Developing an intelligent mind through Technology Education

Recipient of Certificate of Merit: Mr CHOW Wing-ho

School: Wa Ying College

Years of Teaching: 30 years

Teaching Targets: Secondary 1 to Secondary 5 (Design & Technology)

Beliefs in Teaching: "Technology is undoubtedly an integral part of our daily lives. As a teacher, I am obliged to ensure that my students understand how technology affects us and that they are able to use their technological knowledge effectively and flexibly to create new solutions and products for solving daily problems."

Interview with the Teacher

Innovation is an important element in education, and particularly in Technology Education. Mr CHOW Wing-ho, Head of Technology Education Key Learning Area at Wa Ying College, is committed to striving for excellence.

Mr CHOW Wing-ho has accumulated almost thirty years of teaching experience and witnessed the vast changes in Technology Education in Hong Kong from a rather manual period to a high-tech era. Mr CHOW expresses that there is a marked difference in studying technology in his old school days and nowadays. He recalls, "I was inspired by my mentor teacher, who brought me to Wa Ying College as a supply teacher in Technology Education for six months before I became a teacher in Wa Ying College." Since then, his interest in teaching Technology Education has grown rapidly. Eventually, he went to the United Kingdom and acquired a bachelor degree and a master degree. "Studying in the United Kingdom has made me aware of the importance of innovation based on freedom," Mr CHOW says, "and it has helped me develop my teaching principles."

Students participate enthusiastically in a "Project Creative" class.

Mr CHOW further expresses his concern on the resources allocated to Technology Education in the school. "Fortunately, we have received enormous support from our principal who always urges me to further promote the Technology Education KLA in the school," Mr CHOW says. In 2000, Mr CHOW applied for funding from the Quality Education Fund to set up the Graphic Communication Laboratory, the Robotics Laboratory and the Computer Numerically Control and Laser Cutting Laboratory. Over two million Hong Kong dollars were subsequently granted. The new facilities have helped his students to enhance their technological abilities through participation in practical tasks in the laboratories.

Growth Through Students' Active Participation in Daily–life Projects

Mr CHOW is optimistic about the development of Technology Education. He understands clearly how effective teaching, particularly with the assistance of the Computer-aided Design (CAD) software in Design and Technology (D&T), can bring about students' enthusiasm in exploring knowledge. Though devoted to and passionate in teaching, Mr CHOW says he would rather act as a facilitator instead of an intruder when it comes to teaching. "I prefer to be friends with my students and I gave them my opinions on their projects," he says.

Looking Forward

The design is the soul of a product, be it an artifact, a system, an environment, or a service that satisfies people's needs and wants. For D&T in Wa Ying College, students have been given the opportunities to tackle technological problems in which they have learnt to identify alternatives and manage failures. He is pleased to see that his students have achieved satisfactory results when they leave the school.

A group of students expressed their delight and excitement subsequent to winning the Best Dancing Award at the International Robot Olympiad 2001.

Teacher's Sharing

I believe that the ultimate goal of education is to enable students to solve problems in their daily life. This spirit is in line with an old Chinese proverb: "Give a man a fish and he will eat for a day. Teach a man to fish and he will have fish to eat for a lifetime."

Establishment of the Graphic Communication Laboratory

For the enhancement of students' exploratory and problem-solving abilities I applied for a Quality Education Fund (QEF) grant to establish a "Graphic Communication Laboratory" (G. C. Lab.) installed with a Computer-aided Design (CAD) device to facilitate the teaching of Design and Technology (D&T). By computerising the design process and providing a ready means for easy access to worldwide data through the use of the internet, students can explore thoroughly the strengths and limitations of their designs. Meanwhile the computerised design process can help ensure accuracy and minimise risks in realising designs, thereby reducing wastage of resources.

The Robotics Laboratory

My experience reveals that an effective design process starts with creative thinking, followed by making the prototypes for testing and evaluation and the making of the final product. In this connection, the Robotics System Learning Programme (RSLP) was introduced to our students through the "Robotics Laboratory" to provide them with a pleasurable self-advancing learning context. Energised by continuous trials in simulating their designs, our students became more autonomous in learning as they could self-evaluate their work to modify their design. The RSLP has also encouraged female students to take up the subject and explore their design potential.

