



Science, Technology and Society



EE - 1201

99 Filipino Inventions and Discoveries ¹

Scientists greatly help in the economic development of a country. In the Philippines, we have a number of renowned scientists and technologists whose exemplary works and discoveries have contributed to the progress of different industries.

° 20th Century Inventions and Discoveries °

1. FE DEL MUNDO

- The first Asian to have entered the prestigious Harvard University's School of Medicine.
- She was an alumna of the University of the Philippines (UP) College of Medicine.

1 INVENTION: INCUBATOR

- An incubator is an apparatus used to maintain environmental conditions suitable for a newborn baby.
- It is used in preterm births or for some ill full-term babies.

2. GREGORIO Y. ZARA

- He is a renowned Filipino engineer and physicist.
- He was the inventor of the first videophone. A native of Lipa, Batangas, he enrolled at the Massachusetts Institute of Technology (MIT) in the United States and graduated with a BS degree in Mechanical Engineering in 1926.

2 INVENTION: VIDEOPHONE (1095)

- The two-way television telephone, or videophone, was patented in 1955 as a "photo phone signal separator network."

3. AGAPITO FLORES

3 INVENTION: FLUORESCENT LAMP

- He is the inventor of the fluorescent lamp, which is the most widely used source of lighting in the world today. The fluorescent lamp reportedly got its name from Flores. The fluorescent lamp, however, was not invented in a particular year. It was the product of 79 years of the development of the lighting method that began with the invention of the electric light bulb by Thomas Edison.

4. DANIEL DINGEL

4 INVENTION: WATER-POWERED CAR

- Daniel Dingel started working on a water-powered car prototype in 1969. His hydrogen reactor uses electricity from a 12-volt car battery to transform ordinary tap water with salt into deuterium oxide, or heavy water.
- Dingel's car has never been patented and commercialized because of what he suspects is an anti-Dingel car conspiracy by multinational oil companies.

5. EDUARDO SAN JUAN

5 INVENTION: LUNAR ROVER

- Filipinos consider Eduardo San Juan as the inventor of the Lunar Rover, more popularly known as the Moon Buggy. The Moon Buggy was the car used by Neil Armstrong and other astronauts when they first explored the moon in 1969.
- He worked for Lockheed Corporation and conceptualized the design of the Moon Buggy that the Apollo astronauts used

while on the moon. As a NASA engineer, San Juan reportedly used his Filipino ingenuity to build a vehicle that would run outside the Earth's atmosphere. He constructed his model using homemade materials.

- San Juan, however, was not listed as the inventor of the Moon Buggy in American scientific journals. It said the vehicle was designed and constructed by a group of space engineers. In Poland, the moon buggy is attributed to a Polish inventor.

6. DIOSDADO BANATAO

6 INVENTION: GUI (GRAPHICAL USER INTERFACE)

- Banatao is most known for introducing the first single-chip graphical user interface accelerator that made computers work a lot faster and for helping develop the Ethernet controller chip that made the Internet possible.
- In 1989, he pioneered the local bus concept for personal computers and, in the following year, developed the first Windows accelerator chip. Intel is now using the chips and technologies developed by Banatao.

7. ANGEL ALCALA

7 INVENTION: ARTIFICIAL CORAL REEFS

- Angel Alcala is behind the invention of artificial coral reefs used for fisheries in Southeast Asia.

8. JULIAN BANZON

8 INVENTION: METHODS PRODUCING ALTERNATIVE FUELS

- Julian Banzon researched methods of producing alternative fuels. He experimented with the production of ethyl esters fuels from sugarcane and coconut, and invented a means of extracting residual coconut and invented a means of extracting

residual coconut oil by a chemical process rather than a physical process.

9. MARC LOINAZ

9 INVENTION: ONE-CHIP VIDEO CAMERA

- The inventor of the one-chip video camera was Marc Loinaz, a Filipino resident of New Jersey who works with Lucent Technologies. He was featured in the July 1999 issue of Discover Magazine.
- The 1-chip camera uses a single computer chip to process the colors the camera sees. Most videos for a website are used with a 1-chip camera, mainly because the video is compressed in a 1-chip camera, so it transmits more quickly.

