

UNIVERSITI  
KEBANGSAAN  
MALAYSIA

*The National University  
of Malaysia*

**BITARA  
STEM**  
Universiti Kebangsaan Malaysia



**PROGRAM REPORT**  
**EXXONMOBIL-UKM STEM CLUB@SABAH 2019**  
**(Science, Technology, Engineering and Mathematics)**

**STEM TRAINING OF TRAINERS**  
**STEM MENTORING PROGRAM**  
**STEM PROJECT COMPETITION**

**20 FEBRUARY - 17 OCTOBER 2019**

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## Introduction

The ExxonMobil-UKM STEM Club@Sabah program is an adaptation program of ExxonMobil-UKM STEM Club conducted in Terengganu in 2017 and 2018. The ultimate goal of this program is to raise students' interest, literacy, soft skill and values through an integrated and new STEM learning approach and curriculum. Training of Trainers program (ToT) program aims to make teachers especially science, mathematics and other technical teachers more innovative and creative in delivering Science and Mathematics as well as other technical subjects.

Collaboration conducted by Faculty of Education, Universiti Kebangsaan Malaysia (UKM) with ExxonMobil has come to the fifth years (2015-2019). ExxonMobil continues to play an important role in the development of National Education agenda in enhancing education system in Malaysia, especially in science education fields.

## Programs Objectives

The objectives this program are mainly to:

1. Build a group of STEM Master Trainers for sustainability development to continuously training teachers and students on various practical aspects of innovative pedagogic strategies leading to meaningful and productive inclusive science classrooms.
2. Enhance teacher's skills (cognitive, psychomotor and affective) to be creative and innovative to develop STEM projects addressing global problems and in-line with the fourth industrial revolution (IR4.0).
3. Enhance teachers skills in developing values and soft skills of students through integrated STEM and innovative learning.
4. Create mentoring program to develop STEM projects and to execute training using UKM Bitara STEM Science of Smart Communities modules in gearing their teaching and enhancing the learning of their students

## UKM Bitara STEM Initiatives

UKM Bitara STEM program is one of the high-impact programs of Global Science and Innovation Advisory Council (GSIAC) under the agenda of Human Capital Building and of 'Cradle to Career (C2C) initiative. Initially UKM have worked with New York Academy of Sciences (NYAS) and New York Polytechnic School of Engineering (NYU-Poly) to develop STEM-Science of Smart Communities Program.

### Bitara STEM UKM-ExxonMobil Track Records Outreach Programs

1. **STEM Exploration Journey Camp on Sustainable Energy** from May 31<sup>st</sup> to June 4<sup>th</sup> 2015. A total of 142 students from 10 schools in Selangor and 3 engineers / scientists from ExxonMobil were involved.
2. **ExxonMobil-UKM STEM Club** program in December 2016 until March 2017 program involving 500 lower secondary school students from 24 schools in Kuala Lumpur, Kajang, Putrajaya and Pekan, Pahang. The program was conducted in four phases started with opening ceremony and STEM Awareness Program on 21<sup>st</sup> September 2016 until the carnival on 24<sup>th</sup> November 2016.
3. **ExxonMobil-UKM STEM Club@Terengganu** program from 3<sup>rd</sup> to 6<sup>th</sup> September 2017, training 44 teachers from all over Terengganu. The program continued with a pilot program with a total of 480 secondary school students from 8 states in Terengganu from 12<sup>th</sup> to 17<sup>th</sup> November 2017.
4. **ExxonMobil-UKM STEM Club@Terengganu** program from June - October 2018. The program continued with a ToT program with 16 primary school teachers and continued with STEM Mentoring Program for teachers and students' projects for TExMIC competition.

## Rationale

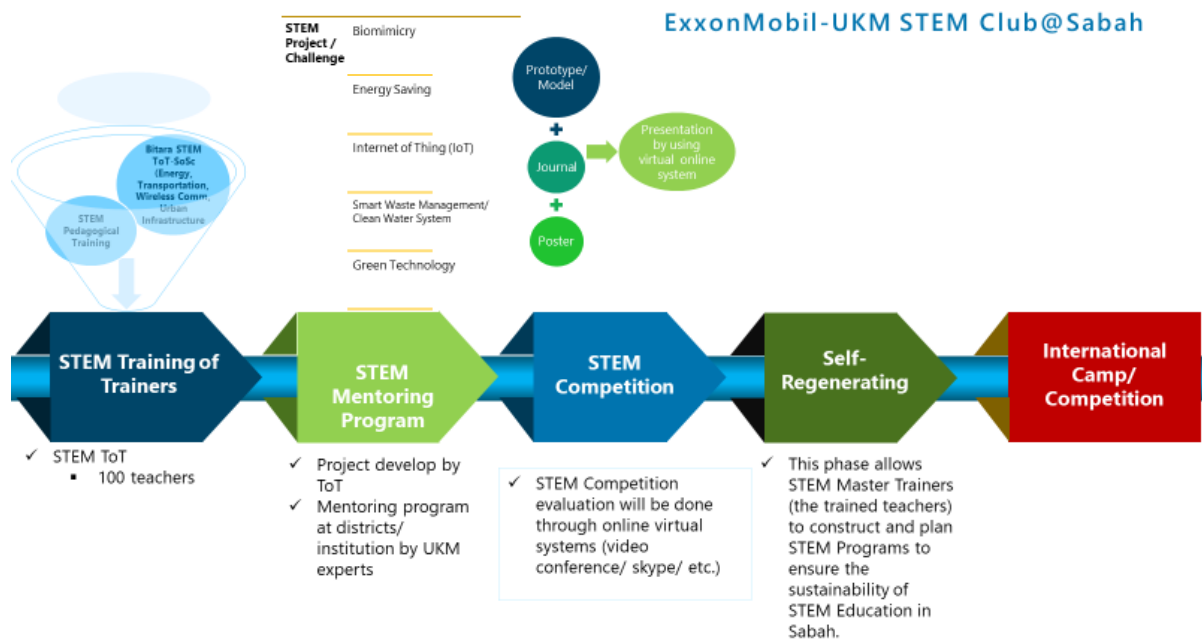
All over the globe, teachers struggle to successfully conclude their classes with meaningful outputs. Policies and curriculum frameworks mention the innovations in a comprehensive manner, but at the same time, there is no mentioning on how to implement the recent advancements in teaching learning, in the real classrooms. There are *N* numbers of experiments in the pedagogy, especially in science teaching. Still there is question do we succeed in better science teaching and exercise of so called new pedagogies?

Lately, the integrated STEM Education seems to be the focus in science curriculum globally. Similarly, the Engineering Design Process for inclusive science classroom is also one

of the significant in the array. A teacher should know the how and why of the methods before implementing the same in his/her studio. Theoretical sketch and practical orientation will surely help the teachers building mastery over the utility of innovative strategies. Assumptions of the innovative methods, principles behind, precautions while using, benefits out of implementation, and various models of such methods like integrated STEM Education, Blended Learning, Cooperative Methods, and Engineering Design Process will be dealt in this course, which would be a great help to science teachers in gearing their teaching and enhancing the learning of their students.

