OUT
OF THE
ORDINARY

TEACHER INNOVATIONS CHANGING STUDENT LIVES

Juan Miguel Luz

Princess Maha Chakri Awards Foundation

Out of the Ordinary:

Teacher Innovations Changing Student Lives

Stories of the first Southeast Asian
Teacher Awardees

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Bangkok, Thailand

About
The Princess Maha Chakri Award

On the occasion of HRH Princess Maha Chakri Sirindhorn's 60th Birthday Anniversary Celebration in 2015, the Princess Maha Chakri Award was established by the Princess Maha Chakri Award Foundation in collaboration with the Teachers' Council of Thailand. The award is given to outstanding teachers from eleven Southeast Asian countries namely Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Timor-Leste and Vietnam, who have made an impact to student development and lives in their communities.

HRH implements several projects that help improve the quality of lives of the people particularly in remote areas not only in Thailand but in other countries in the region and beyond through education. HRH is aware that teachers are an important key success factor to students and education systems. Several projects and program have been established in Thailand to build teachers' capacity in both pre-service and in-service training. These include (1) a program to help the Police Border Patrol become teachers in Police Border Patrol schools in remote areas of the country, and (2) a program to develop local teachers through scholarships (Education degree) in universities in provinces throughout the country.

HRH, herself, is a devoted teacher at the Chulachomklao Royal Military Academy teaching with passion in imparting the very best of her knowledge and experience with her students.

The Princess Maha Chakri Award was established in recognition of HRH's contribution, commitment and devotion to teachers and education.

Every two years, the Award is given to one teacher in each of the eleven countries in Southeast Asia. The criteria and mechanism for selection is set by the Ministry of Education of each country. Each country selects their very best teacher to receive the award based on the theme, "Quality Teachers Shape Quality Persons" within the context of their countries. Teacher-awardees are those who have been recognized as having nurtured students such that students' lives are transformed and changed for the better. The additional criteria is that the practices of these teachers are well-recognized with public acknowledgement. He or she should have inspired other teachers.

The Award serves as a mean to promote best practices of teachers in Southeast Asia and giving them an opportunity to share their best practices with other teachers in the region. Thus, a region-wide community of practice can be developed and encouraged to help improve the quality of education in the region as a whole.

The Princess Maha Chakri Award Foundation committee members work closely with the Ministry of Education of the eleven countries and international organizations such as SEAMEO visiting teacher-awardees after the selection. As each country visit shows, these teacher-awardees share the same unique attributes of passion, going extra miles, and always giving. They are teachers with great hearts.

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Foreword

"A Teacher plants a seed of knowledge, value and character, it grows forever."

Realizing the importance of the methods to plant knowledge to the students, the Princess Maha Chakri Sirindhorn Award Foundation created this Award with the purpose of recognizing successful methods and and pedagogies used by the eleven remarkable 2015 Princess Maha Chakri Award recipients from the eleven countries of Southeast Asia.

We are also aware that teachers are one of the most influential persons in students' lives. Their passion, their caring and the extra miles that they do for their students have an impact on their students' lives. They play an important role in crafting knowledge and shaping life.

We hope that this book will be useful for other teachers, institutions and organizations that work with teachers. In this way, the experiences and practices of these 11 awardees be of benefit to a larger number of students throughout the region.

Dr. Krissanapong Kirtikara
Chairman
Princess Maha Chakri Award Foundation

This book would not have been possible without the guidance and assistance of the following persons and organizations:

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and

All the Princess Maha Chakri Awardees of 2015 – for their innovations and being the extraordinary teachers that they are.

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Creating innovative teaching approaches for students with special needs

Rajah Ratnawati bin Haji Mohammad

Brunei Darussalam

> *"Every child with special needs has the right to an educational program that is suitable to his or her needs"*

The Learning Journey

"Every teacher has a calling, but to be a special education teacher is to have a special kind of calling. Mine came when I became a mother of a child with special needs myself." These were the words of Mrs. Rajah Ratnawati binti Haji Mohammad, a teacher in Keriam Primary School, Tutong District, Brunei Darussalam

"I was 21 years old when I first started as a teacher in a regular classroom. I got married at the age of 25 and had my first child two years later. My daughter was born with Mosaic Down Syndrome and autism. I was devastated at first," she recalled. "But I soon realized that I had to be strong to face the world. Her birth encouraged me to be directly involved in the field of special education." For the next two decades, Ratnawati devoted herself as a primary school special education teacher looking after classes from preschool up through Primary 6 in all subjects except Islamic Religious Knowledge.

In 1996, a lecturer from Malaysia at the Universiti Brunei Darussalam invited Ratnawati to represent parents from her district at the First International Forum in Special Education. The lecturer, himself, was the father of a daughter with Down Syndrome. Following that experience, Ratnawati took up a part-time certificate course in Special Education. At the end of the 16-month course, she set up a Learning

Assistance Centre (LAC) which included a few students with special needs including her daughter and more than 30 others who were low achievers in Mathematics with weak reading skills.

"I still remember when my daughter would be made to sit in the front of the class with her table facing the wall separated from her normally-abled classmates," Ratnawati said. "It broke my heart to see this. There was a time when some teachers were reluctant to accept her in their class and sent her back to my room. The same thing happened to other students with special needs. My LAC was like a dumping area for these students. I was determined to fight for my students' right to a proper education."

The school administration was not always wholly supportive. Ratnawati was often assigned to be a substitute for other teachers on maternity leave. Some staff and colleagues thought that she was doing nothing with her students who had special concerns. She was determined to prove to everybody that they were wrong and that her students could be successful including low achievers taking the national exams.

She began attending courses, workshops, seminars and conferences on special education both inside and outside the country on Autism, Braille, sign language, the picture exchange communication system or PECS[1], dyslexia, and on the use of multi-sensory equipment. In 2002, Ratnawati obtained a Bachelor degree in Special Education. In 2009, she passed the Examination in Signing Exact English.

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1   The picture exchange communication system (PECS) is a form of augmentative and alternative communication developed in 1985 at the Delaware Autism Program by Lori Frost and Andy Bondy. The system is commonly used as a communication aid for children with autism spectrum disorder (ASD) but has also has been used with a wide variety of learners, from preschoolers to adults, who have various communicative, cognitive, and physical impairments, including cerebral palsy, blindness, and deafness.

Challenges in providing Special Education in Brunei Darussalam

"There are many challenges faced by the special education teacher in Brunei Darussalam," Ratnawati points out. "Some parents of special needs children are disinterested in the welfare of their children and fail to provide them with adequate care. Others are overly-protective and may have unrealistic expectations for their child and the child's teachers. Both attitudes can shape children with special needs in negative ways."

Special education teachers often find themselves overly stretched. They are required to attend meetings, conduct assessments and deal with an load of paperwork. Schedules have to be coordinated with other subject teachers who are often given priority by school administrators. It can take special education teachers up to two months at the beginning of the school year to get a schedule in place for themselves and their students only to be disrupted by the entry of new students with special needs or those transferring from other schools in the middle of a school year.

On top of their own schedules, special education teachers also have to supervise teaching aides who may have been differently trained for the job. "We value their work as a part of our team," says Ratnawati, "but we also have to make sure things get done properly because teachers are ultimately the ones responsible for outcomes, not the paraprofessionals."

Special education teachers need to know the general education curriculum in order to support special students. For Ratnawati, this means knowing the curriculum for six

grade levels and collaborating with the teachers of all the regular subjects to make sure that she is supporting what is being taught in these classes. Finding the time to talk to each regular class teacher is extremely important and challenging particularly when general education teachers are reluctant to include students with special needs in their classrooms.

Data collection is likewise important in special education. Everything needs to be validated to make sure these are reflected in a student's IEP (individualized education program). If a child is struggling in a certain area, proof is needed to back up this claim. Special education teachers have to keep track of and monitor all this data, understand its implications for that child's education needs, and adjust instruction accordingly. Evidence of student growth is a part of all teachers' evaluations in order to hold them more accountable for learning outcomes.
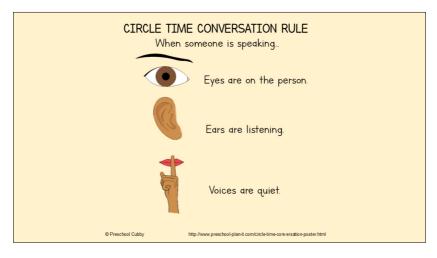
"For students with special needs, we have learned to celebrate the smallest of accomplishments," she smiles. "Their growth is not going to be as fast or as noticeable as their general education peers. However, it is progress! Sometimes, it is very hard for people to recognize the successes of a student when they are constantly comparing them to the best and brightest in the class.".

A special education teacher's class may have students with various disabilities. Since each student is a unique case, the teacher must modify their lessons to suit each learner by providing individualized education programs. Differentiated instruction and individualized teaching practices are challenging for all teachers. It gets even more difficult in a special education where some has students of different ages.

The nature of a special education teacher's work is very different from that of regular teacher. The result of this is that standard classroom teachers may not view them as colleagues. There may be a professional stigma attached to the work of teaching students with special needs. Special education teachers often work with smaller groups and may focus on skills rather than content, thereby leading to the perception that their work is easier or less important.

Planning Circle Time

Circle Time – also known as the Morning Meeting – is a pedagogical method in special education that Ratnawati has adapted and innovated based on her research and readings. The idea, practiced in special education classrooms across the United States, Australia and elsewhere, came about from her experience with SMARTER Brunei, an organization working with autistic children. It took Ratnawati a year to practice and improvise using Circle Time before she felt it was suitable for her students.

CIRCLE TIME CONVERSATION RULE
When someone is speaking...

Eyes are on the person.

Ears are listening.

Voices are quiet.

© Preschool Cubby   http://www.preschool-plan-it.com/circle-time-conversation-poster.html

The primary purpose of Circle Time is to support every child by establishing membership in the class. It provides students with special needs the opportunity to learn socialization, communication, listening, fine motor and academic skills, while establishing a sense of community in the classroom.

Circle Time offers students a sense of order and purpose. In Ratnawati's classroom, Circle Time is the first learning activity of every day starting with the National Anthem and Prayer. Drawings of each students' footprints are pasted on the floor so that students know where to stand, where to face, and how to stand during the national anthem and prayer.

A hand massage follows to relax students and improve their attention span. A fun way of greeting each child and checking attendance is done next complete with a song and actions. This is followed by the sharing of news (calendar, weather and special class events). Group activities including cognitive lessons, games, songs and exercise or gross motor imitation complete the circle time activity.

Circle Time also provides the opportunity to practice communication skills by children sharing their experiences and stories, posing questions and listening to each other. Students with hearing impairment or having no speech (the majority in the class) communicate using sign language. Students learn to take turns, wait for each other, and cooperate during group activities.

Meaningful morning circles require careful planning, including decision-making about the components, arrangement of the physical environment, equipment, staffing, and what positive behaviors to support. Routines that benefit students such as greeting activities are carefully planned and carried out to form good habits.

Equipment decisions focus on adaptive seating and communication devices such as:

- Different colored plastic chairs

- Eye-level seating to facilitate conversation

- Small portable easels

- Slant boards for visually-impaired students

- Use of microphones, photographs, real objects, vcd player, sign symbols, braille, calendars and weather charts

There must be a sufficient number of staff or peer helpers to ensure that every student can actively participate. Using a visual chart to record the Circle Time songs and poems enables support staff to participate more fully. To reinforce the students' positive behavior, specific reinforcement praises such as "very good", "excellent", "well done", "thank you" and "good girl/boy" or a 'high five' action and clapping of hands are done frequently.

Parent Involvement is critical. Ratnawati sends text messages or tells parents what they can do to support the participation of their child in school. For example, parents can collect pictures of food and drinks from old magazines for the students to cut and paste on to pictures of favorite food and drinks for use in the group activities.

To make circle time more successful, she lists down a few things to consider.

Avoid complicated and difficult activities. Use developmentally-appropriate activities for the students. If 8 of the 10 children are not participating, pay attention to this behavior. Either the activity is wrongy plannedl or they are

bored by it. For students with speech problems, activities such as naming flashcards, reciting the alphabet, days of the week, or months of the year are not appropriate.

Sing simple songs with hand motions or songs with lots of whole body activity to encourage participation. Songs such as the "Hokey-Pokey", "London Bridge", "If You're Happy and You Know", "Itsy Bitsy Spider", "The Wheels on the Bus" are songs often used.

Include only activities that children obviously enjoy. The use of the same song to greet each student helps to build routines that can become habits and helps them organize their thinking.

Avoid long durations of circle time and match this with the group's attention span.

Avoid difficult tasks in group activities. Always make sure to give suitable, easy, simple and achievable tasks for students during the cognitive lessons so as to enhance their self-esteem and allow them to experience success.

To measure success, a checklist to keep track of skills learned in each component of circle time is kept. This checklist takes note of the following:

- Ability to identify one's name card independently during greeting activities.

- Ability to listen to their name when called out by the teacher.

- Ability to point out and identify their friends.

- Ability to follow instructions.

- Ability to follow circle time rules.

- Ability to perform their duty as one of the Circle Time helpers when assigned.

From Classroom to School System

The National Education Policy in Brunei Darussalam provides for 12 years of education for all children (1 year of pre-school, 6 years of formal primary education, 3 years of lower secondary and 2 years of upper secondary, or vocational/technical education).

Students who are physically, intellectually or cognitively challenged, as well as those who having visual or auditory impairments and specific learning difficulties are given the option to attend special educational needs programs of different types. Teaching approaches focus on students with different abilities and use diagnostic assessment to identify students' capability and weakness. Appropriate interventions and remedial learning activities will be part of the repertoire of teachers in the classroom.

The Special Education Unit (SEU) established in 1994 is an integral part of the Ministry of Education. The aims, purpose and philosophy of the SEU reconfirm the importance of every student in nation-building and are based on the assumption that the improvement of human resources begins in the classroom by providing appropriate education for children within an inclusive school system.

Special education teachers work in a variety of settings. Some have their own classrooms and teach only special education students in a full-time special education program. Others are special education resource teachers who offer

individualized help to students in general education classrooms called "in class support". Some special education teachers teach together with general education teachers in classes including both general and special education students. This is called "cooperative teaching". A fourth group are special education teachers who work with students with special needs for a few hours each day in their LAC room separate from the general education classroom. After these sessions, these students return to their regular classes to join the other students. This is called a "pull-out" system.

"Many students with diverse learning needs can be educated within the regular classroom," Ratnawati believes. "This setting, however, may be appropriate for some, but not all students with learning disabilities. Some student's learning disabilities are taught in regular education classrooms for some part of their school day. When provided appropriate support within this setting, many of these students can succeed academically and develop positive self-esteem and social skills."

"Twenty years ago when I first started this journey," she continued, "many teachers neglected to accept students with special needs in their classroom. This was because many regular education teachers were not prepared to provide the kinds of instruction that benefit a wide diversity of students in the classroom. They did not feel confident to handle these students in their classroom situation."

In her small way, Rajah Ratnawati bin Haji Mohammad is making a difference in the lives of her students in her LAC and is helping break down the barriers within the school. This is what being a special education teacher is all about – the education of children with special needs and of society in general.

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2 | A student-centered approach to help students perform beyond their expectations

Tauch Bundaul
Cambodia

"We have a slogan in Khmer: Teaching will reduce illiteracy and ignorance among the people and can help decrease poverty in society."

Cambodia is a country that lost a generation of teachers under the Pol Pot regime (1975-79). In a brief four-year period, the cities were emptied of people who were sent to the countryside for re-education. A third of the population died, many of them the educated elites. It was a dark period in Cambodia's history.

"I was born in 1977," said Ms. Tauch Bundaul, a primary school teacher in Siem Reap, the Cambodian city near the ancient temples of the Angkor Wat complex. "It was at a time when the country was under the Khmer Rouge regime. Under the Khmer Rouge, education came to a halt and many of the teachers, academics, and educated people were forced into labor collectives in the countryside where many perished. I was too young to know of the atrocities of the Khmer Rouge at that time and it was only in elementary school when I began to hear my parents talk about the destruction brought about by that period and the effects it had on the people. Nearly 3 million people were killed in a very short period. By 1979, the survivors of this genocide were mostly women and children. As I listened to my father speak, the idea of becoming a teacher became clearer and clearer in my mind."

