
North-East Asia Centre for Technology and Vocational Education (NEACTVE)

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In the article, the authors introduce the North-East Asia Centre for Technology and Vocational Education (NEACTVE), which has been established as a satellite centre of the UNESCO International Centre on Engineering Education (UICEE). The NEACTVE is based at the National Changhua University of Education (NCUE), Changhua, Taiwan. In the article, the authors also elaborate on the NEACTVE's establishment, mission, specific goals and objectives organisational structure, research and scholarly activities, including achievements and publications. Additionally, the authors describe the various linkages, participation in conferences, plus the satellite centre's future plans and milestones.

NATIONAL CHANGHUA UNIVERSITY OF EDUCATION

The National Changhua University of Education (NCUE), Changhua, Taiwan, is located within the urban area of Changhua City in middle Taiwan. Founded in 1971, the University has two campuses: Chin-De and Pao-Shan, located about 15 minutes apart by car. There are six colleges, consisting of 24 Departments, as well as a Center of General Education in the University.

The University was founded on the principles of preparing secondary teachers and research in education. In order to improve the quality of secondary school teachers in Taiwan, the Government of Taiwan founded the Secondary School Teachers In-service Training Institution in January 1970. The place was then designated as Bai-Sha Shan Zhuang (Village).

In addition to teacher preparation, many new programmes have been carefully developed to best serve students with diverse talents and needs, and the University continues to broaden the subjects and opportunities offered to its students. Various domestic and international conferences have also been conducted on both campuses of the University.

The following 4E's are the guiding principles of the University:

- It seeks **Excellence**;
- It searches for **Equality**;
- It intends to improve **Effectiveness** and **Efficiency**;
- It aims to build a campus full of **LOVE**.

University Structure

Three colleges have been established within the NCUE, namely:

- The College of Education;
- The College of Science Education (renamed the College of Science in 1993);
- The College of Vocational Education.

Since its foundation, the NCUE has generated faculties and departments for the training of teachers in humanities education, science education and vocational education. In order to meet the needs of Taiwan's national educational and economic development, the NCUE has steadily expanded and complied with educational policies and government directives.

Notably, academics at the NCUE actively pursue an extensive range of research and development activities in engineering and technology education that are specifically related to human resource development, teachers' training and industrial education. Particular emphasis is being placed on so-called *soft skills*, as

well as personality traits, attributes and attitudes, which are considered so vital for the harmonious development of a professional engineer or technologist. These elements form an essential and imperative component of education, training and upbringing in the Eastern culture.

The School of Industrial Technology at the NCUE, in particular, has developed a postgraduate programme under which several hundred students undertake research projects leading to the award of Masters or doctorates.

The Industrial Education and Engineering Faculties have pledged to consolidate an excellent ambience of career preference and development for future industrial teachers and engineers. Students of different attributes can benefit from the interdisciplinary collaboration. The faculties from both categories are keen to exchange ideas with the Asia-Pacific neighbourhood on engineering and technology education.

PARTNERSHIP WITH THE UICEE

The University became a Partner member of the UICEE in November 2002, thereby upgrading its Supporter status and thus strengthening the existing relationship between the NCUE and the UICEE. Under the terms of the Partnership Agreement, the NCUE established a satellite centre of the UICEE named the *North-East Asia Centre for Technology and Vocational Education* (NEACTVE).

The scope of the collaboration between the UICEE and the NCUE is as follows:

- The UICEE will work with the NCUE to set up a satellite centre at the NCUE to enhance and facilitate technology and vocational education in the North-East Asia region and, indeed, throughout the entire *UICEE Global Network of Engineering Education*.
- To establish a range of activities that reflect the mission, aims and objectives of the UICEE.
- To exchange scholars, as appropriate, in order to take forward academic and research related activities in engineering and technology education.
- To work together so as to take forward seminars, workshops, conferences and other academic meetings, as appropriate, and to support the production of publications, books and software in engineering and technology education.
- Given that the NCUE is one of the prime Taiwanese academic institutions and is a leader in the development of new teaching and training methodologies in technology and vocational education, the satellite centre based at the NCUE

provides a focus for academic and research activities that are related to the transfer of new teaching and training methodologies to other countries, and to developing countries in particular. Particular effort of the satellite centre is focused on developing human resources in technology and vocational education for academia and industry on a worldwide basis.

