International Journal of Chinese Language Teaching (2020)
Vol. 1 (2) 62-69 https://doi.org/10.46451/ijclt.2020.09.05

Interview

Computer-Assisted Language Learning in China: What Opportunities and Challenges Are We Facing?

An Interview with Jianlin Chen

Muqing Ma
Shanghai Polytechnic University, China

Abstract
Computer-assisted language learning (CALL) has developed rapidly in China in the past three decades, and its development history and future direction have been of interest to scholars around the world. Based on his own experience, Prof. Chen Jianlin gave a detailed explanation on the history of CALL in China, his viewpoints on language teaching, and the roles of teachers, students, and technology in CALL. Furthermore, he provided valuable insights into teacher development in CALL context. In the end, Professor Chen also offered an outlook on the future, believing that language teaching should be combined with artificial intelligence and smart learning.

Keywords
Computer-assisted language learning (CALL), artificial intelligence, smart learning

Dr. Chen Jianlin is a Professor at Shanghai International Studies University (SHISU), where he heads the research program of graduate studies in theory and practice of Foreign Language Education and Language Educational Policy. He has an MA in Descriptive and Applied Linguistics (University of Essex) and a Ph.D. in English Language Education (SHISU). Prof. Chen Jianlin worked on different issues in foreign language education related to curriculum development, education technology, web-based foreign language teaching and learning, teacher development in foreign language education, CALL course design, etc.

With a 15-collection TV Program of language education, around 10 books and some 60 articles and book chapters to his credit, Prof. Chen Jianlin has also been a Visiting Professor at several universities in China and America. Among his books are: Organization and Management in English Language Education; Theory and Methodology in Foreign Language Teaching Research; The Integration of Computer and Networks into Foreign Language Curriculum. His TV works "English for Primary School Pupils" shown on CCTV 2 (2004-2005), received the 2005 Award of first prize of Best TV Education Program from the China TV Educational Research Association (CTVERA). Since 2012, he is a vice-president of China CALL.

Address: 2360 Jinhai Road, Pudong District, Shanghai, 201209, China
E-mail: mmqsisu@163.com

You are well known for the research you have done on CALL in China. Can you tell us about how you became interested in this area?

My interest in CALL goes back to 1985 when I was studying for my master's degree in the UK. At that time, I was researching in the field of Descriptive and Applied linguistics, and I took a course called Artificial Intelligence (AI) in the university. Although I had a superficial understanding of AI from the course and the professor who taught the course was not optimistic about the future application of this technology in language learning as well, I began to realize it might be a trend for the language learning with the support of technology other than AI.

In 1994, I received a grant from the British Council to study Language Education Management and English Language Education at Kent University in the United States. I took a course called Language Learning and Technology taught by Stephen Bax, a very famous professor of CALL. As I was going as an associate professor, the university invited me to work as a teaching assistant on Professor Bax's research project, where I learned how to use WORD processor and saw that there were a lot of language learning exercises in the computers, such as cloze, multiple choices, reading passages, etc. Later, a professor from Birmingham University came to tell us about corpus linguistics, and showed us how corpus could help language teachers generate testing papers automatically. I felt so amazed. It was my first real contact with CALL, and I thought how well it would help Chinese students learn foreign languages. However, due to the lack of technical facilities and my major, I did not engage in CALL after coming back to Shanghai International Studies University (SISU). As I majored in Language Education Management and English Education, I mainly focused on these two topics and published two books about those areas. But there was no stopping then with my interest in CALL.