In 1995, Tauch graduated from high school and entered a teacher training college for two years taking a number of subjects that she had never studied before such as psychology, teaching methods and other foundation courses in education. At the end of two years, she had the opportunity to teach in one of the primary schools in Siem Reap province for three months. At that time, she was barely 20 years of age with no teaching experience.

"My first school, Preah Dak Primary School in Siem Reap, was about 19 kilometers from the city. At that time, the country was still relatively unstable with the Khmer Rouge still very much present," Tauch said. "My first class was of Grade 1 students whose parents had little education themselves. They relied heavily on the teacher for everything."

Her second assignment was at a new place called Wat Bo Primary School, located in the center of Siem Reap. Having studied management in college plus having contributed actively to the financial and technical management of the school and with a background in English and computer skills, Tauch was given the opportunity by the Ministry of Education, Youth and Sports (Cambodia) to study in Japan in 2007. She returned home armed with new methods of teaching mathematics and science sharing these with her co-teachers in Siem Reap. That same year, Tauch finally graduated with a Bachelor Degree which she soon followed up with a Master's Degree in Business Administration.

On being a teacher

"In 1997, when I went to work in remote areas," Tauch recounted, "there were many challenges faced by teachers which could affect their performance: remote assignments, low pay, and difficult commutes. Another issue in these remote areas was the lack of appreciation and understanding of the value of education by parents and students."

Tauch's father was a teacher and her role model. She remembers him as always looking out for the weaker students in his class. Every day, as a child, she would ride behind him on his bicycle to and from school, from kindergarten up through elementary. Every day, on the way, they would talk about learning, about doing well, about being a good person, about honesty. People without a good education will struggle, he would tell Tauch. If you want to help them, he would counsel her, be a teacher who can give to others. "When I became a teacher," she said proudly, "my father became my best adviser."

"My parents are a good example for my life and career as a teacher," continued Tauch. "Each day I recommit to myself to doing this work and I consider being an educator as a lifestyle choice. Teaching fills my entire life with purpose and love that continues to multiply over time."

Tauch's philosophy of teaching is pragmatic and humanist.

A personal philosophy:

"Be a good teacher and give your all with no thought of gain."
"Be ethical and the country will develop."
"Practice sufficiency."

Tauch Bundaul

For her, teaching is public service. It may not be a perfect profession, she knows, and it will constantly be changing. To this end, a teacher must be prepared to change with the flow picking up on new new trends and the newest knowledge.

A teacher must also be a mother or a father to a child, if needed. She disciplines them when necessary but she must also be there to cry with them, laugh with them, get angry at them but also to console them. For her, the goal is to encourage every student to achieve his or her best and if someone or something were to impede that process of learning, a teacher should be there to show the way.

"A teacher often comes to work when it is still dark outside," she smiles. "And we stay in the school til it is dark again. We work on weekends and during holidays. And when a student does well, we whisper in their ears, 'I am so proud of you. I knew you could do it.' This is the relationship I try to build with each of my students."

For Tauch, a teacher is also a counsellor. "To help students with difficulties, I visit their homes. When I see their difficult living conditions or the use of violence at home, I understand how this can affect their learning and intellectual development."

In the late 1990's when Tauch first started teaching, she had to go house-to-house to track down students who were perennially absent. Why were they not in school, she would ask. She would discover that many were staying home to watch over younger siblings while their parents were working in their farms. Others were working in the fields with their parents.

"It was difficult to explain the importance of schooling to many parents," Tauch said. Once she was able to convince parents, however, she had to finds ways to constantly remind

them of this. Where in the past, she had no choice but to visit families from time to time, technology today helps her do the reminding.

With the ubiquitous mobile smartphone today, Tauch uses mobile apps such as Line and Messenger to send reminders to parents whose children are absent from class. In serious cases, however, such as families with difficult living conditions or family violence, Tauch makes the effort to visit students to figure out how to help them with schoolwork and to encourage them to return to class.

For students in violent situations, she coordinates with local law enforcers and child rights organizations to seek specific legal protection for child victims. In 2012, she had a young girl who was living with her mother and stepfather. The mother worked evenings. Every night, the young girl would be left with her stepfather. Tauch began to notice bruises on her arms. When asked about it, the little girl shrugged it off as a fall in the bathroom. Three days later, Tauch noticed bruises to her eyes. The girl was reluctant to say what had happened to her for fear of harming her mother. It turned out that the little girl was often beaten by her stepfather. With that information, Tauch reached out the police and child protection authorities to deal with the abusive stepfather and find a solution to this problem at home.

The teacher as counsellor

"I interact with students on a daily basis," Tauch points out. "Because of this high level of contact, teachers may be among the first to notice problems developing in a student.

Making a referral to the Counseling Center can be an effective way to assist students in getting the help they need."

Tauch has drawn up a list of tips for teachers of things to look out for to help identify students in distress. Signs of depression (frequent crying, insomnia, oversleeping, sudden weight loss or gain, loss of pleasure), talk or threats of suicide, confusion including bizarre, alarming or dangerous behaviors are things to look out for. She might note emotional or behavioral indicators that would suggest that the student is under stress. Or a student may be reluctant to discuss a problem with her and is evasive for some reason.

Sometimes, the stress is caused by the system of schooling as in the case of excessive test-taking. The emphasis on testing has created new problems for children. "I have spent many hours visiting with parents who are concerned about whether their children will pass the required tests at the end of the year," she says. "Children also worry. I can hardly believe how many cases of test anxiety I handle of children feeling that their lives will be a total failure if they do not make good on the end-of-grade examinations. What can we do to address this?"

The demand for assessment is wrapped up in the history of standardized testing as a requirement of society. How can student counselors handle the demand for assessment within a philosophy of real-world learning? Tauch tries to find a balance between the two requirements. Assessment is used broadly to determine achievement and the pace of learning of a student. As a counsellor, the teacher attempts to help student engage in individual planning designed to help them establish goals in life and develop future plans.

When symptoms of stress are observed, Tauch does not hesitate to speak to the guidance counselor or seek help from other professions reaching out to students with difficulties. Some children will speak up about their problems; others do not want to reveal what is on their minds. Consultation with teachers is one of many options for helping students who are in distress. The goal is to be ready to help students develop both strength and courage to deal with problems.

Tauch allows students to respond to questions, refraining from making a quick judgment or giving advice right away. She makes sure that she understands the student's difficulty before intervening. Her language is soothing, using such phrases as:

"I think I understand how difficult things are for you."

"It sounds like you are having a hard time right now."

"I can see it is hard for you even to discuss how you feel."

"I understand that you believe there is nothing wrong. Perhaps I got the wrong impression."

"If you don't feel comfortable talking to me about these matters, perhaps you would find it easier to talk to a counselor, privately and confidentially."

"Tell me more about that."

At any time, Tauch may seek help from various organizations to get the best counseling for her students as in cases of health or family concerns beyond the school. Student counseling, for her, is best viewed as a program within a school system aimed at achieving the following goals: (a) The effective and cognitive development of all

students; (b) alignment with the academic mission of the school; (c) collaboration with families and other human services providers and communities; (d) the provision of both preventive programming and responsive services; (e) conformity with applicable laws, regulations, guidelines and appropriate professional ethical standards; and (f) the advocacy for the student counseling profession.

The Khmer Rouge regime, short as it was, plunged the country into a dark place. Citizens were expelled from the city to the rural area to become farmers. Schools, hospitals, temples, markets and other places that served the public were abolished and even destroyed. Doctors, teachers, policemen, and soldiers along with legal scholars were killed or went into hiding. People were deprived of proper nutrition and everyone worked and lived in fear every day. No one knew if one day they would be picked up and put to death by the Khmer Rouge. All basic human rights were eliminated altogether and the people lived in fear of the *Angka* (soldiers of Khmer Rouge).

On 7 January 1979, the country was liberated from the Khmer Rouge regime. Every family had lost its family fortune and loved ones. This was the situation that education had to address. Four decades after the end of that dark period, the country is still recovering. From 2000 onwards, the pace has picked up as more Cambodians have received at least a basic education as a national priority. Parents are beginning to recognize the value of schooling and more are helping to inspire their children to study hard as shown by the rise in private and public investment in education. This is captured in the slogans of the education ministry: "Learning to be knowledgeable; Learning to be skillful; Learning to be virtuous; and, Learning to live together in harmony."

This sums up Tauch Bundaul's personal mission as a teacher. Just as her father was her role model, she strives to be the same for her students.

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3 | Homegrown ingenuity to make science come alive in the classroom

Herwin Hamid

Indonesia

"Students learn best by testing things out for themselves. Experimentation is essential to develop critical thinking which is at the heart of learning."

Forty students in groups of four huddle excitedly around makeshift science kits to build paper-based electricity circuits. Their teacher, Herwin Hamid, moves quietly from group to group offering encouragement and advise yet careful to let each team solve the problem set on their own using the principles of electric circuitry he explained earlier. This is project-based learning, he says.

Herwin is a science teacher in Junior Science High School 6 in Kendari, Sulawesi, North-Central Indonesia. Kendari is the fourth largest city in the region with a relatively small population of about 315,000 inhabitants in what is Southeast Asia's most populous country. Located close to 5 hours by air from Jakarta–1735 kilometers and one time zone away–Kendari served as a trading post during the Dutch colonial government days and remains a major port in this part of Indonesia.

This is where Herwin grew up as a child and attended public school. In 2005, he graduated with an undergraduate degree in Physics from Halu Oleo University in Kendari. This he followed with a Postgraduate degree in Educational Technology from Surabaya State University in 2012. In 2006, he was assigned as a science teacher in Junior High

School 6, Kendari. In 2012, Herwin was made the Head of the Computer Laboratory and Coordinator of the Young Scientist Organization. A year later, he was given the added task as Coordinator of the Science *Olimpiade* Team and Head of School Management Development.

In a setting with limited resources, Herwin has become a master innovator. This he picked up as a champion bass guitar player in Kendari. "I don't have to have the best guitar instrument," he smiled, "but I can be the best bass player." He has applied the same philosophy to his teaching, developing online materials and programs to use as exercises in his science classes for students with limited computer and laboratory resources.

The class bustles with activity and laughter as one by one, each team gets their paper-based electrical circuits to work lighting up the array of bulbs laid out in different configurations. "The us of ICT (Information and Computer Technology) in teaching science can build confidence if students combine ICT materials with other non-ICT subjects." This is Herwin's teaching philosophy. Using ICT in learning helps students understand science concepts and theories. "This gives my students a new learning experience," he says with pride. "Once upon a time, ICT was a luxury for most of them. Now, they are given the opportunity to use it and learn from it."

Having studied in the same junior high where he now teaches, Herwin mused, "I teach in a suburban area where most of my students are children of fisherfolk or farmers. They who come from underprivileged families. Before and after school, many of them help their families sell food from home or work on their family's farm. ICT can give them a different perspective on the world whether in school or when meeting

with friends. I try to keep them engaged in learning activities giving them the same opportunities, even more, to perform in front of their friends and to show their abilities through the use of ICT tools. To create science projects and make presentations that work. Project-based learning makes them feel more comfortable in the classroom and develop a sense of self-worth in their own learning processes. This should motivate them to grow and pay more attention to their other subjects using ICT tools learned in my class."

STEM (Science, Technology, Engineering, Mathematics) anchored on critical thinking

"Students learn best by testing things out for themselves," believes Herwin. "Experimentation is essential to develop critical thinking which is at the heart of learning."

Herwin's thinking process is based on Structured Inquiry:

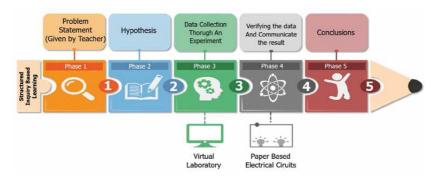Problem identification → Hypothesis formulation → Experimentation → Discussion → Proving theory → Presentation.

The learning process starts with a simple problem statement either given by the teacher or raised by students themselves. An example: "Is it possible to turn on two lightbulbs with a single battery?"

Students working in groups first develop a hypothesis to predict what might work based on prior knowledge before

engaging in experiments. In the above experiment, students carried this out using a virtual laboratory set-up and paper-based electrical circuits to prove it. The discussions that followed were about articulating the theory behind the solution to the problem (i.e. Ohm's Law).

These activities are designed to train students to ask the right questions, formulate problem statements, understand concepts, think creatively, and develop an ability for higher order thinking. Students are encouraged to work together on a common task coordinating their efforts as they experiment and answer the problem together.

"In preparing and planning my classes," Herwin said, "I make use of materials that are readily available." In his paper-based electrical circuit laboratory experiments, Herwin makes use of a virtual laboratory developed using Adobe Flash Software through a Structured Inquiry-Based Learning Model.

The ICT-based interactive simulation serves as a virtual laboratory in this learning process. This engages students intellectually and emotionally. Students involvement is facilitated by providing a wider opportunity to explore the material being taught through interactive simulation. By using

interactive simulations, students can build their own knowledge gradually so as to give them a more meaningful understanding of the material being studied. With this simulation, students are given the opportunity to manipulate the variables further so that from the concepts being studied, they can realize new learning by comparing new information with existing knowledge.[2]
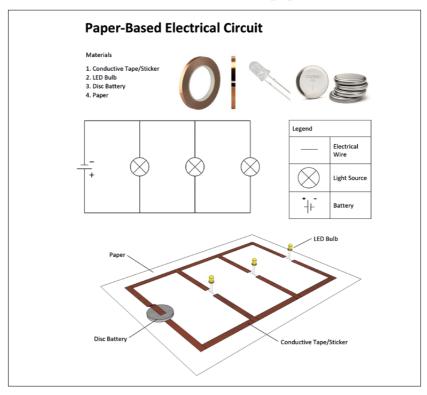
After brainstorming appropriate designs of the paper-based electrical circuits, students collaboratively do actual tests to prove the concept or theory. Activities in this phase helps students learn for themselves the conclusions of experiments rather than relying on the word of their teachers or textbooks. "Students engage in gathering facts, information, or data required through experiments that are conducted through investigation are enriched by this experience with objective and realistic things, eliminating verbalism," Herwin explains.

"In order to make conclusions," he continues, "beside working together, students also use a variety of cooperative skills including sharing tasks, agreeing (or disagreeing), asking more questions, interpreting observations and results, presenting information, communicating findings and many other such tasks. This phase has an impact on their development of self-regulated learning and creates what I call a democratic classroom environment."

Taking a step back from the process, Herwin was introspective. "Regarding my experience, teaching the subject of electricity presents many practical considerations, if not problems, for my students. Many students don't really enjoy the experiment. They worry about damaging the Electricity Kit tools (Standard kit tools in the laboratory) because these tools

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2   Herwin Hamid, *Presentation given at the Princess Maha Chakri Awards seminar,* Bangkok, April 2017.

can be expensive. So, I try to find the solution to this concern. I found Paper-Based Electrical Circuits on the internet as a way to make students really enjoy the experiments because there was no need to worry about damaging equipment or materials."

The tools needed for this experiment are inexpensive and readily available: ICT Tools (Laptop or PC computer), copper tape, diode lights and batteries (all available in most hardware stores). The set-up for such experiments can be downloaded for free from a number of online websites.[3]

"The measure of success are the learning outcomes," says Herwin. "I use many instruments and observations during the learning process for measure learning outcomes.

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3   One website recommended by Herwin is https://phet.colorado.edu

The observation instrument is used to see how students are internalizing the learning process. Students' worksheets, on the other hand, are used to assess the cognitive learning of students. Psycho-motor observation sheets are used during the practicum phase. Character observation sheets are used to record how students work in groups. This is recorded to get the result of character affective learning outcomes. Lastly, social affective observation sheets are used to rate students when they give presentations of the result of their work."