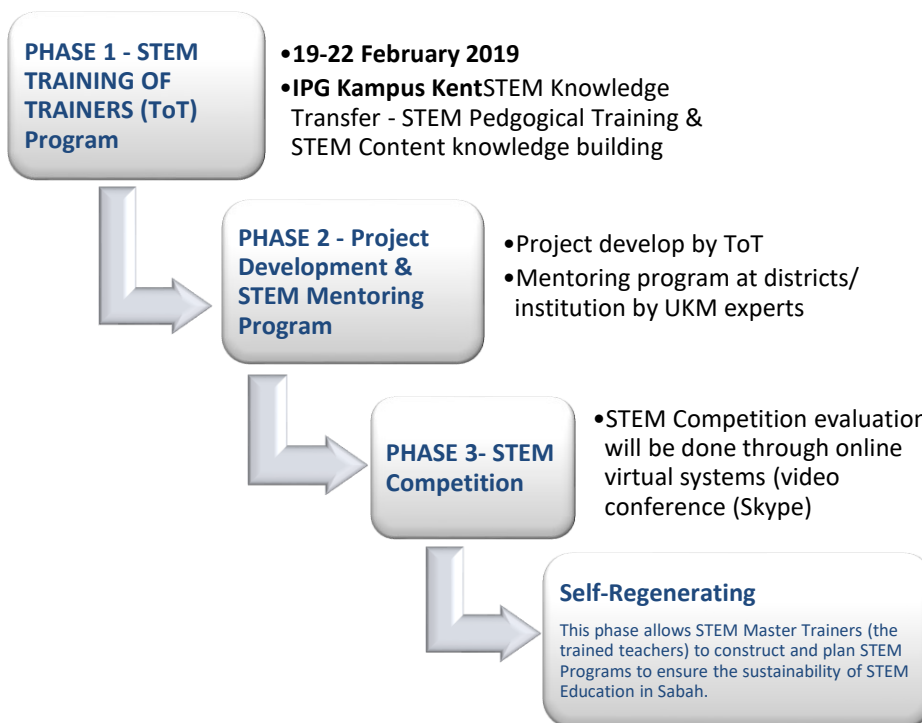
### Program Implementation

The implementation for the program in Sabah are as illustrated below.



### Three (3) phases in STEM Educational Development Program

- Phase 1: Training of Trainers (ToT's)
  - Date from 19-22 February 2019 (Tuesday-Friday)
  - Location: IPG Kampus Kent
- Phase 2: Project Development & STEM Mentoring Program
  - Mentoring Program: 17-21 June 2019
  - Project Development: July – September 2019
  - Saringan: 10 September 2019
- Phase 3: STEM Competition (Online)
  - 17 October 2019



### Phase 1: Training of Trainers (ToT's)

- Date from 19-22 February 2019 (Tuesday-Friday)
- Location: Institut Pendidikan Guru (IPG) Kampus Kent
- 80 teachers from all over Sabah from Jabatan Pendidikan Negeri Sabah (JPNS) and Institut Pendidikan Guru Malaysia (IPGM)
  - 60 teachers from primary and secondary school
  - 20 lecturers form IPG in Sabah ( IPG Kampus Kent, IPG Kampus Gaya, IPG Kampus Tawau)

- Participants Criteria:
  - Science and Mathematics teachers/IPG lecturers
  - Technical subject teachers/IPG lecturers
  - ICT subject teachers/IPG lecturers
  - Age not above 45
  - Balance of gender distribution (50/50 or 60/40)

#### Program Schedules: 1<sup>st</sup> Phase

- a) STEM Pedagogical Training
  - i. National STEM Education Plan & Integrated STEM Concept
    - Associate Professor Ts. Dr. Mohamad Sattar Rasul
  - ii. STEM Inquiry Based Learning
    - Dr. Lay Ah Nam
  - iii. Integration of STEM through Lesson Study and Systems Thinking
    - Dr Zanaton Hj. Iksan
  - iv. STEM Project Oriented Problem Based Learning (PoPBL) in STEM Education
    - Professor Dr. Ruhizan Mohamad Yasin
  - v. STEM Coaching & Mentoring and Entrepreneurial Science Thinking in STEM
    - Professor Dr. Nor Aishah Buang
- b) STEM Content Knowledge Building:
  - i. Bitara STEM Modules (Energy, Urban Infrastructure, Transportation & Wireless Communication)

#### Phase 2: STEM Mentoring Program

- Each ToT participants (teachers/lecturers) developed STEM projects in school/institution involving at least 1 other teachers and 3 students for each project
- Mentoring program was done by UKM experts through face to face program and video conference
- Scope of STEM projects:
  - Energy Saving (*Efficient energy use, sometimes simply called energy efficiency, is the goal to reduce the amount of energy required to provide products and services*)



- Internet of Things (*The Internet of things (IoT) is the network of physical devices, vehicles, home appliances, and other items embedded with electronics, software, sensors, actuators, and connectivity which enables these things to connect, collect and exchange data. IoT involves extending Internet connectivity beyond standard devices, such as desktops, laptops, smartphones and tablets, to any range of traditionally dumb or non-internet-enabled physical devices and everyday objects. Embedded with technology, these devices can communicate and interact over the Internet, and they can be remotely monitored and controlled.*)
- Smart Waste Management (*There are two innovative functions of smart waste management: operational efficiency and waste reduction. Reduce the amount of time and energy required to provide waste management services and reduce the amount of waste created*)
- Clean Water Systems-CWS (*Water purification is the process of removing undesirable chemicals, biological contaminants, suspended solids and gases from water. The goal is to produce water fit for a specific purpose. CWS is the treatment systems for industrial and consumers application*)
- Green Technology (*Green technology, also known as sustainable technology, is one that has a "green" purpose. Green is a reference to nature, of course, but green technology, in general, is one that takes into account the long and short-term impact an invention has on the environment. Green products are environmentally friendly inventions that often involve energy efficiency, recycling, safety and health concerns, renewable resources, and more*)
- Biomimicry (*Biomimicry is an approach to innovation that seeks sustainable solutions to human challenges by emulating nature's time-tested patterns and strategies*)

### **Phase 3: STEM Competition**

- STEM Competition is the evaluation process made from phase 2 projects done by all participants. This evaluation was done through online virtual systems (video conference-Skype)
- Prizes will be given to winners by ExxonMobil in and exclusive platform in 2020.



## Competition Guidelines

### A. INTRODUCTION

The ExxonMobil-UKM STEM Club @ Sabah program is an adaptation program of ExxonMobil-UKM STEM Club conducted in Terengganu in 2017 and 2018. The ultimate goal of this program is to raise students' interest, literacy, soft skill and values through an integrated and new STEM learning approach and curriculum. Training of Trainers program (ToT) program aims to make teachers especially science, mathematics other technical teachers more innovative and creative in delivering Science and Mathematics as well as other technical subjects.

### B. STEM PROJECT GUIDELINES

1. Group size must consist of only 5 participants including those who has attended the Training of Trainers (ToT) program (1 ToT, 1 new recruit teachers and 3 students).
2. All participants in the group must be fully involved in the project development process.
3. Participants will be assign mentor for supervising and consultation from the planning stage until project completed.
4. The suggested STEM projects themes is given in section C, but it is not necessary to follow. Teachers may choose their own theme.
5. This project must include a brief explanation of the project in a Project Book.
6. Project expenses is not covered by the organizer. Teachers may use resources available in the school or used goods. A good STEM project is not based on how big or sophisticated the project is, but how the projects benefits and gives impact to the community and environment as well as impact on the economy and social factor.
7. Selected project will be competing in STEM Project Competition that will be decided by ExxonMobil.
8. Evaluation of the project is based on problems statement where a situation that needs a solution. Integration of STEM elements is necessary and must be clearly stated and explain at every stage of the project development process. Outcome of the projects (solutions) must be based on the impact of the project towards all the aspects and entity involved as stated in the

problem statement. All elements in the model should be functioning not a replica.