It was in 1998 when I joined the Shanghai Foreign Language Audio-Visual Publishing House (SFLAPH), and especially acted as the editor-in-chief of *Computer-assisted Foreign Language Education* that I really engaged in the profession of CALL. The earliest technology used in language teaching referred to equipment such as pictures, slides, and movie clips, but only later did we gradually shift to computers. Thus, the journal articles at that time mainly focused on how to use software, how to build language labs, and other introductory contents. After taking that position, I proposed that the future direction of foreign language teaching should be the combination of theory, methods, and technology. However, when I rearranged the journal and set up new columns, I found that not many people in China then knew about the concept of CALL, so I decided to try it myself and wrote the controversial article *From Assistance to Dominance: New Trends in Language Teaching with Computer* (2005). I initially proposed that "computers should become dominant rather than just auxiliary" mainly because people at that time always said that "computers are an assistive tool". However, I thought this view was not conducive to the College English Reform in China, and hindered the student-centered autonomous learning. Thus, I wanted to change people's perceptions, and tell them that computers are not auxiliary but leading. It should be said that my original idea of "computer-led teaching" was a bit radical, because computers are not human beings, and they do not have the inner emotions and lack the ability to control things completely as humans do. In real practice, there was little likelihood of "dominant" teaching, but it may play a dominant role in some situations, though not in others. Therefore, "dominant" and "auxiliary" are relative, and "from auxiliary to dominant" indicates the new trend of computerized foreign language teaching. But then I gradually realized that the best way to really change people's mindset of "computers play an assisting role" is to integrate it into the curriculum, so I proposed the idea that "computer networks and foreign language courses should be organically integrated".

Since then, my research interests have been on CALL, as I think it is more relevant to language teaching and sometimes can guide teaching. Currently, I think we have reached a consensus that technology and many industries have already been DEEPLY integrated, while the question is what to do

after such deep integration. Therefore, two issues are raised: 1) innovation, technology-driven innovation, and technology-enhanced innovation; 2) an unlimited number of resources, as a support for innovation. Big data and massive amounts of data and information will play a critical role in future development. I agree with the recent view that "the wealth of mankind will not be generated by the material we can see, but by the big data".

It is generally believed that behaviorism, cognitivism and constructivism provide a solid theoretical foundation for the overall study of foreign language teaching and learning, but you have clearly stated that "we need to re-examine our foreign language teaching and learning from an ecological perspective", that is, to employ ecological theories to guide the integrated foreign language teaching and learning. Would you please tell us the background of this view?

Stephan Bax suggested that CALL should be normalized, and I went even further, i.e., computers should play a leading role in integrating technology and curriculum. Later on, I wrote a book *The integration of Computer and Networks into Foreign Language Curriculum* (2010), indicating that researchers need to take an ecological perspective to the integration of technology and language curriculum and apply ecological theories to re-examine language teaching and learning. Of course, it should be noted that theories such as behaviorism, cognitivism and constructivism are still guiding foreign languages teaching so far. Behaviorism can at least let us know how our apparent behavior is characterized, believing that learning is stimulus-response; cognitivism goes a little deeper, exploring the inner mechanisms of human beings, believing that learning is also influenced by the inner psychology of human beings; and constructivism believes that human beings not only have inner mechanisms at work, but also have the ability to actively construct knowledge. It is precisely because human beings can actively construct knowledge that I pointed out in my article that constructivism is the theoretical underpinning of the concept of self-directed learning using computers, as advocated by the Ministry of Education in its reform of College English. However, although constructivism can explain the theoretical connotation of self-directed learning, it cannot explain how information technology can play a powerful role in the field of foreign language teaching. For example, when we use information technology for foreign language teaching, the equipment suddenly breaks down and the information technology cannot function. Therefore, I proposed to use ecological theory as a theoretical foundation.

The key of ecological theory is that each element in a system must find its proper niche when interacting with the surrounding environment. However, after the introduction of information technology into the foreign language teaching system, due to the failure to find a suitable ecological niche, the objectives of foreign language teaching, teachers' and students' concepts, teaching materials, curriculum arrangements, management methods and resource allocation have all changed, which results in many mismatches and breaks the harmonious balance of the original teaching system. In addition, after the integration of information technology and foreign language curriculum, such problems as the overuses, misuse and underuse of the information technology have emerged in the teaching, while the correct use of information technology is relatively rare. All of these indicate that after information technology has entered the foreign language teaching system, its function development is still quite low, and its superb and intuitive functions have not been fully developed in our teaching. Under such circumstances, in order to make proper use of information technology, to explore ways to solve the imbalance and bring the teaching system back to harmony and balance, it is necessary to break away from the traditional theories and re-examine our foreign language teaching with ecological theories.