What is instructive in Herwin's teaching style is how the teaching of STEM (science, technology, engineering, mathematics) can be integrated with humanities and the social sciences. Asked about how this can be so, Herwin gave a concrete example.

"In drawing maps," he explained at a seminar with other teachers, "I may start with Math (scaling) and, in turn, move to Science (geography, earth science, geology), Social Studies (people, countries, urban-rural settings), Economics (resource use and benefits), Art (design, graphics), and Language (writing, presentation). To my knowledge, this is how using STEM education can add value and dimension to social sciences."

From school-level innovation to system-wide application

In Indonesia, STEM is defined as a problem-based active learning strategy.[4] To this end, the Ministry of Education and Culture, Indonesia endeavors to disseminate innovations that

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4   Ministry of Education, Indonesia, 2017.

have been done by Indonesian teachers through seminars and journal articles published by the Ministry of Education and Culture.

Indonesia has the fourth largest education system in the world with roughly 55 million students, 3 million teachers and more than 236,000 schools in 500 districts throughout the country. Across the system, however, enrolment declines markedly with age. In the country, there are 170,000 primary schools with 40,000 junior-secondary schools and 26,000 high schools.[5]

Since the 1970s, Indonesia has boosted primary and junior-secondary enrolment rates dramatically. In the past decade, the gap in school-completion rates has narrowed between rich and poor students, and between those from rural and urban areas since the government allocated a fifth of its annual budget to education starting in 2009.

Whereas primary-enrolment rates in richer districts are close to 100%, in some poorer districts they remain below 60%. Average reading and mathematics scores on standardized PISA tests[6] have improved since 2000, though scores in science have declined. In some regions of the country, scores in math and reading have remained low.

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5   This and the succeeding paragraphs quote extensively from https://www.economist.com/news/asia/21636098-indonesias-schools-are-lousy-new-administration-wants-fix-them-schools. The Economist, December 11, 2014.

6   The Program for International Student Assessment (PISA) is an international assessment that measures 15-year-old students' reading, mathematics, and science literacy every three years. First conducted in 2000, the major domain of study rotates between reading, mathematics, and science in each cycle. PISA also includes measures of general or cross-curricular competencies, such as collaborative problem solving. By design, PISA emphasizes functional skills that students have acquired as they near the end of compulsory schooling. PISA is coordinated by the Organization for Economic Cooperation and Development (OECD).

The problem of quality learning is likewise an issue. For every 100 students who enter school, only 25 will come out meeting minimum international standards in literacy and numeracy. In reading, math and science, the average Indonesian 15-year-old is roughly four years behind the world's best school systems. A recent study by the Boston Consulting Group found that Indonesia faces a dire shortage of managerial talent; a problem for a country with a growing services sector.

In the hope of improving things, a law was introduced in 2005 which required teacher certification. Yet a report in 2014 from the World Bank found that the certification made no big difference to how much students learned. To address this, the MOE has embarked on a large program to starting with governance and accountability. Teachers are to be evaluated not only on how many hours a week they teach, but on how well their students perform. The program includes improving the quality of more than 400 teacher-training institutes in Indonesia. Complementary to this is a program to improve on Indonesia's vocational-training institutes, particularly those in agriculture and fisheries, as a way both to boost the country's skilled-manufacturing workforce and to help those in rural areas dependent on farming and the sea.

In his small part of Indonesia, since the award, Herwin has shared his ICT and STEM innovations in the classroom through a number of workshops and seminars on how to utilize and develop ICT-based STEM teaching materials. The range of seminars and workshops given include utilizing ICT-based interactive multimedia, developing Android applications for education, improving teacher competence through ICT-based learning media, STEM education, and digital learning.

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4 | Helping Teachers become better Mentors

Khamsoy Vongsamphanh
Lao PDR

"The key to good teacher training is for more experienced teachers to work with younger teachers."

"For the past twenty years, I have been a school administrator. But for an even longer time – for the past forty years – I have been a teacher. All that time, I have worked with other administrators to improve schools, teachers and students in several dimensions."

These are the words of Madame Khamsoy Vongsamphanh, an expert teacher in French language instruction, history, geography and political science at Vientiane National High School in the capital of Lao PDR. Despite her retirement, she continues teaching, passing on her knowledge to other teachers as a teacher-trainer, encouraging them to keep improving themselves.

From a small village in Vientiane Province, Mrs. Khamsoy attended public primary and secondary schools before entering the Dong Dak Teacher Training School at the National University of Laos in 1969 which she completed four years later. In 1977, she received her Bachelor Degree in Education, majoring in History and Geography.

In 1998, she had the opportunity to take a second Bachelor Degree in Grenoble, France followed by a Master of French Language (Teaching French as a foreign language for non-native speakers) at the same university. This she topped

off with a Master of Linguistics at the University of Rouen in France in 2005.

Two decades earlier, in 1977, she joined the faculty of Vientiane High School as a member of the History and Geography department, which she soon headed. This is where her journey as a teacher began. By 2000, she was deputy head of that school and also Educational Supervisor and Advisor in the Ministry of Education until her retirement in 2014.

Developing the teaching profession

At the end of every school year and just before the start of a new semester, there is a meeting to evaluate students' strength and weakness. Mrs. Khamsoy assembles her teachers to assess each child's progress and to address issues that arise from the available information. It is important to her that all teaching staff participate in this process because they are also the ones who will implement the changes that need to be made. "It is best that everyone is involved," she says, "so that lesson planning and teaching are well-thought out as a group and not just directed by the school administrator." The goal, after all, is to put together the best learning plan for students on the part of teachers.

Besides planning, Mrs. Khamsoy also directs teacher trainings organized by the Ministry of Education, Youth and Sports of Lao PDR. If there are new text books for the school, she organizes a meeting with all the teachers concerned to collaborate in designing or revising the syllabi appropriate for the entire academic year. If help is needed or new skills to be learned by teachers, she assigns education supervisors to work with them.

At Vien Tien Somboon High school in Vientiane, she has assembled a corps of experienced teachers and administrators to work with younger teachers. Some are Professional Level Teachers, others are Expert Level Teachers, and some are retirees. All are eager to help and guide the younger teachers in whatever way they can.

There are two main objectives in teacher training. The first is to teach young teachers effective methods of teaching. "Many young teachers are sometimes still confused about the context and content of the lesson," she says. "Here, we schedule visits with those teachers for 30 minutes to an hour at a time for coaching and mentoring. We assess and address any complication that may arise together. The next day, we will visit that class again and observe the way the lesson is conducted."

In evaluating teachers, Mrs. Khamsoy has developed a set of evaluation tools and forms for teachers. During the class, if the teacher makes a mistake in the lesson, she takes note of this but never interrupts the class. Careful observation is made of how a teacher handles and controls the class. After the visit, she asks the teacher for their opinion of how they did and for them to do a self-evaluation. Then she discusses that evaluation with them and makes suggestions for the next class.

To set a training program in motion whether in the city or province, a proposal must be prepared for the Ministry asking for support. In every province, a young teacher with good academic achievement and enthusiastic for training can participate and be trained to become an effective agent of change in the classroom. Training in classroom leadership and pedagogy helps them identify and work with weaker students. They are trained to evaluate students on a monthly basis,

meeting with them to try and determine the root causes of the problems they face, and calling for meetings with parents, if necessary.

A teacher innovation: The student contract

Managing student outcomes requires collaboration between a teacher and a student and their parents, according to Mrs. Khamsoy. A particular innovation introduced by her takes the form of a 'contract' between the three parties. There are three steps in this contract:

First, a meeting is called with a student to discuss particular concerns they may have and to identify real or potential problems they may encounter. She asks the student to make a pledge in writing that they will work with the school to address the identified problem, if any.

Second, a meeting is arranged with parents together with the student, the class advisor, and the year-level head teacher to discuss the issue or issues pertinent to the student. The discussion must end with a written plan of action as an agreement for all to sign.

Third, if a student's behavior does not improve, a second or third meeting is held with the level head teacher – whether junior high school or senior high school – and with the student and his or her parents to determine what further action might be needed, such as moving the student to another school or forbid them from taking the level examination. These, however, are extreme steps according to Mrs. Khamsoy. She has only very rarely needed to act on the third step.

"It is essential for the school, the family and the community to work out a solution together with and for the student," she says. At a higher level, there is a committee consisting of the school administrator together with three public sector associations common in Laos: the Men's Revolution Association, the Women's Club, and the Workers Union to look at further matters concerning the schools. Each of the three associations have a role to play in school governance according to the Ministry.

The Men's Revolution Association trains the teacher in the aspect of patriotism. The Women's Club encourages women to participate while giving them knowledge of women's and children's rights. The Workers' Union oversees the rights of teachers and provides training on "working in harmony".

As much as possible, the governance of the school is the responsibility of the school head. The policy is to allow each school to develop its own system of order based on the Ministry's standards. For a large school such as Vientiane High School, the administration is headed by the principal who oversees the operation of the school. In this school, there are four vice principals, each in charge of a specific domain: (a) academics, (b) human resources and administration, (c) student behavior, and (d) student activities.

<div align="center">

Lao People's Democratic Republic

Peace Independence Democracy Unity Prosperity
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Mattayom Somboon, Vientiane
Student Discipline Office

<div align="center">

Pledging Form

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Name................................. L / T.......................... Class..............................

On the date of.......... month.......... year........... Time...................................

I have committed a wrongdoing:..
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Regarding the wrongdoing, I feel...
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I pledge that..
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 Parents' phone number:……………………………………….

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Signature

Student

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Signature   *Signature*

Class Teacher   Level Head

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A profile of Lao Teachers[7]

The typical primary teacher in Lao PDR is a young male with 13 years of experience teaching who has a lower secondary certification plus formal teacher training. Most primary teachers have either 8+3 or less than 8+3 qualifications. In rural areas, teachers are on average younger, less experienced and have less formal education. The typical lower secondary teacher in Lao PDR is a slightly older male than the typical primary teacher and has an upper secondary certification plus formal teacher training.

Most teachers have received some formal pre-service teacher training, but continuous professional development is infrequent. In 2004-05, only 14 percent of teachers were untrained, compared to 23 percent just four years earlier. About one third of lower secondary teachers reported not having received any type of in-service training in the past year.

The customization of teacher education programs to the years of formal schooling of trainees implies an open recognition that secondary education graduates are in very limited supply in vast swaths of Lao PDR. In order for the quality of teachers and teaching to improve, expanding access to the lower and upper secondary streams is an absolute prerequisite. This will be particularly important in remote areas, where teacher trainees enter teacher education programs as primary school graduates.

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7   Excerpts from "Teaching in Lao PDR", by Luis Benveniste, Jeffery Marshall, and Lucrecia Santibañez. Human Development Sector, East Asia and the Pacific Region, The World Bank and Ministry of Education, Lao People's Democratic Republic. 2007.

Although some improvements in the basic levels of education among primary teachers can begin to be noticed, many teachers still enter the profession with minimum educational requirements. This situation makes it all the more imperative to strengthen the quality of pre-service training, as a not insignificant share of each annual cohort enters TEIs with a very short educational history.

Among the working conditions that affect teachers are the following:

... Local teachers have lower attrition levels and are more attuned to the school cultural environment. Close to one-half of primary teachers and 28 percent of lower secondary teachers work in the same village where they are from.

… Most schools in Lao PDR offer less than the five grades required for a full primary education program, and most incomplete schools are in rural and remote villages. Of the 8,573 schools in the country, only 44 percent are complete schools. Incomplete schools place local populations at a disadvantage for school access and educational attainment.

… Close to 26 percent of classes in Lao PDR are taught in a multi-grade setting. Multi-grade classes are most often found in rural areas. Multi-grade instruction presents challenges for teachers who have not received proper training to deal with multiple ability settings or able to tailor their teaching to different grades.

Teacher Performance

The typical Lao classroom is strongly structured with lesson-planning and instructional time allocation determined by the Ministry. In planning, teachers are expected to place great emphasis on developing thinking skills and problem solving. In practice, however, the primary method of instruction in Lao PDR schools is lecturing, copying lessons on the blackboard and encouraging recitation and memorization. Students are mostly passive recipients of instruction. There is little time devoted to practical exercises or application of knowledge. Efforts could be channeled into modernizing the pre-service and in-service teacher training curricula to better equip teachers with child-centered teaching and learning methodologies.

Towards Comprehensive Teacher Reform in Lao PDR

The Eighth Lao People's Revolutionary Party Congress in 2006 emphasized that human resource development was dependent upon education reforms that lead to better basic education. National education goals would be centered around addressing low internal efficiency indicators, lower access and coverage in remote and upland areas, and large inequities in both access and quality of education between rural and urban groups, boys and girls, and Lao-Tai and non-Lao-Tai groups. Because teachers play such a central role in the education quality equation, improving the status of teachers in terms of salaries, education and professional development has been deemed a priority.

The Teachers' Teacher

In 2014, Mrs. Khamsoy reached retirement age. Despite this, she continues her daily regime of teaching and teacher training. At Vientiane High School, her teaching includes teaching French bilingual and general classes, sometimes serving as a substitute teacher for those on maternity leave. As the school's Advisor for Teaching and Learning, she provides technical support and guidance to both new and experienced teachers as well as students. "Recently," she said with a smile, "I trained and supervised two teacher trainees during their teaching practice in the school."

As a member of the school committee, she is also involved in the remedial program for students who have missed classes or are lagging behind their peers. For this, she meets with parents to review with them the individual student contracts and pledges. "Parents play a key role in their children's education," she says. "To the extent possible, I ask parents or guardians of those students to help us by participating in the remedial classes."

As an expert language teacher in French, she takes the lead in preparing standardized and unified French examination papers for the end of academic year in the four provinces of Luangprabang, Savannakhet, Champasak, and Vientiane capital. In 2017, she organized and led students on a study tour to an organic laboratory run by the Ministry of Agriculture. In another instance, she organized a program providing a short course on French language with a French institution for students from the Institute of Law.

"For the past forty years, I have been a teacher and a teacher-trainer for the last twenty of those years," says Mrs. Khamsoy Vongsamphanh, master teacher and education supervisor. "My mission is to work with other administrators to help them improve their schools, their teachers and by extension, their students."

One wonders what retirement means for this teacher. Not much, it appears.

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5

Developing Innovations in Information & Communication Technology (ICT) for the Classroom

Zainuddin Bin Zakaria

Malaysia

"Inspire. Never give up. Never retreat."

The 'Borderless Classroom' is an ICT global project where teachers and students collaborate with partners in different countries to share teaching and learning materials. 21st century skills are the main focus of this partnership where students share knowledge and authority, undertake collaborative learning, and practice responsibility and cooperation using free software and tools from Microsoft. Eight different modules are used in this project involving hundreds of students as learning mates in eleven international and six local Malaysian schools. Teachers involved in the project are called cybertutors.

This is the project first dreamed up in 2008 by Zainuddin Bin Zakaria and a colleague of his, both high school teachers at Taman Bukit Maluri National Secondary School outside of Kuala Lumpur. Zainuddin, an ICT teacher first trained in the teaching of English as a second language (ESL), began putting together learning modules in a range of subjects. Since then, many other teachers have joined the program using a package of modules collaborating amongst themselves. "Because of its huge following," says Zainuddin, "I continue to develop new activities and modules with the 11 international schools in what we now call the 'Borderless Classroom version 2.0'."

For Zainuddin, doing things is the best way for students to learn. Project-Based Learning (PBL) is an approach involving students directly in their own learning by engaging them through projects and hands-on activities. "Teachers should always be creative and innovative in delivering their lessons," he says. "Even teachers in schools with minimal

facilities should never give excuses not to perform their best. They must make their classrooms fun and interesting. Innovation is the key. It can make a lot of difference in their teaching if their lessons are of the real world."

"If teachers want to be successful in their classroom," he continues, "they must dare to be different. They should do something different. They must come out with something new to make learning in their classroom a world where their students would love to be a part of."