## PROJECT THEMES

### 1. Energy Saving:

- Developing monitoring and targeting system which utilizing low energy usage and high efficiency motors or automation
- Power management solutions and continuously optimize efficiency performance
- Efficient energy use or energy efficiency to reduce the amount of energy required to provide products and services

### 2. Internet of Thing (IoT):

- The network of physical devices, vehicles, home appliances, and other items embedded with electronics, software, sensors, actuators, and connectivity which enables these things to connect, collect and exchange data
- Involves extending Internet connectivity beyond standard devices, such as desktops, laptops, smartphones and tablets, to any range of traditionally dumb or non-internet-enabled physical devices and everyday objects.
- Device embedded with technology and can communicate and interact over the Internet, and they can be remotely monitored and controlled

### 3. Smart Waste Management:

- Using innovative functions of smart waste management such as operational efficiency and waste reduction
- The system reduce the amount of time and energy required to provide waste management services and reduce the amount of waste created
- May implement the Internet of Things (IoT) and smart sensors elements to create sanitary technologies

### 4. Clean Water System (CWS):

- Process of water purification to remove undesirable chemicals, biological contaminants, suspended solids and gases from water
- To produce water fit for a specific purpose in community
- CWS treatment systems for industrial and consumers application

### 5. Green Technology/3R:

- Sustainable technology that account the long and short-term impact an invention has on the environment and to mitigate the effects of human activity on the environment
- Green products that are environmentally friendly inventions that often involve energy efficiency, recycling, safety and health concerns, renewable resources, and more
- The development and application of products, equipment and systems used to conserve the natural environment and resources, which minimize and reduces the negative impact of human activities

### 6. Biomimicry:

- Using biological entities and processes as model for designing and developing a project or system
- Using elements of nature to solve complex community problems
- Designing and fabricating of biomimetic robots to mimic certain function to build an energy saving system or project
- An approach to innovation that seeks sustainable solutions to human challenges by emulating nature's time-tested patterns and strategies

## C. STEM PROJECT BOOK

1. Introduction (0.5 – 1 page)
2. Problem Statement (1 – 2 pages)
  - The problem statement implies some question that your research will be answering.
  - When you set up to write a statement problem you should know that you are looking for something wrong... or something that needs close attention.
  - The problem statement should persuasively indicate that major variables/aspects can be measured in some meaningful way.
  - The first step is to write down your problem or the current state. Next, expand on your problem by asking the following inquiry questions:
    - who does it affect / does not affect.
    - what does it effect / does not affect.
    - how does it effect / does not affect.
    - when is it a problem / is not a problem.

where is it a problem / is not a problem.

3. Objectives (0.5 page)
4. Design and Development Process (unlimited)
  - Highlights the integration of STEM elements
    - Conceptual Design
      - State the concept of the project
      - Explain the importance of the project
      - Explain the benefits of the projects
    - State the formulas and calculation involved at every stage and process (Mathematics and Science)
    - Explain the engineering design process
    - Explain the technology involved and the systems used
    - Consideration of the aesthetic value such as ergonomics, green technology and safety of the product
5. Results and Discussion (unlimited)
6. Conclusion (0.5 – 2 pages)
7. References (unlimited)

Notes:

- Pages given is just an indicator. It can be less or more based on the project, and available resources and time that teachers and students have.

## IMPORTANT DATES

No.	Item	Dates
1	Submission of team members and project title (Online submission)	before 31 Mac 2019
2	Online/Virtual Mentoring with UKM mentors (UKM professors) and facilitators (postgraduate student as STEM fellows)	15 <sup>th</sup> April - 30 <sup>th</sup> Mei 2019
3	STEM Project Development Process at school	June –October 2019
4	Face 2 Face mentoring at zone level with UKM experts to supervise/coach on STEM project development	17 <sup>th</sup> – 21 <sup>st</sup> July 2019
6	STEM Report (Online Submission)	1 <sup>st</sup> – 7 <sup>th</sup> September 2019
7	STEM Project Evaluation (Online)	10 September 2019
8	STEM Project Competition	17 <sup>th</sup> October 2019

## Other Collaborations

To coordinate in implementing the program, the collaborators are;

1. Institut Pendidikan Guru Malaysia (IPGM)
2. Jabatan Pelajaran Negeri Sabah (JPNS)
3. Exco Pendidikan Kerajaan Negeri Sabah
4. Pusat STEM Negara

## STEM Program Impact and Sustainable Development

	<i>Program Impact</i>	
<i>Teachers</i>	<i>Enhance Pedagogical Research Experience Enhance Content Knowledge</i>	<i>Enhanced Teachers Technical Skills Generic Skills</i>
<i>School</i>	<i>Transformed Teachers Mindset Sustained Partnership</i>	<i>Improved Academic Achievement Promote Inclusive STEM Curriculum</i>
<i>Higher Institution</i>	<i>Transformed Graduates Program Sustained Partnership</i>	<i>Increase Graduates Employment Larger Institutional Impact Of Graduate Research</i>
<i>Graduate Fellows</i>	<i>Employability Skill Improve Social Context</i>	<i>Enhanced Research Pedagogical Experience</i>

Time Table distributed to all participants in Phase 1 (Training of Trainers) and Phase 2 (Mentoring Program):

**JADUAL BENGKEL - EXXONMOBIL-UKM STEM TRAINING of TRAINERS@SABAH  
19 HINGGA 22 FEBRUARI 2019  
KOTA KINABALU SABAH**

Date	8.30 am	9.30 am	10.00 am - 10.30 am	10.45 am	11.45 am	12.45 pm - 1.45 pm	2.00 pm	4.30 pm	8.00 pm
19 Feb. 2019 (Selasa)	Departure from KLIA to Kota Kinabalu						Team UKM Check-In di Hotel		Program Preparation di IPG Kampus KENT oleh UKM
20 Feb. 2019 (Rabu)	<b>Pogram Briefing</b> PM.Ts. Dr. Mohamad Sattar Rasul	<b>Integrated STEM Conceptions and STEM Inquiry Based Learning</b> PM.Ts. Dr. Mohamad Sattar Rasul / Dr. Lay Ah Nam	M i n u m p a g i	<b>Hands-on activity – Knowledge Building</b> (Energy, Urban Infrastructure, Transportation, Wireless Communication)		M a k a n T g h	<b>Hands-on activity – Knowledge Building</b> (Energy, Urban Infrastructure, Transportation, Wireless Communication)	M i n u m P e t a n g	<b>Hands-on activity – Knowledge Building</b> (Energy, Urban Infrastructure, Transportation, Wireless Communication)
21 Feb. 2019 (Khamis)	<b>Integration of STEM through Lesson Study and Systems Thinking</b> Dr. Zanaton Hj. Iksan / Siti Nur Diyana Mahmud	<b>STEM Project Oriented Problem Based Learning (PoPBL)</b> Prof. Dr. Ruhizan Mohammad Yasin		<b>Hands-on activity – Knowledge Building</b> (Energy, Urban Infrastructure, Transportation, Wireless Communication)			<b>Hands-on activity – Knowledge Building</b> (Energy, Urban Infrastructure, Transportation, Wireless Communication)		<b>Smart City Project Development</b>
22 Feb. 2019 (Jumaat)	<b>STEM Coaching &amp; Mentoring and Entrepreneurial Science Thinking in STEM</b> Prof. Dr. Lilia Halim / Prof. Dr. Nor Aishah Buang	<b>Smart City Project Final Preparation</b>		STEM Project Presentation and Closing					