We can see the CALL has been developed rapidly for decades in China. Can you tell us the history of CALL in China and how it has been developed?

In 1980's, it was actually "tools" that assisted in language teaching and learning, such as flipcharts, self-made models, self-made scenes, role play, simulation activities, etc. Later, slides, video clips and cassette tapes were gradually added to help language teaching. However, the use of these technologies was time-consuming and not cost-effective. With the development of the television universities in the late 1990's, short films became popular as tools for language learning. I still remember we made a lot of short films in the SFLAPH, which took us a lot of time, but were not used for more than one year. When the personal computers (PCs) became popular in China, there were lots of learning materials and software assisting students in learning languages in school labs or at home, as I had experienced in the UK. But the resources could not be shared due to the lack of network. The turning point in CALL's development was the advent of the network. The advent of Web 1.0 enabled the information to be linked within a local area network (LAN) breaking down the information silos; then Web 2.0 allowed language learners to interact on the servers and achieve interconnectivity. Since the problems of information silos and interactions were tackled, the Internet has been highly intelligent, which gave rise to many innovations, such as e-learning, Mobile Assisted Language Learning (MALL), Technology Enhanced Language Learning (TELL), Blended Learning, and Ubiquitous Learning.

The rapid development of Computer-assisted Language learning and teaching in China was attributed to the College English Reform from 2002. Our journal gained a great reputation as we published many articles concerning CALL. When the reform started, quite a few language teachers were at a loss at how to shift from teacher-centeredness to learner-centeredness in their teaching practice. Therefore, I wrote an article on *Learner-centeredness in Computer-assisted Classroom-based Multimedia College English Teaching model* (2005).

In sum, when China entered the WTO in 2001, CALL had not attracted much attention. With the advancement of technology, it has become an indispensable part of language learning. Especially since 2010, China's CALL has been developing rapidly. Now the technology is even more powerful, like Tencent Meeting can take several hundred people at the same time.

What roles do you think the teachers, the learners and the technology will play in future language learning and teaching?

As time goes on, it will be easier to promote and apply the technology in future language teaching because the learner is different. Previously, the language learners were the immigrants of the Internet, but after 2000, the technology has been deeply rooted in the minds of the learners and they have become the aborigines of the Internet. We would like to suggest that the normalization and integration proposed by CALL should be related to the changing characteristics of the learners, as the technology is becoming more and more accepted by the learners.

The change of the teachers' role is slower than the learners. On average, the teachers are ten to fifteen years older than the students. In the time of big data and technology, it is in fact the "immigrants" who are now teaching the "natives". Therefore, the language teachers' information and communication technology (ICT) competence must be rebuilt and further developed.

What are the biggest challenges in the process of teaching and learning language with technology?

The biggest challenge is educators' understanding of current technology and reality. Many teachers are very comfortable using technology in their daily lives but seem overwhelmed when teaching in class. I personally think it is due to three aspects: 1) the teachers themselves were educated in a more traditional way and have formed a preconceived mindset about language education; 2) although technology is a must in daily life, there are many alternatives in language teaching and they might choose the one they are more familiar with; 3) some teachers are psychologically weak or have technophobia. When it comes to content and course design, they feel fearful due to the lack of training.

At present, there are many teaching software and platforms for Chinese language education. The use of technology is advocated for everything from traditional textbooks to multimodal teaching materials. As Chinese is a hieroglyphic language, the pronunciation is much more complex than the English one, and relatively speaking, the combination of Chinese characters differs greatly from English in word meaning. If we can combine Chinese language education with technology, it will help a lot for foreigners to learn our language.

What is your viewpoint on language teachers' professional development with technology?