10. ROBERTO DEL ROSARIO

10 INVENTION: KARAOKE (1975)

- He developed a sing-along system in 1975 and patented it in the 1980s, called his sing-along system "Minus-One," and now holds the patent for the device now commonly known as the "karaoke machine."
- Roberto del Rosario, a Filipino, is claiming the right for the invention of the Sing-Along-System (SAS) that eventually led to the development of karaoke, a Japanese term for "singing without accompaniment."

11. NARCISO MOSUELA

11 INVENTION: SUPERKALAN

- The Superkalan is a stove that can be powered by any substance that burns. Narciso Mosuela of the Filipino province of La Union invented it and received the Best Design award from the Food and Agricultural Organisation (FAO) in 1987. Among the substances that can power the Superkalan are wood, paper, dried dung and leaves, corncobs, and coco shells. Mosuela has also invented a functional rice thresher.

12. JUAN SALCEDO JR.

7 INVENTION: ENRICHED RICE

- Developed “Enriched Rice,” a rice variety fortified with vitamin B1, which helps prevent beriberi. His discovery helped reduce the cases of beriberi in the Philippines and in other countries.

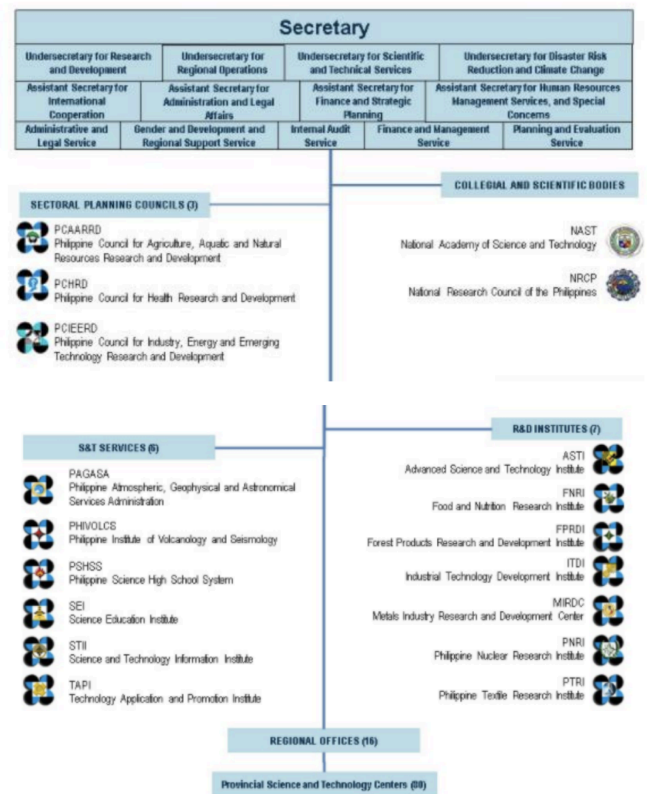
13. RAMON BARBA

7 INVENTION: TECHNIQUES TO PROMOTE CROP FLOWERING

- Horticulturist Ramon Barba is known for inventing techniques to promote crop flowering. His work, which has helped develop the local mango industry, is the only invention in Southeast Asia that the World Intellectual Property Organization recognizes. Barba’s other research, meanwhile, focuses on tissue culture of bananas, sugarcane, and other horticultural crops to develop methodologies in plant physiology and plant breeding.

In 2017, DOST launched the Science for the People through Administrative Order No. 003 s. 2017. This is in response to the government’s call to address inequity in developments within and among countries and is aligned with the national goals and plans. It aims to make science and technology more relevant to the conditions, needs, and opportunities for contributing to regional development while keeping abreast with the trends and development in the country and in the world. Likewise, the program intends to maximize the use of science, enhance innovation and the creative capacity of the Filipinos towards the achievement of inclusive and sustainable growth.

DOST Organizational Chart



Science, Technology and Nation Building

In the Philippines, the Department of Science and Technology (DOST) is tasked to oversee and manage national technology development and acquisition, undertake technological and scientific research, and promote public consciousness of science and technology. DOST is responsible for formulating and adopting a comprehensive National Science and Technology plan for the Philippines and subsequently monitoring and coordinating its funding and implementation. It undertakes policy research, technology assessment, feasibility and technical studies, and maintains a national information system and databank on science and technology.