For Zainuddin, the use of ICT has been the way to engage and challenge students to take charge of their own learning. PBL and ICT have become allies in this endeavor and as such, an additional asset is revealed: Collaboration – within the classroom among classmates, with other classes in the same school, with other schools in Malaysia, and ultimately with students from other countries. Hence, the Borderless Classroom.

"All my innovation projects see no barriers," says Zainuddin. "So long as teachers and students are ready to connect, communicate and collaborate, everything becomes handy. The success of PBL depends very much on the willingness of my collaborative partners to work at any given time to help students achieve their learning outcomes."

In terms of ICT facilities, the requisites are minimal. Both sites just need a basic Internet connection so that they can communicate with one another using Skype, e-mail, and any social media app such as WhatsApp, Telegram or Messenger.

Zainuddin is quick to point out, however, that PBL activities are not for ICT students only. Any student, he claims, can participate. ICT is a tool for learning; not a

subject. During these activities, students acquire 21st Century skills such as communication, collaboration, self-regulation, and so on. Neither is language a barrier, as claimed by some. "Students may use online translators like Microsoft Bing or Google Translator to communicate with their foreign friends who speak a different language," he smiles. "I managed to make my students work with Spanish-speaking students in Medellin, Colombia for three months to produce an English-Spanish Talking Dictionary successfully."

Each PBL project has its own learning objectives. The outcome produced at the end of a project are indicators of how well the 21st Century skills are developed. Zainuddin's projects are based on long-term outcomes: How students acquire the skills needed in real life later on. Being able to survive in the real world is the goal of every PBL project.

The Innovation: Kodu in Classrooms Around the World

The Borderless Classroom project involves eight learning modules:

1. AusMas Connection
2. Project ColMas
3. Malaysia-Korea Connection
4. e-Buddy System
5. e-Mentor, e-Mentee
6. Ask the Experts
7. Kodu in Classrooms
8. Parts of Speech KODU

The eight modules require a time period of 3 to 18 months to complete. However, the time limit is extendable until both parties are happy with their work. Before starting a project, all modules are either planned by the students and their partners themselves or with help from their teachers. Students must agree with one another before they start any module.

A few cultural exchange programs with Australian, Japanese and Korean school children.

All modules require teachers and students to assess the progress of their work over time. There are several phases in each module which students have to go through to complete all the required tasks. It is very important to note that activities can only proceed if both parties agree with the completion of each of the phases.

Evidence of learning is critical for PBL to be successful. These are manifested and recorded in a number of tangible outcomes such as the following:

- Evidence of Learning 1: Many high-quality tutorial sessions are conducted between local and international students and teachers.

- Evidence of Learning 2: An eighteen-month long project-based learning among seventy Malaysian and Korean students ended with a school visit to each other's school.

- Evidence of Learning 3: A cultural exchange program with Australian, Japanese and Korean school children.

- Evidence of Learning 4: 38 Malaysian and Colombian students communicate using Microsoft Bing Translator to produce a 200-word English-Spanish Talking e-Dictionary.

- Evidence of Learning 5: Malaysian students collaborate with school children in Russia, Australia, South Korea, Vietnam and Nigeria to develop educational games.

- Evidence of Learning 6: Several peer-to-peer coaching sessions with Australian and Malaysian students to exchange lessons using ICT tools like Skype and Windows Live Messenger.

- Evidence of Learning 7: An ICT Simulation Class at Boonpo Middle School in Busan, Korea conducted to extend pedagogical expertise to APEC teachers.

The key to learning is to see how students are able to move beyond just reproducing what they have learned to

building knowledge through interpretation, analysis, synthesis, and evaluation. It is about extending learning beyond the classroom. "If the learning experience is not bound by the classroom walls," explains Zainuddin, "the time-frame of conventional lessons and the subject matter can be greatly expanded. If the project addresses real world issues such as authentic situations and data from outside the classroom or has meaningful impact on communities locally and/or globally, the learning can be so much richer."

To demonstrate this, students have assembled computers on their own after having had several discussions amongst themselves and viewing videos with their online friends in the e-Buddy system. A second group of students came up with an English-Spanish e-Dictionary after having discussions with their pairs from Colombia. Others created a game with messages about environmental issues using Kodu Game Lab. A fourth group tried out international dishes suggested by their foreign friends and then added in some local ingredients to enhance the flavors.

STEM policy in Malaysia[8]

The importance of Science and Technology education is a priority in Malaysia. From as far back as 1970 with the implementation of the first National Science and Technology Enrolment Policy, the target was set of enrolling 60 percent of university students in science with the remaining 40 percent in the arts.

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8   The Star newpaper, 12 March 2017

In 1991, Vision 2020 was implemented with one of the goals to establish a scientific and innovative society. As a result, the government set up 69 science secondary schools and 51 Mara Junior Science Colleges. In 2011, the Malaysia Education Blueprint was initiated. One of the priorities identified in the blueprint was STEM. STEM was more than just an acronym for science, technology, engineering and mathematics. STEM became a skill or a philosophy – an approach and a way of thinking for educators and parents to help students integrate knowledge across subjects by incorporating flipped learning and encouraging students to think in a more logical and holistic ways in order to be better equipped with 21st century skills.

STEM subjects are where students learn the skills to gather and study information (investigative skills of science), evaluate and make sense of information (analytical skills of mathematics) and determine how the information can solve a problem (inventive skills of engineering) using the technology available to them today.

STEM provides students with the opportunity to investigate information provided to them in order to understand it based on their own experiences – also known as contextual learning. By allowing students to construct their own meaning and understanding of an area of study strengthens their learning. STEM also makes learning more relevant as students are exposed to the concept that what they learn is based on current and real-world situations. By facilitating and asking the right questions, educators can stimulate students to incorporate different activities – identifying, comparing, predicting, testing – in their learning process thus developing problem-solving skills.

To illustrate this, Zainuddin refers back to the "Kodu in Classrooms Around the World". Using MS Kodu GameLab software, students learn to develop simple but interesting computer games within two weeks. The games are designed specifically to raise awareness among players about local environmental problems such as deforestation, illegal hunting of turtles, and the effects of pollution. Copies of selected games, together with their programming module and playing manuals were sent to teachers in five schools in Australia, Russia, South Korea, Vietnam and Nigeria. There, students played the games and learned the moral lessons found in the games. Then, they were trained to use Kodu based on the module sent to the teachers. In two weeks, students in those schools in those countries began to design new games that depicted the environmental problems in their own countries. Later, these games were e-mailed back to Malaysia by their teachers to be played by Zainuddin's students. This innovation is replicable and may apply different themes appropriate to students of different ages.

A second innovation was called the "English-Spanish e-Dictionary". In this innovation, each of Zainuddin's students was paired with a student of *Institucion Educativa Jose Asuncion Silva* in Medellin, Colombia where they developed an English-Spanish e-Dictionary using Bing Translator or Google Translate to translate their 'written conversations'. PowerPoint was used to present a 200-word dictionary complete with proper pronunciation. Each pair of students contributed 20 words to the class project. This "learning beyond the classroom" was carried out for three months. At the end, it was highlighted

on Medellin television in Colombia.[9] This innovation is being replicated by Zainuddin with a Korean teacher and her high school students to come out with a 'Malay-Korean e-Dictionary'. His Colombian partner is likewise trying it out with another primary school teacher in Brazil on a 'Spanish-Portuguese e-Dictionary'.

"The response to the Borderless Classroom and from foreign students who have participated in the 'Kodu in Classrooms Around the World' project has been a very positive one," Zainuddin smiles. "By taking part in the project, students they have been exposed to good moral values and are more aware of their different environments. They also learn about cooperation, logic and creativity and how to communicate effectively across cultures."

Apart from being able to improve their ICT skills, students are helped to prepare for the world of work and social life. "Children learn how to collaborate with their team members when carrying out a project together. They learn how to share responsibilities, how to reconcile disagreements peacefully, and how to present constructive criticism to enhance their final products."

With this, Zainuddin smiles before returning to his classroom to embark on another journey of learning with his students. This time to another land.

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6 Creating the student-centered classroom

Yee Mon Soe
Myanmar

> *"The purpose of the discovery method is to help students understand the link between knowledge and the practical use of that knowledge."*

A Socratic method to teaching

The crowded classroom sat quietly as the teacher began showing slides of planets, comets, the solar system. "What is the difference between a lunar and solar eclipse?" she asked, showing drawings of the difference between the two phenomena. But this was not a science class, much less one in astronomy. Rather, this was Daw Yee Mon Soe's senior high school English class at No. 2, Basic Education High School in Hlaing Thar Yar town outside Yangon, the main city of Myanmar. The topic for the week: The universe. Words for the week: planet, solar system, galaxy, eclipse, ellipse, satellite, comet, and other interstellar words.

"My teaching philosophy is to bring the world into the classroom," Yee Mon explained. "I try to get my students to experience the world so that they can internalize the learning." The key is to go from a teacher-centered classroom to a student-centered one. "Traditionally, a classroom is led by a teacher explaining everything, instructing and standing at the center of the classroom or in front of students. The interaction goes only from the teacher to student. In that kind

of a classroom, students are taught each and every detail and explanation of the prescribed lesson by the teacher."

"Only the teacher is the source of knowledge, ideas and thoughts," she continued. "Students are rarely given the chance to express their thoughts, ideas and feelings. Students lack participation and no discussion can be found between teachers and students or between students and their classmates. Students are totally passive and their creativity and production cannot be promoted by a teacher-centered approach. The traditional teacher uses this method because it is convenient in covering a lesson given limited time and large-sized classrooms."

"But is this best way for students to learn?" she asks.

As she works her way around the crowded classroom, Yee Mon encourages students to speak up, to ask questions, to interact with each other. Many are hesitant being expected from their early schooling to be quiet in class. "I encourage my students to develop not only knowledge of the prescribed lessons but also other useful skills. They must be given the chance to express their own ideas and thoughts, explore things both inside and outside the classroom, and extend their knowledge beyond the prescribed lesson. It is important that students actively participate in every activity. I know, however, that it can be difficult for a teacher to manage all student activities at one time in a student-centered classroom when students are working on different things at different stages of the same project."

How does a teacher manage this kind of learning environment?

Yee Mon offers some practical advice. Unlike a teacher-centered classroom, a student-centered class is busy, noisy

and seemingly chaotic because students learn on their own, interact with one another and actively participate to complete their tasks. To manage a student-centered class, planning each lesson before a class is held is vital. A teacher has to prepare each part of the lesson thoroughly, anticipating questions and problems that may arise. "What if" is a common query a teacher has to prepare to address. For each class, the teacher checks answers, gives feedback and makes sure students' problems and questions can be addressed properly for each and every task assigned.

"Personally," Yee Mon counsels, "I always go around the class to check whether students are on the right path or not while they are doing their tasks. I then choose a good student to present their work and lead the discussion. Selecting students randomly without checking their work can cause them embarrassment and hurt their confidence to speak up in future."

"Another benefit to this approach," she continues, "is that other students can learn from their peers, even if only by imitation at first. Students who need individual feedback or intensive help are given feedback or helped with much more explanation. The purpose of assigning students to produce their own work is to help them achieve good progress and practical application of the lesson."

In developing her lesson plans, Yee Mon takes a "mixed approach". What is meant by this and what might be a desired mix?

Different lessons have different objectives that can vary based on the approach taken by a teacher. Engaging in a new topic or reviewing an old one for exams can be differently done. There are also other factors that can affect teaching methods:

class size, allotted class duration, availability of teaching aids and so on. For this, a lot of time is needed to prepare, sufficient time required to teach, and proper teaching aids to develop to deliver on the lesson. Managing a big class within a very short period to finish a lesson is challenging for a teacher, so sometimes a mixed approach – discovery, lecture, practice, presentation – are used to finish the prescribed lesson plan within the academic period whether this be a class, a week, a semester or a full year.

Techniques in asking questions

At a "show and share" session with teachers, Yee Mon explained her techniques in helping students learn to frame and answer questions.

Categories to the types of questions asked of students
- Eliciting questions/Warming up questions
- Concept-checking questions
- Instruction-checking questions

What are you trying to develop/explore when asking questions?
- To know their prior knowledge
- To link their knowledge to the lesson
- To check their understanding
- To help them produce thoughts and ideas in kind of participation

A logic to how a teacher should ask questions
- Questions must be simple enough for the students to answer.
- Ask questions that encourages student participation in the teaching-learning process.
- Difficult questions can be asked to students to do further research or extend their learning.
- Sufficient information must be provided while teaching, so students do not panic when being questioned.

Teacher Daw Yee Mon Soe

Questions can vary due to different stages of the lesson, she starts. In the "pre-teaching" stage, students are encouraged to engage with the lesson through questions that explore their background knowledge. Most questions are clarificatory and answered mostly by Yes/No answers since students might not have enough new information to respond adequately.

In the "while-teaching" stage, instruction checking questions (ICQ) can be asked in order to know if students understand what they have to do. Concept checking questions (CCQ) can also be asked to clarify how much they have learnt.

In the "post-teaching" stage, information questions can be asked to know the degree of understanding and to clarify learning. To elicit students' ideas and thoughts, open-ended questions are asked to arouse interest and participation. Asking questions can be a way of informally assessing the teaching-learning process.

Thus, there are different categories to the types of questions asked of students: (1) Eliciting questions (or warming-up questions; (2) Concept-checking questions; and, (3) Instruction-checking questions.

The objective of such a Socratic (questioning) method is to develop and test students' prior knowledge, to link this knowledge to the current lesson, to check their understanding of the lesson being studied, and to help them produce their own thoughts and ideas as a measure of their participation in their own learning.

In this Socratic method, there is a logic to how a teacher should ask questions. Questions must be simple enough for students to answer. Questions should be asked in an encouraging way and not be so far beyond their current

knowledge. Difficult question can be asked that can help them to do further research or extend their learning. In this regard, sufficient information must be provided while teaching so students may not become unnerved or panic when being questioned.

How can the system better develop good teachers efficiently in Myanmar?

"The discovery method for students works only if teachers know how to discover things for themselves," says Yee Mon. Different teachers have different teaching styles, she explained, and each usually has a unique strategy based on their experience. Most theories and methods were learned as pre-service students in college or senior high school. When theoretical knowledge is applied practically as in the case of in-service teachers, most teachers have difficulty making the adjustment. This is where teachers' knowledge of teaching particular subject should be regularly assessed and continuous learning opportunities offered. Refresher courses and workshops which focus on teaching technique and methodology should be conducted annually for every teacher. Newsletters, which contain the latest knowledge of school subjects and modern teaching techniques for teachers should be presented every month. Sufficient references and easy access to internet sources should be provided to every school teacher in order to promote and enhance their capacity.

The purpose of the discovery method is to help students understand the link between knowledge and the practical usage of that knowledge. "The word 'discovery' here does not mean further exploration outside the classroom without the help of teachers," says Yee Mon. "Instead, we can use enjoyable activities to point out the main ideas around learning instead of giving direct rule-driven explanations."

"For example, when I want to explain what a noun is, I can say it can be the word for a person, a thing, a place, of an animal. This is the definition for students but it can also be far removed from what they understand vividly. Instead of this, I ask students to make a list of things they see in the classroom or school. They understand this better and get the concept of a noun more easily. Giving a direct explanation or short definition can be said to be 'rule-driven'; having them give examples that are real and around them can be said to be the essence of the 'discovery method'."

