007).

There are major concerns that were consistently raised by lecturers regarding students' performance in academic writing. First and foremost, basic writing conventions such as grammar, punctuation, choice of vocabulary and sentence structures, genre features such as organizational structure of an essay are generally considered largely problematic (Lillis & Turner, 2001). More importantly, students were confused over the appropriate use of source materials in their writing.



Many were unable to cite properly, and resulted in plagiarizing, sometimes unknowingly (Cumming, Lai, & Cho, 2016; Plakan 2009). Furthermore, students need to evaluate on the credibility of the source materials, compare and contrast the views and the argument (Afflerbach & Cho, 2009), shape the research gap or identify the point of argument. These are skills that need to be learnt explicitly and consciously while immersing in the specific field of study. By synthesizing 69 publications on writing for academic purposes, Cumming et. al. (2016) concluded that students experienced difficulties in dealing with the complex processes of writing from sources.

## ***2.2. Processing during Multiple-text Comprehension***

Academic writing depends heavily on writer's ability to process information not only intra-textually, but also inter-textually (Segev-Miller, 2007). Kintsch's (1988) Construction-Integration model illustrated discourse comprehension in single-text comprehension at word-level, text-level, and situational level. Zhu's (2005) Six Types of Reading Comprehension Processes established a reading comprehension framework consisting of the skills of Retrieving, Explaining, Summarizing, Elaborating, Evaluating, and Creating. In Hong Kong, it has been incorporated into frameworks for Chinese language education and assessment, including the Hong Kong Diploma of Secondary Education Examination (HKDSE) (Zhu, 2005; Zhu, Liao, & Deng, 2016). Transitioning into tertiary education, authentic academic information processing places greater demands on students in relation to multiple-text comprehension. The cognitive processing operations required in multiple-text comprehension would need students who are more accustomed to the training paradigm of single-text comprehension at primary and secondary school levels (Bråten, Ferguson, Strømsø, & Anmarkrud, 2014; Cisco, 2014) to shift to multiple-text comprehension. Although the importance of multiple-text comprehension is well

recognized, empirical studies that have tapped into multiple-text comprehension in academic writing are relatively scant.

### ***2.3 Discourse Synthesis during Reading and Writing***

Academic writing is not merely the compilation of information; it requires purposeful and effortful synthesis of information from multiple sources to create new texts, which is a process of transforming texts (Bereiter, & Scardamalia, 1987). For instance, when writing a literature review, upon searching for relevant literature, students need to evaluate the sources, identify the themes, arguments, and research gaps, and then organize argument by connecting the relevant information in a logical structure. Spivey and King (1989) referred to the hybrid constructive process as discourse synthesis, highlighting three cognitive operations of selecting, organizing, and connecting that are central to the process. When writing for academic purpose, writers form a mental representation of the text they are reading based on its organizational patterns and apply appropriate patterns to structure their written products. Working with multiple sources also requires strategic selection of information by identifying key ideas and distinguishing relevant notions from irrelevant ones. Connecting is at the core of discourse synthesis; writers make connections of ideas from different materials and synthesize these ideas into an integral unity. The three discourse synthesis operations have been established as essential skills that students need to develop to engage in academic discourse effectively (Plakans, 2009). Operating in concert, the three discourse synthesis skills have been proven a critical construct accounting for differences in integrated writing, which meet the requirement of academic writing (Asención Delaney, 2008; Plakans & Gebril, 2012; Segev-Miller, 2007).

In addition to integration of source information, academic writing also requires writers to demonstrate critical analysis of key issues and build their arguments about prior research (Jaidka,

Khoo, & Na, 2013; Steward, 2004; Torraco, 2016). In Granello's (2001) study of literature review writing of graduate students, she indicated three essential skills regarding original opinions and arguments, including analyzing, drawing inferences from, and critiquing source texts. Prior research has found that novice writers tended to consider all source materials to be equally valid and to rely on strategies such as direct copying, patchwriting, or deletion when asked to summarize information from multiple sources; on the other hand, more advanced writers were able to evaluate the quality of the source materials and build their own arguments (Cumming, Lai, & Cho, 2016). Therefore, besides the synthesis among the texts read, there is an interplay with the writer's prior knowledge and perspective that is at work during the processing of information in academic writing.

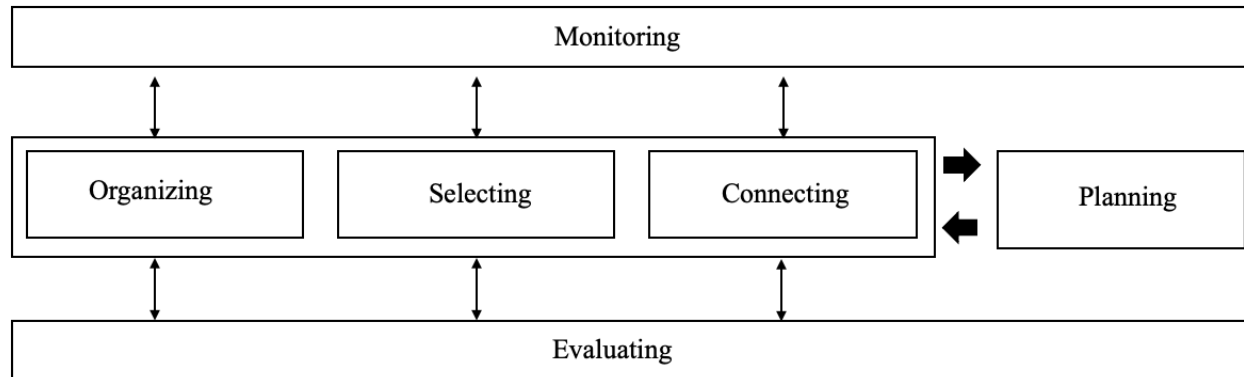
In the current study, we will extend Spivey and King's (1989) work by adding the skill of generating objective opinions to the existing framework of discourse synthesis with a view to examining academic writing performance in a more comprehensive manner.

### **3. Conceptual framework**

A revised framework of discourse synthesis (see Appendix A) was constructed based on Spivey and King's (1989)'s discourse synthesis model to fulfil the need of academic writing. In addition to adapting the original three cognitive skills, such as organizing, selecting, and connecting, to align with the demands of multi-text reading and writing integration (Afflerbach & Cho, 2009; Hayes & Flower, 1980), the revised framework also incorporates metacognitive skills such as planning, monitoring, and evaluating, as proposed by Flavell (1979). Figure 1 illustrates the interconnectedness of six skills in the writing process. Organizing involves predicting discourse patterns, constructing personal interpretations, and developing cohesive structures. Selecting entails following rules, evaluating validity and usefulness, and connecting information. Planning

involves identifying topics, enhancing mental representation, and generating ideas. Monitoring requires adjusting information selection and revising thoughts. Evaluating involves comparing quality and assessing strategy usefulness.

Figure 1. The revised framework of discourse synthesis



#### 4. Methodology

The project comprised of two phases that encompass different research plans. In Phase One, the research team did a mixed-method study by gathering assignments from Year Two undergraduate students and conducting an analysis of their use of sources in academic writing to elicit their integrated writing skills. Additionally, semi-structured interviews were conducted with a subset of these students, focusing on their perspectives on citation and the challenges they faced as inexperienced writers in academic writing. In Phase Two, Year One students were recruited for a longitudinal study to investigate their transition from secondary school to university and assess the efficacy of the integrated writing skills taught to them.

##### 4.1. Phase One: Mixed-method study

###### 4.1.1. Participants

Phase One involved the participation of 103 Year two students from two universities from The University of Hong Kong (37 students) and The Hong Kong Polytechnic University (66 students).

Participants were sampled based on the grade point average (GPA) they achieved in the first year of their course (21 students are excellent, 66 students are good, and 16 students are satisfactory). The participants' age ranged from 19 to 25 with an average of 21.37 years old ( $SD = 1.69$ ). There were 58 female (56.3%) students. The participants enrolled in various programs in humanities and social science, including history, linguistics, literature, education, psychology, economy, and other subjects. All participants' first language is Cantonese.

Out of the 103 students, 20 (12 from the University of Hong Kong and 8 from the Hong Kong Polytechnic University, anonymized as S1-S20) from 3 levels of academic achievements (i.e., 7 students are excellent, 10 students are good, and 3 students are satisfactory) were chosen to attend the interviews. The participants' age ranged from 19 to 23 with an average of 20.68 years old ( $SD = .89$ ). There were 13 female (65%) students.

The students who submitted their essays and filled in questionnaires were given \$50 supermarket coupons as an incentive, and an additional \$50 (\$100 in total) were given to the 20 students who attended the interviews. All participants were informed of their rights and their written consent were sought, conforming to the research ethics guidelines.

#### 4.1.2. Collection and analysis of textual data

All participants were requested to submit one Chinese essay they wrote during the first year of their undergraduate study and fill in an online questionnaire (the website link of the questionnaire can be found in Appendix B) regarding their attempts to use the reading materials in their assignment writing, and their perception of how their secondary school education supports them in academic writing. For the essay submission, there is no word count or topic limit, but the essays should include sources as citations or references. 103 Chinese essays were collected. Before analysis, all essays were scanned through Turnitin, a software tool that detects plagiarism by

comparing student work with previously published material. All the referenced sources were located and analyzed based on the related items of the conceptual framework.

#### 4.1.3. Collection and analysis of interview data

Semi-structured interviews were conducted with the 20 selected students (anonymized as *PIN1-PIN20*), and each of about 40 minutes in duration. The interview was mainly to elicit students' thoughts on source use in academic writing, and the challenges they faced as inexperienced writers. Sample questions of the interview can be found in Appendix C. The interviews were audio-recorded digitally and transcribed verbatim. Each of the transcripts was coded by two independent raters who used natural breaks in the transcript as cutting-off points, which typically indicate a change in topic (Corbin & Strauss, 2008). The inter-rater reliability between the two raters was .91.

### **4.2. Phase Two: Longitudinal study**

#### 4.2.1. Participants

In Phase Two, 51 Year One students (anonymized as *P2N1-P2N51*) from The University of Hong Kong (29 students) and The Hong Kong Polytechnic University (22 students) were recruited. Participants were sampled based on their DSE Chinese language grades (21 students are 5\*, 17 students are 5, 11 students are 4 and 2 students are 3). The participants' age ranged from 18 to 20 with an average of 18.69 years old ( $SD = 0.81$ ). There were 12 female (60%) students. The participants enrolled in various programs in humanities and social science, including history, linguistics, literature, education, psychology, economy, and other subjects. All participants' first language is Cantonese. Each participant was given \$120 supermarket coupons as a compensation of their time.