Stipulated in the strategic plan are the seven outcomes that the agency strives to achieve. These are as follows:

1. Innovation and stimulus

2. **Technology and adoption promoted and accelerated**
3. **Critical mass of globally competitive STI human resources developed**
4. **Productivity and efficiency of communities and the production sector, particularly MSMEs improved**
5. **Resiliency to disaster risk and climate change ensured**
6. **Inequality in STI capacities and opportunities reduced**
7. **Effective STI governance achieved**

The strategies to attain these outcomes are embodied in the DOST Eleven Point Agenda as follows:

1. Pursue R&D to address pressing national problems.

Agenda 1 highlights the latest advancements in research and development geared towards the shared goal of improved nutrition and health for all. Focused on health technology development, drug discovery and development remains to be the high-impact and big-ticket program supported by the Department in the area of health.

- Central to this R&D program is the study of endemic resources, partnered with documentation of traditional knowledge and practices in health, that could eventually lead to decreased cost of medicines and health interventions for diseases that affect the quality of lives of many Filipinos.
2. Conduct R&D to enhance productivity and improve management of resources.

Agenda 2 presents how R&D can be utilized to make key traditional industries steadfast and competitive through technological innovations that can address gaps in productivity and increase production yield.

- Enhancing the capacity of marginalized 50 sub-sectors and people groups to use better

and new technologies can expand their access to participate in economic activities and progress.

- The primary industries that will benefit from the featured major R&D programs include the agriculture, specifically coconut and rice production, non-wood forest products, i.e., bamboo processing and utilization, and natural textile among others.
3. Engage in R&D to generate and apply new knowledge and technologies across sectors.

Agenda 3 engages R&D in emerging scientific and technological platforms which lay the inroads to the development of new products, services, and industries.

- Promising new technologies may potentially disrupt and change the way things are done. Recognizing this, the Department anticipates impact of new technologies in existing industries in the country by supporting local capability programs in the areas of artificial intelligence for new industry development and supporting research in nanotechnology for new materials development.
4. Strengthen and utilize regional R&D capabilities.

Agenda 4 focuses in strengthening institutional capacity to undertake research and development and contribute to regional development. Utilizing local researchers equalize opportunities in generating new knowledge and technologies suited for the specific need of the region.

- The Department partners with Higher Education Institutions in the regions in establishing niche R&D centers which may also serve as hubs for developing R&D capability of adjacent localities.

5. Maximize utilization of R&D results through technology transfer and commercialization.

Agenda 5 includes mechanisms to encourage technology transfer and avenues where R&D results are promoted in the bid to maximize its utilization. The Department provided support in bringing R&D results to its final stage of development up to commercialization.

6. Develop STI human resources and build a strong STI culture.

Agenda 6 aims to build a critical mass of competitive researchers, scientists, and engineers (RSEs) and promoting a culture of STI. Towards this goal, the Department continues to provide scholarship programs to scale up the number of RSEs.

7. Upgrade STI facilities and capacities to advance R&D activities and expand S&T services.

Agenda 7 features various S&T facilities that offer technical services for carrying out research and development, as well as addressing the needs of the industry in terms of quality assurance, adherence to standards, product development, and innovation.

- The electronics, semi-conductor, automotive parts, gear assembly manufacturing, agriculture produce, and food manufacturing industries can benefit from the various S&T facilities and technical services.
8. Expand STI assistance to communities and the production sector, particularly MSMEs.

Agenda 8 focuses on S&T assistance provided to upgrade the technological capabilities and improve the productivity and efficiency of Micro, Small and Medium Enterprises (MSMEs).

- The Department has continued to provide technological interventions such as process and system improvement, technical

consultancy, packaging and labelling, training, testing and calibration, and product development to empower MSMEs to innovate, move up the technology scale and become more competitive.

9. Provide STI-based solutions for disaster risks and climate change adaptation and mitigation.

Agenda 9 highlights the role of the Department in building a disaster-resilient community through the provision of accurate and timely information. Specifically, progress was made by establishing and upgrading observation and monitoring systems, efforts in hazard and risk assessment, and researches for disaster risk management, as well as climate change adaptation and mitigation.

10. Strengthen industry--academe-government and international STI collaboration.

Agenda 10 focuses on the linkages and networks being pursued by the Department in terms of S&T collaboration. In 2017, the Department took part in 24 bilateral engagements and participated in a number of activities which involved 14 international organizations.