MISSION OF THE CENTRE

As a member of the UICEE's expanding network of satellite centres, the NEACTVE has been established with the following objectives:

- To take forward the mission, aims and objectives of the UICEE;
- To facilitate research, development and dissemination of information on technology and vocational education on a global scale, and especially in the North-East Asia region;
- To collaborate in the exchange of scholars, as appropriate;
- To take forward academic and research activities in engineering/technological and vocational education;
- To work with the network to develop and promote seminars, workshops, conferences, and other academic meetings as appropriate;
- To support the production of publications, books, and software for the discipline;
- To enlarge the cadre of engineers and technologists capable of working effectively with modern technology;
- With the NCUE's assets in the effective integration of multimedia courseware in engineering/technological and vocational education, to provide a focus for academic and research activities related to the effective integration of the new media technologies into technology-enabled engineering/technological and vocational education.

The primary role of the NEACTVE in this framework will be to be active within the alliance, thereby strengthening the international and collaborative engineering/technological and vocational programmes of the University.

SPECIFIC GOALS AND OBJECTIVES OF THE CENTRE

The specific goals and objectives of the NEACTVE are as follows:

- To provide the focus for the development of academic and research related activities in engineering and technology education within the activities of the North-East Asia Centre for Technology and Vocational Education (NEACTIVE);
- To work with the UICEE to further the globalisation of engineering and technology education;
- To become the research centre and clearinghouse of technology and vocational education in the North-East Asia region.

ORGANISATIONAL STRUCTURE OF THE CENTRE

The organisational structure of the NEACTIVE is illustrated in Figure 1. The consulting system of the NEACTIVE at the NCUE is given in Figure 2. Staff of the NEACTIVE are listed in Table 1.

RESEARCH, DEVELOPMENT AND SCHOLARLY ACTIVITIES

Key research and development activities, as well as scholarly endeavours, include the following:

- Ministry of Education projects:
 - The objectives and function of meaning, and the essence of vocational and technical education. *Encyclopedia of Vocational and Technical Education* (2001);
 - The meaning and essence of vocational and

- technical education. *Encyclopedia of Vocational and Technical Education* (2001);
- The relationship between vocational and technical education and special education. *Encyclopedia of Vocational and Technical Education* (2001).

- National Science Council projects:
 - A study of spatial ability indicators for junior high school students (2002-2004);
 - Utilising a problem-based teaching strategy for the promotion of college students' working competence in practice (2002-2004);
 - Investigation into the relationship between school-based management and school effectiveness of vocational (high) schools of industrial programmes (2003);
 - A study of the promotion of student's spatial abilities and problem-solving abilities in the context of engineering drawing in vocational high schools (1999-2002);
 - A study of the effects of cognitive style and spatial ability in promoting students' logical and problem solving abilities in programming language (2000-2002);
 - A study of the promotion of students' spatial abilities and problem solving abilities in orthographic engineering drawing in vocational high schools (1999-2002);
 - An investigation into the promotion of students' spatial abilities and problem solving abilities concerning the intersection and

