Primary School Students' Perceptions on Using IT Tools for Chinese Compositions

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Abstract: Recent advances in computer technology have made the input of Chinese characters more users friendly. These advances, when considered from a pedagogical point of view, may afford new opportunities for students to enhance their learning of Chinese language in general and composition writing in particular. In this exploratory study, we engaged six primary school students in using Chinese software and hardware, namely, Chinese input tools (with both the input modes of pinyin and handwriting) and Chinese e-dictionary, in hope that they would enhance their Chinese compositions. Qualitative analysis of the observation, video recordings and interview data collected reveals that while the affordances of the technology may be logically conducive for pedagogical purposes, a careful match between the students' language entry level skills and thoughtfully designed pedagogical support are necessary for the affordances of these new tools to be exploited. The input systems and the user interface may also need redesign from an education standpoint if they are to support learning for primary school students.
Keywords: Chinese composition pedagogy, learning technology, language learning, qualitative methods, student perceptions

Introduction

Although over 75% of the population in Singapore is of Chinese origin, Chinese language education faces more challenges than ever before. As a result of reducing Chinese Language into an isolated subject in primary and secondary schools since 1984, the amount of time allocated in Chinese Language only takes up five hours per week. In addition, there is a dramatic difference of using English and Chinese at home. For example, according to the statistics from Singapore's Ministry of Education in the year of 2004, 9.3% first year pupils of primary schools of Chinese origin used English at home in 1980, but the figure soared to 45% in 2003. Because of the uniqueness of the pictorial form of the Chinese characters to its pronunciation, and possessing different meanings to a similar pronunciation, it is difficult for Singapore students who have been intensively exposed to the learning of English Language since young (Neo, 1999).

Based on the Liu *et al.*'s (2004) study, Singapore's Chinese language classroom can be described as a classroom that is highly task-focus. The teachers controlled classroom talks and activities for more than 70% of class time and these times were devoted to learning of linguistic and content knowledge. Traditional teaching and learning activities such as lectures, questions and answers and silent seatwork dominate the lesson time. Learning outcomes were very much confined to reproduction of basic knowledge. The impact of IT is minimal since they have only observed the use of PowerPoint which accounted for only 8% of class time. However, little attention is given to students' perceptions of learning Chinese in general, and in Chinese composition written in particular.

Although there is a trend of methodologies for teaching compositions moving from a focus on writing product to emphasis on the writing process (Matsuda, 2003; Raimes (1995), Hinkel (2002) summarizes the results of a number of studies and states that there are severe shortcomings in national and standardized curricula for the teaching of writing in Asian countries, namely, a wide gap exists between the curricular expectations of learners' writing proficiency and their actual skills.

In this paper, we report on an exploratory study of six primary students' perspectives on using selected IT tools in their Chinese compositions versus traditional approach of using paper and pen. We conducted one-to-one semi-structures interviews and group interviews about the students' attitudes of learning Chinese and the purpose of writing Chinese compositions. We observed how they used selected IT tools for writing Chinese compositions. We also used the software tool MORAE to capture their on-screen actions in video format for detailed analysis of their patterns of using the selected IT tools. The study aimed to achieve an in-depth understanding of how meanings, satisfaction and frustration contributed to the dynamic learning process in which a range of technology tools have been provided and adopted to write Chinese compositions from the viewpoints and voices of the "insiders", that is, the students. Therefore, the empirical study had focused on the writing process, not the product.

Due to the constraints of time and nature of the study, we could not draw a convincing conclusion from this exploratory study about the impact of using IT in Chinese teaching. However, our study identifies certain issues that can shed new light on how to reconsider Chinese composition writing by incorporating IT tools.

Literature Review

The advancement of IT-based language and communication tools has been opening up new promises in teaching and learning Chinese. These tools are getting more user-friendly and easier to use, including word processors, e-dictionaries, the Internet, and so on. Sullivan & Porter (1997), and Selfe (1999), argue that electronic writing (including Word processing, e-mail Internet file transfer, WWW) is the key for future writing – very shortly, writing would mean "electronic writing" – hence the need of training students in ICT-mediated compositions.