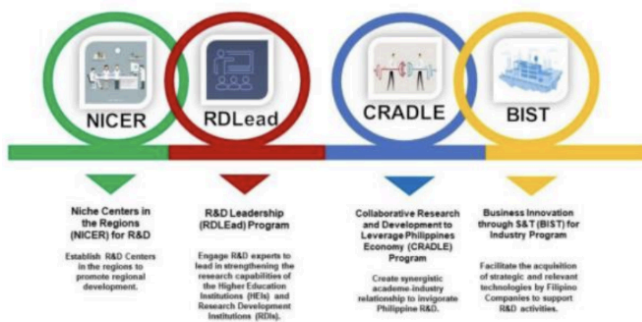
11. Enhance effectiveness of STI governance.

Agenda 11 (Enhance effectiveness of STI governance) provides the policy framework that governs the implementation of the programs, projects and activities of the Department in contribution to national development and progress. Taking off from the National 0+10 Socioeconomic Agenda and Philippine Development Plan, the Department crafted the Science for the People 11-point Agenda, Harmonized R&D Agenda, and Regional Offices Strategy Map.

Major Development Programs and Personalities in Science and Technology in the Philippines

Major Development Programs in Science and Technology

The Science for Change Program (S4CP) was created by the Department of Science and Technology (DOST) to accelerate STI in the country in order to keep up with the developments in our time wherein technology and innovation are game changers. Through the Science for Change Program (S4CP), the DOST can significantly accelerate STI in the country and create a massive



S4CP focuses on Accelerated R&D Program for Capacity Building of R&D Institutions and Industrial Competitiveness which is composed of four (4) programs namely:

1. Niche Centers in the Regions for R&D (NICER) Program,
2. R&D Leadership (RDLead) Program,
3. Collaborative R&D to Leverage PH Economy (CRADLE) for RDIs and Industry Program,
4. Business Innovation through S&T (BIST) for Industry Program.

The NICER Program capacitates Higher Education Institutions (HEIs) in the regions to make significant improvement in regional research by integrating its development needs with the existing R&D capabilities and resources. It provides institutional grants for HEIs in the regions for R&D capacity building to improve their S&T infrastructure. The NICER Program was

established in consultation with the academe and industry;; and endorsed by the Regional Development Council (RDC).

Hence, a NICER is a unique center for collaborative R&D to address specific S&T needs of local communities and industries, thereby accelerating regional development. It caters to the specific needs of the Regions, which include upgrading, development, and acquisition of R&D equipment to undertake collaborative R&D activities. Currently, there are 18 existing NICERs across 14 regions for a total funding of P641M.

The R&D Leadership Program complements the establishment of R&D Centers thru the NICER Program.

RDLead provides the mechanism to bring in experts and highly skilled professionals with strong leadership, management and innovative policy-making proficiencies to be in charge of strengthening the research capabilities of the HEIs, National Government Agencies (NGAs) and Research Development Institutions (RDIs) in the regions.

Together, the RDLead and NICER Programs will capacitate HEIs to help improve and hasten the use of research results that will contribute to the socio-economic development of the country and help address pressing challenges. The NRCP is the implementing agency for this program.

The Collaborative Research and Development to Leverage Philippine Economy (CRADLE) Program is specifically designed to foster collaboration between academe and local companies to improve competitiveness and catalyze innovation. It aims to improve the country's innovation ecosystem by facilitating the smooth transition of new technologies from universities and research and development institutes (RDI) to industries - from lab to market.

The framework of CRADLE is a trihelix partnership⁵³ between the government, the industry and the academe wherein the government finances the collaboration of the private company and the partner university or RDI. The Program

aims to address a problem of a Filipino company using R&D to develop innovative solutions.

To date, the DOST has already provided almost Php 125M of funding to 29 academe-industry collaborations all over the country.



The Business Innovation through S&T (BIST) for Industry Program aims to level-up the innovation capacity of the Philippine Industrial Sector through R&D by helping private companies and industries acquire novel and strategic technologies, such as state-of-the-art equipment and machinery, technology licenses and patent rights among others. The program will cover up to 70% of the total eligible cost of the needed technology at zero percent interest. To date, the BIST Program has approved one project from an herbal company, Herbanext Laboratories Inc., providing a total financial assistance of Php11.7M.