A difficult transition

Making the transition to a 21st century curriculum is not without its difficulties in Myanmar. Yee Mon's pedagogy and that of her fellow teachers is a step in the right direction. According to data compiled by the United Nations Development Programme's Human Development Index, Myanmar spends well below the required spending for public expenditure on education UNESCO, 2011). Consequently, the education system showed a low number of students attending school, with few making it to university. Education is only compulsory for five years, and the majority of students drop out after this short period. According to UNESCO, only 50% of Burma's children are enrolled in secondary education.[10]

Myanmar's constitution guarantees access to free and compulsory primary education to all children. Low levels of investment in the education sector, however, have prevented the achievement of quality basic education for many children. According to the 2013 National Millennium Development

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10 http://www.oxfordburmaalliance.org/education-in-burma.html

Goal Report, the country did not meet the targets related to universal primary education (MDG 2 and MDG 3) though public spending in education in 2014 increased significantly by 49%. In addition, the government embarked on a Comprehensive Education Sector Review (CESR) to better understand the current status of education and developed a National Education Sector Plan (NESP) accordingly. UNICEF supports the achievement of Basic Education and Gender Equality for all children in Myanmar focused around the donor-funded Quality Basic Education Programme (QBEP) and Peace-building, Education and Advocacy program (PBEA).[11]

Myanmar society has traditionally valued and stressed the importance of education. In villages, secular schooling often takes place in monasteries with the government answering for secondary and tertiary education. While Myanmar was shut off from the world for a period of time, it has opened up again and the education system has moved steadily to try and provide more universal coverage. While education expenditures may be low, the literacy rate for individuals aged 15 and over (can read and write) was 89.9 percent (2006 estimate).[12] The country's high literacy rate is partly due to the high regard for literacy by socialism and Buddhism.

According to Arohana, Thabyay Education Network, "Throughout the education system, there is a prevailing culture of rote-learning which discourages the development of analytical thinking. Students are considered as vessels to be filled with pre-ordained 'knowledge' which they must learn by heart. There is little or no emphasis on understanding the

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11 https://www.unicef.org/myanmar/education_1360.htmlinitiative.
12 The literacy figures are based on UNESCO Institute of Statistics figures based on government statistics.

information being committed to memory, or being able to practically apply it."[13]

It is this observation that makes Daw Yee Mon Soe's Socratic method of teaching unique, compelling and hopeful that it can serve as a model in innovation that can help transform the education landscape in Myanmar.

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13 Arohana, Thabyay Education Network. Cited in http://factsanddetails.com/southeast-asia/Myanmar/sub5_5f/entry-3117.html

7 The school as focal point for the development of a remote rural community

William Egot Moraca

Philippines

"The community has become more involved in the schools and because they are now more involved, our school attendance has improved."

Community concerns and a teacher's personal mission

It's five o'clock in the morning with low-lying mist covering the mountains in the distance. William Moraca prepares for his daily motorcycle commute from his home in General Santos City on the southern island of Mindanao to the two elementary schools in Barangay San Jose he supervises as a head teacher. Set in the mountains overlooking Sarangani Bay, the area is beautiful but remote. This land is inhabited by the T'boli and B'laan indigenous peoples, two of the many native ethnic groups on the island of Mindanao.

Klolang Elementary School has an enrolment of 115 students. Datal Salvan Elementary School is slightly larger with 149 students. The two schools are located 28 kilometers from General Santos City, the capital of South Cotabato province. The hour-long+ journey each way is along winding, treacherous dirt and gravel mountain roads crossing rivers and creeks five times along the way. Both schools are situated within a 3,809 hectare reservation called Barangay San Jose that has a total population of 7,651 people living in 1,614 households. Nestled

1,500 meters above sea level, the remoteness of Sitios Klolang and Datal Salvan are reflected in the schools' infrastructure. Sitio Klolang – the B'laan word for "freedom" – was without electricity for years; Sitio Datal Salvan had no potable water system until William organized the community to build one.

School attendance was a major problem. "The distance from home to school," William said "hampers school attendance. Our children have to travel long distances and cross rivers to attend classes. Having fifty-per cent attendance in school every day was not uncommon for the two schools. As the head teacher, I had to do something to encourage parents to make sure their children attended classes."

Jacqueline Relacion, one of three female teachers under William's supervision in Klolang Elementary School spoke up. "Never had this village produced a single college graduate," she said, "because upon completion of primary or elementary education, most of the female children as young as 13 years old usually get married."[14] If students could be encouraged to complete at least a full basic education to the end of high school, William knew it would bring change to these indigenous people.

Poverty among ethnic groups especially those living in the hinterlands is a major part of the problem. Food depends on harvests and during the growing season between harvests, children come to school hungry. Datal Salven lacked a potable water system. Until William organized the community to build the water system, water had to be fetched by children from a free-flowing creek some 80 feet below the school. As in

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14 Jaime Laude, "Power generating windmill provided electricity to Gensan folk", *Philippine Star Sunday Magazine,* November 13, 2011 (PhilSTAR.com/headlines/747280/power-generating-windmill-provided-electricity-gensan-folk)

the case of many schools located away from the electricity grid, Klolang lacked electricity as well.

The problem of schools without electricity and potable water systems is still significant in a school system as large as the one run by the Department of Education in the Philippines. Of 47,645 public elementary and high schools nationwide, 5,954 schools serving an enrolment of 1.101 million students are still without electricity.[15] "Without electricity, our schools could not take advantage of technology for learning," William explained. "During overcast days, we would have no lighting to brighten our rooms. At night, children could not study without lights. The kerosene lamps were too dim and sooty to be helpful."

The lack of water systems is even more critical. Just as bad were unsafe water systems. In the Philippines, 24 million Filipinos of all ages lack improved sanitation even as the Department of Health (DOH) has made significant strides in this regard over the last two decades. Poor sanitation practices among the 20 million poorest Filipinos have been linked directly to poverty bringing to the fore the vital role of government in breaking this vicious cycle. The lack of access to safe and clean water and poor sanitation and hygiene practices among the nation's poorest families have led to an estimated 43.7 percent and 44.7 percent of pre-school age and school-age Filipino children, respectively, having soil-transmitted helminth infections.[16]
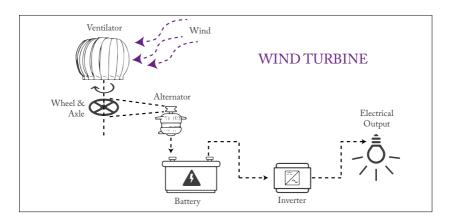
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15 http://www.nea.gov.ph/news/299-elementary-secondary-schools-as-sepblep-beneficiaries-

16 https://www.teacherph.com/policy-guidelines-comprehensive-water-sanitation-and-hygiene-in-schools-wins-program/

Innovations Introduced

To address the lack of electricity, William began thinking of a local solution to this need. The electric cooperative was just too far away and the school was isolated from the power grid. "I am actually a frustrated engineer," William confessed. "I wanted to study engineering in university but my family did not have the resources for such a course. Instead, I opted for an education degree with the chance of becoming a teacher in the Department of Education."
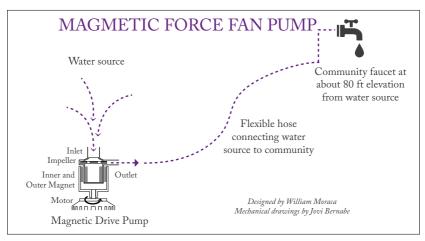
The first effort to provide Klolang with a source of electricity was through a wind turbine designed by William and built with the assistance of the Philippine Army. A commercially-available spinning roof exhaust vent normally used to cool and ventilate factories and warehouses was purchased. This was mounted onto a frame on the school's roof. To produce electricity, the spinning roof vent was turned into a wind-powered dynamo turning a car fan belt attached to an alternator producing raw energy. A converter then transformed this energy into electric power that could charge two 12-volt wet cell batteries releasing 3000 watts of power – enough electricity to light up the school and its appliances and computers.

Ventilator   Wind

WIND TURBINE

Wheel & Axle   Alternator

Electrical Output

Battery   Inverter

Wind power, however, has its drawbacks. Windless days produced no power. Hence, William began to think about solar energy to augment the wind turbine. With funds from friends and supporters, he purchased a commercial solar panel which he affixed on to one of the roofs of the school. Heavily insulated wiring connected the panel to batteries inside the building. By reconfiguring the wiring, he was able to recharge the batteries in half the time of the normal set-up.

Between the two sources of electricity, a surplus of electric power was generated. At that point in time, William began the wiring of the community adjacent to the school. By 2014, forty houses were provided electricity through this off-grid innovation. A major change in the habits of adults and children was immediately felt. Daylight hours were extended. Adults had evening activities that kept them occupied and productive and children had light to study at night. William was able to provide a large television set in a community area which introduced this indigenous people's community to the world outside.

The potable water system similarly transformational Sitio Datal Salvan. The previous water system for the village

was provided by the local government. Its source was a nearby creek located below the school but the pump had fallen into a state of disrepair. As in many local government projects, maintenance funds were in short supply. And the community was too far away and too small to warrant the attention of the local government authorities.

MAGMETIC FORCE FAN PUMP

Water source

Community faucet at about 80 ft elevation from water source

Flexible hose connecting water source to community

Inlet
Impeller
Inner and Outer Magnet
Motor
Outlet

Designed by William Moraca
Mechanical drawings by Jovi Bernabe

Magnetic Drive Pump

"We had to do something," William said, "otherwise the state of health of our children and our community would suffer." The local response was to build their own water system. The challenge: The right technology that could raise water 80 feet from the creek up to the school site.

Again, the frustrated engineer set to work. William designed a magnetic force fan pump to raise water up to the school site. This technology uses a rotating assembly of magnets to produce an alternating magnetic current to open and close valves that would push water up a water pipe at a rate of 1.5 liters per second. By pushing water into this pipe, the pump would use pressure to raise it to the desired level. This spared children and adults from having to carry heavy water cans and containers long distances and ensured that clean water was available to the school and community.

An additional innovation designed by William was the construction of swimming area close to where the school was located. A series of pools of different depths allow members of the community, especially children, to enjoy leisure time together. The pools also served as a small reservoir for water used for the school gardens.

Homegrown innovations to help modernize remote schools

The impact on this small community of indigenous peoples was significant not only from a learning perspective for children but also from the point of view of the adult community. But can this individual effort become, in reality, a system-wide solution for isolated schools without electricity and potable water systems?

The Department of Education (Philippines) has recognized the need to upgrade the infrastructure of all public schools. In 2016, the Department entered into a memorandum of agreement with the National Electrification Administration to mobilize electric cooperatives to identify schools where access to power lines may be available and to provide power lines up to the point of service connection in school premises. Two agreements were signed: The Sitio Electrification Program (SEP) and the Barangay Line Enhancement Program (BLEP).[17]

The above programs, however, assume that a school is within striking distance of the electricity grid. What about schools that are isolated from the grid? This is where William's

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17 http://www.nea.gov.ph/news/299-elementary-secondary-schools-as-sepblep-beneficiaries-

wind turbine and solar power innovations can make a difference. The fact that these were made from locally-available materials (except for the solar panels) at fairly low cost makes this an attractive solution for off-grid schools.

Water and hygiene are also a major concern of the Department. The Essential Health Care Program (EHCP) first set up in 2009 set out to teach children simple, basic, and doable health interventions to promote cleanliness and prevent sickness. As of 2014, the program was able to cover 16 of the country's 17 regions in partnership with a number of government organizations (GOs) and non-government organizations (NGOs) that have continuously sponsored health kits and packages for more than three million young students in the primary years nationwide. This means coverage of 68 out of 220 Schools Divisions nationwide with 9,366 EHCP-implementing schools out of a total of 38,689 public elementary schools. The Department has partnered with stakeholders to promote correct handwashing practices among school children.[18]

The water system built by William and his community can serve as a model for stand-alone water systems in remote schools not served by water districts or water utility companies. The low-technology mechanism adopted by William is simple to construct, cost-effective and easy to maintain.

More importantly, two complementary goals have been realized by William for his two schools. "The community has become more involved in the schools," William smiled, "and because they are now more involved, our school attendance has improved."

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18 https://www.teacherph.com/policy-guidelines-comprehensive-water-sanitation-and-hygiene-in-schools-wins-program/

The Department of Education, Philippines has produced a video of William's innovations which can be accessed from the Department and on YouTube:

- DepED.gov.ph/videos/William-moraca-being-recipient-princess-maha-chakri-award

- YouTube.com/watch?v=d7LIN5zRkOE

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8

Every child with special needs can learn

Wang-Lim Ai Lian
Singapore

The challenges of providing education services for children with special needs

The 12-year old dyslexic boy and his teacher stayed on after class to do extra reading. The teacher is Mrs. Wang-Lim Ai Lian, an English teacher at Holy Innocents' Primary School located in the north-east part of the city-state of Singapore.

In 1994, armed with a Diploma in Education from the National Institute of Education, Ai Lian – Mrs Wang to her students – first set foot at Holy Innocents'. After a decade of teaching, she was appointed Subject Head until 2015 when she was made the Head of the Department of Character and Citizenship Education.

Sitting together in the quiet classroom, Ai Lian patiently coached the boy in reading. Dyslexia is a brain-based condition characterized as a specific learning disability where dyslexic individuals have trouble reading accurately and fluently or where they have trouble with reading comprehension, spelling and writing. The spelling of words come across jumbled as do words in sentences. It is important to note that this condition is not a visual impairment nor is it a question of lower intelligence. Rather, it is a condition of the brain which prevents it from

processing words and sentences readily. That it is not a function of diminished intelligence is borne by the fact that dyslexic individuals can overcome their reading difficulties with practice and methods.[19]

To help the young boy keep words and sentences in order, Ai Lian teaches him how to use mnemonics[20] to help him remember the spelling of longer words. For example, to spell the word "Because", she outlined a short one-sentence story stringing together the first letter of each word of the story to spell the word: "*B*ig *e*lephants *c*an *a*lways *u*nderstand *s*mall *e*lephants."

In modern societies such as Singapore, parents may not be as involved with their children's progress as they could be given the day-to-day demands of everyday life. "Some of my students are from disadvantaged backgrounds," Ai Lian offered. "Some parents are not actively involved and do not give as much attention to their children as they could because of their preoccupation with day-to-day challenges."

"My approach," Ai Lian continued, "is to win their support by investing time to listen to their difficulties and understand the family's background. I make a deliberate effort to share with parents their child's little successes through affirmation and positive reinforcement to get them on board to support their child. I also share with them resources and link them with community partners and social agencies."

Singapore supports the education of students with special needs. For example, resources are made available to mainstream

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19 https://www.understood.org/en/learning-attention-issues/child-learning-disabilities/dyslexia/understanding-dyslexia

20 A mnemonic device, or memory device, is any learning technique that aids information retention in the human memory. Mnemonics make use of elaborative encoding, retrieval cues, and imagery as specific tools to encode any given information in a way that allows for efficient storage and retrieval.

schools in the form of Allied Educators trained in Learning and Behavioural Support [AEDs (LBS)] to help students with mild special educational needs such Dyslexia, Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD), the three most common special education needs in mainstream schools on the island.

In mainstream primary and secondary schools, training is provided to a core group of teachers leading to a Certificate in Special Needs Support. These teachers, known as 'Teachers trained in Special Needs' (TSNs) are equipped with deeper knowledge and skills to better support students with mild special education needs in their schools. "They are able to plan instruction and adapt and differentiate the instructional strategies to meet the needs of diverse learners in their classrooms," Ai Lian explained. "They can also build the capacity of their fellow teachers in their schools on the strategies and resources to support students with special educational needs."

The innovation: HIPS

To build an inclusive education system, a tripartite effort involving the school, the home and the community is required to nurture a child with special needs and ensure his or her holistic development through appropriate interventions and programs. With this in mind, the HIPS Resource Toolkit – an initiative by teachers for teachers – was developed by a team led by Ai Lian.

HIPS – *Helping Individual Pupil Succeed* – is a resource toolkit conceptualized and designed to enhance teachers' understanding in the area of special education. It was developed

to empower teachers with practical strategies to support students who have been diagnosed with special needs.

HIPS
Resource Toolkit
Helping Individual Pupil Succeed
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Varied school programs have been put in place to foster an inclusive school environment. A 'whole school' approach provides for school-wide programs for all students regardless of abilities, age or grade level. Within this larger grouping, there

are segmented student programs for specific groups of students. The segmented student programs include the *VIP Club*, *Play with Clay*, *Music Therapy* and *Creative Play Therapy*.

The VIP Club was set up to provide customized support through small group instruction to level up students with special needs. The club was specially designed to ensure that members are given the necessary support for their learning. Ai Lian explained, "Through early intervention, we address their learning needs via differentiated instructional strategies and resources." Membership in the VIP Club are for children with special needs and the HIPS toolkit is used by the VIP Club for in-class support sessions.

