Chapter 4
Using ICT in Teaching the Chinese Language: Practices and Reflections from Singapore

Cheelay Tan and May Liu

Overview: Information Communication Technology Literacy as a Twenty-First-Century Skill

The twenty-first century is the era of communication and knowledge construction, especially with the rapid advancement of information technology. In this quickly evolving ICT era, society and education face new changes. Students need to develop new skills and dispositions to handle new challenges beyond school. In 1996, a United Nations Educational, Scientific and Cultural Organization (UNESCO) report (Delors et al. 1996) noted that the key characteristic of the twenty-first-century education was learning how to learn. Jacques Delors et al. suggested four pillars of developing a student's learning abilities: learning to know, learning to do, learning to live together and learning to be. In 2007, the partnership for the twenty-first-century skills proposed a learning framework that concretely explains knowledge and skill standards required for the twenty-first-century life. It suggests a complete support system (including standards, assessment, curricula and teaching, professional development for teachers and learning environments) and a learning design that integrates these skills (Partnership For 21st Century Skills 2011). The report proposes that the twenty-first-century learning outcomes should include the following knowledge and skills: (1) core subjects and important twenty-first-century issues, (2) skills for learning and creativity and (3) news, media, technology, life and career skills. Out of the numerous twenty-first-century skills listed in the report, ICT literacy gains importance by the day.

Teaching in the traditional classroom mainly comprises textbook-based lecturing, with teachers presenting and teaching in a linear order. Each country's

C. Tan (✉) • M. Liu
Singapore Centre for Chinese Language, Singapore, Singapore
e-mail: cheelay.tan@sccl.sg

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discussions on the twenty-first-century skills and education have different foci but agree that the twenty-first-century learning environments should differ significantly from traditional ones. Information technology promotes these changes and has become both necessary for students to master and also the main channel for students to nurture other twenty-first-century skills. For example, network technology has broken traditional learning boundaries and promoted the creation of a global online learning community. This change requires students to have Internet skills and to be able to use the Internet to develop other skills such as cultural skills, communication and cooperation, problem-solving skills and self-directed learning and development abilities. Hence, with the rapid development of multimedia technology and computer and device usage, ICT literacy becomes a critical necessity as more visual resources and technologies are part of teaching and learning processes. In this process, information technology has also made new demands of teachers who not only have to learn technology skills but also should be able to integrate them into lesson design and the teaching of new skills. Using new technologies, teachers can now choose teaching resources and design lesson plans based on syllabus objectives to pique student interest and overall academic performance.

Developing ICT literacy in the younger generation is a complicated task, but Singapore already has an excellent head start: Singapore's information technology infrastructure is an international leader, infusing the country's economy, society and education. The Singapore government launched 'Intelligent Nation 2015' in 2006, aiming to use pervasive information technology to 'build Singapore into An Intelligent Nation, A Global City, Powered by Infocomm' (Infocomm Development Authority of Singapore 2010). In addition, information technology is also an important element of the framework for twenty-first-century competencies and student outcomes (Ministry of Education ,Singapore 2010) that skill education in Singapore, including the teaching of languages (often by computer-assisted language learning or CALL) which is the focus of this chapter.

CALL has changed since the 1970s with the development of technological and teaching philosophies. Wong (2011: 93–94) identified CALL's stages of development in two ways: his progression adapted from Warschauer and Healey (1998)'s philology theory is divided into three stages (Table 4.1), while his progression adapted from Bax (2000)'s usability angles is divided into three stages (Table 4.2).

Table 4.1 reflects the trends and changes in the past 40 years of language teaching in Singapore – from formal learning based on mastering language rules in the classroom, gradually moving towards informal learning for language use in real-life situations (Wong 2011: 94). The table also shows that the rapid development of Web 2.0 skills from the early twenty-first century is an important technological basis and reason for this trend.