There is also a research shift for ICT-mediated writing for the focus and the design of the study. In light of the research trend in Computer-assisted Composition (CAC) as observed by Reed (1996), pre-1987 studies were more tool- and experimental design-centred. The general findings were that students in a computer group performed better than those in a non-computer group. For example, Hawisher's (1989) meta-analysis of 42 studies conducted

between 1981 and 1987 show that students exhibited consistently positive attitudes toward revision in Computer-assisted Composition (CAC), attitudes that tended to contribute to a spirit of cooperation rather than competitiveness within the classroom. Post-1987 research focused less on isolated skills and was better grounded in research designs based on theoretical frameworks; there are much more pedagogically complex treatments as well as greater focus on writing process, thus a reduced need for control groups.

There is an increasing number of studies relating to technology-supported strategies for composition pedagogy in Singapore. Integrating ICT into the Chinese curriculum had raised individual learners' confidence and aroused their interest in learning Chinese (蔡志礼, 1997; 林时, 1999). 赖金定 (1997) envisages the development of Chinese composition supporting software to assist students who are weaker in Chinese, particularly those who have learnt limited numbers of Chinese characters (as computer offers phonetics-based input method), to compose better essays. 林时 (1997) found that IT support provides great help to composition writing for Singaporean students, including the nurturing of creative and abstract thinking.

However, research has also begun to uncover areas that may not benefit from the use of CAC. Erickson's (1992) study shows that the quality of compositions written on computers depends on variables like writers' experience, maturity, technical competency, and instruction in the writing process. Peckham (1996) cautions practioners in integrating technology with existing writing pedagogy. He found that the move between in-class and online peer responses is not seamless. Similarly, Vician & Brown (2000) argue for the need to carefully craft writing assignments to align with their intended outcomes, as students tend to follow instructions closely in completing their assignments. The tendency towards attributing positive effects to the use of ICT tools must be balanced with a fuller understanding of how teachers and students make use of the technologies in situated contexts (Greenleaf, 1994). 吴传照 (2002) found that many students are not inspired by or have not benefited from innovative writing tools due to their inadequate IT competency.

In summary, the past decade has witnessed great achievements in applying technology to Chinese Language teaching and learning. Since ICT can provide great opportunities for Chinese teaching and learning, it is imperative for teachers of Chinese to tap the potential of ICT to enhance Chinese learning. At the same time, it is vital to understand students' perspectives and experiences of using ICT for Chinese compositions.

The Design of the Study
Six 11-year-old Primary 5 students in a neighbourhood school were involved in this study. This school admits predominantly ethnic Chinese students. Prior to the study, a survey was distributed to a class of 33 to get some background information, such as parents' education and linguistic background, major spoken language at home, self-reported written level of Chinese and English, day-to-day IT usage and so on. These students were stratified into three major categories based on the average scores of Chinese compositions that they earned in the previous year when they were at Primary 4. The six students, representing a high, medium or low level of Chinese compositions, English or Chinese spoken language at home, were purposively selected to participate in this study. Table 1 provides general information on the target students, who are identified by pseudonyms, starting with character L, M and H respectively, to represent individuals' level of compositions.

Table 1: *General Information of the Target Students*

Pseudonym (Gender)	Chinese composition level before study†	English composition level before study†	Major spoken language at home††	Preferred written language††	Hours spent in using computers per week††
Liya (F)	low	medium	English	English	1-5
Lianqing (M)	low	low	Mandarin	English	1-5
Minghui (F)	medium	low	Mandarin	English	< 1
Mucheng (M)	medium	medium	English	English	1-5
Huiyi (F)	high	medium	Mandarin	English	1-5
Hanyun (F)	high	medium	Mandarin	English	1-5

(† Categorized by the teacher; †† As stated in the student survey form)

As IT has not been extensively used in Chinese teaching and learning in Singapore schools, we conducted two hours of training sessions on using the selected Chinese input software tools (with both tablet-based handwriting and keyboard-, phonetic-based input modes, plus an e-dictionary) prior to the empirical activities. In addition, on-going training sessions were provided during the activities. After that, we lent the students the installation CDs and the writing pads for them to install and practice on their home PCs. Table 2 lists the software tools that we recommended the students to use for writing Chinese compositions during the empirical activities.

