



## TF SCALE: An ASEAN exchange like no other

For four weeks starting in March 2014, TF SCALE brought student leaders from Cambodia and Indonesia together with RP students from Singapore to co-develop solutions to social and community issues. In Sep 2014, the Singapore students will fly over for two weeks as part of the exchange programme to help implement the new technologies and techniques created here.

### PRAHOK PARADISE

PHOTO: EMMANUEL PHUA



(From left) Ngov Sereybopha, 23, Royal University of Agriculture, Lihuet Noun, 20, Royal University of Phnom Penh, Muhsin Bin Mohammad, 17, Republic Polytechnic, You Chanarthy,

22, Royal University of Agriculture and Sin Sopheana, 20, Royal University of Phnom Penh, present the four dishes and a bottle of Prahok used for cooking.

The dishes were cre-

ated for a competition with four Singapore-Cambodia teams.

And the winner was the Laksa dish from Chanarthy's team. With Prahok added, of course.

### Gourami: Fishing for food security

The Gourami is hardy fish that is native to Asia and can live in the rice paddies in Thailand and Cambodia.

Gouramis have a lung-like labyrinth organ that allows them to gulp air, so they can thrive in shallow, oxygen-poor water.

Therefore, the fish is a valuable source of sustainable food for rice farmers in Cambodia in between rice harvests.

The fish are fermented into a paste called Prahok that creates fish sauce as a by-product.

Prahok made from Gourami fetch the highest price in a Cambodian market and has a unique flavour found in popular dishes like Pad Thai.

### ENTERTAINMENT BRIDGE

PHOTO: KANE RAYNARD GOH



Students from State Polytechnic of Malang, Indonesia and Republic Polytechnic, Singapore, use a Raspberry Pi-based home entertainment system.

The system allows users to convert their ordinary TV sets to smart TVs at an affordable price.

By simply using other smart devices, they can

use it as a remote control or to beam their music or videos straight from the device to the TV.

All powered by a little Raspberry Pi.

### Raspberry Pi: A computer for everyone

A Raspberry Pi is a credit-card sized computer developed in the UK by the Raspberry Pi Foundation in 2012.

Although it costs only US\$35, it can do almost anything a traditional computer can.

As of March 2014, 2.5 million Raspberry Pi computers have been sold worldwide.

The Raspberry Pi was developed to be as cheap as possible to make computers accessible to everyone and as a way to teach basic computing and programming skills.

# Fishing up a treat

*Republic Polytechnic and Cambodia's Royal University of Agriculture and Royal University of Phnom Penh collaborated on the Gourami Project as part of the TF SCALE programme. Over the next four weeks, 25 students from Cambodia will work with 23 students from Singapore on new ideas to rear Gourami fish and strengthen food security in the region.*

By EMMANUEL PHUA, DEEPANRAJ GANESAN AND SHANJAYAN MUNIAPPAN



## RAW BITES

The fermentation process to make edible Prahok proved to be too long for Chong Yan Huan (left), 18, Republic Polytechnic and Songly Krich, 21, Royal University of Agriculture as they looked to take a bite straight from the tank.

Prahok paste is raw and is typically prepared

in three ways.

It is fried with meat and vegetables, or covered with banana leaves and left to cook under pieces of rock or over hot coals.

The last way is as Raw Prahok where it is preferably used as a dipping paste for vegetables and fruits.

## PRAHOK ROJAK



(From left) Jason Ang, 20, Republic Polytechnic, Wilson Yeoh, 19, Republic Polytechnic, Lihuat Noun, 20, Royal University of Phnom Penh, Houn Kimsrea, 22, Royal University of Phnom Penh and Ky Channimol, 20, Royal University of Phnom Penh, whip up a plate of Rojak—a traditional fruit and vegetable salad dish popular in Indonesia, Malaysia and Singa-



pore—with the added Cambodian taste of fermented prahok.

“Rojak” in Malay means to mix different things together.

The dish usually consists of pineapple, apple, fried dough fritters, bean curds, boiled potatoes, prawn fritters, hard boiled eggs, bean sprouts, cuttlefish and cucumber mixed with a sweet thick, spicy peanut sauce.