A Steering committee for CRADLE and BIST Programs was created through the DOST Special Order No. 0276 which was approved on 02 April 2018. The Steering Committee is headed by Dr. Rowena Cristina L. Guevara, Undersecretary for R&D, and the members include the Department of Trade and Industry (DTI), Federation of Philippine Industries (FPI), Philippine Chamber of Commerce and Industry (PCCI), Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD), Philippine Council for Health Research and Development (PCHRD) and Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD)

The committee performs the following functions:

1. Review/formulate policies relating to the implementation of CRADLE and BIST Program;

2. Provide advice and guidance in the management and administration of the projects;; and
3. Other functions necessary for the successful implementation of CRADLE and BIST Programs. Since the implementation of the S4CP in 2017, the DOST has spent a total of Php 407,585,946.60 to the four programs.

	2017	2018	2019	TOTAL
NICER	133,791,318.00	35,921,212.80	138,614,162.00	308,326,692.80
CRADLE	9,893,065.00	14,823,963.99	33,404,892.51	58,121,921.50
RD LEAD	-	7,528,190.90	21,909,141.40	29,437,332.30
BIST	-	-	11,700,000.00	11,700,000.00
	GRAND TOTAL			407,585,946.60

99 Personalities in Science and Technology in the Philippines'

Aisa Mijeno

To light up the rest of the Philippines sustainably was the vision of Filipinascientist Aisa Mijeno when she made the Sustainable Alternative Lighting (SALt) lamp.

The product concept was formed after living with the Butbut tribe for weeks relying only on kerosene lamps and moonlight to do evening chores. Her mission and advocacy is to address the light inequality gap and end the use of combustion based light sources (kerosene lamps and candles) for the 16 Million Filipinos and 1.4 Billion people across the world.

The Salt Lamp is an environment-friendly and sustainable alternative light source that runs on saltwater, making it suitable to those who live in coastal areas. It can also function well in remote barrios. With just two table spoons of salt and one glass of tap water, this ecologically designed lamp can run for eight hours.

The idea behind the SALt lamp is the chemical conversion of energy. It utilizes the scientific process behind the Galvanic cell, but instead of electrolytes, the SALt lamp uses saline solution, making it harmless and non-toxic. Compared with kerosene lamp, the SALt lamp is

also a lot safer since it does not have components and compounds that may spark fire.

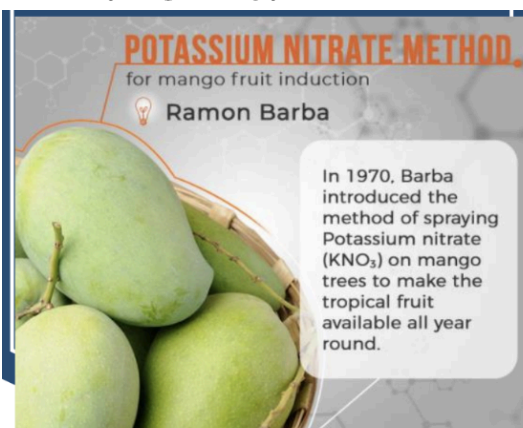
Moreover, it does not emit toxic gases and leaves minimal carbon footprint. Because of its inspiring vision and ground-breaking innovation.

The SALt lamp has received various awards and recognition from organizations in the Philippines, Singapore, Japan, and South Korea. SALt have won several awards including KOTRA Top 5 Best Global Startup at Startup Nations Summit 2014, People's Choice at Startup Nations Summit 2014 and recognized by the ASEAN Corporate Sustainability Summit and Awards 2015 giving them the SME Sustainability Commitment Category.

One of Mijano's career highlights was when she was invited as an APEC CEO Summit panel member together with ex- President Barack Obama and Alibaba CEO Jack Ma. Looking forward, she wishes to distribute more lanterns to communities across the Philippines and possibly throughout South East Asia.

Ramon C. Barba

He is a Filipino scientist, inventor and horticulturist who is known for his successful experiment on the inducement of flowering of mango trees by spraying them with ethrel and potassium nitrate. He developed a process that caused the flowering and fruiting of mango trees three times a year, instead on once a year, so dramatically improving yields.



