

UNIVERSITI
KEBANGSAAN
MALAYSIA
*The National University
of Malaysia*

**BITARA
STEM**
Universiti Kebangsaan Malaysia



PROGRAM REPORT

EXXONMOBIL-UKM STEM CLUB@TERENGGANU 2019
(Science, Technology, Engineering and Mathematics)

STEM TRAINING OF TRAINERS
STEM ENHANCEMENT PROGRAM

20 FEBRUARY - 17 OCTOBER 2019

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Introduction

The ExxonMobil-UKM STEM Club program 2019 is a continuation program from a program conducted in 2017 and 2018 with 64 secondary and 16 primary school teachers in Terengganu. The STEM Enhancement Program 2019 involved 100 participants, the trained participants (STEM Master Trainer) and 20 Institut Pendidikan Guru (IPG) lecturer. This program is an initiative to raise students' interest through new learning approach and to build students' awareness, interest and literacy of Science, Technology, Engineering and Mathematics (STEM). By increasing students' awareness, interest and literacy through STEM integration approach it make students become more innovative, creative and competitive. This program prepares teachers and students to develop Science Project for TExMIC in October.

Our collaboration with ExxonMobil has come to the fifth year and ExxonMobil still continues to play an important role in the development of national education in Malaysia and committed in STEM education.

Programs Objectives

The objectives this program are:

1. To enhance STEM Master Trainers on various practical aspects of innovative pedagogic strategies leading to meaningful and productive inclusive science classrooms.
2. To enhance STEM Master Trainers programming and digital technologies skills in line with the fourth industrial revolution.
3. To equip the teachers with the relevant learning, so that they can not only confidently integrate coding with the other STEM subject matter in projects, but also can make an immediate impact in their classrooms with coding concepts to develop STEM projects addressing global problems.

The trained STEM Master Trainers skills were developed and they were able to apply the knowledge into Science Projects which was mentored by UKM experts and finally showcased the project in TExMIC 2019.

UKM Bitara STEM Initiatives with ExxonMobil

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 31st to June 4th 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 21st September 2016 until the carnival on 24th November 2016.
3. **ExxonMobil-UKM STEM Club@Terengganu** program from 3rd to 6th September 2017, training 64 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 12th to 17th 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.
5. **ExxonMobil-UKM STEM Club@Sabah** program from 20 – 22 February 2019. The program starts with a ToT program with 62 secondary and primary school teachers and continued with STEM Mentoring Program and competition.

Rationale

Results from 2018 Program in Terengganu

Knowledge

Analysis below shows that participants' knowledge regardless of their gender is still in moderate level and needs improvement.

Knowledge of program participants by gender

Aspect	Gender	Mean score	Standard Deviation	Level
Module content knowledge	Male	3.560	0.583	Moderate
	Female	3.677	0.499	Moderate
Teaching through STEM integration knowledge	Male	3.835	0.369	Moderate
	Female	3.971	0.329	Moderate
Knowledge	Male	3.698	0.460	Moderate
	Female	3.824	0.379	Moderate

Mean score interpretation (Roslinda 2007)

1.00-1.99 (weak)

2.00-2.99 (low)

3.00-3.99 (moderate)

4.00-5.00 (high)