Table 4.1 CALL stages of development: philology theory (Warschauer and Healey 1998)

Stage	1970–1980s/ structuralist stage	1980–1990s/ communicative language stage	Beginning of the twenty-first-century/ integrated stage
Technology	Host computer	Personal computer	Multimedia and the Internet
Language teaching methods	Grammar translation, listening and speaking-based teaching	Communication-based teaching	Content-oriented teaching, teaching with special purposes
Language learning theories	Structuralism (language is in the form of a structural system), behaviourism	Cognitivism (the brain builds new language systems when learning a language)	Social cognitivism (a learner develops language skills through socialisation)
CALL techniques	Mechanical exercises	Communication exercises	Using real-life language materials
Learning goals	Correctness with no errors	Correctness with no errors and fluent communication	Correctness with no errors, fluent communication and real-life usage skills

Table 4.2 CALL stages of development: usability (Bax 2000)

Stage	Restricted CALL	Open CALL	Comprehensive CALL
Task types	Closed-format practice and testing	Stimulating games, computer-mediated communication	Computer-mediated communication
Student activities	Text reconstruction, closed questions, little interaction with students	Computer-based homework, occasional interaction with fellow students	Frequent interaction with fellow students, some computer-based homework related to texts
Feedback	Correcting errors	Concentrating on language skill development, open and flexible	Explaining, commenting, suggesting, encouraging reflection
Teacher roles	Supervisors	Supervisors, facilitators	Promoters, managers
Computer locations	Normal computer labs	Computer labs or language learning labs	Any classroom, any table, in students' backpacks

Current Practice of Using ICT in the Teaching of Chinese in Singapore

Among the school subjects, the application of ICT has been most prevalent in the field of teaching Chinese as a second language. Various aspects in Chinese language teaching reflect ICT's wide applicability, as described below.

Integrating ICT into Chinese Language Curriculum Goals and Assessments

The 2010 Mother Tongue Languages Review Committee (Ministry of Education, Singapore 2010) made key recommendations to enhance the teaching and learning of mother tongue languages (MTL) in schools. One key recommendation is greater use of ICT to enrich students' learning and to have educators treat ICT integration as an education goal and a crucial learning outcome. ICT-assisted assessment introduced in recent years also further aligned educational assessment with changes in teaching and learning. Compared with just a decade ago, students use ICT platforms more widely to create realistic, interactive settings that test their ability to use language effectively and meaningfully (Ministry of Education 2011a). In fact, even before the MTL Review, in 2007, the Ministry of Education Chinese Language (Primary) syllabus already outlined the goals of integrating information technology into Chinese language teaching (Ministry of Education, Singapore 2008). Furthermore, for secondary school students, the Chinese Language (Secondary) syllabus (2011) has concrete teaching goals for information technology to be integrated into Chinese language teaching (Ministry of Education, Singapore 2011b).

The use of ICT is also quickly becoming commonplace in preuniversity Chinese language teaching, not only are teachers encouraged to use it in class but also in assessment. This, again, is based on the MTL Review's recommendations calling for greater alignment of teaching and testing so that students are assessed on the knowledge and skills acquired in their learning. With computer-based writing as the norm in the workplace and in social communication, students should therefore have opportunities to practise and be assessed on computer-based writing.

In fact, to align learning and assessment, computer-based writing was first introduced in paper 1 (functional writing) of the 2013 GCE 'A'-Level MTL B Examination, where pre-university students taking Chinese Language B was required to compose an email response or a blog entry on an examination-controlled laptop; this part of the paper constitutes as much as 20 % of the GCE 'A'-Level B examinations (Ministry of Education and Singapore Examinations and Assessment Board 2013). Not only do written examinations utilise ICT, but oral training and examination will also rely on ICT to create a more engaging and authentic context. Short video clips have been introduced as stimulus in the GCE 'O'- and 'A'- Level B Oral Examinations from 2014 as well.

Integrating ICT into Chinese Language Teaching

The 2010 MTL Review also advocated much more ICT use in the Chinese language classroom. A survey commissioned by the committee found that students today were ICT-savvy and highly motivated in using ICT to learn their mother tongue languages, as 'ICT opens up new possibilities such as the use of interactive content,

assignment of individualised tasks, and the provision of different resources and activities to suit the different needs of students' (Ministry of Education, Singapore 2008: 16).

