

Chapter 1

Information and Communication Technology and Language Education

ABSTRACT

This chapter introduces the definition of Information and Communication Technology (ICT) and its concise history along the development of three generations of computers from 1940s to now. It then summarizes the influence of ICT on language education in general. Standalone computer software facilitates the knowledge and skills acquirement and transformation in language learning, including vocabulary, grammar, reading, writing, listening, and speaking, and boosts motivation and interest. The Internet and mobile technology supply not only unlimited resources and practice opportunities but also authentic communication via text or speech for language learners worldwide. Intelligent computer-assisted language learning programs can analyze the learners' text and speech syntactically and semantically, formulate corresponding responses, and provide comprehensive language resources and support. It is equally important to realize that language learning can improve the learner's information literacy, including the knowledge and skill to acquire and apply ICT in daily life, learning, and work.

INFORMATION AND COMMUNICATION TECHNOLOGY

Information and communication technology (Abbreviation: ICT) refers to the modern technologies dealing with information and human communication with the core equipment computer that can be connected by telecommunication technology with each other. The emergence of modern programmable computer is represented by Konrad Zuse' computer Z3 from Germany made in 1941

(Mainzer, 2007; Zuse, 1945) and by ENIAC from the USA made in 1946 (Goldstine, 1993). The first generation computer was initially designed mainly for military calculation, and was a very expensive and giant computing instrument with totally thousands of vacuum tubes and miles-long wires. The second generation computer, coming into birth from 1955 onwards, was composed of transistors, which needed smaller space and less power than vacuum tubes. The explosive use of computers began with the third-generation

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computer, making use of the integrated circuit (or microchip) during the 1960s that led to the invention of the microprocessor. Microminiaturization and powerfulness characterized computers' development from first generation to third generation. The popular use of computers in offices, workplaces, schools, universities and colleges, as well as in households, has been available due to the development of large-scale integrated circuits and their usage in computers since 1980s, as well as the development of more convenient operating systems and application software constructed on the hardware. According to Daniels (2002), ICTs have become one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and knowledge of ICT as part of the core of education, alongside reading, writing and numeracy.

The computer hardware comprised of microchips looks like the physical body of the computer, while the computer software looks like the soul, spirit and thought of the computer. The software included system software and application software. System software mainly refers to operating system. Operating system evolves from UNIX and DOS that solely use command lines to control the computer, to Windows, Macintosh, IOS and Android that mainly use graphic interface to control the computer. Because in the command line form of an operating system, the user should input concise English words or abbreviations together with some attached parameters like "type" or "dir" (the abbreviation of directory), fundamental English language knowledge is required to drive the computer. On the contrary, the graphic interface of an operating system since 1980s enabled the easy and convenient usage of computers for every user who just needs to distinguish the icons or simple label symbols in the user's mother tongue. The more and more powerfulness of programming language from imperative forms to declarative forms, from machine language to object oriented programming language, have created innumerable application software for different kinds of contexts

from business, industry to office and education. However, until nowadays the fundamental English language knowledge is still required to become a master of any programming language, because all the programming languages are written in English.

Modern electrical and electromagnetic telecommunication technologies evolved from telegraph, telephone, wired and wireless networks, radio, microwave transmission, fiber optics, communication satellites and finally to the Internet. The Internet connects computers and transfers multimedia information to every corner around the world, just as the nerves connect the neural cells in the human brain and transfer biological signals in the human neural network. Emerging in 1980s and popularizing through 1990s, the Internet enables instant and low-cost human-human communication by electronic mail, instant messaging, Voice over Internet Protocol (VoIP) phone calls, two-way interactive video conference, and World Wide Web (WWW) that provides functions of websites, discussion forums, and social network systems including blogs, micro blogs, video broadcasting and sharing. With those information production and exchange capability, the Internet has great impact on social, economic, political and educational development and reform worldwide. In the new century, the portable mobile phones and tablet computers combine the computer technology with third generation (3G) mobile telecommunication technology, and enable the seamless access to Internet anywhere anytime.

LANGUAGE EDUCATION

Language education refers to the educational process for a human being to acquire the knowledge and skills of a human language. With those knowledge and skills he or she can communicate with other natural people or artificial objects in the world with the same language through oral utterance or hand-written texts or machine-printed texts. The aim of the communication is informa-

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