#### 4.2.2. Instrument

##### a. Pre-test, mid-test, and post-test

Pre-test, mid-test, and post-test (see Appendix D) were designed and conducted during Phase Two with Year One undergraduate students. All three tests were identical. Five academic papers in Chinese that amount to approximately 12,000 Chinese characters were provided as source passages. The source passages included conceptual papers and empirical research papers that feature both continuous texts and non-continuous texts. Students were required to synthesize information from the given sources, and to express their opinions on the topic related to “reading assessment”. The required word count for the task was 1,000 to 2,000 Chinese characters. Participants had 100 minutes to complete the task.

#### b. Semi-structured Interview

Year One students were interviewed twice during the academic year of 2022-23. The first interview (see Appendix E) included two parts. Part One focused on the students transition from secondary to tertiary education, specifically on how their literacy skills support their academic life in the university. Part Two was stimulated by their performance in the pre-test to generate conceptions on their skills in dealing with writing based on multiple texts. Towards the end of their first year, they will be interviewed (see Appendix F) again on their experience of use of skills and on their views on the effectiveness of the skills as well as reflect on its relationship with their literacy skills acquired at secondary school.

#### c. Discourse synthesis skills workshop

All the students attended a two-hour online workshop regarding improving their discourse synthesis skills during the second month of the first semester according to their time schedule. During the workshop, four instructional videos that created by the research team were played and there was a discussion session afterwards. Research team also provided information and guided the participants on keeping of their learner portfolio.

#### d. Learning Portfolio

Year One students were required to create an online learning portfolio after participating in the discourse synthesis skills workshop. They were asked to select and keep four of their assignments throughout the year and document their use of the skills. In addition, Students also been asked to fill in an online questionnaire (Appendix B) which concluded five variables (i.e., strategy use, growth mindset, academic motivation, academic buoyancy, self-regulated leaning) every four months through the academic year. The questionnaires were kept in the leaning portfolio as well.

#### e. Grading Rubrics

The three rounds of tests were scored using a five-level scale rubric which adapted from Lu, et. al (2023). The adapted rubrics includes ten criteria areas regarding topic, background, research questions, literature selection, quotation, source integration, evaluation, text structure, content organization and language expression. The total marks were 100 points. For each criterion, the examiner will give the participants 10 points for the highest and 0 for the lowest based on their performance.

#### 4.2.3. Data collection and analysis

For data collection, 51 participated students completed three times of the tests and questionnaire, one workshop, two interviews through the academic year and submitted their learning portfolio at the end of the second semester.

For data analysis, all the tests were scored by two independent raters based on the grading rubrics, and the inter-rater reliability between the two raters was .93. One-way ANOVA was conducted using SPSS to examine the differences in the scores across three rounds of tests. The interviews were recorded digitally and transcribed verbatim. Each of the transcripts was coded by two independent raters and the inter-rater reliability between the two raters was .94. The textual



data and interview data together have revealed the answers to research questions. The timeline regarding data collection and analyse process for both Phase One and Two is presented in Table 1.

Table 1. Timeline of data collection and analyse process

Details	Timeline
<b>Phase One: Year Two Participants</b>	
Recruited 103 participants and collected their essays and questionnaire responses	Oct 2021- Feb 2022
Identified 20 interviewees and conducted online semi-structured interviews	Feb 2022- Mar 2022
Analyzed essays, questionnaire responses and interview scripts	Apr 2022- Sep 2022
Drafted research findings and wrote academic papers	Oct 2022- Mar 2023
<b>Phase Two: Year One Participants</b>	
Conducted pre-test and first semi-structured interviews with 51 participants and collected their first questionnaire responses	Sep 2022- Oct 2022
Conduct workshop for Year One participants	Oct 2022
Conducted mid-test and collected second questionnaire responses	Jan 2023
Conducted post-test and second semi-structured interviews with 51 participants and collected their third questionnaire responses	May 2023
Collected learner portfolios from the participants	June 2023
Drafted research findings and wrote academic papers	July 2023-now

## 5. Results and discussion

This section presents the findings of both Phase One and Phase Two studies, followed by a discussion that addresses the two research questions. We use the initial letter of each skill plus a number to represent the item of the conceptual framework. For example, *O1* stands for the first item in organizing, which predict and discern discourse pattern based on previous acquired knowledge, their own schemata, familiar situation, and cues from the texts.

### 5.1. Results of Phase One study

Phase One of the project focused on exploring how a college inexperienced writer incorporates selected sources from existing literature and the challenges they are facing in academic writing. After analysing students' essays, we identified four types of quoting methods: direct quoting, block quoting, paraphrasing, and generalizing. Table 2 presents the definitions and corresponding percentages of usage for each method.

Table 2. The definitions and corresponding percentages of usage for each quoting method

Quoting types	Definition	Percentage
Direct quoting	Direct quotes of 1 to 39 words.	27.57%
Block quoting	Direct quotes of 40 or more words.	9.11%
Paraphrase	Recontextualize the information from one source text.	62.28%
Generalization	Synthesis and recontextualize the information from two or more sources.	1.04%

#### 5.1.1. Novice writers' strategies in source use

##### Employing strategic quoting and expanding upon the source message

As shown in Table 1, on the one hand, a significant proportion (62.28%) of the students paraphrased the sources when quoting them in their own essay, indicating most of the novice writers are used to build their own interpretations of the sources by dismantling, chunking,

reordering, recombining and reconfigure content in the act of appropriation (O2). Based on our observations and interviews, we discovered that writers demonstrate the ability to extract additional details from the source text to a great extent, and they also exhibit a high level of confidence in comprehending the author's intended message. As a result, they tend to expand upon the original source information based on their own understanding. This can be seen in the following example.

*Source: Under feudal etiquette, the "Three Obedience and Four Virtues" and the "Three cardinal guides and five constant virtues" prevented women from appearing in public, walking in the center of the room, or exposing their bodies to strangers. As a woman in women's clothing, she correspondingly sacrificed herself as a seeker of beauty and the embodiment of beauty and lost the interrelationship between clothing and the human body...In the overall social environment, the existence of women is ignored, and the expression of women's curvilinear beauty is weakened, and all of this is attributed to the decisive role of Confucianism in the rites and rituals. (the original paragraph in Chinese has been translated into English)*

*Student's paraphrase: Under the influence of Confucianism, women's clothing has always been associated with modesty in ancient times. Women could not expose their bodies to strangers, so they often used clothing to hide their appearance. Loose designs weakened the curves of women's bodies, and regardless of the season, women were tightly wrapped and never bared their breasts or backs (XXX; XX, 2010). (the original paragraph in Chinese has been translated into English)*

*Student's comments: This is one of the details in the article, it is said that before the Tang Dynasty, women were not allowed to dress scantily. I have summarized the Three Obedience*

*and Four Virtues as Confucianism, and I have also reinforced this fact based on the original text, for example, by using the words such as "regardless of the season" and "absolutely". (the original paragraph in Chinese has been translated into English)*

On the other hand, 36.68% students directly quote sources in their essay, and most of the quotation are from modern/traditional Chinese literature and historical classics (e.g., A Madman's Diary, The Analects of Confucius). During the interview, students mentioned that they normally paraphrase or rephrase the source to avoid the plagiarism, as the high repetitive rate is not acceptable, as S4 stated, “usually, I paraphrase and summarize. I don't copy directly unless it's a famous quote that doesn't have to be changed. For general content, I will paraphrase, maybe summarize the main points, if those may be difficult to summarize, it will be broken up to reorganize the sentence, but the meaning is the same, so avoid the problem of plagiarism.”

#### *Integrating useful sources based on explicit criteria*

After searching and reading an adequate amount of literature, students will select proper sources and integrating them into their own writings. Normally, they determine the validity and usefulness of every single text and the relation between multiple texts (S3), and select the information based on certain criteria (S1). According to the interview, there are three types of sources that they would quote in their essay: a) the bibliography and articles assigned by the teacher; b) articles with a high degree of relevance to the writer's own viewpoints and the topic of writing, especially with the same keywords but from a different perspective; c) articles from authoritative journals. Besides the above strategies, students need support in identifying and judging the credibility of the sources (E1). In addition, most of the citations came from secondary source (73.6%) compared to primary source (26.4%). Students believe that primary source and secondary source serve different functions, as S6 stated, “I think there are two types of citation. I will directly quote some sentences

from the primary source and let the reader know that I am analyzing it. Then, secondary sources are quotes from other scholars that are related to the content of the article. This citation is an aid to help me write the paper and make it clearer.” It can be seen that the roles of primary and secondary sources in students' writing exhibit certain distinctions.

#### 5.1.2. Challenges faced by novice writers in source use

##### *Deficiency of establishing connections between sources*

According to Table 1, only few writers generalized information from two or more sources, indicating that the majority of inexperienced writers may lack awareness or the ability to establish connections between their current reading materials and previous texts by comparing and contrasting differing perspectives (C2) using related strategies such as concept mapping, outlining, etc (C3). Typically, students tend to combine examples conveying similar meanings or juxtaposing examples conveying different meanings. One student mentioned a strategy where they extract ideas supporting the same viewpoint from various sources, compile them in a separate document, and then selectively incorporate those ideas into their essay (PIN4). However, it is evident that this simplistic approach falls short of meeting the standards of high-quality academic writing.

##### *Limited grasp of the purpose of utilizing sources*

Based on the interview findings, the majority of students identified two primary reasons for utilizing sources. Firstly, they acknowledged the importance of incorporating multiple sources to establish a comprehensive background for their topic (77.34%). Secondly, they recognized that citing sources serves as a means to strengthen their own arguments by using examples from external works (12.85%). However, it is noteworthy that only a small number of students mentioned additional purposes, such as evaluating cited sources, borrowing arguments and concepts, and applying them to their own writing. While students recognize the importance of

evaluating cited sources, they often struggle with effectively implementing this practice. As one student noted, "I have tried to comment and find the shortcomings of past literatures, but of course, this part is rather superficial, and I have not reached a very good level" (PIN5).

### *Lack of skills in referencing*

When questioned about their familiarity with referencing skills during their first year, the majority of students responded negatively. Generally, students would resort to searching for information on the internet due to the lack of instruction during their classes. Interestingly, some students mentioned that since English was not their first language, their school typically provided them with a single lesson on source use in academic paper writing, which allowed them to transfer what they learned from English as a second language writing to their Chinese writing, which is their first language writing. However, they were uncertain if this approach was appropriate. This is evident in one student's interview response: "Because when we were freshmen, we took an English writing class, and one of the classes taught us how to write these references. The teacher provided us with a form regarding how to cite different types of literature, so in fact, we could just follow his format when writing. But I don't remember the Chinese class providing this kind of teaching. I will just do whatever the English teacher taught us in Chinese writing as well" (PIN18). This finding indicated that there is a need to teach referencing skills, even it is in students' first language.