**JADUAL EXXONMOBIL-UKM STEM CLUB@SABAH MENTORING TRAINING of TRAINERS**  
**17 HINGGA 21 JUN 2019**  
**SABAH**

Date	7.00 am	7.30 am	8.30 am	8.45 am	9.00 am	10.30 am	10.45 am	11.45 am	12.45 pm	2.00 pm	4.30 pm	7.00 pm	9.30 pm
16 Jun 2019 (Ahad)											Flight dari KLIA ke KKIA	Pergerakan ke Hotel GL Kota Marudu (2 jam 30 minit)	Check in Hotel GL Kota Marudu
17 Jun 2019 (Isnin)		Pergerakan ke Bilik Mesyuarat <b>SMK Bengkongan</b> , Kota Belud (30 minit)	<b>Taklimat Mentor</b> PM.Ts. Dr. Mohamad Sattar Rasul	<b>Taklimat Peserta</b> PM.Ts. Dr. Mohamad Sattar Rasul	<b>Sesi Mentoring</b> (Zon: Kota Marudu, Kudat dan Kota Belud; Kumpulan 1)	Minum pagi	<b>Sambungan Sesi Mentoring</b> (Zon: Kota Marudu, Kudat dan Kota Belud; Kumpulan 1)	Makan Tengah Hari	<b>Sambungan Sesi Mentoring</b> (Zon: Kota Marudu, Kudat dan Kota Belud; Kumpulan 1)	<b>Sambungan Sesi Mentoring</b> (Zon: Kota Marudu, Kudat dan Kota Belud; Kumpulan 1)	Pergerakan balik ke Hotel GL Kota Marudu (30 minit)		
18 Jun 2019 (Selasa)	Check out Hotel GL Kota Marudu	Pergerakan ke Bilik Mesyuarat, <b>SMK Bengkongan</b> , Kota Belud (30 minit)			<b>Sesi Mentoring</b> (Zon: Kota Marudu/ Kudat/ Kota Belud; Kumpulan 2)		<b>Sambungan Sesi Mentoring</b> (Zon: Kota Marudu/ Kudat/ Kota Belud; Kumpulan 2)		<b>Sambungan Sesi Mentoring</b> (Zon: Kota Marudu/ Kudat/ Kota Belud; Kumpulan 2)	Pergerakan ke Hotel The Klagan Kota Kinabalu (2 jam 30 minit)	Check in Hotel The Klagan Kota Kinabalu		
19 Jun 2019 (Rabu)	Sarapan	Pergerakan ke Dewan <b>PPD Tuaran</b> (45 minit)			<b>Sesi Mentoring</b> (Zon: Tuaran/ Kota Kinabalu/ Penampang/ Ranau; Kumpulan 1)		<b>Sambungan Sesi Mentoring</b> (Zon: Tuaran/ Kota Kinabalu/ Penampang/ Ranau; Kumpulan 1)		<b>Sambungan Sesi Mentoring</b> (Zon: Tuaran/ Kota Kinabalu/ Penampang/ Ranau; Kumpulan 1)	Pergerakan balik ke Hotel The Klagan Kota Kinabalu (45 minit)			
20 Jun 2019 (Khamis)		Pergerakan ke Dewan <b>PPD Tuaran</b> (45 minit)			<b>Sesi Mentoring</b> (Zon: Tuaran/ Kota Kinabalu/ Penampang/ Ranau; Kumpulan 2)		<b>Sambungan Sesi Mentoring</b> (Zon: Tuaran/ Kota Kinabalu/ Penampang/ Ranau; Kumpulan 2)		<b>Sambungan Sesi Mentoring</b> (Zon: Tuaran/ Kota Kinabalu/ Penampang/ Ranau; Kumpulan 2)	Pergerakan balik ke Hotel The Klagan Kota Kinabalu (45 minit)			
21 Jun 2019 (Jumaat)		Pergerakan ke Bilik Mesyuarat <b>SMKA Limauan</b> (1 jam)			<b>Sesi Mentoring</b> (Zon: Papar/ Beaufort/ Keningau)		<b>Sambungan Sesi Mentoring</b> (Zon: Papar/ Beaufort/ Keningau)		<b>Sambungan Sesi Mentoring</b> (Zon: Papar/ Beaufort/ Keningau)	Pergerakan balik ke Hotel The Klagan Kota Kinabalu (1 jam)			
22 Jun 2019 (Sabtu)							Check out Hotel The Klagan Kota Kinabalu		Pergerakan ke KKIA (15 minit)	Flight KKIA ke KLIA			



## Participants

The participants includes Mentors (lecturers with various research background in STEM Education, Industrial Engineering and Systems, Robotic, Artificial Intelligence, Computer Vision, Mobile Apps, Electrical and Electronic System Engineering), Mentors from UiTM and Politeknik and Kolej Komuniti in Sabah, facilitators from various STEM related faculties in UKM, and teachers and IPG lecturers in Sabah. For mentoring program, a total of 450 participants (180 teachers/lecturers and 270 students from 90 teams) who had attended the Training of Trainers Program involved.

## Participants' Biography Data

Participants	Training of Trainers	Mentoring Program
Mentor (Lecturers)	6	UKM: 5 Sabah: 20
Facillitators	10	2
Tearchers/Lecturers	90	180
Students(Standard 4 - Form 3)	-	270
Total	106	467

## List of Lecturers (Mentor)

No.	Institution	Mentor
1	Universiti Kebangsaan Malaysia	Prof. Madya Ts. Dr. Mohamad Sattar Rasul
2		Ts. Dr. Abdul Hadi Abd Rahman
3		Prof. Madya Dr. Azmin Sham Rambely
4		Dr. Ang Wei Lun
5		Prof. Madya Ir. Dr. Nasharuddin Zainal
6		Dr. Zanaton Hj. Iksan
7		Siti Nur Diyana Mahmud
8		Prof. Dr. Ruhizan Mohammad Yasin
9		Prof. Dr. Nor Aishah Buang
10	Pusat STEM Negara	Dr. Lay Ah Nam
11	Politeknik Kuching Sarawak	Aidawati Mustapha
12	Kolej Komuniti Kota Marudu	Ts. Dr. Robert@Kerk Swee Tian
13		Jackly Muriban
14		Abdul Rahman Abdul Latip
15		Jamrin Jasmin
16	Kolej Komuniti Penampang	Mohd Suhairi Mohd Shariff
17		Jawariyah Abdul Ja'afar
18		Nurmaryam Aida Hashim
19		Norfadzilatul Zaleha Khalid
20		Christoper Asok
21	Politeknik Kota Kinabalu	Wong Wei Ming
22		Noor Azlyn Ab Ghafar
23		Nor Winda Ismail
24		Ninie Farhana Kamarulzaman
25	Uitm Sabah	Mohd Ruzaleh Nurdik

26		Hamjah Rusli
27		Ts. Dr. Alexius Kotom
28		Mohd Faizal Achoi
29		Dr. Ajis Lepit
30	Kolej Komuniti Beaufort	Christoper Asok
31		Felani Stefanzie Choe

### List of Facillitators

No.	Facillitators	Faculty/Institute
1	Fitri Hakeem Mohd Salih	Faculty of Science and Technology
2	Mahathir Harris Eshak	Faculty of Technology and Informational Science
3	Mohd Aizuddin Saari	Faculty of Education
4	Muhamad Rabani Abu Hasan	Faculty of Education
5	Noor Atikah Abdullah	Faculty of Engineering and Built Environment
6	Nur Athirah Abdullah	Solar Energy Research Institute
7	Nur Atiqah Jalaludin	Faculty of Science and Technology
8	Nurin Asyikin Ahmad	Faculty of Education
9	Nurul Nazli Rosli	Solar Energy Research Institute
10	Siti Arina Hureen Azman	Faculty of Technology and Informational Science

### List of Participants (ToT)

NO.	PARTICIPANTS	SCHOOL/INSTITUTION	PPD	UNIT
1	ASRIE BIN ZAINAL	SMK TAUN GUSI	KOTA BELUD	E
2	AZMI BIN NORDIN	SMK TAMBULION	KOTA BELUD	UI
3	JAFFAR AHMAD	SMK ARSHAD	KOTA BELUD	T
4	JINIUS BIN MAINTUM	SK TEMPASUK II	KOTA BELUD	WC
5	RASDIH@MOHD RASDIH BIN JAILUN	SK BANGKAHAK BARU	KOTA BELUD	E
6	SUFIAN BIN ASMARA	SK TAMAU	KOTA BELUD	UI
7	WILFRID BIN DUIN	SMK NARINANG	KOTA BELUD	T
8	JAMALUDIN BIN JAPAR	SK SEMBULAN	KOTA KINABALU	WC
9	JOMILIN SIBIN	SK DARAU	KOTA KINABALU	E
10	LO SU THONG	SM LA SALLE KK	KOTA KINABALU	T
11	MUSTAMIN SAMAD	SMK BANDARAYA	KOTA KINABALU	WC
12	NOOR RAMDHAN BIN RAMLI	SMK LIKAS	KOTA KINABALU	WC
13	VIVIAN LOW YEN YEONG	SMK TAMAN TUN FUAD	KOTA KINABALU	E
14	ROZIAH BINTI RUSDIN	SMK SANZAC	KOTA KINABALU	E
15	ELOISE KAREN MANSANAH	SMK KOTA MARUDU	KOTA MARUDU	UI
16	ERLINDA ORDONO	SMK TANDEK 2	KOTA MARUDU	T
17	LAMIT BIN MADILANG	SK LANGKON	KOTA MARUDU	WC
18	CATHRINE JOHNJIN	SK POPOK	KOTA MARUDU	E
19	IRAWANI MUNIRA BINTI ISMAIL	SK LOK YUK SIKUATI, KUDAT	KUDAT	UI
20	NICHOLAS JINIDU CHUA SIAW CHIANG	SRK ST. PETER, KUDAT	KUDAT	T
21	ROSTAH BINTI JIPLEE	SMK MATUNGGONG	KUDAT	WC
22	ROSLE BIN BASAS	SK ST. JAMES	KUDAT	WC
23	NUR AMALINA BINTI ISMAIL	SMK ABDUL RAHIM KUDAT	KUDAT	UI