The professional development of language teachers is even more important in the new era. The initiative of "Internet + innovation" advocated by the Chinese government promotes teachers to work even harder. It is difficult to summarize the ICT teaching competence in one sentence. In the early stage, the teachers just needed to operate computers and certain software so that the learners could study effectively. While in the normalized stage, it was not enough for the simple operation, and the teachers were encouraged to create some learning materials in order to adapt to students' effective learning. Additionally, teachers were also required to possess the competence to categorize and reorganize the information resources and then develop something suitable for students' personalized learning. At the stage of integration, we should be able to use intelligent teaching environment and intelligent learning scenarios, integrate and make good use of the huge amount of ICT resources and give full play to teacher agency to further develop the existing teaching materials to maximize its effect, as I suggested that teachers need to have the ability to use living textbooks (make resource-based textbooks to its full extent). In order to make technology embodied in foreign language teaching, teachers should not only stick to the traditional teaching materials, but also understand that the teaching materials nowadays are multimedia, emphasizing the structured design, dynamic development, three-dimensional expression and visualization of the content. They contain not only text and graphics, but also sound, animation, video, and simulation of the three-dimensional scene, combined with the network of unlimited learning resources, so that the original "rigid book" evolved into a "living book". Therefore, with today's emphasis on the application of advanced technology and smart learning, our teachers should have the ability to use the "living book" for information-based teaching and learning, and focus on exploring and researching how to design a "living book" curriculum and how to put the "living book" into practice. The content of the "living book" is redeveloped and the teachers should know how students can learn the "living book" well.

Can you tell us something about your vision for the future of CALL?

On the basis of the proposed theories, methods, and technology now, two conditions will be added in the future. One is the intelligent condition of artificial intelligence technology as a prerequisite, and the other is who can mine big data well can stand on the high ground of language teaching.

The first one is the concept of high intelligence, which means that a computer can think like a human

and play the role of a human in teaching. Artificial intelligence technology makes the computer function highly intelligent, which means that the computer can think like a human being and play the role of a human being in teaching, so artificial intelligence technology can be regarded as the core technology in the process of informationized language teaching. Precisely, because computers have the function of anthropomorphic thinking, highly intelligent computer language teaching systems can humanize teaching behavior, naturalize human-computer interaction, rationalize the teaching process, rationalize complicated tasks by proxy, and so on. Due to the highly intelligent computer functions, language teaching systems can also achieve: 1) personalized teaching: the intelligent tutor system built by artificial intelligence technology can teach and provide help according to the different personal characteristics and needs of students; 2) virtual environment: artificial intelligence technology can make the teaching situation highly virtualized, which also means that teaching activities can be detached from the physical space and time to a large extent. 3) Automated management: Highly intelligent computer functions can automate teaching management, including computerized testing and evaluation, learning problem diagnosis, learning task assignment, etc. The current development trend is that intelligent computer network management systems can establish electronic profiles for all kinds of learners, including electronic works of students, records of learning activities, learning evaluation information, etc. In the 1990s, artificial intelligence technology achieved machine thinking and a high degree of anthropomorphism. Today, thanks to the emergence of digital information and network technology, the functional development of computers has entered the highly intelligent big data era, which can improve the teaching effect in an all-round and three-dimensional way.

