**Application of Modern Distance Education Technology to Farmer Training In China**

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**Abstract**

Distance education aided by modern communication technologies offers an unprecedented excellent technical support to rural education and farmer training. Distance network system based on satellite communication technology plays a key role in the establishment of rural-area information service. The development of rural distance education targeted to farmer training in China in recent years was summarized, and the achievement of construction and application of technology platform of modern rural distance education in Jiangsu Province of China was introduced.

**Keywords**: distance education, farmer training, satellite, agricultural informationization

**Introduction**

In recent years, along with the civilianization of satellite technology, the popularization of CATV (Community Antenna Television) and rapid development of internet-based communication, the Chinese government has made significant progress in promoting application of modern distance education to rural-area information service and farmer training, in addition to knitting distance education into traditional education.

Although internet-based distance education has caught great attention, using communication satellites is the most effective way to realize a large-scale transmission of dynamic images of teaching programs and real-time bidirectional interactions, especially when the receiving spots are abundant and dispersed. With the advantages of wide coverage, high-quality information, simple operation, and low-cost, satellite broadcasting is considered to be an appropriate technology to transmit distance education information in China.

**Current Situation of Application of Modern Distance Education Technology to Farmer Training in China**

The current internet has a relatively short construction period and the bandwidth of backbone network meets the demands of data and text transmission, however, it still can not qualify the transmission of multimedia information. Due to differences in the network hardware and operation systems, bandwidth and delay differ in each section of network, which will bring more difficulties in achieving rapid transmission and remote call on internet. Meanwhile, being short of network basic facilities, people have little access to internet in many rural areas. Considering the difficulties mentioned above, it is necessary to transmit coursewares by means of digital satellite broadcasting rather than by internet. Distance education based on satellite
communication technology has incomparable advantages over other media, such as low investment, fast initiation, no spatial-temporal limitation, broad frequency band, and wide coverage, leading to a high-quality multimedia information transmission of images, videos, audios, texts and so on.

The practice has indicated that the advantages of satellite communication technology are very obvious in performing distance education especially rural-area informationization service. Since distance education was carried out in China, satellite has been the main means in Tsinghua University as well as Central Radio and TV University, Renmin University of China, Chinese Agricultural University, College of the People's Liberation Army, and other universities.

At present, distance education for farmers has become a key project of China's “Eleventh Five-year Plan”. The State Ministry of Science and Technology has not only listed rural distance education technology into the key extension program of national science and technology, but also included its base construction into the Spark Program, propelling forward designedly and targetedly.

In 2003, Jiangsu Academy of Agricultural Sciences undertook the project of “Jiangsu Farmer Distance Training Project Construction” supported by Ministry of Science and Technology, and officially launched the construction of Jiangsu modern rural distance education base. In 2004, sponsored by Jiangsu Academy of Agricultural Sciences, Jiangsu Rural Distance Education Center (JRDEC) was officially established and has fifteen staffs. JRDEC includes resource department, network department, training department, and other relevant departments, which are equipped with video recording and editing equipment and other special equipments. In addition, the center has a multimedia studio, a studio for experts to give lectures, and a network center and other workplaces, covering an area of 1200 m2.

In May of 2004, an assisting website of Jiangsu rural distance education (www.jsrde.cn) was opened, with ten sections currently, such as news summary, world agriculture, agricultural express, video broadcasting, reference information, market updates, topic databases and so on. It cooperates with satellite broadband network, connecting the “satellite net” with “internet” for distance education. Now, JRDEC has become a comprehensive platform for modern rural distance training by integrating main station satellite, resource construction, courseware development, base services and network assistance.

According to the current status and farmers needs, JRDEC has purchased and made varieties of multimedia coursewares and agricultural databases featuring the latest scientific and technological achievements and applied techniques in agriculture of Jiangsu Province by employing digital technology for systemic classification and integrated processing, and has established an expert bank for farmer training. Now standard technical workflows of multimedia courseware making has been set up, that is, in the light of ten sorts of practical technologies, adopting popular science form such as television and the way of experts giving lectures to make multimedia coursewares. To date, the multimedia teaching resource library has owned over 4000 hours in time, and more than 80000 programs in number.