24	SYAFIQ HELMI BIN HAMAT	SMKA TUN DATU MUSTAPHA	PAPAR	E
25	BERNADETTE BINSON NANDU	SK PEKAN KINARUT	PAPAR	UI
26	NORAINI MIDIN	SMK MAJAKIR	PAPAR	T
27	FELIX BIN IPIN	SK KAMBIZAN	PAPAR	WC
28	MILEN SUM AH WAI	SK PEKAN BONGAWAN	PAPAR	E
29	MUHAIYANTI SURATMAN	SMK BONGAWAN	PAPAR	UI
30	ROZY REGINA JIMMY	SMK KINARUT	PAPAR	T
31	YONG SOOK VUN	SJKC ST JOSEPH	PAPAR	WC
32	DG MASJAH TALIP	SK PEKAN KIMANIS	PAPAR	T
33	AFIZAH BINTI SULAIMAN	SK ST ALOYSIUS LIMBANAK	PENAMPANG	E
34	DEBBIE MELANIE CLARENCE BOTITI	SM ST MICHAEL	PENAMPANG	UI
35	EVA YVETTE JAMES	SMK LIMBANAK	PENAMPANG	T
36	FRANKIE BIN GIDJU	SK ST JOSEPH PENAMPANG	PENAMPANG	WC
37	SYLLVIA BINTI SAGUNTING	SMK BAHANG	PENAMPANG	E
38	ADRIANYSIA FRANCIS	SMK KUNDASANG	RANAU	UI
39	LEDWINA BINTI IBAR	SK KONBURONGOH	RANAU	T
40	STELLA LADIP	SMK MAT SALLEH RANAU	RANAU	WC
41	SCHOLASTICA LEA LUCIUS	SMK RANAU	RANAU	E
42	STELLA DUMAT	SK LOHAN	RANAU	UI
43	AJIRIN @ ADRIAN ANGKAJI	SMK TUN FUAD STEPHENS KIULU	TUARAN	T
44	ARNETT DONATUS ANTHONY	SK PEKAN TUARAN	TUARAN	WC
45	JUSTINA AUGUSTINE	SMK Tenghilan Tuaran	TUARAN	E
46	MAISIM BINTI SAPINGGAR	SK BUNDUNG	TUARAN	UI
47	MARINUS JOE	SMK BADIN	TUARAN	T
48	ROJIL BIN MONGUNJIM	SK BANTAYAN TAMPARULI	TUARAN	WC
49	RON HADDRICK BIN LOUIS	SMK SUNGAI DAMIT TAMPARULI	TUARAN	E
50	RUGAYAH BINTI ISMAIL	SK TERMUNONG, TUARAN	TUARAN	UI
51	WONG XIN JIAN	SJKC CHUNG HWA TAMPARULI	TUARAN	T
52	JASNIE OMAR	SK TINAMBAR	TUARAN	UI
53	MAYZIELLA PRIMUS KAYAU	SMK GUNSANAD	KENINGAU	WC
54	DG HARTINI BINTI PG ABDUL RAZAK	SK ST FRANCIS XAVIER	KENINGAU	E
55	AWANG ARSAT BIN PANAI	SK KARANGAN	BEAUFORT	UI
56	AZRIH TAIP	SMK BEAUFORT II	BEAUFORT	T
57	MOHD NOH SHAHRI BIN SALLEH	SMK WESTON	BEAUFORT	WC
58	MOHD ROSHIDI SUBNDI	SK BIAH BATU 65	BEAUFORT	E
59	SALLEH BIN SALIP	SK LUPAK	BEAUFORT	UI
60	LAIN KOK CHUNG	SMK MEMBAKUT II	BEAUFORT	T

Unit: E: Energy; UI: Urban Infrastructure; T: Transportation; WC: Wireless Communication

Division	District	Total
Kudat	Kota Marudu	4
	Kudat	5
West Coast	Kota Belud	7
	Kota Kinabalu	7
	Papar	9
	Penampang	5
	Ranau	5
	Tuaran	10
Interior	Keningau	2
	Beaufort	6
Total		60

## Details of Participants of Mentoring Program in 3 Zones in Sabah

EXXONMOBIL-UKM STEM CLUB@SABAH TRAINING OF TRAINERS  
FASA 2  
17 HINGGA 21 JUN 2019

BIL.	ZON	BIL. GURU HADIR ToT (JUMLAH KESELURUHAN)	BIL. PENSYARAH IPG HADIR ToT (JUMLAH KESELURUHAN)	JUMLAH PESERTA	PUSAT PENGANJURAN	TARIKH	PENGINAPAN MENTOR UKM
1	KOTA MARUDU / KUDAT / KOTA BELUD	16 (80)	-	80	BILIK MESYUARAT, SMK BENGKONGAN	17- 18 JUN 2019 (ISNIN-SELASA)	16-18 JUN 2019 HOTEL GL KOTA MARUDU
2	TUARAN / KOTA KINABALU / PENAMPANG / RANAU	27 (135)	22 (110)	245	DEWAN, PPD TUARAN	19 - 20 JUN 2019 (RABU-KHAMIS)	18-22 JUN 2019 THE KLAGAN KOTA KINABALU
3	PAPAR / BEAUFORT / KENINGAU	17 (85)	8 (40)	125	BILIK MESYUARAT, SMKA LIMAUAN KIMANIS	21 JUN 2019 (JUMAAT)	
JUMLAH PESERTA		300	150	450			

\*Jumlah keseluruhan adalah termasuk dua orang guru dan tiga pelajar

## STEM Project Competition

### List of Online Registered Participants

The list below shows the details of ToT Teachers/Lecturers, one additional teacher/lecturer and three students:

No	DISTRICT	SCHOOL	PROJECT NAME	TEACHER I (ToT)	TEACHER II	STUDENT I	STUDENT II	STUDENT III
1	TUARAN	INSTITUT PENDIDIKAN GURU KAMPUS KENT	CATAPULT DAN KOORDINAT	DR. KHOO CHWEE HOON	TAN SEOK KIANG	NUREZAIKA BINTI SAIFUDIN	MOHD FIRDAUS SYAHRULLNIZ AM BIN TUGIMAN	NURUL 'AIN SAHIRA BINTI SHAHIDAN
2	KOTA KINABALU	IPG Kampus Gaya	MULTIPURPOSE ORGANIC FERTILIZRR	LEE CHEE HUAT	HAFIZA SAAD	AZAZ AZANI BIN JUAKIM	CYRIL JAITON@ JAMES	BENN COLLIN LINUS
3	TUARAN	IPG Kampus Kent	Pengasingan Bahan Buangan Menggunakan Robot	NG LEE FONG	BENNY KONG TZE LOONG	HAZIQ BIN ABDUL LATIF	VERGEER VOI ANAK PAUL	KIMBERLY CHIA DEE NA
4	TUARAN	IPG KAMPUS KENT, TUARAN, SABAH	I - C - I - K	DR. ROSNAH@NINI NG BINTI SIDEK	ARUN BIN DAUD	NABILAH SYAFAWATI BINTI SAPARI	MUHD JUMARDI BIN ALIMUDIN	MUHAMMAD TAKBIR IDHAM BIN JEPRE@KIPLI
5	KENINGAU	IPG Kampus Keningau	STEM : Traditions Games	Dr. Jeromie jolly	Vurisiah Dadong	Ervinna Jamili@Jamali	Rylyana Eva Raymon	Richard Pilus
6	TUARAN	IPG Kampus Tuaran	Dual System Water Storage	Awang Nazrul Bin Ag Masri	Norhafizah Zakaria	Ahmad Afiq Bin Ahmad Nazri	Nur Afiqah Binti Mat Asri	Siti Norraihan Jislum
7	TUARAN	SMK BADIN TUARAN	The Intelligent Village	MAARINUS JOE PETER	SALEHA KULING	FREANDY FRANCIS	IZZUL ISLAM BIN JUNAIDIH	NUREJJA SALIMAH BINTI ABDULLAH
8	KUDAT	SK LOK YUK SIKUATI, KUDAT	STEM MARVEL	IRAWANI MUNIRA BINTI ISMAIL	ABDULLAH FAJARANI BIN MASDUKI	ANIS ADLINA BINTI ABDUL HAMIT	JOVIE ANN BINTI JOHN	IRA RIHANNA SAPUTRI BINTI ABDULLAH FAJARANI