Table 2: *Software tools used during the empirical activities*

Category	Name	Functionalities related to compositions
Word processor	Microsoft Word	General word processing
Chinese character input	Bider PenPlus Professional Edition 必达"一笔通"专业版	• Handwriting input along with the bundled tablet (writing pad) • *Pinyin*-based (phoenetic) input with bundled Bider Chinese Plus 一件通 (software)
	Microsoft Global Input Method Editors (IME)	• Microsoft Pinyin IME for *Pinyin*-based input • Microsoft IME pad for handwriting input along with the PenPlus tablet
Reference	PowerWord 金山词霸	Chinese-English two-way e-dictionary

We attained triangulation by collecting different types of data, including person-to-person interviews of the participants, group interviews and observational field notes. We conducted person-to-person interviews at the beginning and the end of the study to investigate their attitudes in learning Chinese, the difficulties they encountered in learning Chinese, and the purpose of writing Chinese composition. We also conducted group interviews either before or after the activities to explore their reactions on using the selected IT tools, and their preference of using IT tools, the difficulties while using the tools. In addition, we installed and launched MORAE (http://www.techsmith.com/morae.asp), a software application that uses a webcam and a microphone attached to the computer. Such software allowed us to capture the participants' on-screen activities, together with synchronized facial expressions and speeches, in video format which could be used for coding and analysis at the later stage.

We observed four activities of writing Chinese composition. These activities were conducted in four mornings out of their normal classroom hours, as depicted in Table 3. These activities were spread out during February to May, 2006.

Table 3: *Empirical activities*

ID	Activity	Tools used
S1	1st (Paper-and-pen) composition with an assigned topic	Paper & pen, Printed dictionary
S2	2nd (IT-mediated) composition with an assigned topic	Microsoft Word, PenPlus, ChinesePlus, PowerWord
S3	(IT-mediated) self-reviews of the 2nd composition	Microsoft Word, Microsoft IME, PowerWord
S4	3rd (pictorial) composition	Microsoft Word, PenPlus, ChinesePlus, Microsoft IME, PowerWord

We have incorporated some flexibility in the sessions to allow for unexpected challenges to emerge. This would help us fine-tune the design of the subsequent activities and the post-interview questions. For example, we had originally planned to use only PenPlus and ChinesePlus for Chinese input across all the empirical sessions. We later modified our design to incorporate Microsoft IME (Simplified Chinese) in S3 after we had encountered some unsatisfactory outcomes. That is, during S3, we noticed that some participants had some difficulties in coping with the handwriting input "style" of PenPlus, a problem that might not have occurred if they had used the handwriting recognition component of Microsoft IME. Moreover, we noticed that the computers at the school hanged frequently throughout S2, possibly due to the memory hogging combination of PenPlus suite and MORAE software running on each computer (that is, memory overload). To resolve this technical problem, we brought in our own more powerful laptops installed with MORAE (a video capturing software) and all the relevant IT tools for use in S3 and S4. Furthermore, we introduced Microsoft IME to the participants as it is a built-in Windows component and therefore, is relatively lightweight. Nevertheless, as one of our main purposes in the research design is to provide the participants with a range of IT tools and let them to decide the tool(s) to use during the writing session, it was not our intention to make Microsoft IME a replacement of the Bider products. Instead, the participants were encouraged to choose and/or switch between their favourite tool(s).

We have also modified the activities at S3. Due to the technical hiccup at S2, none of the six participants was able to finish their compositions. Therefore, we requested the participants to complete their compositions and performed self-reviews (post-editing) at S3. Occasionally, we offered *ad-hoc* scaffolding to individual participants who were apparently unable to proceed.

We performed on-going data analysis during the study. For example, we started with coding the activity data to identify emerging themes: perspectives on learning Chinese and Chinese compositions; perspectives on using the IT tools, and the experience in using the IT tools. While we continued to collect data, we allowed the dimensions within each theme to recast in order to reflect the collected data. We cross-classified themes to look for patterns between them, and evaluate them based on continued re-examining of the existing data (Bogdan and Biklen, 1998). We used video data collected from the MORAE recording to verify our existing data and added new themes when necessary. We exchanged the analysis data among the research team members in a regular basis. We also wrote a profile for each

participant at the final stage of our data analysis and invite the students to "member-check" the accuracy of the account. By the end of the final empirical activity, we performed a summative analysis to compile our preliminary finding.

