Utilizing Digital Technology to Achieve Leapfrog Learning

by

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Abstract: With the increasing explosion of human knowledge, it is necessary for people to undertake cross-space learning, cross-time learning, and eventually achieve education Leapfrog capabilities. The emergence of digital educational media has made these capabilities both desirable and highly likely.

In the past decades, with the speedy development of modern technology, the quantity of human information has been accelerating, and we are now in the era of knowledge explosion. It is estimated that inventions and discoveries made every ten years since the end of the 1950s have been much more numerous than those in the previous two thousands years. The time taken for doubling our knowledge and the degeneration of knowledge is getting shorter and shorter. The emergence of "knowledge-based society" is changing the global economy and the status of education. It has posed some new requirements for learners: first, they must improve their learning capabilities, enlarging the volume of their learning and shortening the process of knowledge mastery; second, they must pursue lifelong learning; and third, they must construct innovative thinking and inquiry learning. To achieve these goals, the advantages of digital technology should be fully utilized and applied to learning. The utilization of digital technology can construct an ideal learning environment, with brand-new communication mechanisms and rich teaching resources. This environment can support the creation of real and virtual situations, the sharing of teaching and learning resources without limitations of time and space, speedy and flexible information retrieval, varieties of interaction, and cooperation without regional boundaries. The application of digital technology is conducive to the cultivation of learners' creativity, discovery, and inquiry. This in turn will help form a brand-new learning style which can not only exert the functions of teachers' guidance, but also guarantee learners' autonomous learning. To meet the rapid changes in society, education will need to perform three Leapfrogs: Leapfrog in space, Leapfrog in time, and Leapfrog in capabilities, all of which can be achieved through the application of digital technology in education.

Leapfrog in Space

With the development of science and technology, we have realized industrial globalization; and the multiplicity of global industries has enabled the increasing growth of the global economy. It follows that only through the realization of educational globalization can educational resources be used to best advantage to help achieve rapid educational development. Networks have provided the platform for cross-space learning. Departments of education at different levels in China are making great efforts to develop web-based educational resources and first-class courseware, and to offer long distance web-based courses. However, these web-based resources are far from enough, and leave much room for improvement. In particular, it should be noted that global education sharing mechanisms have not been established as yet. How to achieve educational globalization demands our constant exploration. It should not only overcome the barriers in technology, but Leapfrog over the mental and cultural differences.

Leapfrog in Time

In response to the knowledge explosion, learners have to learn better and learn more within the shortest possible time. Therefore, it is necessary to Leapfrog in time. Digital learning can help achieve this goal. First, networking can help people obtain the latest information within the shortest time; second, digital media technology can provide data, text, pictures, audio and visual information. According to Edgar Dale's *Cone of Experience,* compared with verbal and visual symbols, audio and visual teaching aids in the middle of the Cone can provide learners with experiences more concrete and easier to understand. This can not only break through the limitation of time, but also make up the deficiencies of other direct experiences. Digital knowledge can help learners more effectively and more rapidly master knowledge in skills, basic human knowledge, and situational knowledge related to specific times and places. The latter is based much more on learners' real experiences, and requires the existence of particular social relationships and real situations. Nowadays, the development of digital technology, through simulations and virtually "real" situations, can establish and optimize environments for learners' mastery of skills, construction of knowledge, and development of social relationships. The goal of these efforts is to achieve enhanced capabilities in real environments. In addition, through digitalized learning, learners can independently control the contents and pace of their learning, monitor the learning process, greatly improve the efficiency of their learning, and achieve optimization of the time for knowledge mastery.

Leapfrog in Capabilities

With the accelerating update of knowledge, humans usually cannot predict new knowledge of the future. This makes it a MUST for learners to pursue lifelong learning and inquiry learning. By using super-text and multimedia technology, digital media can construct text, sound, picture, audio and visual information organized by

super links, which can enable users to find needed media information in efficient and ideal ways. The linear organization of information is in line with human cognitive styles and thinking habits, so it is favorable for learners' autonomous learning. In multimedia / computer interaction learning environments, learners can choose their learning contents according to their own learning proficiencies and interests. Learners can make independent inquiries and choices instead of being dominated by the teacher as passive receivers. Learners can collect, analyze and process information by means of digital media, and personally feel and experience the generating process of knowledge in the course of inquiry. They can establish outcomes with social and individual values, thereby understanding the needs of contemporary and future society. At the same time, learners can also grasp various ways of learning, possess comprehensive capabilities of receiving information for analyzing and solving problems, and form innovative mindsets. By learning to discover and even to create problems, learners' capabilities will be highly expressive of education Leapfrogging.

Facing the accelerating changes of science and technology, human educational thoughts and modes of education must be changed to adapt to the accelerating changes of knowledge. To achieve Leapfrog development is an important part of innovative education, and digital education is an important route to promote Leapfrog development in education. The application of digital technology, especially Internet and multimedia, has brought revolutionary changes to education. The establishment and improvement of modern long distance educational networks has made education Leapfrog over the boundaries between countries. It has also changed educational contents, styles and ideas with leaps and bounds. Leapfrog development in education is not so much an adjustment of educational strategy as a change of thinking style a shift in paradigm. Therefore, we must strengthen our innovation awareness, break conventional thinking, and dare to leap over our former thinking.

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