

International Center for Engineering Education (ICEE)

Under the Auspices of UNESCO

Why- a Center for Engineering Education Needed

Global engineering education is faced with challenges in terms of quality and equity. The systematic and intricate modern engineering poses a challenge to the quality of engineering education and makes it an urgent task. Educating engineers by science education, faculty lack of engineering background, industry-university disconnection, students short of innovating abilities and young generations have limited interest in engineering, such issues exist globally. The current disproportion of engineering education resources indicates woeful inadequate spending on engineering education and severe shortage of engineers and technicians in developing countries. UNESCO data shows that developed, industrialized countries have between twenty and fifty scientists and engineers per 10,000 population, compared to around five scientists and engineers on average for developing countries, down to one or less for some poorer African countries, in some developing countries particularly African countries. Hence, an international Center for engineering education is needed, to face the challenge and promote global sustainability.

What- is the Center for Engineering Education

The proposed Center for International Engineering Education will be an international and comprehensive center of engineering education, under the auspicious of UNESCO. The Center commits itself to international cooperation of engineering education, to promote the cultivation of engineering technology talents and the promotion of quality in engineering education, so as to support these countries in pursuing sustainable social and economic development.

The Center will be guided by the mission of UNESCO and strategies of Natural science section of UNESCO, and will put constant emphasis on the path of innovation-driven and industry-university collaboration, focusing on the talents cultivation of engineering and thereby promoting quality and equity in engineering education. The Center aims to become a think-tank type research and consultation

center, an incubator for high-caliber personnel, and an international exchange and cooperation platform in the area of international engineering education. Its tasks are as following:

- ✓ Think-tank type research and consultation center: from local and international perspectives, research and popularize successful experience and advanced concepts of different countries, therefore providing intellectual support for national governments and international organizations to formulate policies, strategies, standards, and rules on engineering education.
- ✓ Incubator for high-caliber personnel: capitalize on and expand the industry-university collaboration network of the Center, innovate educational mode in industry-university collaboration, and cultivate high-caliber engineering technicians for developing countries, using both traditional and emerging means of education.
- ✓ International exchange platform: the Center is open to all member states of UNESCO, emphasizes UNESCO Global Priority Africa and Global Priority Gender Equality, and seeks to expand its global exchange and cooperation network on engineering education, aiming to promote cross-border, cross-region, and cross-culture sharing of knowledge, experience, and resources on engineering education.

Who- The Supporting Institutions

Chinese Academy of Engineering (CAE), the top-level honorary and consulting academic institution of China, represents a national-level think tank on engineering science and technology. Tsinghua University is a prominent university of China, also an important base for training high-caliber personnel and conducting scientific and technological research. Of various university rankings worldwide, Tsinghua University has for many times topped the list of universities in the Chinese mainland, and has been ranked as a first-class university globally. CAE and Tsinghua University will provide adequate fund for the management and daily operation of International Center for Engineering Education, and offer all necessary facilities, equipment, and staff as required to conduct activities. The Chinese Government will firmly support the operation and development of the proposed International Center, the Center may receive fund inter-governmental organizations (IGOs), non-governmental

organizations (NGOs), as well as from donations from other organizations and service charge.

How- to Achieve the Aims

The Center will be an important organization of UNESCO to push engineering education and promote sustainable development. The Center will carry out research and consultation, educational training and international exchange activities, based upon existing international, regional and national networks and focus on quality and equity of engineering education.

- ✓ **Research and Consultation Activities:** The Center will conduct academic research and consultation activities, closely focusing on the path of innovation-driven and industry-university collaboration, quality assurance, and educational innovation. Innovation-driven and Industry-university Collaboration Research.
- ✓ **Educational Training Programs:** The core mission of the Center is to cultivate high-caliber engineering technicians for developing countries. Based upon industry-university collaboration, the educational training programs of the Center will focus on the training of engineering teachers and students, and on the continuing engineering education for technicians. While carrying out the above-mentioned educational activities, in addition to traditional means of education, the Center will also use modern information communication technology (ICT) and launch online education program featuring MOOC. Meanwhile, the Center will seek to cooperate with relevant UNESCO institutes and centers, to promote understanding of Paris Declaration in 2012 on UNESCO's Open Educational Resources (OER).
- ✓ **International Exchange Activities:** Working as a bridge and connector, the Center will connect global cooperation network in the industrial and educational communities, and connect engineering education in developing and developed countries, therefore promoting cross-border, cross-discipline, and cross-culture exchange and sharing of knowledge, experience, and resources in terms of engineering education.
- ✓ **Assisting UNESCO's Major Programmes:** The Center will assist UNESCO in executing Major Programmes in an interdisciplinary manner, strengthening

trans-department collaboration. The Center will strengthen cooperation with UNESCO's offices and centers, especially center of category I and II. Except for Major Programme II, the Center's cooperation with Major Programme I will promote the application of engineering technological knowledge to education, in order to improve equity, tolerance, and quality of engineering education, to promote sustainable development in education.

Whom- UNESCO and Its Member States Benefit

The Center will support and promote the establishment of global and regional Engineering Education Community, assist UNESCO in playing a role as the world's knowledge exchange center and think tank, offer strategic consultation for UNESCO's major Programmes and help training engineers for developing countries for their capacity building.

(The End)