

**Temasek Foundation, Singapore- Singapore Polytechnic Programme in  
Conceive, Design, Implement, and Operate Framework for  
Rethinking Engineering Education for Muhammadiyah Universities, Indonesia**

**PROGRAMME FACTSHEET**

Temasek Foundation (TF) and Singapore Polytechnic (SP) have initiated a new training programme that will impact engineering education using the context of *Conceive, Design, Implement, and Operate* (CDIO) framework, in partnership with the University of Muhammadiyah Surakarta (UMS) and University of Muhammadiyah Yogyakarta (UMY).

CDIO is an innovative educational framework for producing the next generation of engineers. It was originally conceived at the Massachusetts Institute of Technology in the late 1990's. It has now evolved into an international network of over 90 universities and technical colleges worldwide. Together, the CDIO collaborators provide a platform for sharing and benchmarking of engineering curriculum and learning activities.

SP joined the CDIO Initiative in 2004 and was designated as the CDIO Regional Centre for Asia in June 2011. SP has also successfully implemented a new approach to teaching and learning for Engineering in SP through the adoption of the innovative CDIO framework. It has also effectively adopted the same framework and skills for non-engineering programmes. It is well-placed to provide the expertise in assisting faculties in the adoption and implementation of the CDIO framework.

The two-year programme is funded mainly by TF with a grant of S\$453,780, while UMS and UMY will jointly fund the remaining cost of around S\$146,250. With this programme, both UMS and UMY will utilise the CDIO framework to enable them to provide more effective engineering education that can better meet industry demands.

A series of training workshops will be held over two years and will produce 35 Specialists in the CDIO Teaching and Learning framework. They will be able to design an integrated curriculum, conceive and design innovative products and systems, design active experiential learning experiences, and evaluate programmes for continuous improvement. Some 12 of these 35 participants will also be trained to become Specialist Master Trainers who will then cascade the training to another 100 participants from the two universities and other Institutes of Higher Learning.

The first workshop on *Introduction to CDIO Teaching and Learning Framework* took place in Yogyakarta on 2 February 2013, while the second workshop on *Designing an Integrated Curriculum* took place in Solo from 4 to 8 February 2013.

About six Singapore Polytechnic academic staff will be involved in this project, which consists of five components:

Component 1 – Introduction to CDIO Teaching and Learning Framework,  
Component 2 - Designing an Integrated Curriculum,  
Component 3 - Conceiving and Designing Innovative Products and Systems,  
Component 4 - Designing Active and Experiential Learning Activities, and  
Component 5 - Evaluating Programmes for Continuous Improvement.

In training component 4 (*Designing Active Experiential Learning Experiences*), the participants will learn how to create student projects that promote active and experiential learning experiences in and out of classrooms. To illustrate how CDIO can be implemented in the design of student learning activities, SP will run a Learning Express project to coincide with the TF-funded CDIO collaboration, where the SP trainers and programme participants will work with their students on an experiential social innovation project.

In the TF-funded workshops, the SP trainers will also share with programme participants the CDIO skills required of current and future engineers – including analytical reasoning and problem solving, teamwork and communication, and conceiving, designing, implementing new products and processes for sustainable development. The Learning Express provides the platform for SP, University of Pembangunan Nasional “Veteran” Yogyakarta (UPN) and UMY staff and students to develop these CDIO skills while applying their technical know-how to co-create innovative sustainable solutions for the local communities.

Since 2008, this is the twelfth capability building training partnership between TF and SP in six countries, including Indonesia, Malaysia, Mongolia, Myanmar, Thailand and Vietnam.

*Date: 5 March 2013*