To support CL teachers, a new resource package that promotes interaction skills and greater use of ICT was produced by the Ministry of Education (MOE), and a web-based MTL oracy portal named iMTL Portal (www.imtl.sg) was developed in 2012 to help teachers improve their oral interactive and written interactive skills, as well as students' communication proficiency. This iMTL Portal, developed for primary four to preuniversity students, is an interactive platform that helps MTL learning through the use of authentic language tasks, such as audio and video presentations, to express their views after seeing the authentic stimuli. Besides reading fluency functions and lesson resources, this portal also has multimodal individualised feedback features such as audio clips, text files and rubrics. This individualised feedback enhances students' ability to communicate effectively through both oral and written forms and also encourages self-directed learning (Ministry of Education 2012c). MOE has also increased the curriculum time for ICT-based interactive language use at all levels. Furthermore, the review recommended that schools introduce computer-based writing alongside traditional teaching of scripts, as typing and voice input are becoming common in Singapore.

In addition, the MOE Educational Technology Division (ETD) rolled out a '10C' ("Very Chinese") platform (www.10c.sg) in 2008 to encourage the adoption of ICT in primary schools' Chinese lessons under the 'Teach Less, Learn More' guidelines. With ETD providing pedagogy, material development, training, consultation and sharing sessions, this platform's main objective is to encourage interactive and integrative use of ICT in the normal Chinese language classroom.

From 2008 to 2015, 80 primary schools adopted this programme in their Chinese language curriculum (http://10c.sg/etd_cep/slot/u10/Intro/school.htm). Through long-term supplementary reading, computer typing, online interaction and peer appraisal, '10C' integrates the learning of character recognition, reading and composition in an ICT environment, so students can improve their CL standards in a cosy learning environment (see introduction on portal: http://10c.sg/etd_cep/slot/u10/Intro/intro_cl.html).

With the recommendations by the Review and with the concerted efforts of MOE and schools, Chinese Language teachers in mainstream schools have been integrating ICT-based programmes and lessons into their classrooms. Since the late 1990s, teachers have been receiving relevant ICT training. One fundamental aspect of their early in-service training is to alleviate the fear and worry teachers have towards ICT-linked lessons. This training reiterates the critical difference between traditional teacher-centred teaching and ICT-linked and student-centred learning in the language classroom. Not only are there significant differences in terms of teaching resources, but the roles of each stakeholder, ICT-oriented and student-centred learning models are also based on a belief in the cognitive dynamism and mutability of knowledge over time. Table 4.3 contrasts ICT-oriented and student-centred learning models with the traditional approach to teaching (Zhang and Zhu 2002).

Table 4.3 Traditional teacher-centred versus ICT- and student-centred teaching

	Traditional teacher-centred teaching models	ICT- and student-centred teaching models
Teaching goals	The syllabus is based on individual parts and emphasises basic skills	The syllabus moves from the whole to its parts, emphasising major concepts
Teaching content	Sticks strictly to preset teaching resources	Tracks students' questions and interests
Teaching resources	Textbooks and manuals are the main sources	Original messages and customisable materials
Messages to be taught	Well prepared for students, excellent packaging	For learners to discover, analyse and organise on their own
Teaching process	Learning is an iterative process	Learning is interactive and built on students' existing cognitive structures
Teaching method	Teachers communicate messages to students, who are the recipients of knowledge	Teachers are in a dialogue with students and help students construct knowledge
Teacher roles	Directors, experts, authorities	Questioners, guides, helpers, facilitators, consultants, negotiators
Student roles	Students mainly learn independently	Students learn with a small group
Assessment by teachers	Students are assessed through examinations and correct answers, and results are emphasised. Assessment is based on quantitative analysis	Examinations, student work, experiment results and viewpoints. The process is considered as much as results. Assessment uses a blend of quantitative and qualitative analysis.
State of knowledge	Knowledge is static	Knowledge is dynamic, changing with our experience

Source: Zhang and Zhu (2002)

With the ICT and student-centred teaching models widely recognised by the Chinese language teachers, the integration of ICT into the Chinese Language curriculum tied with the twenty-first-century skills, will make technology meaningful to learning. Chin (2011) suggested a tiered structure for information technology skills' development in the Chinese language syllabus according to the different domains of information, including knowledge, exchange, decision-making, analysis, creativity and social awareness. These domains are the core of the Twenty-first Century skills advocated by MOE to develop students into global citizens with comprehensive knowledge and the ability to communicate, exchange ideas, make decisions, solve problems and create.