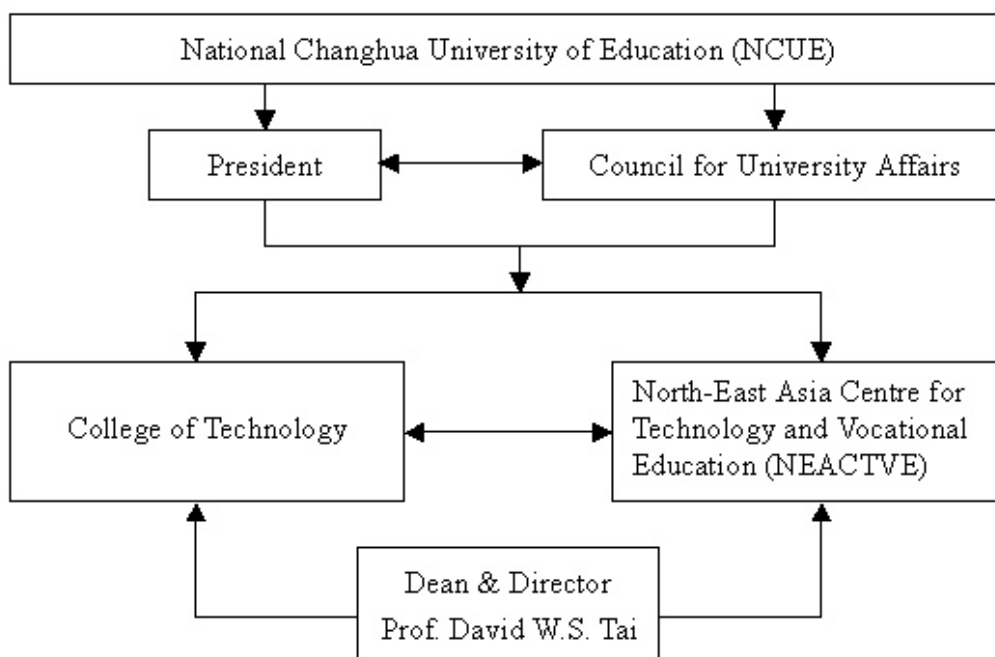


Figure 1: Management structure of the NEACTIVE at the NCUE.

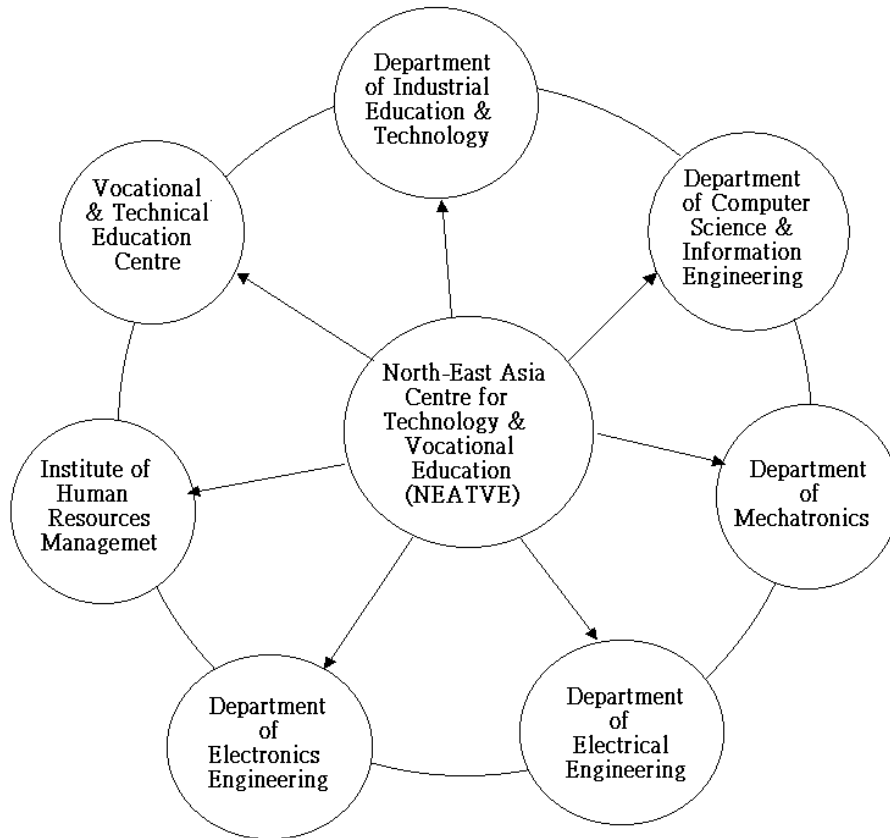


Figure 2: Consulting System of the NEACTVE at the NCUE.

development of engineering drawing in vocational high schools (2002);

- A study of the relationship between school management models and school effectiveness (2002);
- A study into the school effectiveness of industrial programmes in senior high schools (2000).

• Conference activities at the NCUE:

- *1st North-East Asia International Conference on Engineering and Technology Education*, 10-13 November 2003;
- *Annual International Conference for*

Promoting TVE Institutes and Industrial Technology Education (1999-2003);

- *Annual Conference on Business Education* (1995-2003);
- *Annual Conference for Promoting Competitive Capacity of Human Resources* (2002-2003);
- *3rd Asia-Pacific Forum on Engineering and Technology Education*, 8-11 July 2001.

1st North-East Asia International Conference on Engineering and Technology Education

The very successful *1st North-East Asia International Conference on Engineering and Technology*

Table 1: Relevant details of staff at the NEACTVE.

