07 Higher Education

Taiwan enjoys excellent global competitiveness in spite of limited land and natural resources. According to the World Competitiveness Yearbook 2014 published by the International Institute for Management Development (IMD) in Switzerland, Taiwan ranked thirteenth overall in global competitiveness among 60 countries, and was notably outstanding in "Economic Performance" and "Business Efficiency."

One reason for Taiwan's economic prowess is its quality human resources, an accomplishment closely tied to the issue of higher education. In the Global Competitiveness Report published by World Economic Forum (WEF) published in 2014, Taiwan ranked twelfth in "Higher Education and Training." Taiwan's human resources provide highly-qualified workers in sufficient supply to the labor market and bring positive benefits for industry innovation.

Universities, Colleges and Junior Colleges

Higher education institutions in Taiwan include 2-year junior colleges, 5-year junior colleges, and universities. Like most countries, the study period is 4 years for an undergraduate university degree, 1 to 4 years for a master degree, and 2 to 7 years for a doctoral degree.

The popularization of education has led to a rapid increase in universities, colleges and student enrollment numbers, although the figure has leveled off in recent decades. In SY2014, there were 159 universities and colleges, totaling 1,339,849 students.

Reforms in teacher training have played an important part in the expansion of higher education. Significant improvements in teacher quality can be attributed to policy adaptations and the newly implemented evaluation system. Currently, Ph.D. degree holders account for over 80% of faculty in universities, the figure having increased by 15% in the past 10 years. Professors account for one-third of all teaching personnel.

To maintain competitiveness, Taiwan's government has invested more than US$400 million in higher education annually in the last five years to encourage universities to enhance their standards for research and teaching, and the results have been remarkable.

Although Taiwan's higher education system has gained recognition for its achievements in many areas, tuition still remains very reasonable. Tuition is about NT$58,720 (US$1,924) dollars per year at public universities, and about NT$109,944 (US$3,552) dollars at private universities. College tuition stands at only 10~20% of the national per capita GDP, considerably lower than that of many other countries, which in some cases is over 30%.

The Ministry of Education and several universities have jointly established the Higher Education Evaluation and Accreditation Council of Taiwan in the year 2005 to conduct evaluations of universities. This evaluation consists of Institutional Evaluation and Program Evaluation. The former is held every 6 years to examine whether schools have achieved their strategic goals, while the latter is also conducted once every 6 years to examine the quality of faculty, teaching, research, and service. The Ministry also encourages universities to obtain international certification. The Higher Education Evaluation and Accreditation Council of Taiwan, for example, is a member of several international organizations, such as the Asia-Pacific Quality Network (APQN) and the International Network for Quality Assurance Agencies in Higher Education (INQAAHE).

Another of Taiwan's significant achievements is in the area of "Innovation". In a report from the World Economic Forum (WEF), Taiwan ranked tenth among 144 countries in innovation in 2014. To encourage students to unleash their creativity, the Ministry screens and selects outstanding students to study abroad under sponsorship by the government. In recent years, students from Taiwan have been making their mark in international design competitions such as Germany's iF Awards and Red Dot Award every year.

More Signs of Progress in Education

Everywhere around the world competition is getting fiercer and more talent is migrating across borders. How can Taiwan's higher education industry face up to these challenges so as to promote commercial innovation while strengthening Taiwan's international competitiveness?

Knowledge and innovation is the only way to increase global competitiveness. Countries the world over spare no effort in investing in the cultivation of innovation and talent by improving their higher education systems. Thus since 2006, the Ministry of Education has been promoting a plan to develop world-class universities and research centers. The program was renamed "Heading toward Top Universities" and has been in place since April 2011. After 7 years, we are now reaping the rewards:

A Taiwan is Reaching Out to the World

Seven years after the plan started, 11 of the universities that have been subsidized by this plan as of the end of 2014 are ranked in the world's top 500 universities as well as the world's top 100 universities in the global university rankings (UK's The Times and Quacquarelli Symonds, QS). In addition, night schools are ranked among the 500 schools in Shanghai Jiao Tong University's Academic Ranking of World Universities and their ranks improved year by year. In 2014, 7 schools made the list. This is a sign that the subsidized schools have inspired themselves to meet international benchmarks and rise up to international competition with the top schools in the world.

B The Quality of Students Continues to Improve

Top universities in Taiwan have instigated reforms in their general education systems and interdisciplinary programs. Currently, there are 109,397 students enrolled in interdisciplinary programs as of the end of 2013. The universities are also fulfilling their social responsibilities, as seen in actions like support of disadvantaged students. Between 2006 and 2013, a total of 21,622 disadvantaged students enrolled in colleges and universities, a figure growing at an average rate of 139% annually.

In addition, the top universities have also responded to public outcry at poor higher education quality, promising to improve the learning environment and boost student motivation to enhance the quality of university students.