Table 4.4 shows three important skill sets of Chinese language teaching: spoken, written and combined abilities and their relationship with ICT development (Chin 2011: 8). The table gives an overview of how information technology is used in language teaching. For example, when developing written language skills, students can use Chinese language learning courseware and software and online translation tools to carry out online searches (knowledge). Students can also express and exchange written opinions about particular topics on online platforms (interaction).

Table 4.4 Integrating ICT skills with CL skill sets in the Chinese language classroom

CL skill sets	Knowledge: basic literacy	Interaction: interpersonal interaction	Decision-making: problem-solving	Analysis: individualised learning	Innovation: developing creativity
1. Oral skills training	1. Learning about the spoken language platform interface and its functions 2. Using a computer's voice recording tools 3. Simple sound editing 4. Using electronic reading assessment tools	1. Understanding and checking digital information (verbally) 2. Short and simple message conversations (sentence analysis and assessment) 3. Expressing viewpoints on set topics on an online platform and commenting on others' viewpoints (spoken) 4. Situational dialogue practice and learning	N/A	1. Voice recording and tone correction Oral sentence formation relay	1. Round robin (oral skills)
2. Written skills training	1. Learning and practising how to use an online interface 2. Using Chinese language learning resources/software 3. Using Chinese text input tools (including handwriting input) 4. Searching for an online dictionary 5. Looking words up on an online dictionary 6. Online bilingual translation	1. Understanding and checking digital messages (written language) 2. Process writing (sentence construction) 3. Round robin storytelling (written language) 4. Process writing (full text) 5. Expressing viewpoints on set topics on an online platform and commenting on others' viewpoints (written language)	1. Class website design 2. Electronic editing (multimedia homework)	1. Digital stroke order correction (online or offline) 2. Digital homework (online or offline) 3. Building an electronic portfolio	1. Writing electronic writing for children (online or offline) Digital literature

(continued)

Table 4.4 (continued)

CL skill sets	Knowledge: basic literacy	Interaction: interpersonal interaction	Decision-making: problem-solving	Analysis: individualised learning	Innovation: developing creativity
3. Combined language skill practice	1. Introducing an interactive online platform Multimedia software editing skills	1. Multimedia message transfer and exchange 2. Online chat and video conferencing	1. Small-group project work in school (wiki platform) Building an electronic database and reporting on it (school survey) Resource-based learning	1. Individualised multimedia learning reports (spoken and written language combined) Personal blogs	1. Themed websites (literature, art, science, history, folk customs, religion, culture, etc.) Online publishing

Source: Chin (2011: 8)

They can also build a class website (decision-making) and a personalised electronic learning portfolio (analysis) or read or create online literature (innovation).

To effectively integrate ICT into Chinese Language teaching, the above needs to be systematically carried out, and the functions and objectives of the activity design become all the more important. Even with ICT, face-to-face explanations and clearing doubts are still important and hence *blended learning* or integration of ICT and face-to-face pedagogy would be desirable. Blended learning allows a teacher to better judge the ability and difficulty faced by a student and to adjust the ICT to provide a scaffold for different levels and encourage learning.

Web 2.0 Technologies and Chinese Language Teaching

As information technology has become the primary daily media source to students and teachers in the twenty-first century, multimedia resources, in particular Web 2.0 sources, have become an indispensable learning resource in school and in families. According to Huang and Yin (2011), in this technological age, 'multi' refers to multiple media performances, multiple sensory organ use, multiple device integration, multidisciplinary intersections and multi-field applications, and 'media' refers to an intermediary between the person and the objective world and the combination of different media into one. Meanwhile, Web 2.0 refers to a second generation of the World Wide Web that is focused on the ability for people to collaborate and share information online.

Currently, the most commonly used multimedia ICT platforms are all found under Web 2.0. Out of the many Web 2.0 platforms and tools, eight of the most popular ones include blogs, Facebook, Flickr, wikis, podcast, Twitter, Voicethread and WeChat. These Web 2.0 platforms contrast greatly with their predecessor Web 1.0, a fixed, monodirectional display and storage platform. Web 1.0 mainly uses Dreamweaver, Flash, RapidWeaver, FrontPage, iWeb, HyperStudio and other software to create websites that were both difficult to use and time-consuming to update.