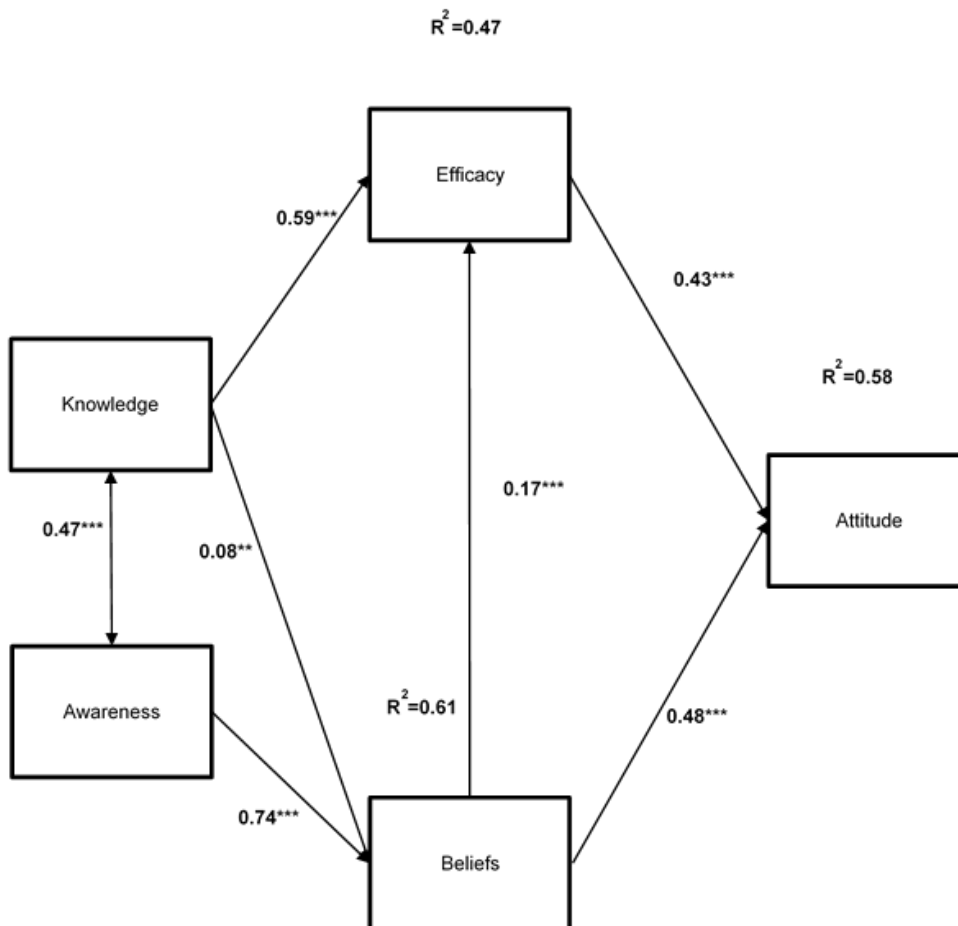
Relationship Between Study Variables

Based on the table below, the study found that there was a low but significant correlation between belief and knowledge towards STEM education integration ($r = 0.383$). **This finding shows that beliefs towards STEM integration increases with increasing knowledge.** The findings also found that there was a strong and significant relationship between self-efficacy and knowledge ($r = 0.620$) and moderate and significant correlation with beliefs towards STEM integration ($r = 0.419$). **The result shows that self-efficacy of teachers increases with increasing knowledge. In addition, when self-efficacy increases, the teacher's beliefs in STEM integration is also increased.** For attitude variables, there is a simple and significant correlation with knowledge ($r = 0.447$) and teacher efficacy towards PdP of STEM integration ($r = 0.536$). Meanwhile, beliefs variable shows a strong and significant relationship ($r = 0.604$) with teachers' attitude towards STEM integration. **This finding suggests that, when the knowledge, beliefs and efficacy of teachers towards STEM integration increases, teachers will demonstrate positive attitudes toward STEM education integration.**

Relationship between knowledge, beliefs, attitude and self-efficacy of teachers towards teaching and learning STEM education integration

	Knowledge towards STEM education	Beliefs towards STEM education	Self-efficacy towards STEM education	Attitude towards STEM education
Knowledge towards STEM education	-	0.383**	0.620**	0.447**
Beliefs towards STEM education	-	-	0.419**	0.604**
Self-efficacy towards STEM education	-	-	-	0.536**
Attitude towards STEM education	-	-	-	-

**p<0.01



In conclusion, findings from the model on teachers' attitude toward STEM integration indicate that the teachers' attitude depends on their beliefs and self-efficacy towards the teaching of STEM integration.