## ***5.2. Results of Phase Two study***

In Phase Two, distinctive features of academic writing by Year One students and how these features evolve throughout the duration of one academic year were explored.

### ***5.2.1. Changes observed in the pre- mid- and post-tests***

All participants' pre-test, mid-test and post-test were graded based on the rubrics, and one-way ANOVA was conducted using SPSS to examine the differences in the total score across three

rounds of tests. The descriptive results are shown in Table 3 and there is a statistically significant difference ( $F= 3.56$ ,  $p < .05$ ) among the three rounds of total score (see Table 4).

Table 3. Descriptive statistics of pre-, mid- and post-tests

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval		Minimum	Maximum
					Lower bound	Upper bound		
Pre-test	51	41.50	5.040	1.075	39.27	43.73	33	52
Mid-test	51	44.86	5.157	1.100	42.58	47.15	38	54
Post-test	51	45.45	5.688	1.213	42.93	47.98	38	56
Total	153	43.94	5.508	0.678	42.59	45.29	33	56

Table 4. ANOVA results of pre-, mid- and post-tests

	Sum of Squares	df	Mean Score	F	Sig.
Between groups	200.212	2	100.106	3.560	0.034
Within groups	1771.545	63	28.120		
Total	1971.758	65			

\*. The mean difference is significant at the 0.05 level.

A Post Hoc test was conducted to further analyse the significant results obtained from the initial statistical analysis. The Tukey's Honestly Significant Difference (HSD) test was chosen as the Post Hoc test method due to its ability to compare all possible combinations of group means while maintaining the overall experiment-wise error rate (Abdi and Williams, 2010). The results of the Post Hoc test (see Table 5) revealed significant differences between pre-test and mid-test ( $p=0.039$ ), as well as between pre-test and post-test ( $p=0.016$ ). However, there were no differences between mid-test and post-test ( $p=0.713$ ).

Table 5. Multiple comparison among three rounds of tests

		Mean	Std. Error	Sig.	95% Confidence Interval	
		Difference (I-J)			Lower bound	Upper bound
Pre-test	Mid-test	-3.364*	1.599	0.039	-6.56	-0.17
	Post-test	-3.955*	1.599	0.016	-7.15	-0.76
Mid-test	Pre-test	3.364*	1.599	0.039	0.17	6.56
	Post-test	-0.591	1.599	0.713	-3.79	2.60
Post-test	Pre-test	3.955*	1.599	0.016	0.76	7.15
	Mid-test	0.591	1.599	0.713	-2.60	3.79

\*. The mean difference is significant at the 0.05 level.

### 5.2.2. Features of students' writing performance

The writing tests were graded based on the adapted rubrics that includes ten criteria: topic, background, research questions, literature selection, quotation, source integration, evaluation, text structure, content organization and language expression. The descriptive result is shown in Table 6.

Table 6. Descriptive statistics of the writing tests

Grading rubrics	Pre-test				Mid-test				Post-test			
	Min.	Max.	M	SD	Min.	Max.	M	SD	Min.	Max.	M	SD
1.topic	2	5	3.86	0.710	2	5	4.05	0.844	2	6	4.14	0.889
2.background	2	5	3.68	0.894	2	5	3.91	0.750	3	6	4.05	0.844
3.research questions	2	5	3.41	0.854	2	5	3.91	0.921	2	5	3.68	0.894
4.literature selection	2	4	3.68	0.568	3	6	4.18	0.664	4	6	4.23	0.612
5.quotation	3	4	3.41	0.503	2	5	3.64	0.658	3	5	3.86	0.640
6.source integration	1	3	1.82	0.501	1	4	2.18	0.588	2	4	2.41	0.666
7.evaluation	2	5	3.32	0.780	2	5	3.59	0.796	2	5	3.59	0.734
8.text structure	5	8	5.95	0.844	5	8	6.32	0.995	5	8	6.41	0.959
9.content organization	5	8	6.00	0.873	5	8	6.41	0.796	5	8	6.41	0.734
10.language expression	5	8	6.36	0.727	6	8	6.68	0.839	6	8	6.68	0.839
Total	33	52	41.50	5.040	38	54	44.86	5.157	38	56	45.45	5.688



Based on the findings presented in Table 6, the highest average scores were observed for "text structure", "content organization", and "language expression" and both "text structure" and "content organization" are belong to the skill of organizing, especially the structure of the entire passage (e.g., *O3*). The reasons behind this phenomenon can be found in the interviews. Students expressed that they perceive academic writing in university to be similar to argumentative writing in secondary school. As a result, they tend to apply the argumentative writing format and techniques they learned during their secondary school education to their academic writing tasks. This is exemplified in the statements made by *P2N5* during the interview: "I wrote argumentative essays for three years in high school, and the format and structure were standardized. As a result, I was able to fluently write the exam essays within the given time limit." *P2N11* made a similar comment, "argumentative writing is easier for me because it follows a fixed structure, including an introduction, followed by supporting arguments, counterarguments, and illustrative examples. Regarding examples, I usually prefer to memorize the materials provided by my teacher, although I don't have enough time to memorize a lot. Instead, I focus on memorizing a few examples that I am already familiar with, such as the story of Li Bai sharpening an iron rod into a needle during his childhood."

Furthermore, there was an increase in scores from the pre-test to the mid-test, whereas the results in the mid-test and the post-test remained relatively similar. These results suggest that students quickly adjusted to the transition from secondary school to university academic writing within the first semester. Relatedly, it indicates that three skills, namely text structure, content organization, and language expression, are relatively well-developed and consistent, and well-transitioned from the writing skills acquired in the secondary school years.

The student's performance in the categories of "determine topics" and "introduce research background" demonstrates gradual improvement over the academic year, indicating an increasing proficiency in planning skills (e.g., *P1*, *P2*). During the interviews, students emphasized the significance of re-reading in the process of topic identification (i.e., *P2*). For instance, *P2N2* mentioned that when encountering a question that differed from their usual writing, they initially felt unsure and were overwhelmed, especially when it further involved lengthy materials. To overcome this, they read the content multiple times, extracted key sentences, and took notes. This approach eventually enabled them to determine the topic they wanted to write. Additionally, students highlighted the importance of persevering with continuous reading of relevant literature while writing. They observed that this practice often sparked off new ideas, which was not commonly seen when reading the sources for the first time.

The scores obtained in the "literature selection" category shed light on the students' limitation in the skill of selecting appropriate content (e.g., *S1*, *S3*). Analysis of the students' written work revealed their tendency to choose examples from the reading materials that support their own viewpoints while disregarding what they oppose and perceive those as irrelevant sections. This approach may indicate an incomplete understanding of the materials and a lack of critical thinking in their approach towards academic writing. This pattern is also evident in statements made by some students during interviews, such as "I consider it crucial and beneficial to incorporate content that is directly relevant to the topics and viewpoints I am addressing" (*P2N32*), and "I prioritize using example C instead of A and B, since they are not pertinent to the main argument I presented at the beginning of the essay" (*P2N40*).

Notably, students obtained the lowest scores in the categories of "source integration" and "making evaluations". In particular, some students lack the awareness to integrate information while they

access multiple sources. They simply chose one or two sources that they were familiar with and relied solely on them. As one student (*P2N19*) mentioned in the interview, "Out of all the materials, I only used passage A. It was the first one I saw and the one I spent most time reading, so I had a stronger connection and a deeper understanding of it. I also felt that passage A had a clearer structure, and I was more confident in my ability to write about it while the rest were more challenging to comprehend." Some other students recognized the importance of establishing connections between key points across different materials on the topic. However, they lacked the ability to effectively integrate the gathered information (*C2*). This is evident in the statement made by *P2N34*, who said, "During the preparation stage, I highlighted the points that I deemed important and then attempted to establish connections while writing, linking them with my own words. I find it to be a very challenging task because each paragraph appears to be about the same literacy system, but in reality, each piece of literature offers a distinct perspective. So, I feel that the difficulty lies in how to connect these seemingly similar yet different key areas together."

Regarding the aspect of making evaluations (*E1*), students face challenges in approaching the academic topics with in-depth analysis, and articulating their own perspectives on the points discussed in the materials (*C1*). Often, their responses are limited to copying the content without offering original insights. This is exemplified in the interview statement of *P2N21*: "I have been provided with a significant number of materials, but I'm not familiar with them, and they contain many terms that are of specialized fields. Consequently, I struggle to determine what I should write about, and it becomes exceedingly difficult for me to engage with the materials and express my own viewpoints. As a result, I may gravitate towards selecting content that I am more familiar with, simply for the sake of putting something down on paper."

### **5.3. Discussion towards the research questions**

Incorporating the findings above, we hereby answer the research questions we asked initially.

***Research question 1: What are the effects of information processing skills in academic writing of undergraduate students?***

According to the revised framework of discourse synthesis, six skills regarding information processing skills were developed and they are organizing, selecting, connecting, planning, monitoring and evaluating. The effects of these skills in academic writing of undergraduate students involve several key aspects.

Firstly, the skill of organizing has a significant influence on both the overall organization and structure of a passage, as well as the approach to citing previous literature in academic writing. Students who demonstrate proficiency in organizing can methodically arrange their ideas and adeptly incorporate information from various sources. As a result, their essays exhibit coherence, cohesiveness, and a heightened comprehension of the writing topic and the reading sources that they gain access.

Secondly, the skills of selecting and connecting are the most important abilities when processing the information. The writer's perspectives on the issue and the potential for a thorough discussion of the research topic are contingent upon how the material is selected. Based on what are selected, the writers further connect the information to their prior writing experiences or topic knowledge, and actively looking for connections between the sources will lead to a higher-level of synthesis and present well-supported arguments.

Lastly, the metacognitive skills of planning, monitoring and evaluating influence the validity of the information and the efficiency of the writing process. Students who possess these skills constantly sharpen their ideas and elaborate the goals by using strategies such as rereading the passage, taking notes and justifying the quality of the writing.

***Research question 2: To what extent is the transition from secondary education to tertiary education successful, from the perspective of literacy development?***

The transition from secondary education to tertiary education is successful to a certain extent, but far from enough to reach the requirements of good quality academic writing in the university. In short, year one undergraduate students have demonstrated commendable abilities in organizing and planning, primarily attributable to the positive carry-over of writing skills from high school. However, there is a need to enhance their critical thinking skills to foster development the skill of selecting, which will avoid the purely selection of the sources to support their arguments or they are more familiar with. In addition, students currently lack proficiency in the skills of connecting and evaluating, both in terms of establishing connections between multiple sources and relating texts to their own prior experiences. Neglecting the former leads to extracted material in essays appearing disjointed and lacking coherence. Neglecting the latter hampers the construction of sound arguments and the persuasive presentation of personal viewpoints.