Since his discovery, the mango industry in the Philippines expanded. Apart from the mango producers themselves, other business sectors such as the producers of the pest control chemicals, harvesters, sellers, and all the other smaller groups of workers related to mango industry have benefitted from his invention. This technology has also been successfully applied on other fruit trees including cashew.

Barba also developed a tissue culture procedure for the banana plant and sugar cane which enabled production of large quantities of planting materials that were robust and disease-free. With his research team, Barba devised micro propagation protocols for more than 40 important species of fruit crops, ornamental plants, plantation crops, aquarium plants, and forest trees. In 2013, Ramon C. Barba was conferred the rank and title of National Scientist in the Philippines for his distinguished achievements in the field of plant physiology.

Fe V. del Mundo

She is known as the Mother of Philippine Pediatrics, a very great scientist and a symbol of female empowerment in medicine, both in the Philippines and abroad. The first Asian woman admitted into Harvard, she pursued graduate degrees in America after receiving her medical degree from the University of the Philippines.

Del Mundo pioneered numerous inventions throughout her more than 70-year medical career. She revolutionized Philippine medicine, making major breakthroughs in immunization and in the treatment of jaundice, and providing healthcare to thousands of poor families.

She is credited with studies that led to the invention of the incubator and a jaundice relieving device. Her methods, like the BRAT diet for curing diarrhea, have spread throughout the world and saved millions.

Del Mundo's field of natural science and the field of public health was something she was actively involved in. When she was not busy treating and taking care of children, she did some

pioneering work on infectious diseases in Philippine communities and authored the Textbook of Pediatrics, as well as hundreds of articles and medical reports on diseases such as dengue, polio and measles.

During her lifetime, del Mundo won numerous awards and recognition for her outstanding work. Among these was the Ramon Magsaysay Award for Public Service, which she received in 1977. She became the Philippines' first female National Scientist in 1980, in recognition of her work in Pediatrics.

The rank of National Scientist is awarded to science practitioners with "distinguished individual or collaborative achievement in science and technology." In 2010, del Mundo was awarded the Order of Lakandula, rank of Bayani, as a Filipina who lived a life "worthy of emulation." Posthumously, she was conferred the Grand Collar of the Order of the Golden Heart Award in 2011, by President Benigno Aquino III.

Maria Y. Orosa

Advances in modern Filipino food technology owe a great deal to the creative researches and salutary inventiveness of a woman chemist and pharmacist from Batangas – Maria Y. Orosa. The now- commercially available thirst quencher, the calamansi juice, is just one of the popular native food products in whose preparation and preservation she had a hand. She produced the "calamansi nip," the desiccated and powdered form of the fruit which could be made into juice.

The most notable of her food inventions, is "Soyalac," a powdered preparation of soya--beans, which helped save the lives of thousands of Filipinos, Americans, and other nationals who ever held prisoners in different Japanese concentration camps during World War II. It became known to them as the "magic food."



She is also credited with the making of the banana ketchup; wines from native fruits, like casuy and guava; vinegar from pineapples; banana starch; soyamilk; banana flour; cassava flour;; jelly from guava, santol, mango, and other fruits, as well as the invention of rice cookies, known as ricebran or darak, which is effective in the treatment of patients with beri-beri.



Aside from making food preparations, Miss Orosa taught Filipinos how to preserve such native delicacies as the adobo, dinuguan, kilawen and escabeche. Together with her associates in the Bureau of Plant Industry, she invented "Oroval" and "Clarosa."

In 1928, the government, recognizing her dynamism and strong leadership, sent her to various countries as a state scholar to specialize in food processing and canning. To perpetuate her memory, the government has named after her a street stretching from T.M. Kalaw to Padre Faura in Ermita, Manila, as well as a building in the Bureau of Plants and Industry.



Angel Alcala

He is a Filipino scientist whose biological contributions to the environment and ecosystems have made him a hero for natural sciences. During his 30 years of experience as a biologist, Alcala made major contributions to marine biology research efforts in the Philippines and authored over 160 scientific papers as well as books.

Alcala was the first Filipino scientist to engage in comprehensive studies concerning Philippine reptiles and amphibians and minor studies on mammals and birds. From the 400 already known species of reptiles and amphibians, 50 more species were identified due to his efforts. Because of his work, conservation programs in the Philippines are now well established.

