During the past decade, Julong Educational Technology Co., Ltd. (Julong*) has been committed to the education industry and has developed into one of the leaders in the global interactive whiteboard industry and the domestic education informatization. Julong owns China's largest modern standard workshop of interactive electronic whiteboard and supporting devices, with designed annual capacity of 20,000 sets, and is the undertaker of many national projects and key research subjects of the Ministry of Education. Julong interactive electronic whiteboard serves education users in more than 60 countries and regions around the world, leads the domestic industry in terms of production and sales volume, and boasts the largest market share in overseas high-end markets including Netherlands, Portugal, India and Thailand, becoming a top brand of interactive electronic whiteboard in China.

Challenges

• Interactive teaching is popular due to rapid development of information technology: the development of information technology brings a new charm to interactive teaching, which develops faster due to the more effective teaching mode. The new teaching innovation mode cannot be continually implemented without a powerful computer platform.

• Inconvenience in maintenance and update of information devices: the increase of interactive Internet teaching products brings problems in management and maintenance, and adds to the teaching costs of the school. A more effective method is needed to address this issue. At the same time, the advancement of new technology calls for continuous platform upgrading capability. How to upgrade the whole system while keeping growing the original investment becomes a new challenge for the school.

Solutions

• Rely on IPSS modular computer to promote interactive teaching: the IPSS specification introduced by Intel is based on the Open Pluggable Specification (OPS) prevalent in the industry. While being fully compatible with the original OPS design, it adopts the solutions based on the newest 4th generation Intel® Core™ processor, boasts stronger CPU and GPU computing capability, and integrates Intel® Active Management Technology (Intel® AMT) and ultra high-definition display functions. Based on this product, Julong has developed a series of interactive teaching products with smooth interaction experience and result, which effectively support the development of smart interactive teaching mode.

• Rely on Intel® Active Management Technology (Intel® AMT) to reduce field maintenance cost and achieve the energy conservation and environmental protection objective: Intel AMT supports auto on/off, and provides virtual field maintenance and problem diagnosis, thus significantly reducing the maintenance costs and management difficulty of interactive teaching products while saving maintenance costs and time.

Influence

• Explore the new development of teaching mode through interactive teaching: with the help of information technology, interactive teaching is carried out in many locations, which is an active attempt on the way of finding new teaching mode. IPSS and the series of technologies including Intel AMT have effectively driven this process and pave the way for the promotion of interactive teaching.

Education informatization has been a common consensus of the industry in the information age. However, how to truly reform the education industry by informatization instead of simply bringing computers and the Internet to the campus? We should think over this question: how should the traditional education industry change the concepts, integrate information technology into the process of teaching and learning, and create a new teaching mode which will be an important driving force for the development and transformation of teaching mode.
With Intel's technical support, Julong* has integrated a series of interactive products into the interactive teaching process. The interactive teaching mode becomes richer and the interaction between teacher and students becomes more active. Active and effective exploration has been made in the development of interactive teaching.

Apparantly, interactive teaching mode is an effective exploration. With the leap forward of interactive technology, the focus of teaching mode has shifted from simple preaching to the interaction between teacher and students and among students. Leveraging Intel's technologies and products, Julong has introduced a series of interactive products in the interactive teaching process, and achieved huge success in a series of practices.

In the eyes of Liu Xiaoling, a student of Mudan Primary School, she is having fun in the classroom because of a new teaching mode: the teachers are giving lessons in a variety of forms, and she can communicate with the teachers and classmates in many ways. Having lessons does not been sitting quietly and listening, but discussing and having fun during teaching and learning.

The change started from the implementation of interactive teaching after Mudan Primary School introduced a series of interactive products launched by Intel and Julong. According to a teacher from Mudan Primary School, “Interactive teaching came into existence a long time ago, but was not implemented on a large scale due to technology and tool restrictions. Now, we are finally able to carry out interactive teaching with the help of electronic devices.”

In fact, this teaching mode has been implemented by many other schools and even achieved better teaching experience. “Interactive teaching is a teaching mode of the future. The interactive class built on education informatization inspires the kids to think, explore and acquire knowledge by themselves. It is an important step of efficient education. The implementation of the pluggable, modular, controllable interactive LCD whiteboard system launched by Intel and Julong* has effectively driven the accomplishment of our objective,” said Huang Guangai, a teacher of Primary School attached to Shenzhen Bao'an Middle School, who has just completed a wonderful “multi-angle thinking training” demo class.

After Mr. Xiong wrote a question on the electronic whiteboard and provided a simple introduction, the kids discussed around the interactive desk and worked together to find the right answer. According to Mr. Xiong, “That is the typical ‘subject discussion method’ in interactive teaching, which has five steps – providing subject, bringing up questions in the subject, discussing the questions, finding answers, and summarizing. The teachers are responsible for the first two steps, the students dominate the following two steps, and the teacher or student representative will finally make a speech on the subject.”

This “multi-angle thinking training” shows us that the series of Intel® processor-based products from interactive LCD whiteboard to interactive desk have effectively helped teachers and students in the school build an efficient, stable, smart and interactive teaching environment, and created a new learning environment.

In addition, the application of IPSS has benefited the school in terms of the maintenance and update of interactive teaching products. The teachers are able to truly focus on teaching instead of IT devices. IPSS technology consists of a modular industrial PC based on Intel® architecture, adopts Intel Core processors, covers such storage devices as memory and HDD, and is fully compatible with its previous version – OPS that was widely adopted in the industry. Intel AMT allows the maintenance personnel of interactive teaching products to remotely fix and maintain problems, or even complete fault investigation and recovery in case the remote system is closed, the OS crashes or the HDD fails. This will save the school a lot of expenses and time for management and maintenance, effectively reduce the TCO of interactive teaching, and save the energy consumption.

In the future, Intel will work with Julong to promote more interactive teaching products to all areas of education, so that the effective teaching mode – interactive teaching will be accepted by more people and benefit more teachers and students.

**LESSONS LEARNED**

- **Interactive teaching method**
  Interactive teaching is a teaching mode which allows mutual discussion and communication between teacher and students and among students. It highlights question guiding, scenario creation and problem solving through interactive collaboration. Different teaching modes shall be formed according to questions and scenario settings. After the introduction of electronic interactive whiteboard, teachers can give full play to the features of interactive teaching, better control and manage the class, leverage the wide range of interactive resources, and attract students to participate in subject discussions.

- **OPS**
  Open Pluggable Spec., formulated in 2010 by Intel, Microsoft*, NEC* and Taiwan Digital Signage Association, currently has more than 30 ecosystem partners in computer module and screen, and is widely applied in Europe and China's education interactive liquid electronic whiteboard markets.

- **IPSS**
  Intelligent Pluggable System Spec., a new generation solution introduced by Intel in 2013 based on OPS, was officially launched at ISE and DSE in 2014. IPSS is fully compatible with OPS specification in hardware design, and integrates Intel® Active Management Technology (Intel® AMT) to provide such advanced functions as 4K×2K ultra high-definition display. It can be combined with Intel's relevant software solutions such as Intel® Retail Client Manager (Intel® RCM) to provide one-stop solution of hardware and software for customers.

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