## **6. Conclusions and Recommendations**

In conclusion, this project validated the theoretical framework of discourse synthesis and investigated the effects of revised discourse synthesis skills (i.e., organizing, selecting, connecting, planning, monitoring and evaluating) on academic writing performance of undergraduate students. Additionally, it gathered invaluable insights into the transition of Chinese literacy levels from secondary to tertiary education. Based on the results of the project, we propose the following approaches to enhance the effectiveness of teaching and learning.

Firstly, most of the students lack the ability to use some of the synthesis skills (e.g., connecting and evaluating), as they are usually overwhelmed by the lengthy and unfamiliar readings, the research team created and uploaded a series of instructional videos regarding academic writing

for students to gain access to higher-order cognitive skills with more ease and less challenges, and thus produce better-quality essays. The instructional video series comprised four short videos, each serving a specific purpose. The initial video provided a brief overview of the fundamental structure of academic writing and highlighted the distinctions between academic writing in the undergraduate level and argumentative essay writing in high school. The second video focused on techniques for locating and selecting appropriate sources. The remaining two videos delved into the six essential discourse synthesis skills required for producing high-quality essays, supported by vivid examples to illustrate their application. All the videos were presented at the Year One workshop and were adjusted and modified accordingly after gathering feedback from the students.

Additionally, the research findings highlighted a significant disparity between the skills necessary for college-level academic writing and the skills typically acquired in high school. This underscores the need for interventions and improvements in classroom instruction for both college and high school educators.

High school teachers can consider incorporating explicit instruction for students in the skills they may struggle with when attempting academic writing tasks. While students may prioritize constructing an essay based on their existing knowledge, they may allocate less cognitive attention to effectively selecting and connecting sources from multiple articles. By providing explicit explanations, modeling, and guided practice, teachers can scaffold students' proficiency in using these specific connecting skills. This, in turn, will enable students to approach the topic from a more comprehensive perspective. Furthermore, teachers can create opportunities for students to look for supporting materials in their argumentative writing by themselves instead of offering them direct sources for memorizing.

University teachers should recognize that Year One students, despite being native Chinese speakers, possess limited knowledge of academic writing. Therefore, it is crucial for teachers to provide additional guidance to students on how to compose a well-structured academic essay, including aspects such as text structure, literature search and synthesis, referencing skills and citation style, and more. In light of this, university teachers can offer students detailed grading rubrics to provide clear guidelines for their writing tasks. Furthermore, teachers can dedicate the curricula time to share exemplary essay samples with students, thereby establishing a benchmark for acquiring specific writing skills. This practice sets a standard and helps students understand the expected level of proficiency. Lastly, students are likely to benefit from using the framework developed in this project as a metacognitive tool to assess and monitor their own learning progress. By employing this framework, students can evaluate their own performance and make necessary adjustments to enhance their academic writing skills.

## **7. Deliverables from the project**

### ***7.1. Research outputs (To date)***

1. Cheong, C. M., Mu, R., & Zhang, X. (2023). A framework for cognitive and metacognitive processing skills in argumentative integrated writing assessments. In *Teaching and Learning Source-Based Writing* (pp. 203-220). Routledge. <https://doi.org/10.4324/9781003283485-17>
2. Wei, W., Cheong, C. M., Zhu, X., & Lu, Q. (2022). Comparing self-reflection and peer feedback practices in an academic writing task: A student self-efficacy perspective. *Teaching in Higher Education*, 1-17. <https://doi.org/10.1080/13562517.2022.2042242>
3. Cheong, C. M., Luo, N., Zhu, X., Lu, Q., & Wei, W. (2022). Self-assessment complements peer assessment for undergraduate students in an academic writing task. *Assessment &*

*Evaluation in Higher Education*, 48(1), 135-

148. <https://doi.org/10.1080/02602938.2022.2069225>

4. Cheong, C. M., & Mu, R., & Zhang, X. M. (drafting). Citation practices in undergraduate novice writers' academic writing: A within-subject comparative analysis of L1 Chinese and L2 English.

5. Cheong, C. M., & Mu, R. (drafting). Changes during the transition from high school to college: A longitudinal case study of the development of students' cognitive and metacognitive processing skills and task perception in academic writing.

## **7.2. Conference presentation**

1. Zhu, X. H., Mu, R., Cheong, C. M., & Zhang, X. M. (2023). Citation practices in undergraduate novice writers' academic writing: A within-subject comparative analysis of L1 Chinese and L2 English. Paper presentation at the 7th International Conference on Teaching and Learning of Chinese as a Second Language cum the 11th International Forum on Chinese Language Education, Sep 5-6, Ngee Ann Polytechnic, Singapore.

2. Cheong, C. M., & Mu, R. (2024). Changes during the transition from high school to college: A longitudinal case study of the development of students' cognitive and metacognitive processing skills and task perception in academic writing. Paper presentation accepted at Thirty-First International Conference on Learning, July 10-12, Utrecht University, Utrecht, Netherlands.

## **7.3. Media resources**

1. Integrative writing skills in undergraduate academic reading and writing- Workshop videos (大學本科學術學習讀寫互動中的綜合能力——工作坊視頻)

<https://www.youtube.com/@academicwriting3977/playlists>



\*The screen captures of the videos are provided in Appendix G.

2. A website page that synthesizes the project to distribute the research findings.

<https://www.cacler.hku.hk/hk/research/project/5881>

#### **7.4. *Knowledge sharing events***

1. A focus group meeting was held online with high school Chinese teachers and university teachers to share our finds and suggestions on teaching.

- Date and time: September 25, 2023 16:00 to 17:30
- Attendance: 8 Chinese teachers from high school in Hong Kong, 3 university teachers from The University of Hong Kong, the Hong Kong Polytechnic University and The Education University of Hong Kong, respectively.
- Question discussed:
  - What strategies can be employed to equip high school students with the necessary skills to adjust to university-level academic writing?
  - What are the difficulties that students encounter in academic writing, and how can university instructors support them in overcoming these challenges?

2. A two-hour seminar was conducted to report the results on the transition of DSE Chinese integrated writing skills to university academic writing and provide practical suggestions to enhance students' academic writing abilities. 38 students and teachers attended the seminar.

- Date and time: September 28, 2023 16:00 to 17:30
- Agenda:
  - Part One: Introduce the framework of cognitive and metacognitive processing skills for Integrated writing
  - Part Two: Difficulties and Solutions in Practical Writing for Secondary School Students in

Hong Kong

- Part Three: Characteristics and methods of essay writing among first-year university students
- Comments from the attendance:
  - The sharing session has deepened my understanding of the difficulties encountered by secondary school students in practical writing.
  - I will try to make use of the information from the sharing session to plan the teaching and assessment of practical writing in the classroom.
  - The sharing session has deepened my understanding of academic writing.
  - I will try to use the information in the sharing session to improve my academic writing skills.

<https://www.cacler.hku.hk/hk/events/events/standing-committee-on-language-education-and-research-sharing>

\*The photos of the seminar are provided in Appendix H.

## **8. Bibliography**

- Asención Delaney, Y. (2008). Investigating the reading-to-write construct. *Journal of English for Academic Purposes*, 7(3), 140-150.
- Afflerbach, P., & Cho, B.-Y. (2009). Identifying and describing constructively responsive comprehension strategies in new and traditional forms of reading. In S. E. Israel & G. G. Duffy (Eds.), *Handbook of research on reading comprehension* (pp. 69-90). New York: Routledge.
- Bereiter, C., & Scardamalia, M. (1987). *The psychology of written composition*. Hillsdale, N.J.: L. Erlbaum Associates.

- Bråten Ferguson, Strømsø, & Anmarkrud, 2014 (Bråten, Anmarkrud, Brandmo, & Strømsø, 2014), Bråten, I., Anmarkrud, Ø., Brandmo, C., & Strømsø, H. I. (2014). Developing and testing a model of direct and indirect relationships between individual differences, processing, and multiple-text comprehension. *Learning and Instruction*, 30, 16.  
doi:10.1016/j.learninstruc.2013.11.002
- Cheong, C. M., Mu, R., & Zhang, X. M. (2023). A framework for cognitive and metacognitive processing skills in argumentative integrated writing assessments. *Teaching and Learning Source-Based Writing*, 203-220. <https://doi.org/10.4324/9781003283485-17>
- Cheong, C. M., Zhu, X., Li, G. Y., & Wen, H. (2019). Effects of intertextual processing on L2 integrated writing. *Journal of Second Language Writing*, 44, 63-75.  
doi:10.1016/j.jslw.2019.03.004
- Cheong, C. M., Zhu, X., & Liao, X. (2018). Differences between the relationship of L1 learners' performance in integrated writing with both independent listening and independent reading cognitive skills. *Reading and Writing*, 31(4), 779-811.
- Cisco, 2014 Cisco, J. (2014). Teaching the literature review: A practical approach for college instructors. *Teaching and Learning Inquiry: The ISSOTL Journal*, 2(2), 41-57.
- Cumming, A., Lai, C., & Cho, H. (2016). Students' writing from sources for academic purposes: A synthesis of recent research. *Journal of English for Academic Purposes*, 23, 47-58.
- Cummins, J. (1979). Linguistic Interdependence and the Educational Development of Bilingual Children. *Review of Educational Research*, 49(2), 222-251.  
doi:10.3102/00346543049002222

- Cummins, J. (2016). Reflections on Cummins (1980), “The Cross-Lingual Dimensions of Language Proficiency: Implications for Bilingual Education and the Optimal Age Issue.”. *TESOL Quarterly*, 50(4), 940-944. doi:10.1002/tesq.339
- Deane, P. (2011). Writing assessment and cognition. *ETS Research Report Series*, 2011(1), i-60.
- Gall, M. D., Borg, W. R., & Gall, J. P. (1996). *Educational research: An introduction*. Longman Publishing.
- Granello, D. H. (2001). Promoting cognitive complexity in graduate written work: Using Bloom's taxonomy as a pedagogical tool to improve literature reviews. *Counselor Education and Supervision*, 40(4), 292-307.
- Hart, C. (1998). Doing a literature review: Releasing the social science research imagination.
- Hong Kong Examinations and Assessment Authority (HKEAA) (2018). 2018 Subject Question Papers with marking schemes and comments on candidates' performance (Chinese Language). Hong Kong: HKEAA.
- Jaidka, K., Khoo, C. S., & Na, J. C. (2013). Literature review writing: How information is selected and transformed. *Aslib Proceedings*, 65(3), 303-325.
- Kintsch, W. (1988). The role of knowledge in discourse comprehension: a construction-integration model. *Psychological Review*, 95(2), 163-182.
- International Baccalaureate Organization. (2019). *Language A: language and literature guide* (First assessment 2021). Cardiff, Wales, United Kingdom.
- Lau, K.-L. (2019). Hong Kong senior secondary students' reading motivation and classical Chinese reading comprehension. *Read Writ*, 32(4), 963-982. doi:10.1007/s11145-018-9897-7