Some of the more prominent examples of using Web 2.0 in Chinese Language teaching include teachers using blogging platforms (for instance, www.iWrite.sg developed by Singapore Centre for Chinese Language to assist creative writing teaching) and wikis to disseminate supplementary reading materials and composition model essays and receive feedback and comments from students; Facebook, Twitter and WeChat are mostly used as social media platforms to encourage student interactions using Chinese in an authentic virtual setting; podcast and Voicethread are exceptionally useful for developing listening and speaking skills and are used by many schools in oral exam training.

To further tap on Web 2.0 capabilities, mobile devices such as smartphones and tablet computers common among teachers in Singapore allow 24/7 access and seamless learning anytime and anywhere, such as using WhatsApp to interact in the Chinese language among student discussion groups. In virtual worlds, Web 2.0 technology has now made students' online experiences more personalised with

more interactivity in networks and with other learners. Web 2.0 technology is becoming more experience based, with content changing and being enriched to reflect our real lives, which is all desirable for CSL/CL2 learners whose language abilities are even more varied than CNL/CL1 or CFL learners.

At the same time, Web 2.0 allows the learner's role to evolve from being mere content consumers to content producers and participants (Godwin-Jones 2007), which means constructive Chinese language learning materials can easily be shared among learners. Web 1.0 only gave teachers and students' communication and reference abilities in the language learning classroom, and Web 2.0 is now giving them a full learning environment.

After the Web 2.0 era began in the early twenty-first century, it became user-centric, giving users a high level of autonomy while providing them with web platforms for interaction and exchanging opinions. Outside of work and school, blogging, social media and online chatting are a daily task for the general public now, and of course, including teachers and students. According to *Lianhe Zaobao* (Ong and Ding 2010: 10), Ho Peng, the 2010 Mother Tongue Languages Review Committee chair and former director general of education at the Ministry of Education, said at the Global Chinese Conference on Computers in Education that current students in Singapore grew up as digital natives surrounded by text messages, blogs and online interaction platforms, so the way they learn differs vastly from students of the past. To support students in being more actively immersed in learning, teaching must integrate new technologies more effectively (Ong and Ding 2010).

For teachers to fully understand the concept of Web 2.0 to unleash their benefits in the classroom, it is important to highlight the characteristics of Web 2.0 platforms (adapted from Tan 2011: 112–113):

- Suitable for many types of learning models, such as individualised planned interventions (IPI).
- Users own and control information: unthreatened by technology, highly interactive, present resources can be used and repeated use is possible.
- Information technology can create suitable learning environments outside the classroom when paired with multimedia applications.
- High student appeal platforms attract students towards low student appeal subjects.
- Independent learning: from learners' perspectives, independent learning can be according to personal progress at any time and any place, as learners please.
- Users can add value to Web 2.0 platforms.
- Mainly put together in a random or modular way, putting an interface and functions together to contain multimedia messages.
- Social and interactive functions.
- Real-time updates, what you see is what you get (WYSIWYG).

Use of ICT in the Teaching of Chinese in Singapore

The goal of integrating ICT into the teaching of the Chinese Language is not only to use its interactivity, participatory nature, multimedia and other advantages to enhance students' interest in learning but also to improve students' language abilities. ICT, especially Web 2.0 platforms, can be integrated into the teaching of the Chinese by providing a multidirectional form of communication, as well as to let students interact, exchange ideas and learn independently and collaboratively online.

The key to Web 2.0's success in language teaching is not in choosing the most popular tool among students for classroom use but appropriate teaching design. These lesson plans must be rooted in L. Vygotsky's theory of social constructivism so that 'language learners learn to express their own thoughts or feelings in the language they are learning through a social constructivist process' (Wong 2011: 97).

Wong notes, furthermore, that there are three main roles for Web 2.0 lesson design for the teaching of the Chinese. Firstly, there are teacher-centric roles in which Web 2.0 tools are used to create and distribute learning materials, allowing limited teacher-student and/or student-to-student interaction. Secondly, there are student-centric roles in which students independently use Web 2.0 tools to create and share work, comment on others' work and to collaboratively build media content, while teachers simply play supervisory and facilitation roles on the side. Thirdly, both the above-mentioned roles can be combined, with teachers providing learning materials and discussion topics and actively encouraging students to independently create content or to suggest topics of discussion (Wong 2011: 98).