Play with Clay utilizes clay as a way to develop and enhance the motor skills of children with special needs while building self-esteem and self-expression. Research has shown that this kind of activity has the following benefits:[21]

- It promotes verbal and non-verbal communication of participants;

- It develops sensory and fine motor skills development (e.g. rolling, squeezing, forming clay helps with dexterity);

- Play can be a form of learning; and lastly,

- The repeated actions can have a therapeutic effect on the child.

Parents participate in this multi-sensory hands-on experience so as to promote parent-child bonding through the co-creation of clay art.

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21 Sholt, Michal and Gavron, Tami, "Therapeutic Qualities of Clay-work in Art Therapy: A Review". Cited in the presentation of Wang-Lim Ai Lian, PMCA Forum, Bangkpk. 25-28 April 2017.

Music Therapy for Learning Motivation explores music as a way to promote positive change in behaviors and to motivate identified children with special needs to learn beyond the music classroom. Music activities are designed to improve students' self-esteem and to increase their motivation. With the help of a music therapist, this music intervention program helps develop better self-management skills of children with special needs.

Following Music Therapy, the team embarks on *Creative Play Therapy* to reach out to a targeted group of students with social behavioral issues. During play therapy sessions, each student is guided by a trained therapist to use coping strategies in the face of challenges or difficulties. Creative Play Therapy is a collaborative effort to get children with special needs to be better able to express themselves in more constructive ways. "Play therapy," explained Ai Lian, "builds confidence, boosts concentration, and develops greater resilience amongst students."

Extending HIPS to the Fraternity

Singapore's development philosophy is premised on its people. For decades, Singapore averred that its people were her only natural resource and thus the city-state's vision has been to prepare them to join the workforce "in an increasingly uncertain and globalized world". In this regard, there is close coordination in developing connections between the Ministry of Education (Singapore) and other government agencies, and between Post-Secondary Education Institutions and Industry.

The belief that every child matters lies at the heart of the national education system. Singapore's education system is built on strong fundamentals, the focus of which is a student-centric,

values-driven education based on the belief that every child can learn regardless of their background or ability.

"This is something close to my heart," said Ai Lian, "because I teach students of varying abilities and from different backgrounds, including low-progress learners and special needs students in a mainstream school. I want to create a safe and inclusive learning environment where they can thrive and experience success. Every classroom presents a unique community of learners. It is important to adapt and utilize different strategies to reach out to every student."

Recognizing that collaboration is key to supporting students with learning needs, Ai Lian now leads a multi-skilled group called the "We Care Team". The team is composed of teachers with diverse skill sets so as to ensure that no student falls through the cracks. This is done by providing the necessary classroom support and interventions for them to succeed. To foster greater inclusivity, transition support sessions are conducted to induct teachers on the profile of students with special needs. Teachers are taught strategies and pedagogical models to help them deliver inclusive education in their classrooms.

Moving forward, Ai Lian and her team of teachers are embarking on the next phase of their HIPS Resource Toolkit project: To partner with parents to train them on the use of the toolkit and to explore possible collaboration with professional agencies to refine and improve on its content. The toolkit has been shared with allied educators from other schools in the education system in Singapore.

In 2016, the HIPS Resource Toolkit was awarded the Innergy Commendation Award by the Ministry of Education, Singapore. The award recognizes innovative projects at the national level.

9 | A teacher puts knowledge into practice in real life

Chalermporn Pongteerawan
Thailand

"The role of a good teacher is to train students to ask good and meaningful questions."

As he walked back and forth in front of the roomful of secondary teachers listening to his talk on STEM (science, technology, engineering, mathematics) in everyday life, Khun Chalermporn Pongteerawan, science teacher and Head of Academic Affairs at Suratpittaya School in Surat Thani Province, Thailand, paused: "Self-discovery is critical. Students must think for themselves. This means changing the traditional ways of teaching where teachers think they are the experts. Teachers are not always the experts. What's important is that teachers know how to guide students to learn for themselves."

Years as a classroom teacher has blended a sharp mind with a practical approach to teaching. "The role of a good teacher," Chalermporn stresses to the group, "is to teach and train students to ask good and meaningful questions…to teach them how to research and how to probe."

This philosophy reflects the thinking of Thailand as it reviews its role as a rising middle-income country in the world. Thirty years ago, 67 percent of the population lived below the poverty line. By 2014, that number had dropped to 11 percent representing one of the most successful transformations of any economy in the world. But while the country spends around 20 percent of its national budget on education making it one of the highest spenders in the world, its international ranking in science and math education is in the bottom quartile of countries whose students take internationally-administered tests. To turn this situation around, science, technology,

engineering and mathematics education have become a government priority.[22]

"STEM should be integrated in all learning," he continued as he walked across the front of the room. "It should be integrated with all other subjects. STEM is actually a way of teaching and not just a subject. It is about understanding as an approach to learning and not just activities you do in the classroom around science."

Here, the importance of observation outside the classroom and on the internet can add to and expand what is being done in the classroom. "Science is everywhere," he concludes, "and is not just a subject." With that, Chalermporn thanked his audience of young teachers and raised his hands together in the respectful *Wai* greeting of the Thai people.

In 1980, Chalermporn began his teaching career as a science teacher in the same school where he is now head of academics. Armed with a Bachelor of Education degree in Physics from Srinakharinwirot University (Songkhla Campus), he began as a traditional teacher downloading information and knowledge from textbooks. But as he grew as a teacher, he began to develop his own teaching materials and equipment. An avid reader and hands-on technician, Chalermporn began to think deeply about how to best develop his own students' critical thinking skills.

"Lessons need not have known answers or programmed responses all the time," he realized. "Even teachers can learn from others; even from their students." To this end, a new form of thinking was developed: A process of asking 'what-if'

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22 http://www.aljazeera.com/programmes/rebel-education/2016/12/inspiring-science-building-thailand-future-161223163004103.html

questions in what Chalemporn described as "a form of self-discovery; of simulation and experimentation".

"It is essential to build inspiration within students themselves," he says. "It gives them confidence to think for themselves. Use tools to guide them to think systematically and let them use these thinking skills to solve everday problems whether this be in the family or in the livelihoods they see around them or in their communities."
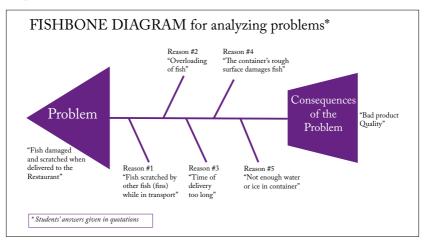
This is more tedious than downloading from textbooks, but it was exhilarating and gave Chalermporn a sense of freedom. More importantly, it gave him a new perspective of his role as a teacher. "Three things in life are important: The importance of the right attitude towards things; the importance of partnerships; and the importance of self-reliance which is 1% inspiration, 99% perspiration."
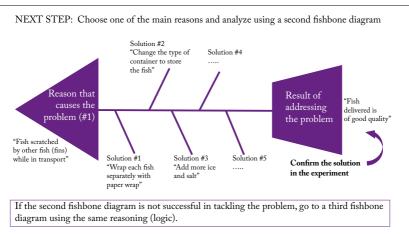
Learning to apply the thinking process

The Fishbone Model is a critical thinking tool for taking apart a problem. Described by Kaoru Ishikawa in 1968 (hence the name "Ishikawa Diagram"), a fishbone diagram lays out possible cause-and-effect relationships of a specific event or phenomenon. The purpose of such a diagram is to break down in successive layers of detail the root causes that potentially contribute to a particular effect.[23] The effect is shown as a fish head with the causes extending as fishbones towards the tail. The ribs branch off the backbone representing major

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23 Ishiwaka, Kaoru (1968). *A Guide to Quality Control.* Asian Productivity Organization. IBN 92-833-1036-5.

causes, with sub-branches for root causes to as many levels as required.[24]

FISHBONE DIAGRAM for analyzing problems*

Reason #2 "Overloading of fish"

Reason #4 "The container's rough surface damages fish"

Problem

Consequences of the Problem

"Bad product Quality"

"Fish damaged and scratched when delivered to the Restaurant"

Reason #1 "Fish scratched by other fish (fins) while in transport"

Reason #3 "Time of delivery too long"

Reason #5 "Not enough water or ice in container"

* Students' answers given in quotations

NEXT STEP: Choose one of the main reasons and analyze using a second fishbone diagram

Solution #2 "Change the type of container to store the fish"

Solution #4 …..

Reason that causes the problem (#1)

Result of addressing the problem

"Fish delivered is of good quality"

"Fish scratched by other fish (fins) while in transport"

Solution #1 "Wrap each fish separately with paper wrap"

Solution #3 "Add more ice and salt"

Solution #5 …..

Confirm the solution in the experiment

If the second fishbone diagram is not successful in tackling the problem, go to a third fishbone diagram using the same reasoning (logic).

For Chalermporn, the first order analysis is to outline the problem into major and minor causes. The second order

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24 While Ishikawa popularized the fishbone (Ishikawa) diagrams at the Kawasaki shipyards in the 1960s which became one of the first models for understanding modern management, the basic concept actually originated in the 1920s and is considered one of the seven basic tools of quality control. (Teague, Nancy R. (2004). "Seven Basic Quality Tools". *The Quality Toolbox*. Milwaukee, Wisconsin: American Society for Quality.)

analysis is to determine the reasons that cause the problem. The inverse of the causes of the problem are the possible solutions. This is an iterative process by which investigators (i.e. students) should continually review and refine to determine if the arrangement of cause-and-effect are logical and if the order of causality is correct (i.e. first order causes, intervening or intermediate causes, and root causes).

"Through this process," Chalermporn explained, "organizing the inquiry this way can also reveal the possible solutions. In this way, one can initiate innovative ways to solve problems not only in learning but in their (students') lives as well."

To sustain students' interest, Chalermporn recommends starting with issues that are of interest to student. "Let them research these for information and ideas," he says, "then have them analyze the data to create their own solutions. Finally, design and build the innovation through trial and error. Revise, reach a conclusion to be implemented in the real world, and share this with the community."

How easy or difficult is it to teach children to think systematically?

"Not difficult," he avers. "Besides the fish bone diagram, there is also de Bono's Six Thinking Hats Theory to guide and teach students."

Six Thinking Hats is a system of thinking designed by Edward de Bono which uses a tool for group discussion characterized as six colored hats. It is associated with the idea of parallel thinking which provides a means for groups to plan

out thinking processes in a detailed and cohesive way.[25] The premise of the method is that the human brain thinks in a number of distinct ways which can be deliberately challenged and discussed in a structured manner allowing one to develop ways of thinking about particular issues. De Bono identifies six distinct directions (The Six Hats) in which the brain process information. In each of these directions, the brain will identify and bring into conscious thought certain aspects to be considered. None of these directions is a completely natural way of thinking, but rather how people represent the results of thinking.

The White Hat calls for information known or needed ("The facts, just the facts.").[26]

The Yellow Hat symbolizes brightness and optimism. Under this hat, one explores the positives and probes for value and benefit.

The Black Hat is judgment – the devil's advocate or why something may not work. Spotting the difficulties and dangers and where things might go wrong makes this probably the most powerful and useful of the Hats but can be a problem if overused.

The Red Hat signifies feelings, hunches and intuition. When using this hat, one can express emotions and feelings and share fears, likes, dislikes, loves, and hates.

The Green Hat focuses on creativity: the possibilities, alternatives, and new ideas. It is an opportunity to express new concepts and perceptions.

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25 de Bono, Edward (1985). *Six Thinking Hats: An Essential Approach to Business Management*. Little, Brown, & Company. ISBN 0-316-17791-1 (hardback) and 0316178314 (paperback).

26 http://www.debonogroup.com/six_thinking_hats.php . The Six Thinking Hats is a registered trademark of the De Bono Group.

The Blue Hat is used to manage the thinking process. It is the control mechanism that ensures the Six Thinking Hats guidelines are observed.

"There are a number of these kinds of thinking tools we can borrow from outside of education and in the real world," says Chalermporn. "What is crucial is to have an open mind and an organized approach to thinking about the world around us."

From classroom teaching to system

Thailand, as a country, has put together a number of strategic initiatives to seriously ramp up STEM education in the country as a driver for growth. In 2014, the Institute for the Promotion of Teaching Science and Technology (IPST) began a campaign to develop social awareness in Thai society for STEM and ingrain the idea of how crucial STEM education is in terms of driving development in an increasingly more competitive and changing world.

In the early years, IPST established and launched projects to help teachers and educators understand and be able to implement STEM activities in the classroom. These projects were designed to meet five objectives originally in 13 Regional STEM Education Centers (RSEC) in 13 provinces. This was later expanded to 78 RSECs across the country. The five objectives were: (1) To promote awareness of STEM Education in society, (2) to build STEM education networks among organizations, (3) to increase the implementation of STEM activities in classrooms across the country, (4) to promote teachers' understanding and ability to implement

STEM with students, and (5) to establish a system that could support and maintain the implementation of STEM education.[27]

The Ministry of Education is supporting the government's push to improve scientific literacy and international performance by working with a team of teachers and educators across the country to develop the *Inspiring Science* project, an inquiry and problem-solving approach to teaching science. The project aims to develop the motivation, achievement and take up of science, technology, engineering and mathematics among young peopl across Thailand through innovative better pedagogy, teaching resources, professional development, material support and events.

Central to the project is engaging students in solving local problems, such as the design of a bridge to replace a rope bridge used by a community in the South of Thailand, the development of floating farms in flooded areas, or the design special candles to be used in candle festivals. As part of the *Inspiring Science* project, students try to solve an issue affecting many Thai communities. The *Inspiring Science* project develops and supports 15,000 teachers from 7,500 schools across Thailand. Inquiry-based approaches have also been introduced in 1,500 kindergartens where the children are taught to ask questions and investigate things as the first step towards being scientific.[28]

One of the goals of the Ministry of Education in Thailand is to develop scientists for the future. In his own way, Khun Chalermporn has done this by sharing his teaching

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27 The Institute for the Promotion of Teaching Science and Technology, "The Path to Success for STEM Education in Thailand". PowerPoint presentation, 2017.
28 http://www.aljazeera.com/programmes/rebel-education/2016/12/inspiring-science-building-thailand-future-161223163004103.html

techniques with all the departments in his school (first) and with other schools in Surat Thani province and around the country. The Office of the Higher Education Commission has filmed his teaching sessions on critical thinking methods and broadcast these on television. The Institute for the Promotion of Teaching Science and Technology also produced a video of his teaching methods for teachers across Thailand making this available on YouTube.
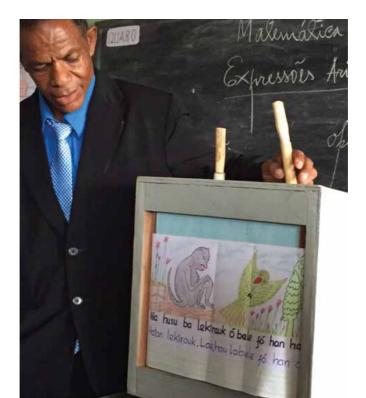
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10 | Creating Child-Friendly Schools as the learning environment

Julio Ximenes Madeira

Timor-Leste

The two second-grade students chatted excitedly as
they did their spelling using the 'Learning Sandbox' in their
classroom. Called the *Quadru* in Portuguese, it has been used
in Timor-Leste as an educational tool since the colonial
period. These days, the Ministry of Education of Timor-Leste
provides a Learning Sandbox in every classroom of most
primary schools in the country.

Learning Sandbox ("Quadru")

Sand walls

Table Frame

Sand

Connection to base and legs

Completed Model

Illustration by Raj Luz

This is a primary school in Hatolia, Timor-Leste where Julio Ximenes Madeira is an education coordinator and teacher. His school is one of a number of primary schools across the country that has been recognized as a 'Child-Friendly' school by UNICEF. "One of the challenging problems for a rural school head in Timor-Leste," he says, "is the remoteness of our school and the distance from our children's homes. This is also the case for our teachers who face difficulty in the daily commute between home and school, especially, during the rainy season when roads become muddy and difficult to use."