- Lea, M. R., & Street, B. V. (1998). Student writing in higher education: An academic literacies approach. *Studies in higher education*, 23(2), 157-172.
- Li, Zhu, & Cheong, 2020 Li, G.Y., Zhu, X. & Cheong, C.M. (2020). Secondary teachers' conceptions of integrated writing skills: Are teachers' conceptions aligned with the curriculum objectives. *Asia Pacific Education Review*. <https://doi.org/10.1007/s12564-020-09629-x>.
- Liao, Zhu, Cheong, upcoming Liao, X., Zhu, H., & Cheong, C.M. (upcoming). The Direct and Indirect Effects of Independent Language Skills on the Integrated Writing Performance of Lower Proficiency L1 Students.
- Lillis, T., & Turner, J. (2001). Student writing in higher education: contemporary confusion, traditional concerns. *Teaching in higher education*, 6(1), 57-68.
- Perez, M., Lopez-Yerena, A., & Vallverdú-Queralt, A. (2020). Traceability, authenticity and sustainability of cocoa and chocolate products: A challenge for the chocolate industry. *Critical Reviews in Food Science and Nutrition*, 62(2), 475-489. <https://doi.org/10.1080/10408398.2020.1819769>
- Plakans, L. (2009). Discourse synthesis in integrated second language writing assessment. *Language Testing*, 26(4), 561-587. doi:10.1177/0265532209340192
- Plakans, L., & Gebril, A. (2012). A close investigation into source use in integrated second language writing tasks. *Assessing Writing*, 17(1), 18-34.
- Rub-Funes, M. (2001). Task representation in foreign language reading-to-write. *Foreign Language Annals*, 34(1), 226–234. <https://doi.org/10.1111/j.1944-9720.2001.tb02404.x>.

- Segev-Miller, R. (2007). Cognitive processes in discourse synthesis: The case of intertextual processing strategies. In M. Torrance, L. Van Waes, & D. Galbraith (Eds.), *Writing and cognition: Research and applications*. Amsterdam: Elsevier.
- Spivey, N. N. (1990). Transforming texts: Constructive Processes in Reading and Writing. *Written Communication*, 7(2), 256-287. doi:10.1177/0741088390007002004
- Spivey, N. N., & King, J. R. (1989). Readers as writers composing from sources. *Reading Research Quarterly*, 24(1), 7-26.
- Steward, 2004; Steward, B. (2004). Writing a literature review. *British Journal of Occupational Therapy*, 67(11), 495- 500.
- Torraco, R. J. (2016). Writing integrative literature reviews: Using the past and present to explore the future. *Human Resource Development Review*, 15(4), 404-428.
- Yang, L., & Shi, L. (2003). Exploring six MBA students' summary writing by introspection. *Journal of English for Academic Purposes*, 2(3), 165–192. [https://doi.org/10.1016/S1475-1585\(03\)00016-X](https://doi.org/10.1016/S1475-1585(03)00016-X).
- Zhu, X. (2005). A study of setting standards of Chinese Language assessment in reading, writing and integrated skills. Technical Report (unpublished). Project No: CD/C/13-0309. Commissioned by Education and Manpower Bureau, HKSAR. Singapore: National Institute of Education, Nanyang Technological University.
- Zhu, X., Li, X., Yu, G., Cheong, C. M., & Liao, X. (2016). Exploring the relationships between independent listening and listening-reading-writing tasks in Chinese language testing: Toward a better understanding of the construct underlying integrated writing tasks. *Language Assessment Quarterly*, 13(3), 167-185.

Zhu, X., Li, G. Y., **Cheong, C. M.**, Yu, G., Liao, X. (upcoming). Secondary school students' discourse synthesis performance on Chinese (L1) and English (L2) integrated writing assessments. *Reading and Writing*.

Zhu, X., Liao, X., & Cheong, C.M. (2019). Strategy Use in Oral Communication with Competent Synthesis and Complex Interaction. *Journal of Psycholinguistic*

Zhu, X., Liao, X., & Deng, M. (2016). Concerns of secondary school teachers about reforming Chinese language instruction with the use of a comprehension process model of reading in Hong Kong. *L1- Educational Studies in Language and Literature*, 16, 1-17.

Zorn, T., & Campbell, N. (2006). Improving the writing of literature reviews through a literature integration exercise. *Business Communication Quarterly*, 69(2), 172-183.

## 9. Appendices

*Appendix A: A revised framework of discourse synthesis* (Cheong et al., 2023)

Organizing	Planning
<p><b>O1:</b> Predict and discern discourse pattern based on previous acquired knowledge, their own schemata, familiar situation, and cues from the texts</p> <p><b>O2:</b> Build own interpretations by dismantling, chunking, reordering, recombining and reconfigure content from the sources in the act of appropriation</p> <p><b>O3:</b> Produce a tighter structure, larger content clusters and more links between units of contents when the reader has better reading and writing ability, also the way they perceive will affect their task representation</p>	<p><b>P1:</b> Identify the topic and views across multiple texts and present general information (and personal ideas) on the topic based on intertextual criterion</p> <p><b>P2:</b> Reread the information from multiple texts to build increased mental representation and ideas to plan the writing task</p>
Selecting	Monitoring

<p><b>S1:</b> Select the information based on textural relevance (theme and semantic content), contextual relevance (social situation and pragmatic communication act), the reader's cultural background, prior knowledge, notion of interestingness and repetition across texts</p> <p><b>S2:</b> Select according to the writer's representations with marking sources (brackets, asterisk, stars, underlining, take notes) and connect it to the related information from previous texts</p> <p><b>S3:</b> Determine the validity and usefulness of every single text and the relation between multiple texts</p>	<p><b>M1:</b> Change the selection as the writer elaborates and reconceptualizes the goals for the texts</p> <p><b>M2:</b> Recognize the problems and revise both written statements and unwritten thoughts by utilizing strategies</p>
<b>Connecting</b>	<b>Evaluating</b>
<p><b>C1:</b> Integrate the current source texts with prior stored knowledge (world knowledge, topic knowledge and discourse knowledge)</p> <p><b>C2:</b> Make the links between current reading texts and previous reading texts by comparing and contrasting the diverse views</p> <p><b>C3:</b> Connect, order, and combine related information across texts using related strategies (e.g., concept mapping, outlining, summarizing)</p>	<p><b>E1:</b> Compare the quality of written product based on the criteria specific to their goals and evaluate the usefulness of the strategies (discover strengths and improvements)</p>

## *Appendix B: The website link of the questionnaire of Phase One Study*

### 學生調查問卷

#### 第一部分：基本信息

1. 中文姓名：
2. 英文姓名：
3. 你的性別: A. 男 B. 女 C. 其他
4. 出生年月：     年     月
5. 就讀大學：
6. 主修：             /副修：
7. 過去成績：
  - 大一年級 GPA（適用/不適用\*）：
  - 副學士成績（適用/不適用\*）：
  - DSE 中文成績：



- DSE 英文成績：
8. 你曾經參加過有關讀寫測試的研究嗎？如有，請告知是哪一項研究。
- 有；項目名稱：
- 沒有
9. 電郵：
10. 手機號碼：
11. 你母親的受教育程度是：
- 如果你不確定選哪個選項，請尋求測試人員的協助。（只圈選一個答案）
- A. 碩士或以上
  - B. 學士（即大學本科階段獲得的學位）
  - C. 高級文憑、副學士、專業文憑（例如 VTC, IVE, HKCT 等）
  - D. 普通高中
  - E. 初中
  - F. 小學
  - G. 沒有讀完小學
  - H. 不確定
12. 你父親的受教育程度是：
- 如果你不確定選哪個選項，請尋求測試人員的協助。（只圈選一個答案）
- A. 碩士或以上
  - B. 學士（即大學本科階段獲得的學位）
  - C. 高級文憑、副學士、專業文憑（例如 VTC, IVE, HKCT 等）
  - D. 普通高中
  - E. 初中
  - F. 小學
  - G. 沒有讀完小學
  - H. 不確定
13. 你家中有多少下列物品？
- （請在每行圈選一個答案）

序號	物品	0 件	1 件	2 件	3 件及以上
1	電視機	0	1	2	3
2	汽車	0	1	2	3
3	有上網功能的手機（如智能手機）	0	1	2	3

4	電腦（桌上型電腦或手提電腦）	0	1	2	3
5	平板（如 iPad）	0	1	2	3
6	樂器（如吉他、鋼琴等）	0	1	2	3

14. 你家裏有多少本書？

每一米長的書架上通常可以放大約 40 本書。請不要將雜誌、報紙和你的課本計算在內。（請在下面的選項中圈選一個答案）

1	0-10 本
2	11-25 本
3	26-100 本
4	101-200 本
5	201-500 本
6	超過 500 本

15. 你母親主要從事甚麼工作？

（如果她現在沒有工作，請在「M. 其他」裏填上她曾從事的最後一份工作。）

- A. 公務員    B. 工業、商業界管理人員    C. 科研人員或大學老師  
D. 專業人士（如醫生、律師等）    E. 技術人員（廚師、技工、修理工等）    F. 中小學  
幼稚園教師    G. 個體經營者    H. 工商企業職員  
I. 農（牧、漁）民    J. 工人（服務員、建築工人等）    K. 臨時工    L. 無業人員  
M. 其他（請寫出）

16. 你父親主要從事甚麼工作？

（如果他現在沒有工作，請在「M. 其他」裏填上他曾從事的最後一份工作。） A. 公務員    B. 工業、商業界管理人員    C. 科研人員或大學老師

- D. 專業人士（如醫生、律師等）    E. 技術人員（廚師、技工、修理工等）    F. 中小學  
幼稚園教師    G. 個體經營者    H. 工商企業職員  
I. 農（牧、漁）民    J. 工人（服務員、建築工人等）    K. 臨時工    L. 無業人員  
M. 其他（請寫出）

