

The Significance of Leapfrog Education Development in China

by

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Abstract: Leapfrog development in education can be classified as 1) Leapfrog development in macro education, which involves Leapfrogging in space, time and quality; and 2) Leapfrog development in micro education, which involves Leapfrogging in the era of curriculum programming, the starting point of teaching, and the growth level of individual students. Implementation of Leapfrog education development strategies is of special significance to developing countries like China. First, it can rapidly narrow the education gap between China and developed countries. Second, it can promote the balanced development of education among regions within China, achieving distributed educational equality and the sharing of best educational resources. Third, it can promote large-scale improvement in the quality of teaching. And fourth, it can explore students' potentials to the utmost extent, enabling them to reach international horizons on the "highland" of the future.

Key words: *Leapfrogging; education; significance*

Looking back at the development of the world's politics, economy, education, culture and many other fields, we always find that some countries, enterprises and schools turn into newly rising forces, and become rising stars. Around the 1760s, England took the lead in carrying on the Industrial Revolution, which had a profound influence on the whole society. Thereafter, England became the most formidable capitalist country in the world for quite a long time. But America caught up with and surpassed England through Leapfrog development in the late 19th century, and further consolidated its status as the world's most powerful country after World War Two.

Starting from the mid-1960s, the "Four Little Dragons" of Asia (Korea, Hong Kong, Taiwan and Singapore) developed their economies at top speed for more than 30 years, and created miracles of economic growth achieved through Leapfrog development. This growth has become known as the "East Asia model," one which has attracted worldwide attention. Since the 1980s, China's economy has been achieving similar Leapfrog development with its GDP leaping to the fourth largest in the world by 2006.

In the business world, through America's Microsoft Corporation and the Haier Group Corporation in Qingdao, China provides a good example of economic Leapfrogging. In the field of education, German universities outdid their counterparts in other countries

(such as England and France), and ranked first in the world in 19th century. In the 20th century, American universities became a new rising force, attracting extensive attention in the field of education. Such rising stars were a result of the Leapfrog developments in education.

It is evident from these examples that Leapfrog development is universally existent, and Leapfrogging is possible in every field. In November, 2004, Microsoft Corporation held the international forum on informatization in Singapore. In its branch forum on education, conferees stressed the need to use information technology to promote educational reform, and proposed to achieve Leapfrog developments in education through utilizing information technology.

What we are calling Leapfrog development means using leading ideas advanced planning to overcome enormous difficulties in conventional development; to catch up with and even outstrip incumbent leaders by shortening development and application timelines. Of course, Leapfrog development needs solid foundations, clear direction, and superior contents. It is also important to refer to others' experiences, to observe the paths they have taken, and avoid slavishly emulating others' histories in order to seek shortcuts – faster, better ways to becoming number one.

Leapfrog development in education can be classified into types as follows:

Types of Leapfrog education	Contents of Leapfrogging	Basic characteristics
Leapfrog development in macro education	Leapfrog in time	Using less time than incumbents; Catching up with or outstripping them;
	Leapfrog in space	Achieving educational cooperation within a region, a country, even the world; Realizing the sharing of high quality educational resources;
	Leapfrog in quality	Educational ideas in line with international practices; advanced educational contents; flexible teaching methods; exploring students' potentials; prompting students' development;
Leapfrog development in micro education	Leapfrog in the era of curriculum programming	Fostering talents for the future generations with a leap of at least 20 years ; Cultivating today's children by projecting social developments 20 years later;
	Leapfrog in the starting point of teaching	Starting teaching not at the actual developmental level, but at the level of potential development, namely, the Zone of Proximal Development (Vygotsky);
	Leapfrog in the growth level of individual students	Gradual growth of children; Necessity of individual child guidance to promote constant Leapfrogging over their actual developmental level.

Implementation of Leapfrog development strategies in education is of special significance to developing countries like China. Just as the types and contents of Leapfrog development in education vary, their significance is also displayed in various ways.