Program Implementation

The program introduced more UKMSTEM Project in Terengganu, under ExxonMobil-UKM STEM Club Program this year. Program implementation in Terengganu for 2019 are as follows:

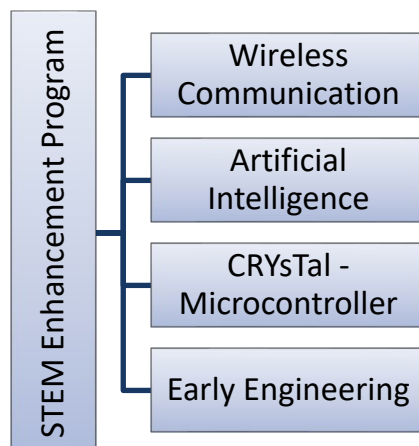
Three (3) phases in STEM Educational Development Program:

- **Phase 1: ToT's STEM Enhancement Courses**

To enhance existing STEM Master Trainers (64 secondary and 16 primary school teachers from 8 districts; 20 Institut Pendidikan Guru (IPG) Lecturers)) to develop coding, programming and digital technologies skills in line with the fourth industrial revolution.

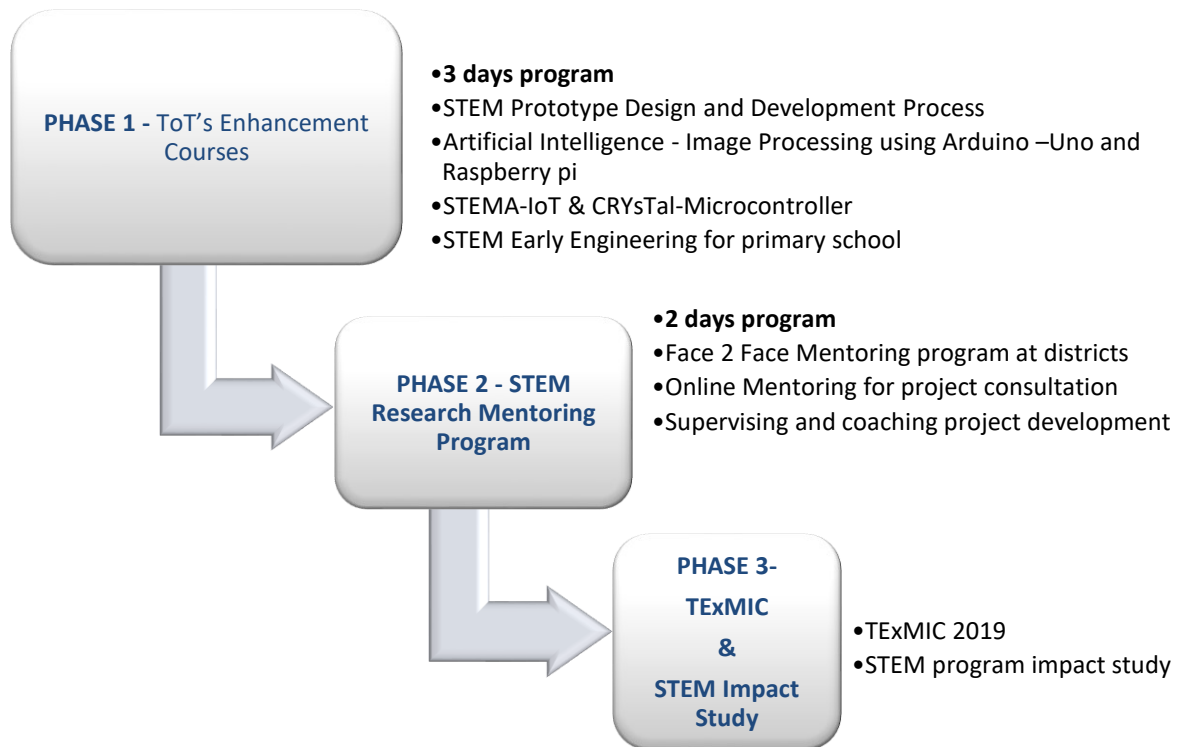
- 2 to 4 July 2019
- The Modules and Experts