Setting up the Computer Numerically Control and Laser Cutting Laboratory

As precision is important in design production, the Computer-Aided-Machinery (CAM) was introduced to help our students minimise their time loss. After setting up the "Computer Numerically Control and Laser Cutting Laboratory" (CNC Lab.), students could enjoy the ultimate fun of learning. In order to maximize the use of the hardware and software by students to meet their specific purposes, learning materials were customised and developed into packages. They were designed to help students re-modify and make concrete easily their design prototypes for enhancement. This vitalizes the learning of D&T and shows the ways that "technology turns virtual design into reality".

During the "Thematic Restaurant" projects, students are asked to create a restaurant model which matches realistic needs.

Thematic Restaurant and Students' Learning Outcome

As for teaching strategies, I advocate a thematic learning approach so that students would learn through a series of thematically linked, instead of fragmented, learning activities to develop their technological capabilities. In the Secondary 2 curriculum, I designed a cross-curricular project on "Thematic Restaurant", which involved the subjects of Design and Technology and Home Economics. Students were required to use materials such as plastic cartoon board, cardboard, medium density fibre, etc to make a model of the restaurant. Their work was found to be aesthetic and attractive, showing a sophisticated lifestyle.

Through the project, students demonstrated their subject knowledge, communication skills, problem-solving skills and presentation skills. Also, their cooperative spirit and social behaviour were improved through group work. Recently, Design and Technology has become a very popular subject for both boys and girls at the senior secondary level in my school.

Summary of Assessment

Through a combination of exploratory learning, problem solving activities and production activities, students' technological capabilities were enhanced.

Mr CHOW believes that fostering students' learning motivation, thinking skills and interactive learning capabilities is very important in Technology Education and could be achieved through a combination of three core learning stages, i.e. exploratory learning of daily-life issues and topics, problem-solving activities and production activities. Upon obtaining the support of the Quality Education Fund for his three school-based curriculum development projects under the subject "Design and Technology", he has systematically renovated the old Design Workshop into a new "Design and Technology Laboratory". The Laboratory was divided into three parts, in line with the three learning stages of the school-based technology curriculum. First, students would work in the "Graphical Communication Laboratory", exploring various design proposals. Next, they would use the facilities in the "Robotics Laboratory" to test their design proposals and solve different design problems. Finally, they would realise their design proposals and put them into production in the "Computer Numerically Control and Laser Cutting Laboratory". As for teaching strategies, Mr CHOW advocated a thematic learning approach so that students would learn through a series of thematically linked activities. In the Secondary 2 curriculum Mr CHOW designed a cross-curricular project on "Thematic Restaurant", involving the subjects of Design and Technology and Home Economics. Students had to identify a problem regarding the dining environment by carrying out research and investigation, solve the problem by exploring different design ideas and realise their final design by cutting, forming, jointing and deforming of materials. Students' designs included evidence of testing and evaluation. Records of production were well drawn and explained and the end products were found to be of a high standard and were ergonomically fit for use. These showed that such thematic learning yielded satisfactory results.

When the Assessment Team interviewed the students, students expressed appreciation for Mr CHOW's profound knowledge and personable qualities. They felt that the learning experience in the D&T lessons made them become more interested in their surroundings. They also thought that they were able to apply the exploratory and problem-solving skills acquired in the D&T lessons to other subject areas, thus enhancing their learning abilities in those subjects.

In promoting professional development and sharing, Mr CHOW was active in making contribution to the New Senior Secondary "Design and Applied Technology" curriculum, participating in EDB's seed projects, sharing in seminars, writing educational articles, and doing voluntary work for Technology Education organisations, etc. He has much to offer to the development of Technology Education in Hong Kong.

Way of Access to Information of the above Teaching Practice

http://intranet.waying.edu.hk/dt/

Preferred Way of Dissemination

Workshop

Contact

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Mr CHOW discusses the work progress and ideas with his students.