



# SWEEP: Investing in the Philippines' future engineers

Smart Communications, Inc. is a telecommunications company based in the Philippines, that is working to improve information technology and engineering education in the country. They have developed an industry-education partnership – the Smart Wireless Engineering Education Programme (SWEEP) that will prepare students for work in industry or to become technopreneurs (technology entrepreneurs).

Offering access to high-quality, up-to-date equipment and training SWEEP equips Electronics and Communications Engineering (ECE) students with the skills the telecommunications industry needs. They are also able to offer first-hand exposure to the Smart engineers who are building and operating the Philippines' most extensive digital mobile phone network.

### Understanding and addressing local needs

In the Philippines, nearly all the school-age population attend state (public) schools but there are problems with a lack of qualified teachers, books and classrooms. These problems are exacerbated by the geographic character of the Philippines as an archipelago and the rapid increase in the population.

Smart aims to improve the situation and contribute to nation-building and human-capital development. They are developing basic education programmes in the community, integrating information and communications technology (ICT) into secondary education, and the SWEEP programme for ECE and IT students in tertiary schools.

### The SWEEP Programme

The Programme was launched on 28 March 2003, with the first wireless lab at the Bulacan State University. The response was so positive that the original target



of involving 20 tertiary schools (offering the equivalent of college/ university education) was exceeded by 60%. To date, they have created a network of 52 private and state-run schools all over the Philippines, benefitting over 14,000 teachers and students.

The SWEEP programme has three parts – up-to-date hardware and software, expert lectures and training, and a platform for students to develop community-based, wireless apps. The training is integrated into existing course subjects.

“Through SWEEP, our school (Bulacan State University) has become one of the top universities producing quality graduates [in] the telecommunications field.”

Oliver R. Mariano, Department Head, College of Engineering/Department of Electronics and Communications, Bulacan State University

### Equipment

Smart donates a wireless laboratory and equipment to schools. The equipment consists of the GSM (Global System for Mobile Communications) and TACS (Total Access Communications System) from Europe and CDMA (Code Division Multiple Access) and AMPS (Advance Mobile Phone System) technologies from the US. These give students a comprehensive knowledge of the development of cellular communications technology and the basics of a mobile phone network.

Their engineers provide training on 2G and 3G systems, WiMax (4G technology), LTE, smart broadband and setting up hotspots in students' own schools.

They also offer training on Android apps, providing the school with a smartphone called the Netphone – a low level smartphone that can support the development of Android apps.

“I am extremely thankful for being a SWEEP scholar ... I am now more focussed in my studies since I no longer worry about financial constraints.” **Rhegine Raymond P. Calderon**, Bachelor of Science Major

in Electronics and Communications Engineering, Year 5, College of Engineering, Technological University of the Philippines, Manila



### Continuing education

Smart couples the hardware donated to the schools with training and seminars delivered by their own experienced engineers

### The SWEEP students:

- IT and ECE students aged 18–22 in years 3–5 of their courses
- in most schools there is an average of 250 students per ECE programme
- there has been no significant increase in the number of ECE students because it is a ‘quota’ subject, where only students who pass the cut-off score in the entrance examination can enrol
- the spread is about 70% male and 30% female and this does not seem to be changing
- 50–90% of the ECE students graduate after five years

### Administrative support

Smart also provides partner schools with support in the form of:

- a web-based communications tool called ‘Smart InfoBoard’ which the school’s officials use to broadcast information (e.g. announcements to the student body), do polling and store information that their users can pull (e.g. grades or exam schedules) all via SMS
- financial assistance for select deserving but poor students from partner state-run schools which includes payment of full tuition and fees, a monthly allowance and an annual book allowance
- financial or in-kind support for the school’s events and activities, including those organised by student groups or organisations.

For more information visit the project website at [www.smartsweep.ph](http://www.smartsweep.ph).

### SWEEP training programme, delivery mode and contact hours

Training	Delivery Mode	Contact Hours
Internetworking Fundamentals	Lecture & Hands on	24
Transmission Control Protocol/Internet Protocol (TCP/IP)	Lecture	16
Voice over Internet Protocol (VoIP)	Lecture	16
3G Systems Training	Lecture	16
Smart Broadband Module 1 Training	Lecture & Hands on	16
Smart Broadband Module 2 Training	Lecture & Hands on	16
Installation and Configuration of Wireless Broadband Equipment	Lecture & Hands on	8
Faculty Immersion	Field Work	80
On the Job Training for Students	Field Work	320
Leadership Forum	Seminar	8
Technology Seminar	Lecture & Hands on	8
Application Developer’s Intro School	Lecture & Hands on	40
Android Application Development	Lecture & Hands on	40

### Celebrating innovation and excellence SWEEP Awards

Smart has created the annual SWEEP Innovation and Excellence Awards – where faculty–student teams compete using Smart’s platform of products and services to develop community-based, wireless solutions or mobile applications, which run on the Android platform and will benefit their respective communities. This is now in its ninth year and prizes are awarded to the winning teams and the schools involved.

Ninety-three prototypes have been developed to date – from wireless solutions for disaster preparedness, environment, education, energy, transportation and health to mobile apps for entertainment, social networking, mobility and productivity.