No.	Module	Experts	Faculty	Specialization
1.	STEM Prototype Design and Development Process	Associate Professor Ts. Dr. Mohamad Sattar Rasul	Faculty of Education	Industrial Engineering and SySTEMs
2.	Artificial Intelligence - Image Processing using Arduino –Uno and Raspberry pi	Ts. Dr. Hadi Abd Rahman	Faculty of Information Science & Technology	Robotic, Artificial Intelligence, Computer Vision, Mobile Apps
3.	CRYsTal-Microcontroller	Prof. Madya Dr. Ir. Nasharuddin Zainal	Faculty of Engineering and Built Environment	Electrical and Electronic SySTEM Engineering
4.	STEM Early Engineering for primary school	Dr. Roseamnah Abdul Rauf	Faculty of Education, University Malaya	STEM education and STEMBuild



- **Phase 2: Project Development & STEM Mentoring Program**
 - 9 & 10 October 2019

- **Phase 3: TExMIC - STEM Competition**
 - 22 October 2019



Participants:

1st Phase – 150 participants

- 100 participants for Enhancement Program
 - 64 previous teachers (STEM Master Trainers) from 8 districts
 - 16 primary school teachers (STEM Master Trainers) from 8 districts
 - 20 IPG Lecturers in Terengganu
- 20 participants for STEM Sustainable Development/STEM Leadership Program/Data Analytic
 - 4 JPN Terengganu Officers
 - 16 Pegawai Pendidikan Daerah (PPD)
- 30 UKM Experts
 - 24 STEM UKM Program and Bitara STEM Facilitators
 - 6 UKM Lecturers/Professors

2nd Phase – 180 participants (30 Teachers + 120 students + 30 New Teachers)

- **STEM Mentoring Program**

- Conduct mentoring program with 30 teams selected for final TExMIC from 8 districts of Terengganu
- Each finalist develop STEM projects at their school involving 1 teachers and 4 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*)
- **Artificial Intelligence (AI)** (*is the branch of computer sciences that emphasizes the development of intelligence machines, thinking and working like humans.*)
- **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*)

Other Collaborators

The collaborators involved in program implementation, carnival, opening ceremony and protocol are:

1. Exco Pendidikan Kerajaan Negeri Terengganu
2. Jabatan Pelajaran Negeri Terengganu
3. Pejabat Pendidikan Daerah Negeri Terengganu
4. Institut Perguruan Malaysia (IPGM)

JADUAL BENGKEL - EXXONMOBIL-UKM STEM CLUB@TERENGGANU
STEM ENHANCEMENT PROGRAM
2 Hingga 4 Julai 2019
Institut Pendidikan Guru Kampus Dato 'Razali Ismail

Date	8.30 am	10.00 am	10.30 am	11.30am	12.45 pm	2.00 pm	4.30 pm	6.30 pm
1 Julai 2019 (Isnin)							Persediaan program dan taklimat fasilitator	
2 Julai 2019 (Selasa)	Program Registration	Pogram Briefing PM.Ts. Dr. Mohamad Sattar Rasul	Minum Pagi	Hands-on activity – Knowledge Building (Wireless Communication, Artificial Intelligence, Crystal, Early Engineering Modules)	Makan Tengahari	Hands-on activity – Knowledge Building (Wireless Communication, Artificial Intelligence, Crystal, Early Engineering Modules)	Minum Petang	Makan Malam
3 Julai 2019 (Rabu)	Hands-on activity – Knowledge Building (Wireless Communication, Artificial Intelligence, Crystal, Early Engineering Modules)			Hands-on activity – Knowledge Building (Wireless Communication, Artificial Intelligence, Crystal, Early Engineering Modules)		Hands-on activity – Knowledge Building (Wireless Communication, Artificial Intelligence, Crystal, Early Engineering Modules)		
4 Julai 2019 (Khamis)	Hands-on activity – Knowledge Building (Wireless Communication, Artificial Intelligence, Crystal, Early Engineering Modules)			Reflection & Closing Ceremony				