C The University is Becoming a Place for Innovation in Business

Taiwan's innovative ability has been recognized in the World Competitiveness Yearbook published by IMD. In recent years, the number of patents and new breeds developed by Taiwanese universities has grown by 161%, and income from intellectual property rights has increased by 240%. This momentum will in turn stimulate more innovations and increase contributions to society.

D Campuses Play Host to the World

"Internationalization" is the key to global visibility. Whether the universities in a country are attractive to foreigners is also a criterion in evaluating national power. More than 60,000 foreign scholars have visited Taiwan, and nearly 55,079 foreign students are studying in Taiwan's top universities. In addition, 15,189 students received the opportunity to be exchange students overseas. On average, almost 473 international conferences are held in top Taiwanese universities each year, thereby broadening the horizons of Taiwanese students.

Vocational and Technological Colleges and Universities

The institutions in this category include junior colleges, technical colleges, and universities of technology, accounting for a total of 91 schools. Junior colleges are divided into 2-year programs and 5-year programs. Technical colleges and universities of technology can admit students for associate degrees, bachelor degrees, and master degrees, while universities of technology can also accept Ph.D. students.

In accordance with government policy, the key points for development in these schools are:

A Implement Multiple-Route Admissions

Vocational and technological colleges and universities recruit students through separate examination and enrollment systems:

1. 5-year junior colleges recruit graduates of junior high schools. Entrance methods include examination-free entrance and special examination admission.

2. The 4-year colleges/universities and the 2-year junior colleges employ the following methods:1.screening by skill; 2. recommendation; 3. registration and placement; 4. The Star Plan, which is designed to balance the gap between urban and rural areas and support disadvantaged students in remote areas; 5. application using the Subject Competence Test for a given year and other written reviews that may be beneficial for the review.

3. 2-year colleges accept the graduates of 5-year and 2-year vocational schools through several methods:1. recommendations of students with outstanding skills; 2. individual recruitment.

B Enhance Teaching Quality

Promotion of government programs, enhancement of teaching quality, and adoption of a practical approach towards teaching.

1. Implement the Program for Promoting Teaching Excellence for vocational and technological colleges and universities, the goals of which are:1. Enhance professional teaching skills; 2. Strengthen curriculum design; 3. Strengthen student motivation; 4. Set up teaching evaluation systems; 5. Implement and/or improve all areas related to teaching quality.

2. Strengthen teaching and learning abilities:1. Offer subsidies for instructors to gain work experience in public and private firms; 2. Recruit from industry to enhance teaching; 3. Promote off-campus internships.

3. Encourage students to participate in various competitions:Outstanding students have been able to apply for airfare and accommodation subsidies to take part in international competitions and exhibitions.

4. Encourage professional certification: Instructors and students are encouraged to obtain professional certification to improve teaching quality and enhance students' competitiveness in the job market.

C Promote Evaluations of Vocational and Technological Colleges and Universities

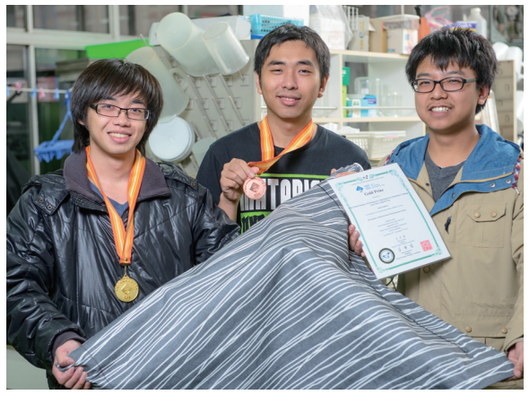
Each school is evaluated as an integral unit every 5 years to improve quality of education.

D Promote Cooperation between the Industry and Academia to Cultivate Talent

Encourage interaction between academia and industry; design specific courses or curricula to meet the needs of industry personnel.

1 Collaboration between industry and academia :Develop vertical education systems, increase the integration between industry and academia; therefore, it will improve the quality in human capital.

- 3+2 (3 years in vocational high school and 2 years in 2-year junior college);
- 3+2+2 (3 years in vocational high school, 2 years in 2-year junior college, and 2 years in a 2-year technical college/ university completion program);
- 3+4 (3 years in vocational high school and 4 years in a technical college/university);
- 5+2 (5 years of junior college plus 2 years in a technical college/university completion program)



2 Masters Degree Program for Industry Professionals

3 Industrial colleges:The academy offers customized training courses that focus on the specific recruitment needs of industry and are oriented toward student employment.

4 Second-Baccalaureate Program

E Emphasize Innovation and Research / Development

To encourage collaboration between schools and industry, the government offers subsidies to six schools that establish regional cooperative work-study centers and promotes the "Industrial Region Work-Study Program", with the goal of improving the national economy and contributing to society.