From a teacher's perspective, some benefits of using ICT to support Chinese Language teaching in today's Chinese as a second language context are:

- Encouraging students to listen, speak, read, write and learn outside the curriculum in great amounts.
- Data entered can be from real-life language sources in the world and exported material can be addressed to the world, easily forming meaningful input and output.
- Students can obtain timely feedback which can encourage them.
- Social media sites or collaboration sites encourage cooperative learning, such as class blogs.
- The platform creates learning progress reports that record student progress or edit counts.
- Different pages on the platform allow for individualised teaching. For example, a wiki teaching tool can have core pages, introductory pages and advanced pages for students to use the pages that match their own levels.
- ICT, especially Web 2.0 platforms, can be easily customised with a search function and links and supplementary information, such as links to online dictionaries or graphic functions.

- Collaborative websites allow students to self-assess and comment on classmates' work to get multiple levels of feedback.

Although ICT-oriented language teaching has many benefits, there are certain common issues to take note of for Chinese Language teachers in Singapore schools because most are still in the early stages of using online platforms to carry out interactive teaching. The reasons for this situation may be:

- Not enough computers in school computer labs or computers that often break down, inconveniencing students.
- Not all students have computers at home, which make it hard for some to carry out self-directed learning.
- Some students with learning disabilities need face-to-face guidance with teachers.
- Some students lack the self-discipline to learn online according to a timetable, delaying their learning progress.
- If students do not have Web 2.0 platform accounts, some administrative and technical issues will need to be solved before use (e.g. helping students register for accounts and inviting individual students to join teachers' websites), taking time and effort.
- When using Pinyin input, students may select similar-sounding incorrect words and should pay attention to fixing such typos.
- Students' privacy is a pressing issue, as cyber safety and consciousness is not well taught.

It is imperative for Chinese Language teachers to recognise and understand these problems in the Singapore classrooms, as only then can teachers use many different teaching strategies (including interactive teaching, collaborative learning and differentiated teaching,) to counter these challenges according to their teaching goals and need to help students learn independently online and transcend the limitations of space and time. When the ICT tools are sharpened, teachers do not just interact with students in the classroom but can also stimulate students to learn the Chinese outside the classroom with web resources.

Scholars including Wei and Yuan (2010), Xiao (2009), Yao and Liu (2010) and Zhong (2012) propose important points about supporting the language classroom with ICT. They discuss three areas of classroom management strategies and information technology support: (1) class goals and rules, (2) teaching design and (3) teacher development. Clear class goals and rules promote a structure for a good learning environment. Excellent teaching design helps students focus and learn effectively with reduced distractions. And good teacher development helps teachers continuously improve classroom management and related skills to ensure the effects of learning.

Class Goals and Rules

ICT-oriented classrooms are known to be even more manageable than the traditional classroom setting as the attention of students will be focused on the ICT and much less on the teacher or other teaching activities. Hence, to ensure teaching objectives are met, setting the class goals and rules are most imperative from the onset:

- Set class goals and individual student learning goals with students so that personal goals and class goals are streamlined in the same direction with ICT as the supplement.
- Have students participate in the creation of class rules, and have teachers support them using the Web 2.0 (such as a class wiki page, like an electronic class diary).
- Enforce class rules with students with using humanistic and positive guidance, and use ICT to help monitor and keep track of progress.
- Pre-lesson education to ensure that students clearly understand classroom management requirements and ICT skills.
- Create a positive outer and inner mood, carry out adjustments in stages for timely feedback and the continuing improvement of the ICT-oriented learning environment.

Classroom Activity Design

With growing popularity, the ICT-oriented activities are now being used in multifaceted methods: they can be in the form of tasks, and content can be embedded within the tasks to encourage students to focus on analysis, discussion, inquiry, conclusion and building an understanding and recognition in the process. They usually take place in small-group collaborations with heterogeneous groupings, where conditions are created for students to learn from each other, and online. Importantly, Chinese Language teachers need to be very clear of the following factors when engaging the students in ICT-assisted classroom activities:

- Whether the activity can inspire students to think and explore
- Whether the activity can encourage students to exchange ideas, communicate and solve problems together, by using ICT or face-to-face
- Whether the learning activity fits students' characteristics and abilities
- Whether the learning activity has a reasonable amount of material
- Whether the activity stimulates student interest and whether there is a sense of accomplishment on completion
- Whether the activity encourages students to learn subjectively