## 第二部分

下列句子描述了你對「學術寫作任務的不同階段所使用的策略」的一些看法，請選擇最符合你實際情況的選項，並圈出「○」對應的數字，每題只選一個選項。

序號	題目	完全不符合	不符合	不太符合	比較符合	符合	完全符合
寫作前							
1	我會認真反復閱讀題目的要求。	1	2	3	4	5	6
2	我會思考我要寫的作文類型。	1	2	3	4	5	6
3	我會嘗試在腦海裏總結整篇閱讀材料的主題思想。	1	2	3	4	5	6
4	我會嘗試理解閱讀材料中各個觀點之間的關係。	1	2	3	4	5	6
5	我會制定寫作計劃，如列出寫作大綱、摘錄筆記、寫下關鍵詞等。	1	2	3	4	5	6
6	我會寫下閱讀材料中的主要觀點和一些相關要點。	1	2	3	4	5	6
7	我會找出閱讀材料中句與句之間的聯繫。	1	2	3	4	5	6
8	我會根據每段的重要性去理解閱讀材料的內容。	1	2	3	4	5	6
9	我會嘗試理解閱讀材料的行文結構。	1	2	3	4	5	6
10	我會找出段落與段落之間的關係。	1	2	3	4	5	6
11	我打算摘錄閱讀材料中的好詞佳句以用於寫作。	1	2	3	4	5	6
寫作階段							
12	我會多次檢查我所寫的文章是否符合任務要求。	1	2	3	4	5	6
13	我會重新閱讀材料。	1	2	3	4	5	6
14	我會寫下先前背誦的作文模板中的字詞句。	1	2	3	4	5	6
15	我會在閱讀材料中摘錄一些詞句然後作出修改。	1	2	3	4	5	6
16	我會在我的文章中提及材料出處。	1	2	3	4	5	6
17	我會重讀已經寫好的部分，審視我的文章是否符合任務要求。	1	2	3	4	5	6
18	我會試圖在我的文章中寫下自己的理解和感受。	1	2	3	4	5	6
19	我會用不同的詞彙和短語來表達閱讀材料中	1	2	3	4	5	6

序號	題目	完全不符合	不符合	不太符合	比較符合	符合	完全符合
	的觀點。						
20	我會重讀已經寫好的部分來審視字詞語法是否正確。	1	2	3	4	5	6
21	我會修改句子以使我的文章意思更加明晰。	1	2	3	4	5	6
22	下筆之前我會斟酌某個詞、短語或者句子的意思和用法。	1	2	3	4	5	6
23	我會把之前背誦的作文格式範例寫出來，然後把閱讀材料中的一些觀點填進去。	1	2	3	4	5	6
寫作後							
24	我會檢查是否有引用例子來支持我的觀點。	1	2	3	4	5	6
25	我會重讀自己所寫的文章，然後修改意思含糊的地方。	1	2	3	4	5	6
26	我會基於閱讀材料的內容而提出新的觀點。	1	2	3	4	5	6
27	我會重讀自己所寫的文章以確保語言表達正確。	1	2	3	4	5	6
28	我會修改一些語句以避免抄襲。	1	2	3	4	5	6

### 第三部分

下列句子描述了你對自己的一些看法，請選擇最符合你實際情況的選項，並圈出「○」對應的數字，每題只選一個選項。

序號	題目	非常不同意	不同意	有點不同意	有點同意	同意	非常同意
1	我不認為我可以做很多事情來提高我的智力。	1	2	3	4	5	6
2	我相信我總是可以大幅度地提高我的智力水平。	1	2	3	4	5	6
3	老實說，我不認為我真的能改變我的智力。	1	2	3	4	5	6
4	只要有足夠的時間和努力，我認為我可以顯著地提高我的智力水平。	1	2	3	4	5	6

序號	題目	非常不同意	不同意	有點不同意	有點同意	同意	非常同意
5	我可以學習新知識，但我沒有能力改變我的基本智力水平。	1	2	3	4	5	6
6	不管我現在的智力水平如何，我相信我有能力顯著地改變它。	1	2	3	4	5	6
7	我個人很難顯著地提高我的智力水平。	1	2	3	4	5	6
8	我相信隨着時間的推移，我有能力改變我的基本智力水平。	1	2	3	4	5	6

#### 第四部分

下列句子描述了「為甚麼要上大學」的一些理由。請選擇最符合你實際情況的選項，並圈出「○」對應的數字，每題只選一個選項。

序號	題目：你為甚麼要上大學	完全不符合	不符合	不太符合	不確定	比較符合	符合	完全符合
1	因為如果只有高中學歷，以後可能會找不到高薪的工作。	1	2	3	4	5	6	7
2	因為我在學習新事物的時候感到快樂和滿足。	1	2	3	4	5	6	7
3	因為我認為大學教育可以幫助我更好地為我所選擇的職業做準備。	1	2	3	4	5	6	7
4	為了體驗與其他人交流自己的想法時的強烈感受。	1	2	3	4	5	6	7
5	老實說，我不知道；我真的覺得我在學校是在浪費時間。	1	2	3	4	5	6	7
6	為了體驗在學習中超越自我的快感。	1	2	3	4	5	6	7
7	證明自己有能力完成大學學業。	1	2	3	4	5	6	7
8	以便日後獲得一份聲望高的工作。	1	2	3	4	5	6	7

9	因為當我發現從未見過的新事物時，我體驗到樂趣。	1	2	3	4	5	6	7
10	因為它最終能讓我進入我喜歡的工作領域。	1	2	3	4	5	6	7
11	因為當我閱讀有趣的篇章時，我體驗到樂趣。	1	2	3	4	5	6	7
12	我曾經有很好的理由上大學，然而我現在不知道我是否應該繼續。	1	2	3	4	5	6	7
13	因為我在超越自己的個人成就時體驗到樂趣。	1	2	3	4	5	6	7
14	因為當我在大學裏取得成功時，我覺得自己很重要。	1	2	3	4	5	6	7
15	因為我想以後過上「美好的生活」。	1	2	3	4	5	6	7
16	因為在增進我所熱愛的學科知識的過程中，我體驗到樂趣。	1	2	3	4	5	6	7
17	因為這將幫助我在就業方向上作出更好的選擇。	1	2	3	4	5	6	7
18	因為當我完全沉浸在某些作者的作品中時，我體驗到樂趣。	1	2	3	4	5	6	7
19	我不明白我為甚麼要上大學，坦白說，我一點也不在乎。	1	2	3	4	5	6	7
20	因為我在完成困難的學術活動的過程中感受到滿足。	1	2	3	4	5	6	7
21	向自己證明我是一個聰明的人。	1	2	3	4	5	6	7
22	為了以後有更高的薪金。	1	2	3	4	5	6	7
23	因為大學的學科內容可以讓我繼續學習很多感興趣的東西。	1	2	3	4	5	6	7
24	因為我相信再接受幾年教育會提高我的工作能力。	1	2	3	4	5	6	7
25	為了體驗學習各種有趣學科的快感。	1	2	3	4	5	6	7

26	我不知道；我無法理解我正在學校裏做甚麼。	1	2	3	4	5	6	7
27	因為大學讓我在追求卓越學業的過程中獲得自我滿足。	1	2	3	4	5	6	7
28	因為我想向自己證明我可以在學業上取得成功。	1	2	3	4	5	6	7

***Appendix C: Sample questions of the interview of Phase One study***

1.	Have you thought about the general structure of your essay before writing it? What are your teacher's requirements for the structure of the essay?
2.	How did you search for the literature on the topic of your essay?
3.	How did you select a certain amount of literature to put in your own essay? What kind of literature will be used in your essay? For example, do you consider the relevance of the topic, the popularity of the author, the influence of the journal, etc.?
4.	How did you connect the different sources you have collected? For example, compare and contrast views related to the same topic presented in different sources?
5.	Any knowledge you learned from high school is useful for your university academic writing?
6.	What are the major obstacles faced by freshmen when writing an academic essay?

***Appendix D: Pre-, mid-, and post-tests presented in original Chinese***

**語篇綜合能力中文寫作測試**

- 根據下列 5 個文獻片段，在「閱讀評估」話題內結合你的興趣點或當下現有問題確定一個題目。請圍繞這一題目，理解/綜合/評述文獻中的內容，也可提出自己的見解。
- 中文寫作，1000 至 2000 字。
- 本測試時長為 100 分鐘。寫作完成後，請在你的作品結尾處寫明起始和結束時間。

**文獻片段 A**

语文阅读能力体系是中学语文学科能力构成体系的组成部分。在编制试题之前，需要从理论上对语文阅读能力评价指标体系进行说明，指标体系的建立主要借鉴认知理论以及国内外阅读测试的经验。

从认知理论来说，布卢姆(Bloom, B.S.)等人认为心理认知过程可以分为记忆、理解、运用、分析、综合、评价六类，<sup>ii</sup>同样适用于阅读能力评估。祝新华则把阅读能力层次分为复述、解释、重整、伸展、评鉴、创意等六种。<sup>iii</sup>加涅(Gagné, R.M.)提出信息加工模型所假设的学习结构理论，即注意、选择性知觉、语义编码、提取信息、反应组织、作业练习、反馈强化等加工阶段。<sup>iv</sup>梅耶(Mayer, R.E.)将学习过程分为无学习、机械学习和有意义的学习三类，提出认知过程可分为记忆、理解、应用、分析、评价五类。<sup>v</sup>

从国际测评来说，国际大型的学生评估项目(包括阅读评估)有“国际学生评估项目”(Programme for International Student Assessment, 简称 PISA)和“国家教育进展评估”(National Assessment of Educational Progress, 简称 NAEP)等。2012 年 PISA 公布的阅读框架<sup>vi</sup>提出，根据阅读任务的不同，PISA 将阅读材料分成了连续性文本、非连续性文本、混合类文本和多重文本四种样式，文本类型包括描述、叙述、论说、论辩、指引、记录等。连续性文本可以由句子、段落、章节或书组成，包括报纸报道、散文、小说、短篇故事、评论、书信、网络评述、博客和网络言论等。非连续文本分为清单、表格、曲线图、图表、广告、日程表、产品目录、索引等。PISA 主要从读取与提取信息、整合与解释、反思与评价层面来评估学生的阅读能力。NAEP 公布的 2013 年阅读框架中提到，阅读过程分为理解书面文字，发展和解释意义，针对不同的文本类型、目的和情境恰当表达意义三个层次，考查内容包括文学类文本(小说、纪实文学、诗歌等)和信息型文本(论说、议论、劝服、程序说明和公文等)两大类。<sup>vii</sup>