Adibah Zahirah (left), 20, Republic Polytechnic and Houn Kimsrea, 22, Royal University of Phnom Penh give the new fusion rojak dish a try.

## STARE CONTEST



Pranav Gour (left), 17, Republic Polytechnic, and Houn Kimsrea, 22, Royal University of Phnom Penh, observe Gourami fish at The Aquaria in Republic Polytechnic.

As the Gouramis have labyrinth, which

is an air-filled breathing hole, located under the gill covers, they can often be seen going to the surface of the water to take in fresh air, enabling them able to survive in waters with low oxygen levels.



## PLANT PARADE

Aquatic plants require special adaptations to live submerged in water, or at the water's surface.

Adibah Zahirah (left), 20, Republic Polytechnic

and her Cambodian counterpart Dos Sok Eng, 23, Royal University of Agriculture, lend a helping hand in placing aquatic plants into a breeding tank.



## FUSION FISH FOOD

The four local delicacies prepared by students from Republic Polytechnic, Royal University of Phnom Penh and Royal University of Agriculture on display.

The dishes consisted of Laksa, Char Kway Teow, Rojak and the Fried Rice.

All the dishes were enhanced with a spoonful of Prahok to create popular Singapore dishes with a slice of culture from Cambodia. Prahok cuisine is intra-Asia fusion food at its best.



## FISH & PASTE

Hajarratu Muhammad Naim (left), 19, Republic Polytechnic and Sreynou Kem, 21, Royal University of Phnom Penh, hold a bottle of Prahok paste and the Gourami fish in a tank, respectively.

Prahok is prepared using fresh fish and Gourami is the most common fish used in Cambodia for Prahok.

The fishes are cleaned, de-scaled, blended and a fermented through a long

drying process.

A popular staple food in Cambodia, Prahok is a useful source of protein for Cambodian families and an important food resource for their citizens.



## HANDY FISH

Referred to as the Three Spot Gourami, the fish gets its name from the two spots along each side of its body in line with the eye, considered the third spot.

Traditionally silvery blue in colour, their colours can change significantly with their moods, as well as during spawning, when they obtain a much deeper blue hue.

Gouramis are considered Labyrinth fish, meaning they can breathe by taking air in direct from the water surface.

During a recce trip in Cambodia, this particular Gourami was caught as

volunteers cleared the small pond to help move the other fishes to a bigger pond.

After processing and

fermentation, which takes at least six months, the end result is the Prahok paste (right) that is used in Cambodian cooking.





# PROJECT GOURAMI

**NGOV SEREYBOPHA, 23,  
ROYAL UNIVERSITY OF AGRICULTURE,  
CAMBODIA**



“Singapore is beautiful! No rubbish, but trees and flowers everywhere. It’s my first time in Singapore and I am enjoying myself so far.”

**CHUA ZONG LIN, 19,  
REPUBLIC POLYTECHNIC,  
SINGAPORE**



“TF SCALE has been useful to help me understand how life is like for my ASEAN counterparts. It opens my eyes to the outside world and realise we are living in a charmed world in Singapore.”

**DR WONG LUH CHERNG,  
REPUBLIC POLYTECHNIC,  
SINGAPORE**



“With the TF SCALE, the students communicate and stay together, so their conversations go deeper and they are able to understand each other’s cultures more.”



## BREEDING TIME

Dy Piseth (left), 22, Royal University of Agriculture and Hazman Azri, 20, Republic Polytechnic put Ketapang leaves into the breeding tank to help manage pH levels.

Gourami fishes reproduce in a beautiful way. The male starts the spawning process by preparing a

bubble nest.

The male then wraps himself around the female and turns the female on to her back to release her eggs.

The eggs incubate for two to three days in the bubble nest before hatching.

## FEEDING TIME

Seoun Theary (left), 22, Royal University of Agriculture and Wilson Yeoh, 20, Republic Polytechnic, drop the food pellets into the breeding tank.

Gourami fish are omnivorous and eat different types of food, from lettuce to dried flakes. These omnivores aren’t particularly fussy when it comes to feeding.

They readily consume meaty live meals – as long as they are tiny enough. Some examples include glass worms, mosquito larvae, white worms, earthworms, tubifex worms, brine shrimp and blood worms.