The second is the concept of big data. With the application of artificial intelligence technology, the existing computers and other hardware and software devices in language teaching can easily accumulate and store huge amounts of data, i.e. big data. How to use these big data well? From an application perspective, we should distinguish between general "data" consisting of numbers and "big data". Big Data has its very essential characteristics, such as Volume, Variety, Velocity, Value, and other characteristics. In addition, the difference between Big Data and general data lies in the following: 1) general data can be handled by traditional data solutions such as databases or business intelligence technologies, while Big Data is not just numbers, but also rich in content, such as foreign language text, images, audio and video and other file formats, as well as blogs, microblogs, WeChat and other types of interactive information; 2) general data are structured data, while Big Data is not. Data can be structured, semi-structured, and also the unstructured data such as images; 3) general data is structured and regular, and results can be obtained through simple linear analysis; while the big data can be frequently interacted to achieve large-scale analysis due to its diverse structural states, and can also be unrestricted data mining according to real-time needs; 4) the analysis of general data is usually linear-simple, regular, and easy to manipulate, while the analysis of big data follows unknown rules, such as: combining multiple types of information to implement comprehensive simulations, analyzing evidence, evaluating hypotheses, responding to results, and then calculating likelihood and credibility to achieve the required data correlation. The super-intelligent capabilities of big data enable people to obtain a panorama of relevant knowledge more effectively. With these distinguishing features in mind, we can make use of Big Data in a systematic and purposeful way so as to promote changes in foreign language teaching and learning, such as: environmental changes (increasingly intelligent foreign language teaching and learning environments, mainly in terms of hardware and software, smartphones for students and teachers, apps for teaching and learning support, etc.), and the change of partial and holistic assessment (assessment is more complete and integrated, not partial assessment data, but holistic, because big data emphasizes the whole sample, and the data reflected and accumulated by foreign language teaching and learning are not fragmented but complete, so assessment appears holistic and comprehensive), the change of massive growth and use of resources (big data creates massive teaching resources that learners can choose to use and learn according to their own characteristics), the changes in people's habits of thought (the way they think of foreign language learning, the ideological function of language may play a role). At the same

time, big data can also help us achieve a more complete learning behavior analysis, such as: automatic recording of student learning online, collection of complete data on student learning (full sample), accurate discovery of key factors (such as motivation, anxiety, efficiency, etc.), targeted and effective improvement of learning behavior and teaching behavior (precise positioning and effective methods), and timely improvement and perfection of the curriculum and teaching based on the discovery and localization (based on data analysis).

It is true that language teaching and learning will change rapidly with the development of AI technology. You mentioned that smart learning will also be applied in language teaching in the future. Then would you please tell us your understanding of smart learning?

The concept of smart learning is closely related to the development of the Internet. Since the birth of the Internet in 1969, it has grown tremendously for 50 years. According to the statistics from Internetworldstats.com, there are approximately 4.5 billion internet users now. The Internet itself evolved from the initial under-connectedness to weak connectedness to strong connectedness. Until now, in 2020, the Internet is hyper-connected, implements AI governance, and has developed into an increasingly highly intelligent network. It can be said that in the first decade of the twenty-first century, the Internet changed lives, but now it has changed societies.

It is with the development of the highly intelligent Internet that we can create an intelligent learning environment and make smart learning possible, because an intelligent internet environment can provide effective support and assistance to foreign language learning in the following aspects: 1) Sensing the physical environment for learning and recording the learning process. A smart learning environment can monitor physical environmental factors such as air, temperature, light, sound, smell, etc., using sensor technology to provide a comfortable physical environment for learners. In such an environment, artificial intelligence technology can perceive and record learners' knowledge acquisition, classroom interaction, and group collaboration through motion capture, emotional computing, eye tracking, etc., track the learning process, analyze learning results, and establish a learner model, which provides an important basis for a more comprehensive and accurate evaluation of learners' learning effects; 2) Identifying learning scenarios and creating learning opportunities. Smart Learning Environment can provide learners with a huge amount of personalized resources and flexible learning tools according to the learner model and learning scenarios to promote effective learning. On one hand, smart learning can identify learning scenarios, including learning time, learning places, learning partners and learning activities, and the identification of learning scenarios provides support for the development of teaching activities. On the other hand, Smart Learning Environment can establish learning communities for specific learning scenarios, which support learners to connect and use learning communities effectively for communication and exchange, thus creating more learning opportunities; 3) Promoting easy and effective learning and integrated use of language. Smart learning is about creating an environment that is documented, context-aware and connected to the communityin order to facilitate easy and effective learning. Such foreign language learning not only embodies the technical features of smart learning environments, but also realizes the powerful functions of artificial intelligence technology, forms language learning input supported by the environment, triggers language interaction, and realizes the comprehensive application of foreign language skills.