从国内测试来看，《2014 年北京市中考说明》将阅读分为现代文阅读和文言文阅读，提出“整体感知文章的主要内容，把握文章的中心”；“体味和推敲重要的词句在语言环境中的意义和作用”；“能区分观点和材料(道理、事实、数据、图表等)，发现观点和材料之间的联系，并通过自己的思考，作出判断”等要求。教育部考试中心颁发的《2014 年普通高等学校招生全国统一考试大纲·语文考试说明》要求考查考生识记、理解、分析综合、鉴赏评价、表达应用和探究六种能力。关于评估学生阅读基本能力，香港实行“全港性系统评估”(Territory-wide System Assessment, TSA)，用以测查小三、小六和中三的学生基本能力，其中语文课程初中三年级的学生要求达到的阅读基本能力包括“能认读一般阅读材料中的常用字、能理解篇章中大部分词句的含义、能归纳篇章的内容要点、能判别篇章的一般写作方法、能概略理解浅易文言作品、能概略理解常见的实用文、能识别视听信息中主要的信息”。台湾于 2011 年发布《国民中小学九年一贯课程纲要语文学习领域(国语文)》，在分段能力阅读指标中提出“能读懂课文内容，了解文章的大意”“能分辨基本的文体”“能掌握基本的阅读技巧”“能从阅读的材料中，培养分析归纳的能力”“能配合语言情境阅读，并了解不同语言情境中字词的正确使用”等阅读要求。

综上所述，阅读考查信息提取、分析概括、领会理解、解释推断、发散拓展和批判赏析等六大能力要素。不同的能力要素具有相应的能力表现指标内容：(1)信息提取包括提取文本



的基本要素、重要细节和关键语句，排除干扰性信息；从文本中捕捉重要的显性信息或隐性信息，做到信息提取真实、准确、完整等。(2)分析概括主要指分析概括文本信息或者文本主要内容、思想情感和写作特点；能够区分各类作品，概括常见文体的基本特征等。(3)领会理解是指体味重要词句的含义及其在语言环境中的作用；理解重要语段的内容及其在文中的作用；理解作品的深层含义及文学文化内涵等。(4)解释推断包括分析文本的观点与材料之间的逻辑联系，合理推断事件现象因果关系等。(5)发散拓展指在阅读材料和实际生活经验之间建立联想和联系；尝试扩写、改写或创作；能够整合、拓展观点等。(6)批判赏析包括对课内外文本的内容进行批判性反思，形成自己的评价；能够批判赏析课内外文本中蕴含的民族心理和时代精神，从而加深对人类社会生活和情感世界的认识和思考；能够通过鉴赏文本发展思维、获得审美体验等。语文学科阅读能力体系的六大能力要素之间在一定程度上存在层层递进的内在逻辑关系，即简单到复杂、从低级到高级。（改编自：张燕华，郑国民，关惠文. 初中生语文阅读能力表现研究[J]. 教育学报, 2015 年第 6 期: 83-90.）

## 文献片段 B

阅读是 PISA 2000 年启动时的评估重点，也是 2009 年的评估重点。由于电子阅读测试的加入，PISA2009 对篇章的分类从形式和内容两方面都已进行相关调整。

篇章形式方面，PISA2000~2006 把阅读测试的篇章分成“连续性篇章”和“非连续性篇章”两类。<sup>viii ix</sup>连续性篇章由句子组成段落，并可形成更上层的节、章和书等结构的文件，而非连续性篇章通常指以表格、图形和地图等多种方式呈现信息的文件。上述分类标准固然清晰，但生活中不乏图文并茂，文章与数据并存的篇章，为此 PISA2009 区分出四种篇章形式，除了连续性篇章、非连续性篇章之外，还包括两类新的篇章形式：(1) 综合篇章。包括连续性与非连续性篇章的元素，篇章各部分内容与形式相配合，衔接得很好，形成篇章特点。如报告、电子邮件、讨论区(论坛)等；(2) 多元篇章。多篇本身是独立的篇章放在一起。它们之间可能在内容上存在某种特定的关系，亦可能只是为体现不同评估目的。这些关系未必明显，且可能相互补充或相悖。电子阅读测试将以多元篇章作为主要的篇章形式。

文章体裁方面，PISA2000-2006 把各种文体作为“连续性篇章”的子类，PISA2009 开始单独提出“篇章类型”，共分出包括描写、记叙、说明、议论、指令、交易型六种。其中，交易型文体是最新加入的类型。

总的来看，PISA2009 对篇章形式及文体方面所作的调整，如下的特点值得我们关注：

1. 对篇章特征的认识更为深入，有利于全面地考核学生阅读多种类型篇章的能力。PISA 之前仅从篇章连续性进行分类，比较单一，现在从篇章形式和文体特点方面入手，对篇章的分类更为全面、立体，确保阅读篇章的取样反映出不同学生真正的阅读情况。

2.贴近现实生活的篇章类型，有利于选取更为生活化及真实性的篇章。新加入的篇章元素更为真实地反映现实生活中章形式及内容的特点，体现时代的阅读特色，能够体现阅读测试的真实性，评估到学生真实的阅读水平。

3.多元篇章有利于阅读测试的编制，以更广泛的信息考核学生的整合、比较分析等能力。选好合适的篇章，是有效的阅读测试的基础。在中文的测试中，香港中学阅读评估一般采用记叙文、文学性作品的区分(2007年会考后重视科学类的说明文)，而中国内地主要进行文学类、论述类、实用类的划分。如我们可引入PISA的这些分类，除了全面考核学生的阅读能力、引导学生读更为多样的阅读材料外，更可为教师展开评估时选文、设题提供指引，帮助他们提供评估领域的专业素养。（改编自：祝新华,廖先.PISA2009阅读评估的最新发展:评价与借鉴[J].教育研究与实验,2010年第3期:45-50.）

### 文献片段 C

PISA2000~2006 阅读测试包括以下五项指标: (1)提取信息;(2)形成对篇章的总体的理解;(3)阐释篇章中的信息;(4)反思和评价篇章的内容;(5)反思和评价篇章的形式。

在此基础上，PISA2009 作出以下两个方面的改革:

其一，把阅读过程的五个指标整合为三部分。由于难以分别报告学生在五个方面的表现，并且为体现电子阅读的特色，PISA2009 把以上阅读过程整合为:

1. 进入和提取。进入所提供的信息空间，并在通过网站中的导航，寻找并提取一则或多则不同信息。如在一则招聘广告中找出雇主的具体要求、找出带有区号的电话号码、找到支持或反对某人言论的特定事实等。

2. 整合与阐释。在篇章内部梳理文意。整合则理解篇章的连贯性，包括辨识局部多个句子相连的特点、理解多个段落之间的关系、辨识多元性篇章的关系等。整合需要连结多则不同的信息理解文意。阐释是获取篇章没有明确表述的意思，包括辨识一种未言明的关系、推出某处含蓄句子或词组的意思。阐释的特点是要从一个方面推得另一个方面。

3. 反思与评价。在篇章以外运用知识、观点或态度，把篇内信息与个人的思维、经验建立联系。反思可以看作读者参照自己的经验或知识进行比较、对比或假设，评价则是以篇章之外的标准来作出评判。反思与评价要求读者把外部信息与篇章信息联结起来。

其二，新增“综合”指标。传统的纸质阅读一般遵循以上三个过程，呈现出线性的顺序。然而电子阅读往往多个过程同时进行，如读者既需要通过链接寻取信息，又需快速对信息的适用性作出判断，以此来决定是否要作进一步的阐释与整合。考虑到这种特殊性，PISA2009 在电子阅读测试中另加入一个“综合”过程，以更好地考察学生电子阅读的能力。

PISA2009 对评价指标的整合，突出各项指标所考核到的核心能力，如“重整”、“反思”等，焦点更为明确。从以上表格可以看出，纸质阅读评估主要评估整合与阐释方面能力，电子阅读中则由于指标增多，各项能力评估的比例较为平均一些，综合更是其中一个新类型。在中文的测试中，对于阅读评估的认知能力已有一些探讨。“六层次阅读能力结构系统”把阅读能力分为复述、解释、重整、伸展、评鉴、创意，在香港、新加坡等地课程、评估教学中都有引用。<sup>x</sup>如香港中学就有约 1620 名教师参加相关的促进学习的阅读评估课程；调查显示所有教师认为六层次阅读能力系统符合新修订的中文课程，与课程配合，可反映学生学了课程以后所达到的阅读能力水平，绝大多数教师认为教师有必要了解这一能力系统 (93%)、能够掌握这一系统(90%)。<sup>xi</sup>这一系统已改进课堂中的评估，并开展实验研究。<sup>xii</sup>公允地讲，在中文阅读评估领域，这方面的研究还有很大的发展空间。（改编自：祝新华，廖先. PISA2009 阅读评估的最新发展:评价与借鉴[J]. 教育研究与实验, 2010 年第 3 期: 45-50.）

## 文献片段 D

閱讀素養是指理解和使用社會需要或者個人認為有價值的書面語言形式的能力。兒童閱讀者可以以各種方式從文本中建構意思。他們從閱讀中學習、參與學校和日常生活的交流中，並以此獲得樂趣。根據對「閱讀素養」的界定，PIRLS 提出三個評價維度，分別為：1. 閱讀理解過程 2. 閱讀目的 3. 閱讀行為和態度。上述三個維度中，「閱讀理解過程」和「閱讀目的」是作為評核學生閱讀素養的基本因素，主要通過試卷測試來完成，而「閱讀行為和態度」將是通過調查問卷測試來完成。

PIRLS2016 認為在閱讀文本過程中，所有的文本閱讀都要經歷四個理解過程。這四個理解過程由低層到高層的表現分別為：「關注並檢索明確的說明資訊」、「直接推斷」、「解釋並整合觀點和資訊」和「檢視並評價內容、語言和文本要素」，即：獲取→處理→解釋→評價。

PIRLS 2016 香港地區共計 139 所學校參加測評，研究小組從這些參與學校的小學四年級中隨機抽出至少一個班級的學生參加測試。參與測試的人員總數為 7,329 人，包括學生 3,533 人(其中男生占 52%，女生占 48%)、家長 3,499 人、參與班級中的中文科任教教師 159 人、校長 138 人。IEA 還根據學生測試所得分數，對 PIRLS 研究制定了四項國際基準(international benchmark)，分別為：優秀(≥625)、高等(550-625)、中等(475-550)和低等(440-475)。(1)「優秀」(Advanced): 達到這一基準的學生一般能夠考慮到整個文本，並為他們的推斷和解釋提供基於文本的支援；(2)「高等」(High): 達到這一基準的學生能夠識別重要的行為和資訊、基於文本的支援進行推理和解釋，且能夠評估內容和文本要素，並能夠識別顯著的語言特徵；(3)「中等」(Intermediate): 達到這一基準的學生能夠檢索資訊，進行直接的推斷，使用一些表像特徵，並開始識別一些語言特徵；(4)「低等」(Low): 達到這一標準的學生具有使用文本中某些資訊的能力，但通常只是在明確說明或者容易定位的情況下才具有這一能力。綜上，「優秀」指的是學生在「理解過程」中可以做到第一層「關注並檢索明確的說明資訊」至第四層「檢視並評價內容、語言和文本要素」的理解；「高等」指的是學生在「理解過程」中可以做到第一層「關注並檢索明確的說明資訊」至第