Major Findings

We organise our major findings into four sections, namely, (1) Perceptions of learning Chinese and writing Chinese compositions; (2) Perceptions of using the IT tools for writing Chinese compositions; (3) Preferences for using the selected IT tools for writing Chinese compositions; (4) Ways of using IT tools for writing Chinese compositions.

Perceptions of learning Chinese and learning Chinese compositions

Assertion 1: The interview data reveals the participants and tend not to have much understanding about the importance of learning Chinese. In addition, their understanding of Chinese composition writing seems to be fragmented.

Firstly, the interview data reveals that the participants do not have much understanding about learning Chinese. There is no clear pattern whether the language skills and the predominantly spoken language at home has influenced their understanding. For example, when being asked, "Why do you lean Chinese?" during the first interview, both Lianqing (from a Chinese speaking family; low Chinese composition ability), and Hanyun (whose mother speaks Chinese and father speaks English; high Chinese composition ability) replied, "I don't know." (March 3, 2006). The latter replied to the same question at the end of the same interview by saying, "It is fun to learn Chinese." (March 3, 2006) Mucheng (English speaking family; medium ability) and Huiyi (Chinese speaking family; high ability) shared the same thought. Minghui (English speaking family; low ability) thought the structure of Chinese characters makes learning Chinese fun, "Because we can make up Chinese characters." (March 3, 2006) Liya (father speaks Mandarin while mother speaks Japanese; low ability) thought that learning Chinese could help her to have a sense of belonging, "I can speak to my friends in Chinese." In addition, she had a sense of responsibility by learning Chinese as she often translates for her mother who is ethnic Japanese. Although she knew that learning Chinese is difficult, she had a sense of the importance of learning Chinese, "I still think learning Chinese is good because usually Singaporeans also speak Chinese." (March 3, 2006)

Some participants altered their perception later. For example, Lianqing had some additional thought during the second interview, "I don't know why. But if I travel to a country where people speak Chinese, I can communicate with people there." (April 20, 2006) During the last interview, Lianqing began to articulate his thoughts, "Because we are of Chinese origin. As a Singaporean, I need to learn Chinese." (May 25, 2006). Similarly, Hanyun asserted, "Because we are Singaporeans, and Singaporeans need to learn Chinese." (May 25, 2006)

We would like to clarify that the change of perception on learning Chinese is not the direct result of using IT tools. Rather, it is the process that they are challenged to think about this important issue. Although the participants could not develop a solid understanding about why learning Chinese, at least, they started to think.

Secondly, as stated before, Chinese is a very difficult language to acquire as a second or foreign language. In particular, writing in Chinese is more difficult than writing in English, as a learner has to complete at least three different tasks to learn a character or a word: the

pronunciation of the word, the meaning of the word, and the shape of the character. In order to write the word correctly, a learner has to remember every stroke and be able to reproduce them in the right positions and in the right sequence.

The participants mentioned during the first interview that they had varied preferences for using English and Chinese. On the one hand, they preferred to converse in Mandarin with their peers after the class. On the other hand, if given an option, they choose to write in English. Their understanding of a good Chinese composition also varied. For example, Lianqing thought that a good Chinese composition should have enriching content. Minghui argued that such a composition should consist of many idioms (成语). Mucheng asserted that it should have a good storyline. Huiyi believed that a good Chinese composition should have an attractive introduction to catch readers' attention. No matter how their views on a good Chinese composition differed, they all agreed that writing in Chinese is much more difficult than that in English. For example, Mucheng commented, "Writing Chinese composition is the most difficult task for me, because I do not know how to use a dictionary to look up the correct character." (March 3, 2006). The participants showed their unwillingness for writing Chinese composition by either heaving a deep sigh or complaining that they had to write another composition at the beginning of each session.

The interview and observation data show that the majority of the participants tended to write Chinese composition for the sake of passing examinations rather than thinking and problem solving. They considered fulfilling the 100-character word count requirement as their priority in writing a Chinese composition. For example, when being asked during S2, "What do you care the most when you write a Chinese composition?" All the participants except Huiyi shouted out, "Counting the number of characters." Moreover, they did count the number of characters from time to time when they were writing their compositions. In particular, they explicitly counted the number of Chinese characters toward the end. When they reached the 100-character requirement, they just wrapped up their compositions. They were not interested in revising or proofreading their work. Instead, they either chatted with their peers or played computer games.