No	DISTRICT	SCHOOL	PROJECT NAME	TEACHER I (ToT)	TEACHER II	STUDENT I	STUDENT II	STUDENT III
9	BEAUFORT	SK KARANGAN	SMART TAGAL	Awang Arsat Panai	Eronce Mustafa	Siti Syafina Zainal	Muhammad Fardi Hamda Saibi	Muhamad Fikri Aimansyah Hamdin
10	BEAUFORT	SK. LUPAK	CLEAN WATER SYSTEM ( CWS )	SALLEH BIN SALIP	MOHD.FADZIL BIN MOHD.NOH	NURFADHILLAH BINTI SALLEH	MOHD.AKMAL SAUFI BIN HAKMAN	AMNAH NUHA BINTI SULIN
11	KUDAT	Smk matunggong	Ultra-water	Rosnah binti jiplee	Botthe toimin	Max raynold sapaun	Einstien masinor	Joice ekklesia selvister
12	KOTA MARUDU	SMK KOTA MARUDU	GREEN TECHNOLOGY/ 3R	ELOISE KAREN MANSANAH	ETHELYN SINGAN	ALESTER ALDRON ALOYSIUS	RIESHAM PHILIS	HATTRICK RAJIUS
13	KOTA MARUDU	SMK TANDEK 2	Clean Water System	ERLINDA ORDONO	SABINUS MARCUS	NURSAHIRA HAZLINDA BINTI KAMRIN	MOHD SYAH FIZAN BIN ZAINAL	MAKLAN USUD
14	KOTA KINABALU	INSTITUT PENDIDIKAN GURU KAMPUS GAYA KOTA KINABALU	CELIK USAHAWAN JUNIOR (CUJ)	DR CHAI CHIN PHENG	SEFIAH AB KAHAR	FATHIA AISYAH BT MOHMAD HAIZAL	AMARIS DI' LAILA BT LEN	NUR SAKINAH BT ISHAK SIBANI
15	KENINGAU	IPG Kampus Keningau	STEM in Art	Donatus Justin	Thadius Gugau	Rayner Jafarin	Mohd Az Dynn bin Justin @ Masidin	Danial Haziq bin Abdullah
16	KOTA BELUD	Sekolah Menengah Kebangsaan Arshad	Green Technology	JAFFAR AHMAD	JOBLE MINSIN	Nurul Farissa Azureen Jufri	Harith Haiffie Hairani	Muhammad Haqeeem Alimmuddin Roslan
17	BEAUFORT	SMK Beaufort 3	Green Technology / 3R	Azrih bin Taip	Jamadil bin Abd. Razak	Siti Aqma binti Rahman	Mohd. Shahrin bin Jamil	Illya Normaisarah binti Ramlee
18	KUDAT	SK St. James (M), Kudat	?	ROSLE BIN BASAS	NURAIN NAUQIAN BINTI RUSLAN	MOHD. HASBUL WAFY	ESTHER SYLVESTER	DARREN

No	DISTRICT	SCHOOL	PROJECT NAME	TEACHER I (ToT)	TEACHER II	STUDENT I	STUDENT II	STUDENT III
19	TUARAN	SMK TUN FUAD STEPHENS KIULU	My Dream Home Town	AJIRIN @ ADRIAN ANGKAJI		CLARISSA CHRISTOPHER	WAWA WALDON ANLYWALDON	IVY CLAYSIE ARGININ
20	PENAMPANG	SMK BAHANG	GREEN TECHNOLOGY - BOKASHI	Syllvia Binti Sagunting	Annah Missun	OLIVIA OCTANIA HOILI	HALLEY ADRIA	FIORESCA FERANCIS
21	TUARAN	IPG Kampus Tawau	Smart Lamp	Naima Binti Kadir	Mahmud Bin Ahmad	Fatin Najwa binti Mohamad Shadon	Adrian Pedro	Nur Darina binti Mohd Noor
22	KOTA KINABALU	INSTITUT PENDIDIKAN GURU KAMPUS GAYA	Gimik Pelancaran	HENRY GOH	SHUKIMAN SUKARDI	AINA INSYIRAH BINTI ABD RASHID	MOHD DANIAL AIMAN BIN MOHD YATIM	CHRISTEL FERLY ANAK ACHONG
23	TUARAN	IPG KAMPUS KENT TUARAN	Gamifikasi e-PemMu	SANTANA RAJAN A/L PERUMALE	HARUN HJ SARAIL	NURUL 'AIN SAHIRA BT SHAHIDAN	ALBERT TING KAH MAU	SITI NUR HANIM BT SAHIDI
24	KENINGAU	SMK GUNSANAD	SMART GREEN HOME	MAYZIELLA PRIMUS KAYAU	VENADITA EXTACIA VENANTIUS	STEVE ALLISTAIR TAGUAH	CLAUDIA ANNABELLA WELFREAD	NUR AQILAH BT MD ZAINI
25	KENINGAU	SK ST FRANCIS XAVIER KENINGAU	THERMAL POWER	DG HARTINI BINTI PG ABDUL RAZAK	AZIZAN BIN AWANG HASHIM	JESS VALENTINE	JOSHUA IVAN JENIUS	DAVID ETHAN
26	KOTA KINABALU	Sk. Darau Kota Kinabalu Sabah	ExxonMobil stem projek	JOMILIN BINTI SIBIN	ROSIE LIEW	SOPHIE MYNA WALTER	FATIN NASUHA FAIRUL NIZAM	CHELSEA SELVA
27	PAPAR	SMK Kinarut	Green Technology	Rozy Regina Jimmy	Ling Hui Hsai	Bernice Anastacia Benny	Benilda Joyce	Mohamad Fakhri bin Kamaruddin
28	PAPAR	SK. PEKAN KINARUT, PAPAR.	Inovasi kepentingan tenaga suria Dan tenaga elektrik dalam kehidupan manusia	BERNADETTE BINSON NANDU	AHMAD ABU BAKAR	BRIELLE	ILMIYAH	MOHD. ADIB