Position	Name	Education	Telephone	Address	e-mail address
Director	David W.S. Tai	PhD Iowa State University	886-4-7232105-7001	No.2 Shi-Ad Rd Changhua 50042 Taiwan	ietaiws@cc.ncue.edu.tw
Executive Secretary	Yoau-Chau Jeng	PhD Iowa State University	886-4-7232105-7213	No.2 Shi-Ad Rd Changhua 50042 Taiwan	jengyc@seed.net.tw
Special Assistant	Yu-ling Hsieh	BS	886-4-7232105-7005	No.2 Shi-Ad Rd Changhua 50042 Taiwan	tvcenter@cc.ncue.edu.tw

Education was held at the NCUE between 10 and 13 November 2003, and attracted international participants from around the world, as well as delegates from across Taiwan.

This Conference basically served as the first opportunity for international academics to travel to Taiwan after the SARS epidemic, which has deeply affected this peaceful, friendly and hospitable society. Hence, there was a smaller than expected number of visitors. Nevertheless, the Conference organisers were able to create a warm climate for the exchange of information, not only through formal paper presentations and discussions, but also through facilitated personal contacts.

Close to 60 papers were presented and are included in a volume of Conference Proceedings. The Conference was summarised in an open forum where many important issues were aired and debated with several overseas specialists, who were keynote speakers at the Conference, providing their strong input. It was decided that the next conference in this stream would be organised in November 2005.

A field trip to Taipei was also organised and provided overseas participants with an excellent opportunity to become familiar with the island's history and rich culture, as well as view new achievements, including the spectacular *Taipei 101*, the tallest building in the world, which was opened in November 2003.

Furthermore, on the occasion of the Conference, a Cooperation Agreement between Hochschule Wismar – University of Technology, Business and Design (HSW), Wismar, Germany, another Partner institutions of the UICEE, and the NCUE, was signed by Prof. Norbert Grünwald, Rector of HSW, and Prof. Charles Tze-Li Kang, President of the NCUE. This networking between Partner institutions reinforces the collaborative nature of the UICEE network, particularly at the Partner institutional level [1].

An excellently presented volume of Proceedings was produced, which printed 85 papers delivered at the Conference. This volume was edited by Prof. Tze-Li Kang, Prof. Wen-Shung Tai and Prof. Zenon J. Pudlowski.

Special Issue of the Global Journal

A *Special Edition* of the UICEE's *Global Journal of Engineering Education* (GJEE) was published in 2001. Volume 5, Number 2, focused on engineering and technology education in Taiwan, and was subtitled *Engineering and Technology Education at the National Changhua University of Education*. This provided a spotlight on the issues and trends affecting one of the most technologically advanced nations on

this planet as it progresses to a knowledge-based culture. This issue featured 13 articles submitted from Taiwanese authors.

Prof. David W.S. Tai of the National Changhua University of Education in Changhua, Taiwan, was appointed Guest Editor of this Edition. The publication of this Edition was fully sponsored from Taiwan [2].

The issue can be accessed via the UICEE's GJEE Web site at:

<http://www.eng.monash.edu.au/uicee/gjee/globalj.htm>

3rd Asia-Pacific Forum on Engineering and Technology Education

The 3rd *Asia-Pacific Forum on Engineering and Technology Education* was held at the NCUE between 8 and 11 July 2001, with over 70 persons participating in the Forum. The NCUE was, in part, chosen to host this Forum to coincide with the University's 30th anniversary celebrations.

An innovation at this Forum included involving the large number of postgraduate students from the NCUE who took advantage of this international Forum being held at their university and participated in the Forum. It was an excellent experience for distinguished international professors to have the opportunity to interact with postgraduate students.

The volume of Forum Proceedings included 46 fully refereed papers, of which over half were represented by overseas contributions.

Apart from the formal activities, the NCUE provided an excellent social programme. The hospitality received was exceptional and was certainly one of the best that a UICEE conference has ever experienced. It may be characterised by old culture and Chinese tradition, and hence by personal, warm characteristics of the Taiwanese hosts. All overseas participants were astounded and overcome by the warmth of the reception in Taiwan.

In his welcoming speech, Prof. Tze-Li Kang, President of the NCUE, underlined the importance of such a meeting being held at the NCUE, which, at that time, was undergoing a substantial level of expansion with the new College of Engineering established under the deanship of Prof. David W.S. Tai [3][4].