Can you describe in detail about how the smart learning may change our current language teaching and learning both in and out of classrooms?

In the process of teaching and learning a language, people can adopt a variety of methods or approaches. In an ideal Smart Learning Environment, each learner can hold a smart mobile device (such as the iPad) with a screen size close to the size of a paper textbook, which can imitate all the functions of a paper textbook, such as taking notes, inserting bookmarks, making annotations and comments on it. This kind of "teaching materials" loaded on smart mobile devices are also called e-learning materials. The content of e-learning materials is multimedia, and the knowledge points are linked according to the semantic relationship, which can realize the personalized presentation of knowledge content; e-learning materials can be bound to learners' learning progress, realize the synchronization of learning data with cloud services, record learners' learning process, intelligently analyze learners' learning results, graphically present the analysis results, and provide guidance to learners' learning with teachers' comments. Smart learning, driven by smart Internet technologies, will make learning "smart" for learners in school, at home and in society.

In schools, teachers can use augmented reality technology to present a variety of realistic learning scenarios, so that students can immerse themselves in experiential learning and enhance their interest and motivation in learning. Teachers focus on explaining or demonstrating learning challenges (history, culture, religious knowledge in the language, etc.) based on student preparation and progress recorded by the system; they design a variety of learning activities using the rich learning resources provided by the intelligent system. Through the integrated instructional control system, teachers can flexibly control learning terminals and push relevant learning resources in real time; teachers can quickly group learners according to their characteristics to facilitate the organization of collaborative classroom learning. Students can use the convenient interactive tools provided by the web system to interact with peers and teachers. Teachers can get feedback from students at the first time and adjust their teaching according to the feedback to meet the needs of students.

At home, students can use electronic materials to prepare for class and complete learning tasks assigned by the teacher. The pre-study is based on a variety of different learning task requirements in order to choose a suitable way to complete the learning task. The intelligent learning system will automatically provide timely feedback to the learner on the completion of the task, give hints and answers to difficult questions, and give a structured diagram of the relationship between knowledge points in the task according to the main points of the learning tasks. The intelligent learning system will record the students' task completion in detail, and teachers can conduct targeted teaching and personalized guidance to students based on the statistics.

In society, a smart learning environment can sense the location of learners and actively push learning resources relevant to the learner's environment according to the location and the learner's learning style to achieve self-adaptive ubiquitous learning. In some cases, learners can be grouped according to their location and learners in the same location can be grouped together to meet the collaborative learning needs of students in real-life situations; it can provide learners with the most appropriate learning paths and the most appropriate learning methods. Smart learning environments integrate formal and informal learning to meet the needs of learners at school, at home and in the community.

In sum, the application of artificial intelligence technology to language teaching and learning is mainly reflected in the three aspects of intellectualization, big data and smart learning, and the application of these aspects is mainly due to the highly intelligent Internet. It can be said that without the Internet, Smart Learning Environment cannot be realized, and without the intelligence of the environment, smart learning is impossible to implement.

Funding

This work was supported by a Shanghai Polytechnic University Fund for research (EGD20XQD22).

References

Chen, J. (2005). Computer-assisted teaching or autonomous teaching. *Computer-assisted Foreign Language Education, 104,*9-12/49.

Chen, J. (2005). On learner-centeredness in computer- and classroom-based multimedia college English teaching model. *Computer-assisted Foreign Language Education,105,*3-8.

Chen, J. (2010). *The integration of computer and networks into foreign language curriculum: A research based on college English reform*. Shanghai: Shanghai Foreign Language Education Press.

Muqing Ma is a faculty member in the College of Arts and Sciences, Shanghai Polytechnic University. He got his PhD degree in Applied Linguistics at Shanghai International Studies University in China. His research interests include language teaching and learning, educational technologies, CALL teacher development, blended learning, ICT and second language acquisition.