1. Leapfrog development can rapidly narrow the education gap between China and developed countries.

Nowadays, China still falls far behind the developed countries, not only in economic strength, science and technology, but also in education. As early as 1983, DENG Xiaoping, the late Chinese senior leader, wrote an epigraph for Beijing Jingshan School, which says “Education should be oriented to ... modernization, to the world and to the future.” Actually, this means China’s education should be constructed by focusing on international standards and the requirements for talents in the future society. Although it is a big leap, it is achievable. Indeed, the “bottom line” is that developing countries like China have no choice but to adopt Leapfrog development as their educational development strategy.

2. Leapfrog development can promote the balanced development of education among regions within China, and achieve educational equality and the sharing of best educational resources.

China has the largest population and the largest education system in the world. As a result of the great differences between regions, including urban and rural, education gaps within China are enormous. Therefore, how to help underdeveloped areas achieve Leapfrog development and catch up with/exceed more advanced areas is an important issue facing China’s educators. The formulation and implementation of distance education programs offers a feasible and effective approach to Leapfrog development of China’s universal education.

Since 1994, interactive web and multimedia-based technologies applied to modern distance education have already taken off in China, following a comprehensive plan developed in 1997. The Modern Distance Education Project mainly includes the following aspects: high-speed hardware transmission platforms; online colleges of education supported by key universities; shared software platforms and tools; courseware and tools used for teacher training; links between universities and the schools; and implementation of the Anti-poverty Project for West China among other measures. In addition, the National Teacher Education Network Alliance Program was implemented to construct a system of lifelong learning for teachers of middle and primary schools, which greatly promoted Leapfrog development in teacher education.

The development of modern distance education offered a broad space for Leapfrog developments in education and has begun to enable these. In October 2000, the Chinese Ministry of Education began an all-round implementation of the Campus Access to ICT

Program. In April 2000, the Chinese Ministry of Education held an experience exchange conference on modern distance education in Hunan University, where it proposed Leapfrog development strategies for modern distance education.

3. Leapfrog development can promote large-scale improvements in the quality of teaching.

HE Kekang, a professor at Beijing Normal University, started to carry out education Leapfrog experiments in September 2000. He pointed out that Leapfrog development of education does not refer to Leapfrogging in speed and in scale, instead it should focus on Leapfrogging in the enhancement of educational quality. He proposed that there are at least two preconditions for Leapfrogging in the quality of education. The first is informed by scientific theories on the integration of information technology and curricula. The second is the theory-driven innovation of teaching in related subjects. In an experiment which involved hundreds of classes and thousands of students, it was established that, without extra lesson periods and extra burdens for students, the ability of second graders to identify Chinese characters, to read and write can reach the level of the fifth or sixth graders, and the fourth graders' English listening and speaking ability can reach the level of students at the seventh or eighth grade. After observing experimental Leapfrogging schools in Changping District, Beijing in March 2005, a group of visiting scholars from the United States, including Dr. Ritchie, professor from San Diego State University, and Seymour Papert from MIT and the founder of LOGO language, commented that the experiment had proven to be impressively effective.

4. Leapfrogging development can explore students' potentials to the utmost extent, and enable students to obtain international horizons on the "highland" of the future.

The theory of "Zone of Proximal Development"(ZPD) put forward by Vygotsky in the early 1930s has been widely applied all over the world. This theory contains the idea of Leapfrogging "the actual developmental level", which refers to the results of children's development cycles and the development level of psychological functions formed from them. ZPD refers to the level that children are reaching for - forming, maturing and developing it. Vygotsky proposed that teaching should be oriented to the children's future instead of their past. In other words, localization of teaching levels should be determined by children's ZPD rather than their actual development level. This means Leapfrogging from actual development level to potential levels. In the development of Leapfrog education in China, attention should be paid to the following:

Leapfrog development should be coupled with other development models. Both Leapfrog development and developmental "phases" should be included in macro decision-making. The development of individuals also needs a combination of Leapfrogging, retrospection, and reflection.

Leapfrogging should be realistic and not too big. Leapfrogging in time spans cannot be too long; for the longer time span, the more uncertainty and unpredictability may develop. Too long a time span could lead to less speed with more waste, “tripping” and “falling”.

Leapfrogging needs a solid foundation. It cannot expect to achieve everything. The Leapfrog development of education must be based on contextual conditions and firm foundations. Properly developed and applied, however, Leapfrog holds great promise for education in China.

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