### Examples of winning applications Wireless solutions

- Wearable Obstacle Detection System and Braille Cell Phone for the Blind developed by students from the Mapua Institute of Technology. The specialised mobile phone, which also uses a SIM card, allows the blind and partially sighted people to receive and ‘read’ text messages via the Braille system.
- TimeFree is a queuing application developed by students from the Ateneo de Zamboanga University. It allows customers to enter their priority number at the TimeFree machine, and specify what number they want to be alerted on so that they can go somewhere else, knowing that when it’s close to their turn, they’ll get an SMS alerting them that it’s time to return.



“Through SWEEP, the students can gain access and knowledge from the latest technologies, and they are able to apply their knowledge to produce projects that are ready for the real world and at par with world standards.”

Rolando G. Peña, Head of Technology of the Philippine Long Distance Telephone Company (PLDT) and Smart Communications, Inc. (Smart)



#### Web and mobile apps

SWEEP also organises mini competitions where students and professional mobile applications developers come together to develop relevant applications:

- ‘Palay’ (Rice) Quality Checker through Leaf Coloration by Image Analysis is a mobile app developed by students from the state-run Bataan Peninsula State University. It runs on the Android platform and uses image processing to analyse the colour of the palay leaves using a photo taken from the mobile phone’s camera. The app displays any deficiencies and gives suggestions to improve the quality of the palay. It is an accurate, convenient and low-cost diagnostic method that helps farmers and ultimately addresses the issue of food sustainability.
- Project NOAH for Mobile (National Operational Assessment of Hazards, a responsive disaster mitigation program developed by the Department of Science and Technology) is a disaster-preparedness and mitigation mobile application developed by Davao-based developers during a Smart hackathon. It uses location-based services and a geo-location application programming interface to determine the user’s location and display relevant weather info from Project NOAH. The mobile app is now available in Google Play.

#### Lessons learned

- **Equitable partnership, real value.** SWEEP has lasted for nine years because it adds real value to both Smart and the partner schools, mainly through the investment in the continuing education programme.
- **Technology is only effective if you get the people side right.** Invest heavily in capacity-building, readiness, acceptance and ownership.
- **Work with a coalition of the willing.** This will guide sustainable programme development.
- **Adaptation.** The geographic spread of schools in the Philippines makes it important to be able to adapt the Programme to varying dynamics.
- **Change.** To keep the Programme relevant, there is continuous effort to improve and innovate by listening to partner schools’ needs.
- **Nurturing innovations.** Young people have many new ideas ranging from simple yet practical to holistic and elegant. The key to harnessing them is to provide a ‘playground’ where they can express and develop their ideas freely, working as partners to come up with tangible and viable applications or solutions.
- **Diversification.** Engaging the schools outside the technology framework helps to create a shared value of applying technology for the common good; for example Corporate Social Responsibility activities like tree planting and house building for the poor.

#### What next?

SWEEP has now also provided additional funding, through the IdeaSpace Foundation, for select student teams who want to take their applications to the next level. IdeaSpace is a non-profit incubator and accelerator arm of the First Pacific Group of Companies, of which Smart is a part. It aims to help budding technology entrepreneurs develop innovative solutions and transform them into successful commercial products or solutions that support social development and poverty alleviation.

This programme provides the following support for local technopreneurs:

#### Incubation:

- seed funding
- mentorship from executives from the group companies
- access to the vast and various resources of a conglomerate including:
  - business planning
  - legal consultancy
  - patent assistance
  - branding and PR
  - financial management
  - communications and marketing.



**Acceleration:**

- a community of technopreneurs to share with and learn experiences from
- clear partner route to markets served by any company in the group whose range of business translates to millions of households, subscribers, motorists and others
- opportunities to be connected and showcase products to potential investors
- partnerships with top technology vendors
- affiliation with top global technology incubators or accelerators to learn and replicate their successes.

“Joselle is one of our key engineers ... I believe that the SWEEP training developed her to become effective and goal-oriented. It is beneficial to the students and develops them to become the best in any profession they choose to be in.”

**Ferdinand I C. Fajardo**, Data Officer, Maynilad Water Services Inc.

“Although developing the application was difficult, it was also exciting and at the end of the day, we were grateful to be part of an endeavour to bring change in our community.”

**Joselle Acebuque Macrohon**, Graduate, College of Engineering, Ateneo de Zamboanga University

**Smart's Education Strategy**

Smart's education strategy seeks to contribute to the overall mission to help advance human capital development in the country by:

- helping strengthen industry-academe partnerships at the tertiary level
- supporting ICT integration at the secondary level so that teachers can better prepare students for tertiary level
- contributing towards strengthening student reading competencies at the basic education level.



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**About the GSMA Connected Living programme**

Connected Living is a three year market development initiative whose mission is to help mobile operators accelerate the delivery of new connected devices and services. Our target is to assist in the creation of 700 million new mobile connections, whilst stimulating a number of service trials and launches in the Automotive, Education and Healthcare sectors. The Connected Living programme is also working with the city of Barcelona, the Mobile World Capital, to develop and showcase smart city services. We are working in mEducation to help bring the operator and education industries together to address market barriers, foster collaboration and speed up the adoption of mobile education services.

For further information please contact us at [meducation@gsma.com](mailto:meducation@gsma.com) or visit [www.gsma.com](http://www.gsma.com)



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