**Technical Design of Rural Distance Education Platform**

**Network Topology**

Taking VSAT satellite broadband network as backbone and combining with internet and cable television networks, broadband distance training and information service platform of
agriculture (BDTISPOA) covering the whole province has been established, which forms rural-area information service network beyond spatial-temporal limitation.

Courseware Resource

By systematically classifying and comprehensively processing the latest scientific and technological achievements in agriculture of Jiangsu Province, multimedia coursewares and agricultural knowledge databases have been constructed. Information services are provided for rural area of Jiangsu Province through BDTISPOA so as to broadcast agricultural science and technology. Multimedia courseware, as a main training resource, has three types:

① Lectures delivered by experts. This type of coursewares is produced by making full use of scientific and technological achievements and advantages, inviting the well-known experts in the academy, on-site video recording, and post-production assisted with caption and images.
② Combination of lectures and reality video. This type of coursewares demonstrates operating processes to the viewers by experts explanation combining with reality pictures.
③ Popular science and education film. This type of coursewares takes real science as the primary part and a specific technical theme as an unit, and makes the popular science teaching film of agriculture. Above coursewares have about 30 minutes running time, WMV streaming media formats, video dimension: 640 × 480, encoding rate: 512 Kbps, which meet the standards established by the Ministry of Education.

Running Mode

Jiangsu rural distance education center, as the management platform, transmits multimedia training coursewares by renting Asia 3S KU-band transponders. The “567” service mode is employed, which is five hours and six coursewares daily, and 7 days per week, with the local station logged in downloading or watching anytime.

As an auxiliary net, Jiangsu rural distance education network (http://www.jsrde.cn) posts course notice and courseware introduction, questions and answers section, and consultation. It provides the local station with technical guidance using telephone or e-mail. The special topic information can be downloaded in batch.

Base Construction

Base construction of rural training and training implementation can be divided into three types: The first is that the satellite ground receiving station automatically receives and downloads training coursewares transmitted by satellite to the local computer hard disk. The station broadcast them or have viewers watch and study through projectors or large-screen TV. Second, through satellite router connecting the local LAN server, coursewares can be received, downloaded and stored in the local LAN database. Users watch and study through video-on-demand. Third, in townships that large popularization of cable TV, training coursewares through channels set by the broadcasting station of cable TV are watched and studied individually, therefore, resolving the problem of agricultural information service, i.e., the “blind spot”.

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Jiangsu rural distance education center goals to develop modern agriculture, to construct modern rural areas and to train modern farmers, makes full use of scientific and technological advantages and knowledge resources of the Jiangsu Academy of Agricultural Sciences to resolve the problems confronting agriculture, rural areas and farmers of Jiangsu, increases rural labor force employment opportunities, develops agricultural science and education, sets up the specific satellite channel supported by the satellite communication platform of Asia 3S which combines with the internet to transmit coursewares, and carries out various agricultural technology training and information services. To date, over 120 subsections of modern rural distance training center and training bases covering cities, towns and villages in the whole province have been established. Since 2003, more than 50,000 coursewares have been transmitted in succession adding up to 25,500 hours. During transmission, signals have been kept quite stable and fast.

Since establishment, JRDEC has trained 371,500 farmers and has helped the transfer of rural labor force and the application and extension of agricultural practical technology through satellite receiving stations. Training contents including topic trainings for agricultural science and technology extension personnel, how to start a small or home business for farmers, and special breeding, which were warmly welcomed by farmers, was reported widely by provincial radio stations, TV stations and newspapers. In October 2006, recommended by Ministry of Science and Technology of China, Jiangsu Rural Distance Education Platform took part in the European agricultural science and technology exhibitions held in Spain, and was paid close attention by visitors from all over the world. Between October 31 and November 4 in the same year, Jiangsu Rural Distance Education Platform was awarded the “Outstanding Exhibition” in the sixth ASEAN exposition, “The 20th Anniversary Exhibition of Achievements of the China Spark Science and Technology” held in Nanning, Guangxi Province.

References