No	DISTRICT	SCHOOL	PROJECT NAME	TEACHER I (ToT)	TEACHER II	STUDENT I	STUDENT II	STUDENT III
29	RANAU	SMK MAT SALLEH	AUTOMATIC RECYCLE BIN	STELLA LADIP	RINA SINUN	VINCE VERRO LAURENTIUS	ESLLY JOHN	JINIVY HIZUANTY JASNI
30	KOTA MARUDU	SK Popok	STIKCON 21	Cathrine Johnjin	Foloradisy Liaron	Jeanley Jurimon	Mohd Isma Haril	Viviana Edora Jeffry
31	TUARAN	IPG KAMPUS KENT	UNDER PRESSURE 2.0	FITRI SHAHWALIAH BINTI SU'UT	DR MOHD SAWARI BIN RAHIM	MUHAMMAD AMIR FARUQ BIN MAT KAMIL	KHAIRIL ASYRAF BIN JAMAT	MUHAMAD SAIFUL BIN SAHRUDIN
32	TUARAN	IPGK KENT	Smart Kitchen	LOW KEE SUN	TEH AH HUAT	Najmuddin Rifaie bin Ahmad Shubkip	Mark Lee	Muhammad Azrul Amin bin Abdul Rasid
33	KUDAT	SMK ABDUL RAHIM KUDAT	ECO- COOLER	NUR AMALINA BINTI ISMAIL	VIVIANA VELENTHIA MICHEAL	NOR AZWAN BIN HILMAN	MUHAMMAD NICK FAIRUL SHAM BIN DARIUS	MOHAMMED SHAHIDIN BIN MAT RUDIN
34	KOTA KINABALU	IPG Kampus Gaya, Kota Kinabalu	Lubawi City	Carole Anne Justin	Dr. Zakiah Noordin	Nurfarahin binti Abd Wahid	Nur 'Alia Syafiqah binti Mas'ad	Nurul Hanis binti Samso Anuar
35	KOTA MARUDU	sk ranau kota marudu	Program STEM Exxonmobile UKM STEM Club@Sabah 2019-Training of Trainer	lamit bin madilang				
36	RANAU	SMK RANAU	BIOPLASTIC	SCHOLASTICA LEA LUCIUS	SAZALIAH ARIFFIN	ADI MAHATHIR BIN MAHADI	ALIF ASYRAFI ABRAHAM	JEREMY JORDAN MACKLAYTON
37	RANAU	SMK KUNDASANG, RANAU	ICYBREEZE PORTABLE AIR CONDITIONER	ADRIANYSIA FRANCIS	JAPLEE BAKOK	FUTRIE IRIANA MOHD ZAINEH	MAXMILLION MEILLINIUM MAJUNTIN	ZHARFANHAL IFI BIN AB.GHAFAR
38	BEAUFORT	SMK MEMBAKUT II	Smart waste management	LAIN KOK CHUNG	GERALD VENIANTUS	MUHAMMAD MIFDHZAL ADHLI BIN MAHMUD	RIEZA' AJMAR FAHMIZIE BIN ROSLEY	MOHD. IQMAL ALIF BIN ILHAM

No	DISTRICT	SCHOOL	PROJECT NAME	TEACHER I (ToT)	TEACHER II	STUDENT I	STUDENT II	STUDENT III
39	KOTA KINABALU	SMK TAMAN TUN FUAD	SMART ECO BIN	VIVIAN LOW YEN YEONG	JIMRU BIN SANGIN	JOSHUA BENEDICT LANGKAB	JOHN JUSTINE LANGKAB	DAVID LAU EE RONG
40	KOTA BELUD	SMK TAUN GUSI KOTA BELUD	Green Technology Recycle	ASRIE ZAINAL	ZULHAIRIE BIN BOLOH	NUR FARAHIN BINTI ROSLAN	SITI ZAHARAH BINTI ZAINUDIN	MOHD HAIMAN AQASHAH BIN DAHLAN
41	PENAMPANG	SM ST MICHAEL PENAMPANG	Green technology	Debbie Melanie Clarence Botiti	Clare Aloysius Sitiol	Carvella Chloe James Mojuntin	Mohd. Adam Firdaus Abdullah	Alif Afandi bin Marzuki
42	KOTA BELUD	Smk Narinang	Fast Digger (Osiau Pomoluang)	Willfrid Duin	Pollenah Sualin	Mc Mandy Jasmin	Claire Avryl Japit	Evora Nicollyca Anak Colin
43	KOTA BELUD	SK. BANGKAHAK BARU	Aroma Box	RASDIH@MOHD RASDIH BIN JAILUN	DALINA SIMON	BRENDA IVY HUSSIN	STECY SOIMOL	ALTHER GILLCHRIST OBIT
44	KOTA KINABALU	Smk sanzac	Exxonmobile	RoZIAH Rusdin	Natasya Lau	Nurul Ellyssa A/K Dauglas	Nuralya Amani Binti Nadzri	Adriana Batrisha Bt Mohd Maseri
45	KOTA BELUD	Smk likas	SMART SCHOOL TOILET	Noor Ramdhan bin Ramli	Noralizah binti Ahmad	Nurafiqah	Putri Nurrahmadina	Siti Azrina
46	KOTA KINABALU	SK Darau Kota Kinabalu	Green Exo-Friendly Bio Fertilizer	Jomilin Sibin	Rosie Liew	Sophie Myna Walter	Chelsea Selvie Charles	Fatin Nasuha Fairul Nizam
47	KOTA KINABALU	SMK TMN TUN FUAD PNMPG	ecobin	mdm vivian	cgu jimru	john justin	joshua benedict (I)	david lau
48	KOTA KINABALU	SM LA SALLE KOTA KINABALU	Smart Fan	LO SU THONG	LILY LEE	Mohammad Nashrul Bin Mohd Najib	Muhammad Rayyan Adam	Mohammad Nadzhim Shah
49	KOTA KINABALU	SK SEMBULAN	Smart pocket garden	Jamaludin Japar	Franjie Abd. Rahman	Mohd Rosyiduddin bin rosde	Muhammad Adam Danial Fung bin Nazaruddin	Rosyiqah Safira Binti Rosde

No	DISTRICT	SCHOOL	PROJECT NAME	TEACHER I (ToT)	TEACHER II	STUDENT I	STUDENT II	STUDENT III
50	PENAMPANG	SK ST. JOSEPH, PENAMPANG	ECO-FRIENDY INSECT TRAP ABSORBENT	FRANKIE GIDJU	DIANA HERO	MEGAN JASMINE BINGKASAN	CHARLIZE HOPE ENSINGAN GARAI	JANESSA JOHNSTON AYONG
51	KOTA KINABALU	IPGK Kent	Petak jam Ajaib (PJA)	En. Teh Ah Huat	Dr. Chiam Sun May	Pn. Low Kee Sun	En. Haslan bin Manja	En. Tan Cho Chiew
52	KOTA KINABALU	Institut pendidikan guru kampus Gaya	Stem ExxonMobil stem club Sabah 2019	Lecture		1		
53	TUARAN	Ipg Kampus Kent	Fiber Board	Adeline Leong Suk Yee	Maspi Peran	Wan Amirul Amin b. Wan Hussin	Ainin Sofiya binti Mohd Hadi	Nur Hannani binti Mukhtar
54	RANAU	SK. Lohan	Tong Sampah "KAKUS" (Kempen Anti Kutu Sampah)	Stella Dumat	Edawati Syamsul	Rachel Noorsin	Ellesandra Liaw Shan Ni	Mohd Syamdie Bin Hamdi
55	RANAU	SK KEMBURONG OH	MESIN PENGASING SAMPAH (KITAR SEMULA)	LEDWINA BINTI IBAR	ELVIRA@VERA KASIMAN@SIM ON	ADDREANZ SHAH RYNO JASON	AFI AFREANZ RYNO JASON	DEWI ALYANIE ISMAN
56	BEAUFORT	SMK WESTON	Green technology	Mohd Noh Sahri Bin Salleh	Ibrahim Ag Besar	Muhammad Izzat Izwan Bin Mohd Yassin	Aselah Sahirah Binti Sari	Mayuni Binti Malik
57	PAPAR	SJKC ST JOSEPH PAPAR	Camouflage Palette	Yong Sook Vun	Czelum Wong	William Siaw Yi Jie	Jacqueline Chong Xin Lei	Terence Amandus
58	PAPAR	SMK Agama Tun Datu Mustapha	Class Reminder	SYAFIQ HELMI BIN HAMAT	NURHASDIANT Y BINTI HASLY	RUSYAIIDI BIN TONI	MUHAMMAD DANIAL HAIKAL BIN ARFIAN	AWANGKU AIDIL HADIF BIN AWANG ABDUL GHANI

## List of Submitted Participation

Table below show the results of each submitted participation. Teams ranked from 1 to 10 were selected to the final.