Perceptions of using IT tools to write Chinese compositions
    Assertion 2: The participants have different perceptions of using IT tools for Chinese compositions. Their perceptions are greatly influenced by their experiences in using these tools.

    One of the advantages of using computer for Chinese writing is that typing Chinese texts on a computer is much easier than writing text on paper with a pen. However, the participants did not make the fullest use of the technologies. The interview and observation data reveal that the participants' perceptions of using IT tools varied from session to session. At the beginning of the study, the six participants were extremely excited about using IT tools for Chinese compositions because of the 'novelty effect." For example, when they were introduced to Microsoft Word, PenPlus, ChinesePlus and PowerWord during the training session, they followed the instructions closely and tried out different affordances even through they were overloaded with information. Some of them were eager to help their peers in launching different programs and using PowerWord. During the group interview after the training session, all of them expressed their enthusiasm and preference for using the IT tools to pen-to-paper, "It is fun to write on a computer. I can use *Pinyin* to find Chinese characters. It is very interesting. It is a time saver because I don't need to write stroke by stroke." (Huiyi, March 3, 2006) "It is much easier to make correction when writing on computer." (Hanyun, March 3, 2006)

    The participants' reaction toward using ICT tools differed greatly after S2. Nearly half of the participants were still excited about using the ICT to write Chinese composition. Lianqing said, "Using computers makes Chinese composition writing much easier, because I can use the e-dictionary." (April 20, 2006) Liya made a similar comment, "I want to use computers to write Chinese composition, because I can use the e-dictionary." (April 20, 2006)

    Some of the participants changed from excitement into frustration when they encountered a variety of linguistic and technical difficulties. Hanyun expressed her nervousness by saying, "I felt a little bit nervous, because I haven't used computers for a long time." (April 20, 2006) Minghui shared her frustration, "When I wanted to write a character, the computer showed a strange character. I had to write that character again, and a wrong character showed up. I had to delete them one by them. Then I forgot what my next sentence was." (April 20, 2006) Similarly, Huiyi experienced more frustrating than satisfaction. During S3, she encountered some technical problems. At one occasion, for instance, she had to write 友 nine times to get it correct (recognised as 支、歹、交 instead). Even though she showed more concern about the content than fulfilling the minimum word count, she expressed her fear, "I'll definitely fail the examination if I use a computer to write my composition." During the post activity interview, she said, "I prefer to write Chinese compositions with pen and paper to on a computer." Her preference has a close connection with the IT tools she chooses to use. We present our finding relating to the choice of using IT tools in the following section of the report.

Selecting the IT tools
    Assertion 3: Due to the complex process of writing Chinese on a computer, the participants found it difficult to learn all input skills simultaneously within a short period. As a result, they selectively used those tools that are similar to writing with pen and paper or with what they were most familiar with.

All the participants mentioned that writing Chinese characters is the most difficult part of Chinese compositions. They were frequently stuck in writing, as they did not know how to write the characters they wanted to use. They preferred to read and write in English, but to speak Mandarin. There is a great difference between typing English texts and typing Chinese texts on a computer. When one types English texts, she uses the keyboard to type what she wants to compose. Inputting Chinese characters requires one to choose from various input methods. In other words, it involves decision-making. Due to the complex process of writing Chinese on a computer, the participants found it difficult to learn all input skills simultaneously within a short period. As a result, some participants selectively used those tools that are similar to writing with pen and paper or with what they were familiar with. Others challenged themselves to use a range of the tools to solve the difficulties they encountered (see Table 4).

Table 4: *Choices of Using the IT Tools*

	PenPlus			Pinyin Input			PowerWord		
Session	S2	S3	S4	S2	S3	S4	S2	S3	S4
	X		X		X		X	x	x
Lianqing	X	X				X	X	X	x
Minghui	X	x			X	X	x		
Mucheng	X		x	x	X	x			
Huiyi	X	X	X						
Hanyun	X				X	X			

X = Mainly used Input Tool in the session
x = Used as Supported Input Tool in the session