Of the 335 students from Grades 1 to 6 in his school, 200 of them have no electricity at home. Candlelight is the only way to allow them to study at night. The thirteen teachers in the school try to make the most of the 5-hour school day to teach students while there is sunlight. This situation is compounded by the lack of classrooms. Students are split into two groups attending morning and afternoon shifts.

"To help us manage school outcomes," Julio continues, "we ask parents to motivate their children and speak to them of the importance of education whenever teachers meet with parents." To provide parents with an incentive, starting in 2017, the Ministry of Education began providing Julio's school with financial support for a school lunch program. Sourcing enough good local products for the school lunch program in such a remote area has been a challenge as well. In response, parents under Julio's leadership started a school garden for this purpose.

Rebuilding the schools in Timor-Leste

Timor-Leste is Asia's youngest country. The country, formally known as the Democratic Republic of Timor-Leste, occupies the eastern half of the island of Timor, the nearby islands of Atauro and Jaco, and the enclave of Oecusse on the northwestern side of the island which is surrounded by the Indonesian province of Nusa Tenggara Timur.

Portugal began to trade with Timor in the early 16th century and colonized it from the mid-century onwards. Skirmishing with the Dutch in the region eventually resulted in an 1859 treaty when Portugal ceded the western half of the island to the Dutch. Imperial Japan occupied East Timor during World War II, but Portugal resumed colonial authority after the Japanese surrender.

In late 1975, East Timor declared itself independence from Portugal only to be invaded by Indonesia nine days later. The country was incorporated as a province of Indonesia In August 1999, in a UN-sponsored referendum, an overwhelming majority of East Timorese voted for independence from Indonesia. On May 20, 2002, East Timor was recognized as an independent nation to be known in the international community as Timor-Leste following a United Nations-administered transition period.

Timor Leste consists of 13 administrative districts with the capital in Dili. Approximately 50 percent of the population live below the poverty line. In response to the many challenges facing the education system following independence, UNICEF

launched a program to help restore the country's basic education system. The program had two main objectives:[29]

First, to assist in developing a system of quality basic education in Timor-Leste through curriculum development and reform, systemic capacity building, and resource gap-filling.

Second, to help advance the government's goal of universal access (with a particular view to achieving gender equity) through institutional capacity-building and the modernization of management and information systems to detect and address barriers to access.

The main component of the program was the establishment of 'Child-Friendly Schools' (CFS) throughout the country. Julio's school was among the first to be set up as such.

Child-Friendly Schools, known in the local language as *Eskola Foun* (New School), was a joint strategy between UNICEF and the Ministry of Education. It was conceptualized following the *Escuela Nueva* model of Colombia and using the CFS global manual generated by the UNICEF New York Headquarters in 2009[30]. The basic principles of CFS are (1) Inclusion (inclusiveness); (2) Child-centeredness, and (3) Democratic Participation.

Timor-Leste introduced a cluster system in 2010 to manage basic education schools. Each cluster is composed of a central basic education school with a few satellite schools (known as "filial" schools) underneath. There are 202 central basic education schools, each led by school directors, deputy directors and personnel responsible for administration and

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29 http://www.air.org/project/unicef-timor-leste-s-child-friendly-schools-initiative-assessment-monitoring-and-strategic
30 UNICEF. (2009). *Child Friendly Schools Manual.* New York: Author.

finance (GAT[31]). On the other hand, filial schools are managed by school coordinators under the supervision of the school director of the central basic education school. There are district superintendents and inspectors who provide supportive supervision to the school directors/coordinators, deputy school directors, GATs and teachers for the effective functioning of schools.

Since the start of the *Eskola Foun* initiative in 2009, the Ministry has taken a two-fold mutually-supportive and complementary approach in advancing the CFS/*Eskola Foun* principles:[32]

(1) Mainstreaming the CFS principles in the systems and policies necessary for institutionalization; and

(2) Direct support to the selected target schools with concrete CFS interventions to show case successful examples.

To mainstream CFS, *Eskola Foun* , CFS principles serve as guideposts for the National Education Strategic Plan (NESP 2011-2030). A child-centered, participatory teaching methodology was integrated into the existing in-service teacher training program in 2012 with teacher training (four modules) and *Eskola Foun* subject-based training in Science, Literacy and Math accredited as part of the Ministry's teacher training complementary course. Hence, the *Eskola Foun* teacher training modules have been adopted as the official in-service teacher training modules nation-wide fully covered by the Ministry's own human and financial resources starting in 2013.

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31 *Gabinete de Apoio Tecnico* – technical assistance personnel

32 UNICEF-TLCO Terms of Reference, *Evaluation of Child Friendly Schools (CFS) Teacher Training Intervention,* UNICEF-Supported CFS Initiative, Ministry of Education, Timor-Leste (AWP 2014, IR: 5.2, Activity ref: 5.2.1.4 : Support Eskola Foun Evaluation

The *Eskola Foun* approach has been applied and mainstreamed in the curriculum reforms for primary grades (Grades 1-6). This includes textbooks, materials and lesson plans. "WASH (water, sanitation and hygiene) in Schools" guidelines were also integrated in the *Eskola Foun* initiative.

To model and replicate CFS at the school level, an initial 121 basic education schools[33] (10% coverage) were identified in 13 districts to be rolled out in two batches of 69 schools and 52 schools respectively with all four phases of the *Eskola Foun* training[34] delivered as school-based training. The 121 schools also benefitted from education supplies (poster paper, crayon, story books, etc.) used to decorate 'learning corners' in classrooms to support the trained teachers.

69 of the 121 schools received school-based, subject-based *Eskola Foun* training on Literacy, Mathematics and Science. 30 schools received support for the construction or rehabilitation of classrooms and WASH facilities, as well as school furniture for children and teachers.

The trainings were delivered by the Ministry's existing system and structures, including trainers from the In-service Teacher Training Institute (INFORDEPE).

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33 Basic Education: Grades 1-9 are free, universal and compulsory in Timor-Leste.

34 The CFS teacher training is composed of the four thematic phases, namely: 1) Basic Principles of CFS; 2) Child to Child Approach for School Hygiene Promotion; 3) Student and Community Participation; and 4) Advanced Methodology and Learning Guide.

Involving the community in school affairs

Julio's Child Friendly School is alive with activity. Classrooms are laid out as learning clusters with students facing each other to encourage interaction, cooperation and group learning. Teachers move about from cluster to cluster rather than standing in front of the classroom. In fact, one cannot tell which is front or back of the room; every side houses an activity center: a reading corner to one side, the learning sandbox to another, blackboards to both sides of the room.

"My classes are all inquiry-based," says Julio. "Children learn from each other; not just from the teacher. For this to be realized, students are grouped into clusters where they do activities together from planning to building and creating to making group presentations."

To facilitate this kind of learning, Julio divides his classroom into four zones.

One zone is arranged against one wall. On that wall, decorated medium-sized envelopes are arranged in neat rows and columns with each envelope emblazoned with the names of each student. These are where student papers for the day or week are filed.

A second zone is the learning corner where small groups of students can huddle to read and discuss projects together. The learning corner assembles books and other reading materials which the students share and take responsibility for. For the younger students, this is where storytelling occurs and where teachers take small groups of students for a tour of books.

A third zone is the wall where vocabulary words with pictures help children learn. Here, Julio and his teachers take different things commonly found at home and in the market – baskets, magazine pictures, different small handheld musical instruments – to hang on the wall and display.

A fourth zone is the learning sandbox, an innovation of the traditional Portuguese learning tool set up to one side of the room. Here, children take turns writing, spelling, drawing on sand. When the lesson is learned or "the page to be turned", students take a small flat stick to smooth out the sand and like magic, a new clean page emerges.

Against the wooden slats that frame the windows on one side of the room, the written and drawn work of children, whatever these are for the week, are hung like banners fluttering in the breeze proclaiming each child's work for the world to see when they enter this classroom.

In the middle of the room, steel desks and wooden chairs are moved around constantly as children form and reform learning clusters around projects, learning exercises and other activity like living organisms mutating constantly.

Outside each room are an array of potted plants tended by the children. Many of these are vegetables and not just ornamental plants. To the sides of the school are vegetable gardens and fruit trees. The vegetable gardens are neatly laid out in rows and carefully labeled with the names of the different vegetables planted. "We started our school gardens to support our school lunch program," said Julio. "Parents join us by growing vegetables – cabbages, morning glory, chilis, tomatoes in soil sacks and small plots. We intersperse these with fruit trees – bananas, snake fruit, and the like."

The Child-Friendly School is a leading strategy to improve on the quality of education in Timor-Leste. For this to happen, it takes a whole village to educate a child, as the saying goes. To this end, Julio's school is more than just a school; it is a community center.

"The school has to be more than just a place of learning," says Julio Ximenes Madeira, as he shows visitors around his school. "The rural school is a community center. Our school is not only the center of the lives of our students, it has also become a center for our parents, especially mothers."

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11

A School District Innovates: The Vietnam Escuela Nueva (VNEN) program in Lao Cai City

Tran Thi Thuy Dung

Vietnam

"The New School model is a learning methodology of connecting theory with real life and using the knowledge in school to apply to daily activities."

In 2009 at a region-wide conference in Cebu in the Philippines, UNESCO, UNICEF and the World Bank introduced the New School Model. *Escuela Nueva,* literally "New School" in Spanish, is a pedagogical model centered around the needs of students. The model transforms the conventional, teacher-centered school into student-centered hubs of learning aimed at achieving high quality education outcomes. Developed in Colombia in the 1970s, it is a bottom-up innovation targeting isolated, multi-grade schools in rural areas.

In 2010, the Ministry of Education of Vietnam sent a delegation to visit Colombia and to study aspects of their program to see what might be applicable for the country's education system. In school year 2011-2012, the New School model was piloted in 24 schools in six provinces under the name, VNEN – the Vietnam *Escuela Nueva* or the "New School Model in Vietnam". The following school year, 2012 – 2013, this was expanded to 1447 schools in the whole country including Le Ngoc Han Primary School, the school then headed by Mrs. Tran Thi Thuy Dung as its principal.

In adopting the *Escuela Nueva* model, Vietnam's goal was to modernize its basic education sector to better prepare

children for the 21ˢᵗ century. To this end, the Ministry of Education used the new methodology to 'flip' the classroom in order to engage students more directly in the learning process with teachers serving as facilitators rather than lecturers and with the participation of parents and other community members in the schools.[35]

Mrs. Dung was a school principal at the time the VNEN was first piloted in Lao Cai City. In 2016, she was promoted as Deputy Head of the City's Training and Education Division in charge of managing twenty primary schools.

Mrs. Dung explained the New School model in her city: "The New School is a model grounded on conditions of the local area, using the maximum available resources and facilities. The model is based on the original framework for basic education in Vietnam: Program, Content, Standards, Skills, Curriculum. There is not much disturbance to both teachers and learners in this respect. What is different is the approach and delivery of learning."

The Escuela Nueva model has four key components:[36]

One, Escuela Nueva makes use of a flexible curriculum focusing on cooperative, active and participatory learning where students progress at their own pace. Classroom learning guides promote dialogue and interaction among students intended to build social, cognitive and other skills. Contextual learning is the preferred norm. In Colombia where it was born, this included peace education. In other countries, entrepreneurship, leadership and 21ˢᵗ century skills were embedded in the curriculum.

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35 http://www.worldbank.org/en/news/feature/2012/10/10/vietnam-escuela-nueva-a-new-and-exciting-way-of-learning.

36 Center for Education Innovations (http://www.educationinnovations.org/program/escuela-nueva)

Two, the Escuela Nueva model seeks to build strong relationships between schools and their surrounding communities. Local culture is incorporated in school activities and community members are encouraged to get involved in all aspects of school life. A key feature of the Escuela Nueva model is the formation of student government in each school to promote democratic values and civic participation.

Three, through experiential workshops, study groups and school visits, teachers are trained in the model's methodology and transformed from being transmitters of facts to facilitators and advisors of children's learning. The formation of Learning Circles among teachers helps them share good practices, collaborate on problem-solving while also promoting positive attitudinal change.

Lastly, local and regional school administrators are encouraged to become more involved in the learning process with special attention paid to the learning outcomes of students.

The Learning Philosophy in the New Schools

"Practice through lessons in class and outdoors is our philosophy of learning," said Mrs. Dung. "For example, we speak of a 'School with real life' which aims to educate students about the value of labor. This follows the principle of 'Learning with practice' based on a 'Theory with practice'. We attach special importance to educating children with ability, with an appreciation for quality, and with living skills in mind."

The aim of this model is to teach students using the things closest to them such as things around their own homes,

the livelihoods of their parents and community life such as working, production of goods, cultural values, ethnic identity and so on. In this way, students learn to respect the value of labor and apply this knowledge to real life. Moreover, Mrs. Dung stressed, these useful activities will make them proud of their country and their history.

BASIC RULES OF AN ESCUELA NUEVA CLASSROOM

• Be voluntary.
• Repect, listen, and share opinions with each other cooperatively, with self-control and confidence.
• Teachers guide and organize activities but without interfering with student learning
• The community will support and take part in school activities and programs.
• The slogan of the New School model: "Fairness, Creativity, Effectiveness."

– Mrs. Dung

Clubs are organized to help students know how to do many useful endeavors – embroidery, knitting, gardening, vegetable growing, duck and chicken raising, handicrafts, and local jobs. In one of the primary schools in Sapa, she set up a tourism school to teach students about tourism, encouraging some to become tourist guides in the future. In a number of other communities, teachers and students set up farm schools where students raise pigs, chickens, and goats and grow vegetables, mushroom and so on.

"The New School model is a learning methodology of connecting theory with real life and using the knowledge in school to apply to daily activities," she explains. "The products made by students will improve their family's income and daily needs. The development of school models should be suitable to students in that region with teaching and learning based on students' ability and their living conditions."

Students, teachers and parents play different roles in the model.

Students are expected to educate themselves. Self-learning means learning how to manage themselves as persons and as learners. To help them learn these skills, student governments are formed and run by the students themselves. Students elect their own management boards, build their own learning corners, organize their community clubs, and create their own Mailboxes ('What you want to say' program) and their own sharing corners.

The role of teachers is now very different in the New Schools. Since students now take more control of their own learning, teachers have to learn how to organize learning activities rather than lecture. They are expected to support rather than lead, facilitate rather than instruct, and encourage rather than dominate.

"To be able to do this," Mrs. Dung counsels, "teachers need to 'let go' and take a step back in the classroom. This means learning self-control and developing a new kind of self-confidence and discipline for self-study and self-training because they will have to learn how to learn along with their students."

Parents roles also evolve in this model. Parents must support their children in their learning. For this, they must be aware of what their children are learning, help teachers monitor and evaluate their children's progress, coordinate constantly with the school and help connect the community and home life with school activities.

On the expansion of the Vietnam Escuela Nueva

In a small classroom at Bat Xat Primary School in Lao Cai Province, a second grader leads a group of classmates in solving a math problem.[37] Her teacher, though present in class, is there mainly to provide support if her group has difficulty with the lesson. This is a sea change from the traditional classroom where group discussion was not encouraged or even allowed in Vietnamese schools and where students traditionally sat and wrote or followed what teachers said. Under the VNEN, hundreds of students, mostly members of ethnic minorities from the initial six provinces have benefited from this new model.

In the past two decades, Vietnam has rapidly increased access to primary education with a completion rate of almost 100 percent. The main challenges, however, as in most developing countries, is in improving the quality of teaching and learning. From an initial pilot project involving 24 primary schools in 6 provinces in 2010, VNEN has been scaled to all 63 provinces in the country reaching 440,000 primary students. VNEN has been supported by the World Bank with a US$84.6 million grant from the Global Partnership for Education.