Contributions

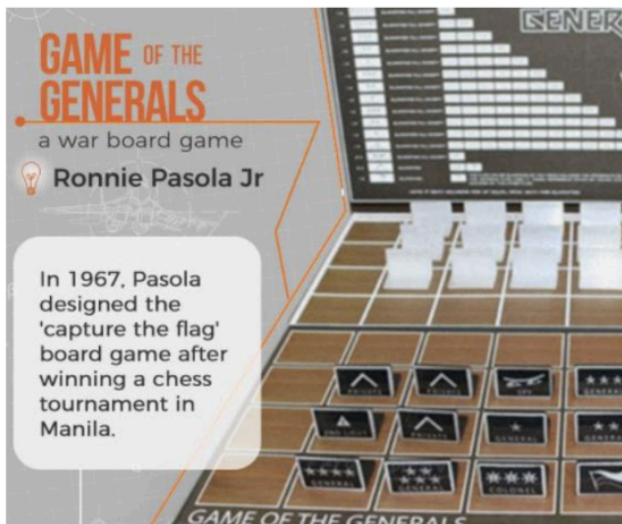
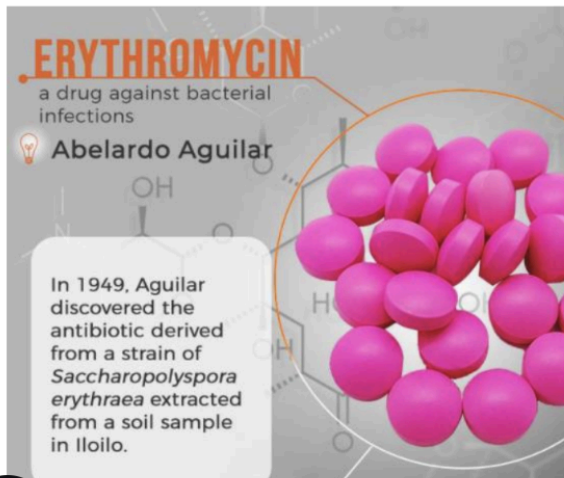
Alcala made major contributions to marine biology research efforts in the Philippines and authored over 160 scientific papers as well as books. Alcala was the first Filipino scientist to engage in comprehensive studies concerning Philippine reptiles and amphibians. He also made contributions for mammals and birds. 50 more species were identified due to his efforts. He set up artificial coral reefs.

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In 1994, he was given the Field Museum Founders' Council Award of Merit for contributions to environmental biology. He is a recipient of the Magsaysay Award for Public Service. In September 2011 he received the Gregorio Y. Zara Award for Basic Science from the Philippine Association for the Advancement of Science Inc. In 2014, he was

proclaimed National Scientist by President Benigno S. Aquino III through Presidential Decree 782 on June 6, 2014.





Science Education in the Philippines'

The general benefits of science have greatly challenged education of the Philippines. While the country might have been a beneficiary of the methods of science even before the program of formal education, it was during the American period that brought about a most significant and essential change in the nature of education.

There has been a corresponding increase in knowledge and understanding of natural and social phenomena covered by all the disciplines of science available now. It is this education that has been largely credited for the development of science in the Philippines.

Early Efforts to Improve Science Education

- Leading scientists made Philippine authorities aware that the teaching of science from grade school level to college levels in both public and private schools was very inadequate.
- The inadequacies and weaknesses of science teaching were recognized as those relating to undertrained teachers, the inadequate science curriculum in schools and colleges, the minimum allotted to science, the lack of books, equipment and teaching aids
- A National Committee for Science Education was set up in 1958 to formulate objectives for the teaching of science education at all levels and to recommend steps that would upgrade the teaching of science.
 - integration of science with classroom instruction
 - acquisition of more science equipment and tools

- coordination of efforts with other agencies
- negotiations for a science institute for teachers
- national science talent search and fellowships
- higher salaries of science and mathematics teachers and promotion of science teachers competence

The BSCS Adaptation Project

In 1959, biological sciences curriculum study (BSCS) project was launched by American Institute of Biological Science, university of Colorado in order to improve biology education in secondary schools. A steering committee of biological scientists, teachers and educators was constituted. The project was financed by National Science Foundation, USA