Although we did not intend to evaluate and compare different IT tools, we observed that the majority of the participants preferred using PenPlus to ChinesePlus (pinyin input) or IME pinyin for Chinese input. Obviously, the PenPlus Input is the most frequently used input tool by the majority of participants at the beginning of the study. Some of the participants use it across the sessions, particularly those with a relatively higher standard of Chinese compositions. As PenPlus is a tablet-based handwriting system, writing Chinese on PenPlus is somewhat similar to writing with paper and pen. This is because it requires users to write a Chinese character stroke by stroke. However, some participants thought that writing Chinese on PenPlus is more challenging than writing with paper and pen. For example, Huiyi used PenPlus in most sessions. Despite of encountering less recognition problems than the rest of the participants, she sometimes had to write and rewrite a character until it was correctly recognised. For example, in S3, Huiyi wrote 友 in the correct stroke order for eight times, yet it was recognised as 支、歹、交 instead. She became frustrated. To Huiyi, writing Chinese with PenPlus is "more troublesome than writing with paper and pen." She added, "It is hard for me to edit what I have written, because I don't know how to edit." (Huiyi, May 25, 2006)

The *pinyin* input method could solve the character recognition problems as it uses the phonetics to locate the characters. However, the majority of the participants are weak in *pinyin* and pronunciation. Although they could have stuck to *pinyin* input all the way, they would rather use it just as a quick fix and then switched back to handwriting input afterward. There are two possible explanations for their preference. One explanation is that the participants self-reported in their pre-activity interview that they lacked confidence in using *pinyin,* as they rarely used it from Primary 2 onwards. Another explanation is that PenPlus

was first introduced in a sequence, and the participants felt comfortable with it. Because of the learning curse, we could not expect the participants to be skilful in using a range of IT tools after two hours of training but without practicing them at home.

Some of the participants chose to use PenPlus and *pinyin* input at the same time. For example, Mucheng's handwriting in Chinese is not good enough to be easily recognized. Secondly, he is left-handed, and in S2, he frequently encountered the problems of wrong handwriting recognition, partly because of the positioning of the pad and the poise of his hand in holding the pen. Thirdly, his wrong stroke sequence also contributed to the handwriting input difficulty that he faced. When he wrote happy (开心), his characters could not be recognised by the PenPlus after six tries. He then switched to *pinyin* input, and yet he keyed in erroneous *pinyin* of "sin" for 心 (the correct "spelling" is "xin"). As a result, he wasted a lot of time by switching between the programs and yet his problem was not solved. At the last 15 minutes of composition, he was gradually worn out and lost focus, causing more "serious" recognition errors.

Half of the participants did not use PowerWord. Whenever they did not know how to write a Chinese character, they conveniently asked their teacher for help as "the quickest resort" (Huiyi, April 13, 2006). In addition, they were not familiar with *pinyin*. Furthermore, some of them did not know how to deal with two windows on the computer. Moreover, there is a gap between "having learnt the skill" and "making good use of it", in particular during the review process. For example, although most of the participants mentioned that they knew the cut-and-paste feature before participating in the study, they did not use this feature during S2. Even though the students were re-trained in using the feature during S3, most of them seldom used it. Those who occasionally used the feature were just moving an individual character or a very short character string each time.

In summary, the participants' choices of using the ICT tools had some connection with the challenges they encountered. Some participants reacted actively by choosing an appropriate ICT tool or a combination of the tools to overcome their difficulties. Others reacted passively as they were overwhelmed by the difficulties they encountered.

Ways of using the IT tools
Assertion 4: The participants have employed a wide range of IT tools and they would each have their preference for a unique combination of tools.

As previously mentioned, some of the participants adhere to PenPlus input across the sessions. Some of them attempted to use different ICT tools to solve the problems they encountered. Even with the same tool, the participants vary in terms of the input speed and methods. For example, Hanyun preferred to input character by character by using PenPlus. Huiyi could input two or three characters at a time by using the same input tool. Although Minghui used pinyin and PenPlus, she chose to input a character at a time during S2. During S4, she used the PenPlus input predominantly, and occasionally, IME. She became quite skilful at the PenPlus input. For example, she wrote seven characters at a time, and six of them were correctly recognized. That was the highest record among all the participants. Minghui was weak in *pinyin* and preferred to just input the beginning sound of a character and then scroll the textbox to look for the character. Often, she missed the character because there were too many characters in the textbox than she could handle. Hanyun used IME pinyin all the way and often made use of 拼音词组. She inputted character by character, unless the software pops up phrases for her to choose from. She is reasonably good in this

input method. However, she is still not aware of some of the tricks to speed up input, despite the training she had undergone.