- How the multistage teaching sets up different tasks designed for students to choose from
- Whether there is adequate preparation of teaching resources, students, technology and teachers to optimise class time
- Whether there is succinct classroom talk that inspires student reflection and guides students towards discussion at appropriate times
- Whether the core learning material and tasks are placed in the golden periods (the first 5–20 min of class)
- Whether the choice and application of ICT can improve classroom management
- Whether there are varying ICT-oriented and face-to-face activities for students to keep focused
- Whether there is constant encouragement for students for sharing their findings online and in real life to keep them engaged

ICT-Assisted Activity Design beyond the Classroom

Mobile computers and hand-held devices are the future trend of technology-supported teaching, as they can extend teaching and learning beyond the classroom into a mobile learning environment. Students can use computers more freely, making out-of-class and outdoor learning, resource sharing and other benefits possible. Studies show that information technology encourages improvements in students' classroom performance but brings new challenges such as students using unrelated websites (Tan et al. 2014). When using mobile computers and hand-held devices, teachers have to pay attention to the three critical aspects of having clear and observable classroom goals, splitting small groups into individual duties and roles and nurturing students' independent study abilities.

Tablet PCs, and especially the iPad which was introduced in 2010, perform excellently, have a clean design, are portable and have quickly become a teaching supplement for many schools and students. Tablet computers will be the new trend in technological support of teaching in the future, and multisided experiments with them should be conducted in classrooms. New Zealand scholars Melhuish and Falloon (2010) noted the benefits and implications for innovative practices of integrating iPads into teaching. From 2010 to 2013, teachers in the UK, USA, New Zealand, Australia and other countries also held iPad classroom trials.

However, in Singapore, research and experiments in using the iPad in Chinese Language teaching are still in its early stages. Some of these early researches include the collaborative research projects to use iPads in teaching creative writing by Singapore Centre for Chinese Language, Nanyang Girls' High School and Bukit Panjang Secondary School. The specially designed iPad-supported creative writing lesson plans generated positive results in developing students' imagination and creativity and increasing their interest in creative writing (Tan et al. 2014; Puah et al. 2014). In addition, together with Nan Chiau Primary School and the National

Institute of Education, Singapore Centre for Chinese Language (Wong and Chin 2010: 69–84) organised Chinese language mobile learning research for learning Chinese idioms with smartphones. Their research clarified how computer-assisted language learning (CALL) conforms to how language learning theory moved from behaviourism to changes in communicative, situational and structural learning, integrating with mobile-assisted language learning (MALL) to form the 'second wave' of learning technology, changing teacher-centred classrooms into student-centred classrooms.

These early research have together showed that, compared to traditional teaching methods, mobile technology-supported teaching was better at enabling students to be more proactive and involved in discussions, as well as continuing their learning beyond the classroom setting. Teachers are not just teaching to students but acting as guides, participants, respondents and classroom observers. Their multiple roles give students more chances to express their creativity and resourcefulness independently. The positive and productive initial conclusions from these studies showed that mobile technology has great potential for Chinese Language teaching and learning and are definitely worth for future research and adoption by more Chinese Language teachers in Singapore.

Teachers' Professional Development

ICT-assisted pedagogy is more information- and student-centred than traditional teacher-led lessons. Although dependent on the development of self-regulated learning in students, these pedagogies actually demand that the teacher has superior guiding and facilitating skills that have to be attained via professional development. Based on the five aspects of self-regulated learning (which include strategic knowledge, self-efficacy, ownership, mastery orientation and self-reflection), Zhong and Xie (2004) suggest corresponding applicable ICT technologies that can be integrated into language learning (Table 4.5) and which can also form part of future in-service upgrading training (see Table 4.5).