The BSCS project was started to design high school biology course with the objectives to:

- provide recent and latest knowledge in biological sciences
- develop understanding of the conceptual structure of biological sciences
- develop skills and processes of biology among the students
- create an opportunity to use inquiry approach in teaching and learning of biology
- prepare rich supplementary or support materials to enrich learning experiences in biological sciences and present current status of biological sciences

The Science Education Project

- The dissemination of improved curricula
- Quality science and math education programs in the recipient-sponsor institutions through new and/or improved course offerings and a generally improved teacher education program

99 The Human Person Flourishing in Terms of Science and Technology ¹

A. Technology as a Way of Revealing

Martin Heidegger

- A German philosopher
- “The Question Concerning Technology”
 - modern technology and its essence as an instrumental way of revealing the world
 - modern technology is conceived as means to achieve ends

TECHNOLOGY BASED ON ITS ESSENCE

1. The essence of technology is not something we make; it is a mode of being, or of revealing.
2. Technology even holds sway over beings that we do not normally think of as technological, such as gods and history.
3. It is primarily a matter of modern and industrial technology.
4. Technology is not simply the practical application of natural science. Instead, modern natural science can understand nature in the characteristically scientific manner only because nature has already, in advance, come to light as a set of calculable, orderable forces — that is to say, technologically

Two Characteristics of Modern Technology as a Revealing Process

1. The mode of revealing of modern technology is a challenging

- It is putting to nature the unreasonable demand that it supply energy that can be extracted and stored.
 - Mining technology is a good example.
 - Tracks of land reveal as something challenged because man sees them as objects where coal and ore can be demanded.
 - Contrasted “Physis”
 - arising of something from itself, a bringing-forth or poieses
2. The challenging that brings forth the energy of nature is an “expediting”
- “unlocks” or “exposes” something
 - what is exposed is still directed towards something else, i.e. toward the maximum yield at the minimum expense
 - things that are revealed in an expedited manner are brought forth as resources that must be used efficiently

“Standing in Reserve”

- Term used by Heidegger to name the things that are revealed in modern technology
- Things as standing in reserve are not “objects”
 - Objects are things that “stand against us” as things with autonomy
- Things as standing in reserve are called to come forth in challenging and expediting.

“Entraming”

- the “essence” of modern technology
- The “frame” of modern technology is the network or interlocking things standing in reserve.
 - world centered on man’s caprices and demands
 - as if nature is put in a box or in a frame so that it can be better understood and controlled according to people’s desire
- the process of truth will revert back into the realm of erring

B. Human Flourishing

Eudaimonia

- “good fortune”, “material prosperity”

- a situation achieved through virtue, knowledge and excellence
- Learning to be human is central to Confucian humanism and its “creative transformation” of the self through an “ever-expanding network of relationships encompassing the family community, nation, world and beyond

THREE MOTIVATING PARTS OF THE SOUL/MIND

1. Rational
2. Spirited or emotional
3. Appetitive

Each of these have their own desired ends, and Eudaimonia or human flourishing requires an ordering of this tripartite structure of the soul

Eudaimonia

It is constituted not by honor or wealth power but by rational activity in the virtues of character (including courage, honesty, pride, friendliness, and wittiness), the intellectual virtues (rationality and judgement), mutual beneficial friendships and scientific knowledge particularly of things that are fundamental and unchanging.

Aristotle’s View

<ul style="list-style-type: none"> ◆ All humans seek to flourish - the proper and desired end of all of our actions ◆ To understand something’s function, you have to understand its nature. 	<p>Four Aspects of Human Nature</p> <ul style="list-style-type: none"> ◆ Physical – nourishment, exercise and rest ◆ Emotional – wants, desires, urges and reactions ◆ Social – live and function in particular societies ◆ Rational – creative, expressive, knowledge seeking, and able to obey reason
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To flourish, a man must pursue goals that are both rational for him individually and also as a human being.

Living rationally (consciously)

- means dealing with the world conceptually
- implies respect for the facts of reality
- not affected by the degree of one’s intelligence not the extent of one’s knowledge; rather, it is the acceptance of

use of one's reason in the recognition and perception of reality and in his choice of values and actions to the best of his ability, whatever that ability may be