No participants seemed to be aware of how to make the fullest potential of the IT tools. Particularly, they did not engage in editing their writing on computers. None of them were willing to spend time in proof-reading and editing their work.

In the following section, we present two cases: Huiyi and Lianqing to describe how they use the IT for Chinese compositions.

Huiyi comes from a Mandarin-speaking family. She is the most productive "writer" among the participants. She was selected to participate in the Advanced Chinese Writing Class every Saturday. However, she had a mixed feeling about using IT tools for Chinese compositions. She enjoyed using the PenPlus input since the beginning of the study. Her input speed for the PenPlus was quite fast. For example, she began to two characters input at a time in S2. However, during S3, she became frustrated when she wrote 友 in the right stroke order eight times, but it was recognised as 支、歹、交 instead. When she switched to the IME pinyin, she had a problem in identifying the characters from the textbox. After selecting 友 from a list of characters, she switched back to PenPlus. In S5, Huiyi used PenPlus predominantly, because she wrote the characters well. She chose not to use *pinyin* input as she quipped, "I'm not good at *pinyin*." (March 3, 2006) Huiyi admitted that she did not practice Chinese Input on computer at home, because she was unable to install the PenPlus software on her home PC probably due to incompatibility. Huiyi made a remark in the midst of S5, "It is much better to write in paper and pen" (April 25, 2006). After she was informed that she had written about 250 Chinese characters during that session, she was delighted: "It can't be. It looks so short." (April 25, 2006) She shared what she learned from using the IT for Chinese composition, "I have learnt how to use the E-dictionary, but I am not good at it. I prefer to write in paper and pen on one hand, because I find that it is easy for me to make corrections. Although I can correct my compositions easily on a computer, I don't feel comfortable about it. In addition, I notice that using the IT tools could sometimes break my thinking flow."

Lianqing comes from a Chinese speaking family. He was categorised as having low abilities in both Chinese and English. The MORAE recordings of his composition sessions reveal that he was the most IT-savvy student in the group of participants. For example, he was able to learn to use PenPlus quickly in S2. According to the MORAE recording, he inputted about 190 characters within 44 minutes. His story has a good plot, such as he could set up the scene well, which makes the story interesting. After he finished, he went on to look for other interesting software and drew it with the pen-based software. During S3, he encountered character recognition errors quite frequently. For example, when he attempted to write (事, meaning a thing,), he failed six times because of his poor handwriting and wrong stroke sequences. Rather than giving up, he solved this problem by switching to the *pinyin* input method. When he was unsuccessful again, he switched back to the writing input method. He developed the flexibility in using the IT tools to solve the problems he encountered. In addition, Lianqing differs from the other participants in a way that he was willing to spend a total of four hours at home, practicing the Chinese input systems. When he was asked, "Why do you practice Chinese Input at home?" He replied, "Because I want to challenge myself." (May 25, 2006) Lianqing shared his insights about using the IT tools for Chinese compositions during the post- interview: "I have learnt so many new things. For example, I could use *pinyin* to find the character that I don't know. I like the *pinyin* input method. It was

really helpful for me. In addition, using computer for Chinese compositions has made my writing so neat. Anyway, I had a very interesting experience." (May 25, 2006) In brief, Lianqing stood out from the rest of the participants because he could often solve minor technical problems on his own and switched between applications, e.g., switch between handwriting and *pinyin* modes, and checking PowerWord, more frequently than others. He maximized the effectiveness of individual tools.

Reflecting on the participants' perceptions and experiences of using IT tools for Chinese compositions, we argue that most of the popular software products on the market (e.g., Microsoft Word, PenPlus and ChinesePlus) have been mainly designed for adult use (UI, affordances, Chinese input methods, etc.). It is important to guide the students to choose the right applications and to provide them with sufficient training and long-term support. Our study suggests that the use of the IT tools for Chinese compositions must be embedded in pedagogical provisions.

Limitations and Future Directions

We like to acknowledge two major limitations of this study. Firstly, we only selected six participants for the study as we have opted for a quasi-qualitative study approach. The small number of students meant that each of them could have easy access to the teacher and the researchers. As a result, they might have response bias that might affect their thinking. As the empirical sessions were conducted out of their regular class, they did not take place in their natural setting.