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NATIONAL AND INTERNATIONAL LINKAGES

Specific linkages within and outside the UICEE global network include the following:

- The Association of Engineering Education in Taiwan, <http://www.tl.ntu.edu.tw/ieet/>
- International Conference on Engineering Education, <http://www.ineer.org>
- National Association of Industrial Technology, <http://www.nait.org/>
- Centre of Technological and Vocational Education in Taiwan, <http://www.ntnu.edu.tw/tvc/www/>

PARTICIPATION IN CONFERENCES ON ENGINEERING EDUCATION

Staff and associates of the NEACTIVE have participated at various international conferences on engineering and technology education, including the following:

- *International Conference on Engineering Education*;
- *Conference of Technological and Vocational Education*;
- *UICEE Annual Conferences on Engineering Education*;

- *Global Congresses on Engineering Education*;
- *Asia-Pacific Fora on Engineering and Technology Education*;
- *Baltic Region Seminars on Engineering Education*.

FUTURE PLANS AND MILESTONES

The future plans and milestones of NEACTIVE will be as follows:

- To initiate academic and research activities in the following areas:
 - Seminars;
 - Workshops;
 - Conferences;
 - Academic meetings;
 - Exchange of scholars.
- To initiate publication activities including:
 - Publications;
 - Books;
 - Software;
 - Newsletters.
- To initiate human resources development activities, such as the following:
 - The interchange and transfer of human resources and working experiences between university and industry or enterprises;
 - Human resources development within and outside of the University.
- To provide a focus for academic and research activities including:
 - The development of new teaching and training methodologies in technology and vocational education;
 - The transfer of new teaching and training methodologies to other countries, and to developing countries in particular.

SUMMARY AND CONCLUSIONS

The North-East Asia Centre for Technology and Vocational Education (NEACTIVE) is a newly established centre under the authorisation of the UICEE at the NCUE. It symbolises the new horizon in the development of technology and vocational education in the North-East Asia region. In the future, it is envisaged that the NEACTIVE will develop new relationships and partnerships, and will work closely with the

UICEE and its satellite centres around the world, especially in the Asia-Pacific and South-East Asia regions.

A good beginning is already halfway to achieving success. In the near future, it is hoped that new plans will be set up and extended. It is anticipated that more resources, from both within and outside the University, will be gradually added to the Centre so that it may function more smoothly and more encouraging results will be accomplished.

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BIOGRAPHIES



Born in July 1951, David Wen-Shung Tai is a professor in the Department of Industrial Education at the National Changhua University of Education (NCUE), Changhua, Taiwan. He completed his undergraduate degree in the Department of Industrial Education at the National Taiwan Normal

University, Taipei, Taiwan, and earned his MS degree from the Department of Industrial Technology at the University of Wisconsin-Platteville in the USA. He earned his MS degree from the Department of Computer Science at Iowa State University in the USA,

and his PhD from the Department of Industrial Education and Technology at the same University in 1987.

From 1987 to 1993, he was an associate professor at the NCUE and was awarded a professorship in 1993. From 1987 to 1993, he has been the Director of the Computer Center of the NCUE. From 1999 to 2001, he was the Chairman of the Department of Industrial Education. He was appointed the Dean of the College of Technology at National Taiwan Normal University in 2001.

Prof. Tai's research experience includes engineering drawing, computer-assisted learning, spatial ability and problem solving. His latest projects include the study of promoting student spatial abilities and problem solving abilities of college students.

In 2001, Prof. Tai received the UICEE Silver Badge of Honour for his services to the globalisation of engineering education and the UICEE. In further recognition of his exemplary and noteworthy contributions in engineering and technology education, he was awarded the UICEE Gold Badge of Honour in 2003.



Yoau-Chau Jeng is a professor of the Department of Industrial Education at the National Changhua University of Education (NCUE), Changhua, Taiwan. Dr Jeng received his PhD in industrial education and technology, and his MS in mechanical engineering, respectively, from Iowa State University

in the USA in 1988. He also received his ME in Industrial Education from the National Taiwan Normal University in 1982.

Dr Jeng was a research assistant at the Research Institute of Studies in Education (RISE) from 1984 to 1985, and a research and teaching assistant in the Department of Engineering Mechanics from 1986 to 1988, respectively, at Iowa State University in the USA. In addition, he was a lecturer in the Department of Mechanical Engineering at Tongnan College of Technology from 1982 to 1983, and a teacher in the Department of Foundry at the National Changhua Vocational Industrial High School from 1977 to 1979. Dr Jeng was the Director of the Foundry Division in the Taiwan Province Skill Competition Committee and the Referee of Foundry in the National Skill Competition Committee, respectively, from 1988 to 1998. Since 1993, his research has been focused on the field of school effectiveness and school improvement in vocational senior high schools in Taiwan.