F Launch International Partnerships and Exchanges

To cultivate international talent, the government encourages schools to establish an international environment, including internationalized campuses, curricula, and administration systems, and promote global cooperation and exchanges, including international collaboration in research and teaching, teacher and student exchanges and other collaborative programs.

G Develope Technological University Paradigms

Guide technological universities to build the research and development environment for industry and academic innovations and bring about the cultivation of talent and intellectual properties in this area. Establish diverse paradigms for the characteristic development of vocational and technological colleges and universities to encourage seamless collaboration between the schools and industry and strengthen the foundation of industry and technology.

Robot Climbs to Grab Gold of 2014 FIRA-RoboWorld Cup

Advanced Intelligent Robots and System Lab, National Cheng Kung University
- Dr. Lin Yu-Ching, Department of Physical Medicine and Rehabilitation
- Prof. Wang Jeen-Shing, Department of Electrical Engineering
- Yu-Liang Hsu, Assistant Researcher, Department of Electrical Engineering
- Chiang Wei-Chun, Doctoral Program, Department of Electrical Engineering
- Chou Te-Feng, sixth grader, School of Medicine
- Chi Yi-Chun, 1st grader, School of Medicine
- Yang Tsung-Han, Graduate Program, Department of Electrical Engineering

Sporty games are not a privilege for human beings, robots also enjoy exercising their mechanical muscles. One of the most frequent winners is aiRobot David, the brainchild of the Advanced Intelligent Robots and System Lab under National Cheng Kung University (NCKU), who just snatched the championship of Hurocup Adult category at the 2014 Federation of International Robot-soccer Association RoboWorld Cup.

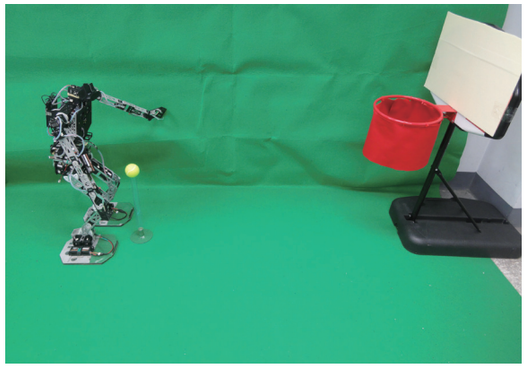
David outshone other competitors with the innovated technology. "We reinforced the mechanic rigidity and improved hand design which made climbing function possible this year, said Prof. Li Tzuu-hseng S. at Department of Electrical Engineering (DEE), who has led the Lab for several years.

In addition to modification on hardware design, Linear Inverted Pendulum Model (LIPM) gait is applied to drastically improve robot walking pace this time. With all the improvements, we were able to defeat teams from other countries and won the 1st place, said Prof. Li.

Crowned at the Hurocup Adult category, the Lab team recalled and shared their experiences. "Despite the hardware of our aiRobot David is much more stable than the previous three generations, we dared not to underestimate our competitors," said team member Ho Ya-fang, 4th grader of DEE Doctoral Program.

"Our robot is more agile so as to complete certain motions that other robots failed to do like climbing," said Ye, Yan-ting, who is in the second year of DEE Graduate Program.

Having led the NCKU iRobt Team for several years, Prof. Li still can learn much from each event. "Every single competition lends a glimpse of current progress in the robotic development in the world," he said.



Toilet Design to Ease Long Female Queues Wins Red Dot Award

Lai Iu-ru, 27, Master Degree, Department of Industrial Design, Tunghai University
Chen Shih-sheng, 25, Master Degree, Department of Industrial Design, Tunghai University

A unisex public toilet design that can be the future solution to the long waiting line outside female toilet has won two Taiwanese students 2014 red dot the best of the best award.

Gentolet designers Lai Iu-ru and Chen Shih-sheng were then in the second year of graduate school at the Department of Industrial Design, Tunghai University when they were granted the honor.

The idea originated from this overspread phenomena, was the theme that Lai adopted for the graduation project in college. They observed and discovered there's gender discrepancy on time and frequency the facility being used, and thus strived to achieve the goal of fairly and harmoniously application for both genders.

Adopting once again the theme, Lai and his partner improved graphic explanation to better convey their ideas. "Rethinking the same issue is the greatest challenge," said Lai, continuing that "I must jump out from the frame and think about the nature of design from a new perspective."

The two young designers also exchanged ideas with peer designers around the world while receiving the award in Singapore. Lai recalled and said that "Gentolet" had been widely acclaimed in western countries, while was less accepted in Asian countries. "Contradictory as it is, Asia is much more populated and can be benefited a lot more from this design," pointed out Lai. He expects to narrow the gap through further improvement to realize the design.

When it comes to future trend, Lai believes that individualized products will be one of the focuses in the design industry, and would like to embark on a career in design research-related field in the future to create new strategy operation models in Taiwan.