Secondly, because of the time constraint, we had only conducted three empirical sessions of IT-based Chinese compositions for the participants. The participants were overwhelmed in learning so many things in a short period. In addition, the participants had no time for practicing at home, because they were under pressure in preparing for their mid-year examination, which took place between S3 and S4. Moreover, their initial enthusiasm might be influenced by the novelty effect.

The next two major stages of the project are,

(1) Professional Development & Pedagogy Co-design: As teacher educators, we will conduct a course for the in-service Chinese teachers on process-oriented writing, and general issues in integrating IT into learning Chinese. The course will lead to the co-design of a long-term pedagogy (that is, a year-round or cross-year curriculum or Scheme of Work [SOW]) for IT-mediated Chinese compositions. We will also make recommendations to the Ministry of Education in the area of the curriculum and examination design for Chinese Compositions. The effort should be directed towards seamless integration of ICT tools and process-oriented Chinese composition writing into the present school system. This effort will only be successful if we take into account research findings, the teachers' views, and the needs of the students. We will then conduct qualitative and quantitative studies to evaluate the new pedagogy and perform successive refinements.

(2) A software tool specially designed for Primary School student to write Chinese Compositions: We will analyse the newly developed, tested and revised pedagogy in the previous stage to find out if the scaffolding process can be automated. The analysis will act as the basis for the design and development of a software tool (inclusive of a word processor; and proactive or reactive scaffolding features, perhaps in the form of intelligent agents) for primary school students to write Chinese Composition. The tool will address the linguistic and technical deficiencies of the target audience, for example, design a user-interface and writing features that suits children.

Based on our findings in this study, we tabulate our recommendations for the next two stages of the project in Table 5.

Table 5: *Recommendations on Future Pedagogy & Software Design*

Issues	Recommendations on Pedagogy Design	Recommendations on Software Design
Students are exam-minded in composition exercises. They focus more on meeting the word count requirement and correcting surface errors than striving for richer content.	Incorporate process-oriented composition activities to the pedagogy. Give students a clear idea that writing the first draft of their compositions is only the first step of the writing process.	Design affordances that support or scaffold process-oriented compositions.
Students do not understand or appreciate the real purpose of composition writing which is to communicate and share their views and feelings. They are therefore exam-minded.	In addition to traditional pictorial and topical compositions, design problem-based scenarios that require composition writing (e.g., e-mail to friends in China).	(Not applicable?)
Students are not motivated to practice Chinese input.	Conduct training for Chinese input practice. Provide incentives or organize Chinese inputting contest to motivate the students to speed up their input. – (A)	Design a step-by-step tutorial module (or a separate application) and introduce gaming elements to a typewriting practice module.
Students lack confidence in *pinyin*.	Conduct a *pinyin* revision session that makes use of Chinese *pinyin* input as a learning tool. Integrate the exercise into (A).	Include *pinyin* revision and practice into the tutorial and practice modules.
It is not intuitive in switching between the two input modes (handwriting and mouse input with the writing pad.	More practice. Integrate the practice into (A).	Reflect the issue to the software vendor and explore possible solutions. One possibility is to add a new input configuration that requires both the writing pad and the mouse, with the former <u>strictly</u> for handwriting input only and the latter functioning as it is.
Students are weak in handwriting.	Shop for good handwriting practice tools or games in the market to get the students practice handwriting on the computer.	Include the feature into the tutorial module. This should be an optional feature.
Students are not familiar with the cut-and-paste	Train the students in using this function.	Include the function into the tutorial module.

function.		
Students are overwhelmed by using multiple software applications at the same time.	Carefully choose individual and the combination of the software applications in the market to address both issues.	Develop a children-friendly software application that integrates all or most of the affordances like word processing, Chinese input (with both handwriting and *pinyin* modes), scaffolding, e-dictionary and other supports, or provides a tool bar to facilitate convenient launching of and switching among the applications. Advanced affordances that are not so useful to the children should not be included.
Most of the popular software applications in the market are not designed for children, for example, the target text box contains too many characters for the children to select from.		

The findings will not only become a guide for language teachers to re-strategise their existing Chinese teaching practices to incorporate existing tools, it will pave ways for our subsequent research in proposing new IT-mediated pedagogy and perhaps scaffolding methods, as well as designing and developing new IT-based tools specifically for Chinese compositions.

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