Commercial pellets and dried flakes also both make good additions to a Gourami’s diet.



## POWER LEAVES

Phorn Vannith (left), 20, Royal University of Agriculture and Jason Ooi, 23, Republic Polytechnic, hold up the Ketapang leaves.

Dried Ketapang leaves are used to promote a healthy water environment by lowering the pH of water.

Natural organic acids released by the decaying

leaves help absorb toxic chemicals and reduce the population of undesirable bacteria.

Ketapang is a prized leaf for many Asian tropical fish hobbyists as they believe that the dried leaves can enhance the colour of aquarium fish and increase their immunity.



# Serve me some Pi

*During their month-long stint in Singapore, students from State Polytechnic of Malang and Polytechnic Caltex Riau, Indonesia will get a chance to experiment and co-develop projects that the students from Republic Polytechnic, Singapore have started with the Raspberry Pi. They will continue to refine these projects back in Indonesia and get together again with the Singapore students this September for the implementation phase.*

By KANE RAYNARD GOH AND RAVETHI JEYAKUMAR

## FUN WITH PI



Students from State Polytechnic of Malang, Indonesia, Raddy Hendrawan (left), 20, Ido Ferdian, 22 and Teddy Alfianto, 22, have fun doing Pi solutions with Singapore students from Republic Polytechnic.

The Indonesian students are currently visiting Singapore to learn new programming techniques that can be combined with their own projects back home.



Paratisa Kharismadita (left in photo right), 21 and Isnau Fauzia Rahmah, 21, from the State Polytechnic of Malang, Indonesia, try out 'voice-to-text' transcriber created by Republic Polytechnic students in Singapore using a Raspberry Pi.

With the goal of breaking down communication barriers, the 'voice-to-text' project also leverages Raspberry Pi power to translate what users say into different languages.

Through TF SCALE, students can work on projects that will

benefit the society.

With many different languages and cultures around the world, students can use this innovation to come together to combat social issues without having to worry about communication barriers.

## LIFE OF PI



For the students of Republic Polytechnic, Singapore, State Polytechnic of Malang and Polytechnic Caltex Riau, Indonesia, this tiny computer is the life source of everything innovative.

After spending months with this credit-card sized

PC, students have created with ways to help communities progress and change the way people interact.

So far, students have programmed the Pi to take class attendance instantly, transcribe and translate, and make a dustbin talk.

## TESTING - SATU, DUA, TIGA..





### AUTO SELFIE

The students from Indonesia were ready for the camera as they strike a pose.

Operated using the Raspberry Pi server, the photo booth captures a shot

through a motion sensor attached together with the camera.

Each picture taken is sent directly to the users e-mail address for keepsake.

The Raspberry Pi plus motion-controlled camera can also be used as a low-cost security system for developing countries or as a photo booth for identification cards.



Raditya Hendrawan, 20 (photo right) and Eduardus Adi Prayoga (photo above), 22, from State Polytechnic of Malang, Indonesia, are in Singapore to start work on joint Raspberry Pi projects with their Republic Polytechnic counterparts.

### SOCIAL FOCUS

The aim is to help address social issues that affect the community.

These projects will be done in September when the Singapore team go to Indonesia as part of the TF SCALE exchange programme.



### INSTANT ATTENDANCE

Students from the State Polytechnic of Malang, Indonesia, and Republic Polytechnic, Singapore, work together on an innovative iBeacon project.

iBeacon, a project inspired from an upcoming app designed for iOS devices, makes use of the Bluetooth technology for short-range location tracking.

With the Raspberry Pi and iBeacon, schools can use Bluetooth in students' phones to take their attendance instantly as they walk into the class.

This project is not only low-cost but also saves teachers the trouble of spending time taking attendance for a big class of students.



## HELLO, APA KABAR?

Having connection problems? With the Raspberry Pi, reception is no longer an issue even in the most isolated area.

Developed by students of Republic Polytechnic, this innovation connects people at low cost as no telco contract is required.

Below, Ichwannul

Suenta (left), 20 from Polytechnic Caltex Riau and Yazid Mahtudzi, 21 from the State Polytechnic of Malang, Indonesia, test out the telco-free system.