Table 4.5 Aspects of self-regulated learning and possible corresponding ICT training

Aspects of self-regulated learning	Possible corresponding training of ICT technologies
Strategic knowledge	Expert systems, intelligent tutor systems, search engines, virtual reality simulators, multimedia teaching software, virtual classrooms, miniature worlds, bulletin board systems (BBS), newsgroups, chatrooms, video conferencing systems, message boards, problem-based and project-based learning (PBL)
Self-efficacy	Self-paced multimedia learning software, virtual learning companions
Ownership	Collaboratory, WebQuest, cognitive apprenticeship
Mastery orientation	Guiding CAI, teaching/experiment simulation software, subject databases, teaching test kits
Self-reflection	Electronic portfolios, concept maps, self-testing tools, case-based learning

In fact, some of the above-mentioned ICT technologies, such as BBS, newsgroups, PBL and electronic portfolios, are used to be employed by teachers trained in the Academy of Singapore Teachers and Singapore Centre for Chinese Language. However, most higher level ICT systems such as virtual learning companions and teaching or experiment simulation software are in fact quite foreign to our Chinese language teachers, because their previous training mostly concentrates on ICT literacy and know-how, instead of the rationale and philosophical aspects of ICT-integrated language learning. Such higher level training will be useful to expand the teachers' understanding and application of ICT in Chinese language teaching and can bring self-regulated language learning to a higher level.

In addition to the possible ICT training programmes, other more general professional development strategies which Chinese language teachers may undertake include:

- Being familiarised with experienced and effective classroom activity plans such as collaborative teaching methods in an ICT-oriented situation
- Continuously reflecting on classroom management problems, especially when using technology
- Experimenting and challenging oneself with more effective ICT-oriented tools and methods continuously
- Joining professional learning communities to learn from other teachers' classroom management experiences

Authentic Learning with ICT: A Possible Future for Chinese Language Teaching

Based on the discussion above and the educational trends today, the future of ICT-assisted Chinese Language teaching in Singapore looks bright and promising. Besides the numerous ICT activities that can contribute to the various aspects of knowledge construction, Singapore is also progressively moving towards technology-assisted, immersive and authentic learning in Chinese language teaching. An emerging trend of teaching and learning the Chinese language that has become more evident in Singapore in recent years is *authentic learning with ICT* (ALICT). This refers to using authentic materials and context for immersive learning in an ICT-assisted environment.

With the advancement of technology, the 'ICT' portion of ALICT will become more intuitive, humanistic and simple. It is the 'AL' or authentic learning part which requires the teachers' deep considerations and innovative design. We adopted the principles of problem design and process design for the immersive learning model from Hung et al. (2006), as well as reference from North Central Regional Educational Laboratory (2004), and believe these principles can help teachers understand the important design requirements for authentic learning as illustrated in Table 4.6.

Table 4.6 Authentic Learning Framework

A. Framing the *Authenticity*: questions, activities, subject knowledge		
1.	Questions	Come from real-life situations Contain learning points related to the syllabus Can be designed by teachers in collaboration with students Are multidisciplinary and direct students to solve problems
2	Activities	Students and teachers design plans to complete learning goals Have questions that contain multiple stages, scaffolding and encourage students to solve problems
3	Subject knowledge	Students are familiar with the subject knowledge needed to solve a problem; Students understand related concepts from different subject areas in the process of solving a problem
B. Designing the *Learning*: ownership, collaboration, monitoring, experts, tools, scaffolding		
1	Ownership	Students determine personal learning goals with the support of teachers and experts Students participate in different areas of the inquiry process, such as exploration, experimentation and reflection Students refine questions and participate in the problem-solving process
2	Collaboration	Students collaborate in small groups to solve problems together Students assign duties and refine duties according to the topic to achieve their goals Students complete the task through mutual reliance
3	Monitoring	The process is monitored, not the result More than one assessment tool is used Learners can self-monitor and assess their learning during the process, determining the range of assistance needed for their next activity
4	Experts	Experts and teachers provide: A guiding framework for exploration and problem-solving that simulates professional supporting tools and techniques Support for the inquiry process, metacognition, collaboration, communication and other aspects to narrow the distance between expert knowledge and skills and students Opportunities for students to play various roles in the problem-solving process
5	Tools	Students, teachers and experts use open access communication tools to complete the problem-solving process These tools mimic experts' tools in terms of the collaborative and dialogue-based nature of their problem-solving environment
6	Scaffolding	Scaffolding in stages gradually increases the level of complexity and variation in questions posed to students

In conclusion, with increased interest in ICT, we hope Chinese Language students will recognise and attempt to link the two rising trends of accessing authentic materials and using easily available ICT as early as possible. One of the fine approaches to associate these trends with the learning of the Chinese could be the appropriate framing of the authenticity problem and the designing of the learning strategies with the aid of ICT, so students and teachers can reap the benefits of ALICT in the long run.

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