No.	School	Teacher I (ToT)	Project	Report		Average	Video/Project		Average	Total
				M1	M2		M1	M2		
1	SK ST FRANCIS XAVIER KENINGAU	DG HARTINI BINTI PG ABDUL RAZAK	THERMOELECTRIC GENERATOR	93	79	86	59	59	59	145
2	SM ST MICHAEL PENAMPANG	Debbie Melanie Clarence Botiti	ECO-TOUALETA	94	82	88	62	50	56	144
3	Sekolah Menengah Kebangsaan Arshad	JAFFAR AHMAD	FREE ENERGY WIND TURBINE	75	93	84	50	62	56	140
4	SMK MAT SALLEH	STELLA LADIP	Tong Sampah 'Good Bin'	90	56	73	64	40	52	125
5	SMK GUNSANAD	MAYZIELLA PRIMUS KAYAU	Smart Compost System	78	67	72.5	57	43	50	122.5
6	IPG KAMPUS GAYA	HENRY GOH	SMART ELUTRIATER	56	72	64	54	57	55.5	119.5
7	Smk likas	Noor Ramdhan bin Ramli	SMART SCHOOL TOILET	91	49	70	57	40	48.5	118.5
8	SMK TUN FUAD STEPHENS KIULU	AJIRIN @ ADRIAN ANGKAJI	Pemantauan Pelajar Ponteng Sekolah Dengan Menggunakan Teknik Smart Card RFID (Radio Frequency Identification) Arduino Code	75	71	73	45	42	43.5	116.5
9	SK Popok	Cathrine Johnjin	STICKON 21	68	62	65	46	51	48.5	113.5
10	IPG KAMPUS KENT, TUARAN, SABAH	DR. ROSTNAH@NINI NG BINTI SIDEK	I-C-I-K	67	70	68.5	41	44	42.5	111
11	SMK TAMAN TUN FUAD	VIVIAN LOW YEN YEONG	SMART ECO BIN	51	84	67.5	40	46	43	110.5
12	SMK KOTA MARUDU	ELOISE KAREN MANSANAH	TONG SAMPAH PINTAR	68	51	59.5	58	42	50	109.5
13	Ipg Kampus Kent	Adeline Leong Suk Yee	SEGAK: TEKAN TUBI	59	71	65	43	44	43.5	108.5
14	SK. LUPAK	SALLEH BIN SALIP	PROJEK INOVASI PENAPIS AIR HUJAN ( PIPAH )	80	49	64.5	52	25	38.5	103

No.	School	Teacher I (ToT)	Project	Report		Average	Video/Project		Average	Total
				M1	M2		M1	M2		
15	SMK BAHANG	Syllvia Binti Sagunting	PEREPUTAN SISA TUMBUHAN DAN MAKANAN YANG LEBIH BERKESAN MENGGUNAKAN BOKASHI PLUS BERBANDING BOKASHI	66	57	61.5	42	36	39	100.5
16	IPG Kampus Tuaran	Awang Nazrul Bin Ag Masri	DUAL FUNCTION WATER SUPPLY SYSTEM	62	69	65.5	28	26	27	92.5
17	SMK KUNDASANG, RANAU	ADRIANYSIA FRANCIS	ICY ENCAPSULATED PORTABLE AIR COOLER	45	63	54	34	43	38.5	92.5
18	SMK BEAUFORT III		SMART TRASH CAR	47	50	48.5	42	38	40	88.5
19	IPG Kampus Tawau	Naima Binti Kadir	SMART LAMP	58	50	54	38	30	34	88
20	SMK MAJAKIR		BEKAS BAWANG AUTOMATIK	55	43	49	41	36	38.5	87.5
21	SMK BADIN TUARAN	MAARINUS JOE PETER	LACTO CLEANER	65	44	54.5	38	27	32.5	87
22	IPG KENT	LOW KEE SUN	SMART TRASH BASKET BASE	55	57	56	21	24	22.5	78.5
23	SMK TANDEK 2	Erlinda Ordone	GO GREEN MUD BALL”	65	41	53	28	20	24	77
24	IPG Kampus Kent	NG LEE FONG	Pengasingan Bahan Buangan Menggunakan Robot	33	55	44	25	34	29.5	73.5
25	SMK MATUNGONG	ROSNAH BINTI JIPLEE	Mini Air Cooler	44	32	38	34	28	31	69
26	SMK TAUN GUSI KOTA BELUD	ASRIE ZAINAL		45	24	34.5	33	15	24	58.5
27	IPG KENINGAU	DR. JEROMIE	WATERING GELEN	34	23	28.5	22	14	18	46.5
28	SM LA SALLE KOTA KINABALU	LO SU THONG	MOTION SENSOR CLASSROOM	30	29	29.5	15	15	15	44.5

Marks	Award	Total of Teams Awarded
>100	Gold	15
50-100	Silver	11
<50	Bronze	2

## Result of Final Competition

Table below show the results of Final Competition for the selected 10 groups. The list follows ranking according to the final result.

NO.	INSTITUTION	PARTICIPANTS	PROJECT NAME
1	<b>SK ST FRANCIS XAVIER KENINGAU</b>	1. PN. DG HARTINI BINTI PG ABDUL RAZAK 2. EN. AZIZAN BIN AG HASHIM 3. MUAIMAN 4. ALYA AZALEA 5. ARISSA DELISHA	THERMOELECTRIC GENERATOR
2	<b>IPG KAMPUS KENT</b>	1. DR. ROSNAH@NINING BINTI SIDEK 2. ARUN BIN DAUD 3. NABILAH SYAFAWATI BINTI SAPARI 4. MUHD JUMARDI BIN ALIMUDIN 5. MUHAMMAD TAKBIR IDHAM BIN JEPRE@KIPLI	I-C-I-K
3	<b>SMK ARSHAD</b>	1. JAFFAR AHMAD 2. JOBLE MINSIN 3. IAN GLENN LRM FLORENCE 4. ALEXANDRO CHANSON BRUCE 5. TREVOR MOOSEN LIM	FREE ENERGY WIND TURBINE
4	<b>SK POPOK</b>	1. CATHRINE JOHNJIN 2. FOLORADISY LIARON 3. JEANLEY JURIMON 4. MOHD ISMA HARIL 5. VIVIANA EDORA JEFFRY	STICKON 21
5	<b>SMK MAT SALLEH</b>	1. STELLA LADIP 2. RINA SINUN 3. VINCE VERRA LAURENTIUS 4. JINIVY HIZUANTY JASNI 5. ESLY JOHN	Tong Sampah 'Good Bin'
6	<b>SMK GUNSANAD</b>	1. MAYZIELLA PRIMUS KAYAU 2. VENADITA EXTACIA VENANTIUS 3. STEVE ALLISTAIR TAGUAH 4. NURAQILAH MD ZAINI 5. CLAUDIA ANNABELLA WELFREAD	Smart Compost System

NO.	INSTITUTION	PARTICIPANTS	PROJECT NAME
7	<b>SM ST MICHAEL PENAMPANG</b>	1. DEBBIE MELANIE CLARENCE BOTITI 2. CLARE SITIOL 3. ALIF AFANDI BIN MARZUKI 4. CARVELLA CHLOE JAMES MOJUNTIN 5. MOHAMAD ADAM FIRDAUS ABDULLAH	ECO-TOUALETA
8	<b>SMK LIKAS</b>	1. NOOR RAMDHAN BIN RAMLI 2. NORALIZAH BINTI AHMAD 3. NURAFIQAH BINTI BASIR 4. PUTRI NURRAHMADINA BINTI ABDIN 5. SITI AZRINA BINTI ARNIZAL	SMART SCHOOL TOILET
9	<b>IPG KAMPUS GAYA</b>	1. HENRY GOH 2. SHUKIMAN SUKARDI 3. CHRISTEL FERLY ANAK ACHONG 4. MOHD DANIAL AIMAN BIN MOHD YATIM 5. AINA INSYIRAH BINTI ABD RASHID	SMART ELUTRIATER
10	<b>SMK TUN FUAD STEPHENS KIULU</b>	1. AJIRIN @ ADRIAN ANGKAJI 2. ROBERT SOLUMBI 3. IVY CLAYSIE ARGININ 4. CLARISSA CHRISTOPHER 5. WAWA WALDON	Pemantauan Pelajar Ponteng Sekolah Dengan Menggunakan Teknik Smart Card RFID (Radio Frequency Identification) Arduino Code