All that is needed are WiFi-enabled devices and a Raspberry Pi to act as the communications server.



## PI PARTNERSHIP

Masul Khusna, 20 (left) from State Polytechnic of Malang, Indonesia, and Chia Wei, 21 from Republic Polytechnic, Singapore, have a good time exchanging tricks and tips on how to programme the Raspberry Pi.

TF SCALE gives students from Singapore and Indonesia a chance to combine their expertise of the Raspberry Pi to create groundbreaking solutions that can address community issues across ASEAN.

**EDUARDUS ADI PRAYOGA, 22,  
STATE POLYTECHNIC OF MALANG,  
INDONESIA**



"I hope to get new experiences to be able to share with my friends back home in Indonesia, not only about the projects and the Raspberry Pi, but also about the Singapore culture."

**ARIEL SEAH POH CHOO, 21,  
REPUBLIC POLYTECHNIC,  
SINGAPORE**



"With TF SCALE, I feel like I am putting my knowledge to good use. This collaboration has opened up new opportunities and helped engage new ideas on Raspberry Pi. It has been a pleasant experience."

**ANANDA, 29,  
POLYTECHNIC CALTEX RIAU,  
INDONESIA**



"Through TF SCALE, I hope that it would broaden the student's perspective of interacting in a diverse education environment. This experience will also help them to appreciate others' potential and culture."



## GOURAMI GROUP FROM CAMBODIA AND SINGAPORE



**(From left) Back:** Muhsin, Pranav Gour, Yeun Yarith, Nurshahadah, Muhammad Norhakim, Krech Songly, You Chanarithy, Desmond Tan, Tauk Chanraksmeay, Chea Bora, Sath Sitak, Kim Sothary, Keo Sotha, Adibah Zahirah, Hajarratu Rahma, Houn Kimsrea, Wilson Yeoh, Amanda Teo, Hazman Azri

**Middle:** Chea Eliyan, Lihuot Noun, Sin Sopheana, Sem Sovanna, Noeurn Sreymom, Ngov Sereyobpha, Khum Sros, Chong Yan Huan, Dy Piseth, Ky Channimol, Soeun Theary, Tay Mei Hua, Raden Nur Su'aidah, Audrey Chua, Jason Ang

**Front:** Khom Chasereivath, Phom Vannith, Sombath, Siti Nur Syafiqah, Sarah Liyana, Jason Ooi, Ngeth Sopheap, Tea Theanpav, Srey-nou, Dos Sok Eng, Jocelyn Ea, The Kyi Soe

## RASPBERRY PI PARTY FROM INDONESIA AND SINGAPORE



**(From left) Back:** Chan Kuang Sheng, Shaun Yam Zhan Hui, Wee Jian Jie Marcus, Muhammad Ar-ief Rahman, Cheok Jia Chin, Raditya Hendrawan, Teddy Bagus Alfianto, Ido Ferdian, Wendy Amai Safri Rosyadi

**Middle:** Wahyudi Munthe, Bintar Maday Raditya, Ang Yi Feng, Ratih Widyastuti, Lim Shun-yong, Kurnia Putri Devitasari, Eduardus Adi Prayoga, Denice Erycka Trinidad Aguilo, Rizki Anggarsasi Suwandari, Laily Maulidiya Syafitri, Mika Pramudia, Mas'ul Khusnah, Seah Poh Choo, Chia Wei, Naufal Farras Hilmy, Ichwan-nul Suenta, Sharmila Kanna, Ananda

**Front:** Jefry, Yeo Jian Min, Paratisa Kharismadita, Isna Fauzia R ahmah, Chalimi Fith-ratu Al Laili, Heksa Merwati, Agytsdita Christie Mariana, Nikmatius Sa'adah, Yan, Chan Wei Zhang, Nicholas Tan Jun Xian, Yazid Mahfud-zi, Ahmad Adil Faruqi

This special supplement is done by students from the Diploma in Mass Communication

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For



### About TF SCALE

TF SCALE brings student leaders from ASEAN countries together to build relationships now that will strengthen ASEAN ties in the future.

The TF SCALE ex-

change programme gives tertiary students an opportunity to appreciate the common social issues in the community and co-create solutions that extend across country and cultural boundaries.