三層「解釋並整合觀點和資訊」；「中等」指的是學生在「理解過程」中可以做到第一層「關注並檢索明確的說明資訊」至第二層「直接推斷」；「低等」則指的是學生只能做到「理解過程」中的第一層「關注並檢索明確的說明資訊」。

PIRLS 2016 香港學生達到優秀國際基準的比例為 18%，與新加坡差距 11%、俄羅斯差距 8%、英格蘭差距 2%。可見，香港小學生在閱讀的高精熟度方面仍表現出不足。同時，在 PIRLS 2016 中，香港處於低等國際基準水平以上的學生的比例為 99%，高於國際平均水平的 96%，而在低於 400 分的比例上，則要低於國際平均的 4%。可見，香港小學生第一層和第二層的理解，即低層次閱讀往往表現較好，但在閱讀的高精熟度方面表現出不足，即「解釋並整合觀點和資訊」(第三層)和「檢視並評價內容、語言和文本要素」(第四層)的理解能力較弱，究其原因主要是香港小學生在推斷、解釋以及評估和評論閱讀材料方面的能力培養相對薄弱。(改編自: 王聰. 基於 PIRLS 2016 的香港小學生閱讀素養分析與啟示[J]. 教育理論與實踐學刊, 2019 年 6 月.)

#### 文獻片段 E

本次小学阅读理解能力测试，阅读理解题目共 4 道，分别涉及明确陈述信息的复述性理解、句群信息的解释性理解、意义段信息的解释性理解和需要整合推论的解释 - 创造性理解四个能力层次。参加测试的学生总平均得分率为 71.2%，各题平均得分率分别为：关注并提取明确陈述的信息 96.7%，整合句群信息 73.3%，整合意义段信息 68.3%，解释并整合观点与信息 43.3%。从学生平均得分情况来看，阅读能力层次越低得分率越高，而阅读能力层次越高则得分率越低。绝大多数学生在复述性理解方面没有大的偏差，但随着难度的加大，学生得分率降低，到最难的解释 - 创造性理解层次时，平均得分率则只有复述性理解题目得分率的一半不到。一方面，这说明学生阅读理解能力从低向高、由易到难的发展顺序，测试结果是符合学生阅读理解能力发展实际情况的；另一方面，也反映出学生高层次阅读理解能力还有很大的提高空间。

通过使用多层线性模型(Hierarchical Linear Modeling)，对 13 所学校参试学生阅读理解能力测试结果信息进行分析，可以比较以下四个维度在学校水平上的差异情况。

第一，不同学校的学生在明确陈述信息的复述性理解题目上得分率没有显著差异。统计结果显示，学校水平解释了复述性理解总变异的 5.8%。然而，对于学校水平的复述性理解的方差的显著性检验表明，复述性理解在学校间的差异不显著( $\text{Var} = 0.007$ ,  $p = 0.153$ )。换句话说，学生在关注并提取明确陈述的信息即复述性理解这个得分项上，学校间是没有差异的。这说明，各个学校的语文阅读教学在最基础的复述性理解能力方面都做得比较好，学生都具有较好的成绩。或者说，在复述性理解方面还看不出学校之间语文教学水平的高低差异。

第二，不同学校的学生在整合句群信息的解释性理解题目上得分率存在显著差异。对句群信息解释性理解进行分析的统计结果表明，学校层面解释了句群信息解释性理解总变异的 4.3%。但对句群信息解释性理解的学校水平的方差的显著性检验表明，学校间存在

显著的差异(  $\text{Var} = 0.093$  ,  $p = 0.015$  ) , 学生在句群信息解释性理解题目上的得分率受到学校水平因素的影响。即在句群信息解释性理解题目上, 不同学校的学生开始出现显著差异。这说明, 不同学校的语文阅读教学水平在涉及到文本内涵和更高层次的阅读能力时, 开始出现分化, 语文教学水平高的学校学生在句群信息解释性理解题目上的得分率就高, 语文教学水平低的学校学生在句群信息解释性理解题目上的得分率就低。

第三, 不同学校的学生在整合意义段信息的解释性理解题目上得分率存在显著差异。对于意义段信息的解释性理解进行分析的统计结果表明, 学校层面解释了意义段整合信息解释性理解总变异的 14.6% , 对意义段整合信息解释性理解在学校水平上的方差的显著性检验表明, 不同学校的学生在意义段整合信息解释性理解题目上得分率存在显著的差异( $\text{Var} = 0.489$  ,  $p < 0.001$ ) , 学生在意义段整合信息题目的得分受到学校水平因素的影响。即语文教学水平高的学校学生在意义段信息解释性理解题目上的得分率就高, 语文教学水平低的学校学生在意义段信息解释性理解题目上的得分率就低。

第四, 不同学校的学生在解释-创造性理解题目上得分率存在显著差异。对于需要利用文本信息和个人经验对相关问题进行合理解释和推论的解释-创造性理解题目来说, 统计结果表明, 学校水平解释了解释-创造性理解总变异的 21.8% 。对这种解释-创造性理解在学校水平的方差的显著性检验表明, 学校间的解释-创造性理解存在显著差异(  $\text{Var} = 0.473$  ,  $p < 0.001$  ) , 学生在解释-创造性理解题目上得分率受到学校水平因素的影响。即语文教学水平高的学校学生在整合信息的解释-创造性理解题目上的得分率就高, 语文教学水平低的学校学生在整合信息的解释-创造性理解题目上的得分率就低。

综合以上四项的分析, 学校之间除了在最基本的明确陈述信息的复述性理解水平上没有显著差异外, 在句群信息解释性理解水平、意义段信息解释性理解水平、整合观点与信息的解释-创造性理解水平上都存在显著差异, 而且阅读理解能力要求越高, 不同学校学生的差异越大。(改编自: 朱洁如. 学科关键能力监测研究——以常州市小学语文阅读理解能力监测为例 [J]. 全球教育展望, 2013 年第 4 期: 52-60.)

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<sup>i</sup> 张燕华, 郑国民, 关惠文. 中学生语文学科能力表现——基于 Rasch 模型的语文测试评价[J]. 课程·教材·教法, 2014(11):69-74.

<sup>ii</sup> Anderson, L.W.& Krathwohl, D.R.& Bloom, B. S.A Taxonomy for learning, teaching, and assessing revision of Bloom's taxonomy of educational objectives [M].New York: Longman, 2001.

<sup>iii</sup> 祝新华. 阅读认知能力层次——测试题型系统的进一步发展 [J]. 华文学刊, 2005(2):1-22.

<sup>iv</sup> Gagné, R. M. The conditions of learning[M]. New York :Holt, Rinehart and Winston, 1977.

<sup>v</sup> Mayer, R. E. Rote versus meaningful learning[J]. Theory into Practice, 2002(4):226-232.

<sup>vi</sup> Mullis, I.V.S., Martin, M.O., Foy, P.& Drucker, K.T. PIRLS 2011 International Results in Reading [R].Chestnut Hill, MA:TIMSS & PIRLS International Study Center, Boston College, 2012.

<sup>vii</sup> David P. Driscoll & Susan Pimentel & Cornelia S. Orr & Mary Crovo. Reading framework for the 2013 National Assessment of Educational Progress[R]. Washington, DC: National Assessment Governing Board, U.S. Dept. of Education, 2012.

<sup>viii</sup> OECD. PISA2006 READING LITERACY FRAMEWORK[M]. Paris: Author.2006

<sup>ix</sup> OECD. MEASURING STUDENT KNOWLEDGE AND SKILLS—A NEW FRAMEWORK FOR ASSESSMENT[M]. Paris: Author. 1999

<sup>x</sup> 祝新華. 閱讀認知能力層次. 測試題型系統的進一步發展[J]. 華文學刊. 2005, 02.

<sup>xi</sup> 祝新華等. 香港中學中國語文課程——促進學生發展的閱讀能力評估研究及發展[R]. 香港：香港理工大學中文及雙語學系，2009.

<sup>xii</sup> 祝新華. 閱讀進展性評估的研究與發展：促進學生能力發展的有效課堂提問[R]. 香港：香港理工大學中文及雙語系，2010.

### ***Appendix E: Sample questions of the first interview of Phase Two study***

1.	How does this test differ from the essays you typically write? Did your previous high school composition writing or coursework assist you in writing this type of essay?
2.	What steps did you take before writing the essay, such as repeated reading or gathering information, to comprehend the topic?
3.	Did you consider the structure of your essay before starting to write? If so, what influenced your choice of structure? Did your prior writing experience play a role in this decision? If not, what led you to omit this step? Did you perceive it as unimportant?
4.	Since all the references are limited to these five readings, and each student's work includes varying references to the original text, could you explain why you selected these particular materials? Did they align with the identified theme? Did they provide interesting insights? Did they meet the requirements of the topic?
5.	Did you annotate the original text as you read it? If so, what was your purpose behind marking the text?
6.	Did you utilize all five articles in your essay? What guiding ideas influenced your selection? How did you integrate the content from these different sources into your own writing? What role will these materials play in your work, such as offering different perspectives or complementing your own experiences? Did you employ any techniques, such as mind mapping, to organize your thoughts?
7.	Did you make any changes to your original plan while writing? Did you modify the topic or structure? Did you engage in self-correction and revision? Did you read as you wrote to deepen your understanding of the topic?
8.	After completing your essay, did you reread it? Did you engage in self-evaluation of your writing? What corrections or adjustments did you make based on this evaluation?

## Appendix F: Sample questions of the second interview of Phase Two study

1.	How does the emphasis on content differ among the three writings cantered around the theme of "Adjustment of the reading assessment system"? What factors contributed to these changes?
2.	What factors led to variations in the number of references, particularly in terms of explanations for concepts like PISA and National Assessment of Educational Progress? Have your writing skills made significant progress?
3.	Have your writing skills made significant progress? Explain your answer.
4.	Can you summarize your freshman year in three words? Has your motivation changed after a year of university study? Are you facing any academic pressures, and if so, where do they originate from?
5.	Do you seek help from your friends for your studies? Are the teachers supportive and helpful?

## Appendix G: The screen captures of the workshop videos