"The most important aspect of the *Escuela Nueva* model is the switch from traditional educational methods to a more advanced and effective one," said Director Minh Kim Truong of the Education and Training Department in Lao Cai Province. "This process also includes reforms in teaching, facilitating

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37 http://www.worldbank.org/en/news/feature/2012/10/10/vietnam-escuela-nueva-a-new-and-exciting-way-of-learning. The succeeding five paragraphs including the quotations draw from the same article.

closer relationships between schools and the community, and improvement in school management and materials for both teachers and students."

Teachers, parents, and the community work closely together under the program to create a more conducive learning environment. An example of this is are the development of community maps to help teachers know where students live in relation to the school and community. These maps allow teachers to easily locate students who need more help with lessons and provide assistance when they lack books, clothes, or transportation. "We learn best when we are challenged, when we help each other, and when we are part of a community," said Suhas Parandekar, Senior Economist, Human Development Sector, The World Bank. "The project brings all these elements to the classroom, the school garden, and the school playground."

On a review mission of the project for the Global Partnership for Education, Koli Banik, Senior Education Advisor, wrote: "What does all this mean and how does it impact children inside and outside school and their long-term learning outcomes? I could see first-hand the major changes happening in the schools where the project was being implemented and compared them to schools which were not part of the project. (In these schools), students no longer sit facing the teacher and are lectured by the teacher. Now children were seated in groups of 4-6 at tables and the teacher walked amongst the groups. Each table had a rotating student leader who helps initiate the group discussions and group work."[38]

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38 http://www.globalpartnership.org/blog/colombia-vietnam-success-innovative-school-model, December 2013.

The plan of the Ministry of Education (Vietnam) is to expand the VNEN to over 3000 primary schools all over the country. The Ministry has appointed a committee to establish New Schools at all districts in the spirit of fairness, voluntarism and consensus. Steps are being studied to pilot the adaption of the model for secondary schools as well.

"While the model has changed in terms of teaching styles and techniques as well as teaching methods," Mrs. Dung says, "it has remained true to the overall objectives of education. Therefore, there is no disturbance to the system. The model still uses the same methods to evaluate teachers and students as the current system."

"There are many who still doubt the New School model in Vietnam," she continued. "The educational effectiveness of the model, however, will answer these doubts as students become more confident in a child-friendly environment more suitable to their abilities and based on a spirit of fairness and respect. There will continue to be many difficulties and challenges ahead. But we are confident of what we are doing, even as we are cautious and must be patient as we push ahead."

The Vietnam Escuela Nueva program is expanding as more primary school districts apply for inclusion in the program with the Ministry of Education (Vietnam).

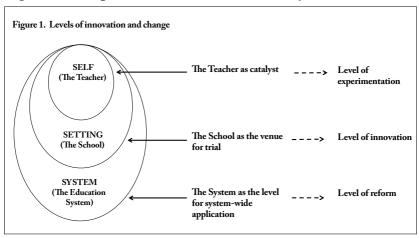# 12 | Innovation in Education Systems: A Discussion Note

Juan Miguel Luz[39]

The moment of truth comes every day in the classroom when learning occurs. In this regard, the school is the single most important unit in the education system.[40] This is where the learning process comes alive fueled by an individual – the teacher or the school head – whose efforts are born out of some inner desire or drive to share something from within and borne on methods that may have been developed elsewhere but have been honed and sharpened by instincts, context and experience. How these are shaped and developed can be a source of inspiration and learning for other teachers, school heads, administrators and education policy-makers.

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Real development, however, has to go beyond the individual effort to be truly developmental. The individual success of a good teacher is noteworthy but a micro phenomenon by itself. The value of a good teaching effort becoming an education innovation lies in its potential for replication and adoption by others. Here, learning from the experience of good educators of the steps in developing innovations can help other teachers develop their own competence and effectiveness in delivering learning for their own students.

Beyond scalability and replication is the question of whether an innovation can become a system-wide solution. An education system that can capture new practices and disseminate these to others in a structured manner is at the heart of a learning organization (Senge et al)[41]. This is what education systems should aspire to be in reality from the school organization up to the education bureaucracy.

Figure 1. Levels of innovation and change

SELF (The Teacher)	The Teacher as catalyst - - - ->	**Level of experimentation**
SETTING (The School)	The School as the venue for trial - - ->	**Level of innovation**
SYSTEM (The Education System)	The System as the level for system-wide application - - ->	**Level of reform**

In these stories of teachers from around Southeast Asia who have been recognized by the Princess Maha Chakri

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41 Peter M. Senge, Nelda Cambron-McCabe, Timothy Lucas, Bryan Smith, Janis Dutton. Crown Publishing Group, 2012

Awards Foundation, the following questions were asked of each teacher's personal journey:

- What was your learning journey as a teacher?

- What were the motivating factors that shaped your becoming an effective teacher?

- What challenges or adversities did you have to overcome?

- Who were your role models and what role did they play in your journey?

As each teacher spoke of their journey, their respective innovations became evident.

- What was the evolution of that innovation or good practice?

- What were the necessary requisites, if any, to setting up and implementing or carrying out the innovation?

- What pitfalls to avoid?

- How do you measure success (key success factors)?

In asking each teacher about their innovation, we explored how these could be used by other teachers and schools.

- Has your innovation been replicated or copied by other teachers or schools? What has been the experience?

- Has the innovation been scaled up to serve more students and schools? If so, what has been the experience?

- How have other schools adopted the innovation or practice?

- Given that the teacher was nominated by his/her Ministry of Education, did the ministry adopt the innovation or practice (e.g. helped in its adoption and dissemination)?

- Can the individual effort become, in reality or potentially, a system-wide solution to a problem or need in education in the country?

What is innovation?

Innovation is about new thinking with application. These can be framed in terms of short-term ideas (What is the reason or purpose?) or as long-term objectives (What is the goal?) (VanGundy, 2007). Strategic innovation does the following for a business (Markides in Roberts, 2002):

- Redefines the business (i.e. education services)

- Redefines the who (i.e. students)

- Redefines the what (i.e. school offerings)

- Redefines the how (i.e. new and better processes in schools)

- Starts the thinking process at different points

A change in the thinking process is a critical element of the theory. A good part of the change or innovation is in process improvement involving brainstorming, constructive confrontation, and experimentation (Sutton in Roberts, 2002). Given the action orientation of innovation, idea generation is a necessary but not sufficient process for success. Idea implementation is a more critical part of innovation. Given the distance between idea generation and implementation,

Magadley & Birdi (2012) identify three different levels of responsibility for innovation: (1) The level of the Individual where ideas are be born, (2) the level of a Group where ideas are shared, and (3) the level of an Organizational where factors that influence idea implementation are strongest.

At the level of a group or organization, the concept and process of collaboration is important. The collaborative process involves a translation of ideas from one party to another through two means: (a) A strategic narrative (e.g. formal planning), and/or (b) everyday narratives (e.g. organizational practices that can translate into organizational culture) (Pedersen & Johansen, 2012).

There are two schools of thought in management theory that look at innovation differently. One school asserts that successful organizations are not innovative by accident but are deliberately managed utilizing proven approaches to "leverage" innovation from within (Dooley, Cormican, Wreath & O'Sullivan 2000).

Mintzberg (in Mintzberg & Quinn,1988) is an advocate of the innovative organization that is less bound by rules and patterns. For him, "a focus on control by standardizing outputs does not encourage innovation" and "to innovate means to break away from established patterns". This means a more flexible organogram.

What kinds of organizations are best suited for innovation? For Quinn (1988, in Mintzberg & Quinn), small companies tend to produce innovations more so than large companies. Large-companies have structural barriers to innovation including top management isolation from the field and factory levels, intolerance within management of outliers or unorthodox thinkers, short time horizons in planning and

implementation, accounting practices, excessive rationalism, excessive bureaucracy and inappropriate incentives. This is not to say that large companies cannot innovate but only if they are prepared to do the following: create the right atmosphere and vision, be more oriented to the market, be smaller and flatter organizations, adopt multiple approaches, encourage developmental shoot-outs, set up skunkworks and engage in interactive learning. The most critical learning from innovative companies is that effective technological innovation develops hand-in-hand with customer demand (Von Hippel in Quinn, 1988).

Innovation in Education Organizations

Business corporations, however, are not the same as schools though educators can learn much from such organizations. How can theories of innovation in the business field inform organizations in the social sector such as schools?

Social innovation is a complex process of introducing new products, processes or programs that can profoundly change the basic routines, resource allocation, authority flows, and/or beliefs of the social system in which the innovation occurs.

There are ways to link management theories of innovation derived from business to that of organizations in the social sectors. The first similarity is how innovation can be stifled by structure. Government bureaucracies such as ministries of education are not unlike large corporations in this respect. Quinn's discussion of large corporations (1988, in

Mintzberg & Quinn) shows what structural impediments they have for innovation that look similar to those in government bureaucracies: the isolation of high officials from the field; an intolerance for individuals thinking out of the box; short planning and budgeting cycles; rigid accounting and auditing rules; top-down instructions; civil service rules (for public school teachers and principals); and few (if any) non-salary incentives or inappropriate benefits.

But if corporations can overcome these structural impediments, why not bureaucracies and government ministries such as schools or ministries of education?

The fact that there are schools or school districts within the education system that do innovate as in the cases in this book, suggests that there are opportunities to study up close the conditions under which these occur notwithstanding the structural impediments in education systems.
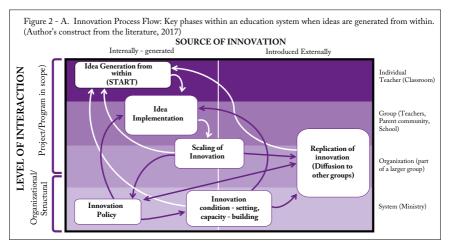
Innovation in the schooling system is about producing educational outcomes well beyond "reasonable" expectations. True educational innovations are those products, processes, strategies and approaches that improve output and outcomes significantly upon the status quo. But to have meaningful impact, new solutions to existing problems must also be able to "scale" (i.e. the ability to grow large enough) to serve more students and teachers or large portions of specific under-served groups.
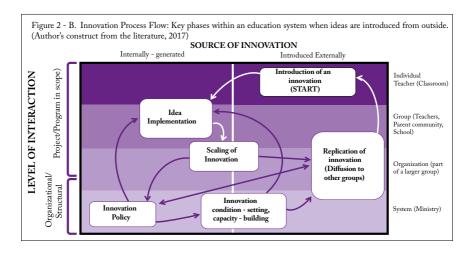
A Framework for Studying Innovation in Education Institutions

Watt (2002) proposed a four-pillar approach to innovation in education systems around people, culture and climate, structure and processes, and leadership.

There are five major components underlying the concept of innovation that can be applied to schools around these four pillars:

(1) Idea generation
(2) Idea implementation
(3) Innovation and diffusion
(4) Policy and leadership
(5) Culture and capacity-building

Figure 2 - A. Innovation Process Flow: Key phases within an education system when ideas are generated from within. (Author's construct from the literature, 2017)

Figure 2 - B. Innovation Process Flow: Key phases within an education system when ideas are introduced from outside. (Author's construct from the literature, 2017)

On idea generation

Idea generation, as in the cases in this book, originate from demand, usually students' needs in the classroom. This is about student learning and whether or not this is happening under the current school set-up and processes. Idea generation can either be (a) internally-generated by a stakeholder or stakeholders within a school or a district, or (b) introduced by an external agent (e.g. an adopted technology).

In the former, the source of an internally-generated idea may be a single teacher who uses his or her classroom as the learning laboratory to test out an idea as in the cases of Daw Yee Mon Soe in Myanmar, Tauch Bundaul in Cambodia, William Moraca in the Philippines, and Wang-Lim Ai Lian of Singapore, to name four of the teachers in this book.

In the latter, the technology may be introduced from outside (e.g. external to the school system). This technology might take the form of hardware (i.e. laptop computers) or

software (i.e. reading programs) and may have originated from outside the agent's perception of a need or problem within the school system and for which a technology is offered as a solution. The cases of Julio Ximenes Madeira of Timor-Leste and Tran Thi Thuy Dung of Vietnam adopting the Child-Friendly Schools model of UNICEF and the *Escuela Nueva* model of Colombia speaks to this.

The driving question at this stage of innovation might revolve around what conditions exist in a school system that would make an innovation possible and robust.

On idea implementation

Idea implementation is about producing outcomes well beyond "reasonable" expectations. True educational innovations are products, processes, strategies and approaches that improve significantly upon the status quo. The question to ask is how to bring such innovations to scale in order to have meaningful impact.

For stand-alone innovations, scale might be established at a level where critical mass can change outcomes at the classroom or school level. For program innovations, scale could mean serving large numbers of students and teachers or larger portions of specific under-served populations (Shelton, 2011). A key question that could be asked: What scale would constitute a system breakthrough?

On innovation diffusion

Innovation diffusion, like technology diffusion, could follow a Rogers' Curve that identifies five categories of innovators or adaptors: (a) Innovators or first-movers (the first 2.5%); (b) early adaptors (the next 13.5%); (c) early majority (34%); (d) late majority (34%); and (e) laggards (the last 16%). (www. valuebased management.net)

In this book, all the cases represent first movers or early adaptors, though usually the former.

What are the preconditions or conditions that are necessary for the above two categories of innovators to set up in order for them to make innovations work out and last? What can we learn in terms of pre-conditions required of others in order to become successful innovation adaptors?

On policy and leadership

Studies of innovative schools recognize that idea generation and idea implementation are readily done at the lowest unit (e.g. the classroom or school). But the studies also reveal that while individual teachers and schools can bring about change without the support of higher officials in the education system (i.e. district, divisional or even national administration), in the final analysis, system-wide change would probably not occur without higher leadership (Dibbon and Pollock, 2007).

To bring about the potential for system-wide application and to support school-based innovation and the integration

of innovation on a larger scale, there is need to expand the focus to include larger parts of a school system. This moves the discussion to the level of policy where such innovations can be integrated in the longer term strategic plans and programs of the system.

Policy requires leadership with a vision for recognizing processes of innovation. The tendency of education bureaucracies, however, is to standardize processes to the point where these can be rigid and inflexible. What attributes of leadership allow for innovations to actually be generated and implemented in the cases presented in this book?

On culture and capacity-building

Policy and leadership, despite being powerful instruments for reform and change, are not guarantees of long-term sustainability of innovation reforms. Policies can change (or be ignored) and leaders can come and go. Schools should be learning organizations able to innovate and adapt to change otherwise its reason for being is undermined by an inherent contradiction – it is a school but does not learn (Senge, Kleiner, Roberts, Ross & Smith, 1994).

If innovation is to become a characteristic of education systems, can innovative thinking be taught up and down and throughout the system? What other ways are there to create the conditions, attributes and characteristics that would make more schools, teachers and administrators creative thinkers and agents of innovation?

The eleven cases in this book are but a few examples of how teachers thinking out of the ordinary can bring about

change in their small sphere of influence. Each effort might be a small step, but the potential for wider reform is laid out inherently in each story and this might be the lessons that can be learned by other educators, teachers and school leaders.

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The moment of truth comes every day in the classroom when learning occurs. In this regard, the school is the single most important unit in the education system. This is where the learning process comes alive fueled by an individual – the teacher or the school head – whose efforts are born out of some inner desire or drive honed and sharpened by instincts, context and experience. How these are shaped and developed can be a source of inspiration and learning for other teachers, school heads, administrators and education policy-makers.

These are stories of teachers from around Southeast Asia recognized by the Princess Maha Chakri Award Foundation. Each story looks at their personal journey, the innovations they introduced and if these could provide system-wide solutions to the needs of education in their countries.

Rajah Ratnawati bin Haji Mohammad, *Brunei Darussalam*
Tauch Bundaul, *Cambodia*
Herwin Hamid, *Indonesia*
Khamsoy Vongsamphanh, *Lao PDR*
Zainuddin Bin Zakaria, *Malaysia*
Yee Mon Soe, *Myanmar*
William Egot Moraca, *Philippines*
Wang-Lim Ai Lian, *Singapore*
Chalermporn Pongtheerawan, *Thailand*
Julio Ximenes Madeira, *Timor-Leste*
Tran Thi Thuy Dung, *Vietnam*

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