**JADUAL EXXONMOBIL-UKM STEM CLUB@TERENGGANU
STEM ENHANCEMENT PROGRAM
9 DAN 10 OKTOBER 2019
KUALA TERENGGANU**

Tarikh	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
8 Oktober 2019	Pergerakan ke Kuala Terengganu										Check in Hotel (TH Hotel)
9 Oktober 2019	Sarapan	Pergerakan ke Bahagian Teknologi Pendidikan Negeri (BTPN) Terengganu	Taklimat Mentor PM.Ts. Dr. Mohamad Sattar Rasul	Taklimat Peserta PM.Ts. Dr. Mohamad Sattar Rasul	Sesi Mentoring Kategori Sekolah Menengah Dr. Zanaton Hj. Iksan Prof. Dr. Ruhizan Mohammad Yasin Prof. Madya Dr. Rosseni Din Dr. Haliza Othman	Minum pagi	Sambungan Sesi Mentoring Kategori Sekolah Menengah Dr. Zanaton Hj. Iksan Prof. Dr. Ruhizan Mohammad Yasin Prof. Madya Dr. Rosseni Din Dr. Haliza Othman	Makan Tengah Hari	Sambungan Sesi Mentoring Kategori Sekolah Menengah Dr. Zanaton Hj. Iksan Prof. Dr. Ruhizan Mohammad Yasin Prof. Madya Dr. Rosseni Din Dr. Haliza Othman	Pergerakan balik ke TH Hotel	
10 Oktober 2019	Sarapan	Pergerakan ke Bahagian Teknologi Pendidikan Negeri (BTPN) Terengganu	Taklimat Mentor PM.Ts. Dr. Mohamad Sattar Rasul	Taklimat Peserta PM.Ts. Dr. Mohamad Sattar Rasul	Sesi Mentoring Kategori Sekolah Rendah dan IPG Dr. Zanaton Hj. Iksan Prof. Dr. Ruhizan Mohammad Yasin Prof. Madya Dr. Rosseni Din Dr. Haliza Othman		Sambungan Sesi Mentoring Kategori Sekolah Rendah dan IPG Dr. Zanaton Hj. Iksan Prof. Dr. Ruhizan Mohammad Yasin Prof. Madya Dr. Rosseni Din Dr. Haliza Othman		Sambungan Sesi Mentoring Kategori Sekolah Rendah dan IPG Dr. Zanaton Hj. Iksan Prof. Dr. Ruhizan Mohammad Yasin Prof. Madya Dr. Rosseni Din Dr. Haliza Othman	Pergerakan balik ke TH Hotel	
11 Oktober 2019	Sarapan				Chek out hotel	Pergerakan pulang ke UKM					

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 in Terengganu, facilitators from various STEM related faculties in UKM, and teachers and IPG lecturers in Terengganu. For mentoring program, there were 120 secondary school students from 30 schools from all over Terengganu involved in preparation for final TExMIC in October.

Participants' Biography Data

Participants	Training of Trainers	Mentoring Program
Mentor (Lecturers)	6	10
Facillitators	24	10
Tearchers/Lecturers	100	60
Students(Form 1 - 3)	-	120
Total	130	200

List of Lecturers (Mentor)

Mentor (Lecturer)	Faculty/Institution
Prof. Madya Ts. Dr. Mohamad Sattar Rasul	Faculty of Education, UKM
Dr. Zanaton Haji Iksan	Faculty of Education, UKM
Dr. Rose Amnah Mohd Rauf	Faculty of Education, UM
Prof. Dr. Ruhizan Mohammad Yasin	Faculty of Education, UKM
Prof. Madya Dr. Rosseni Din	Faculty of Education, UKM
Dr. Haliza Othman	Faculty of Engineering and Built Environment, UKM
Ts. Dr. Abdul Hadi Abd Rahman	Faculty of Technology and Informational Science, UKM
Prof. Madya Ir. Dr. Nasharuddin Zainal	Faculty of Engineering and Built Environment, UKM
Dr. Seri Mastura Mustaza	Faculty of Engineering and Built Environment, UKM
Encik Fahmi bin Mat	Faculty of Technology and Informational Science, UKM
Puan Norhidayatul Hikmee Mahzah	UiTM Terengganu
Encik Mohamad Zamin b. Mohamad Jusoh	UiTM Terengganu
Encik Shaiful Bakhtiar bin Hashim	UiTM Terengganu
Encik Mohd Ariff Ramli	UiTM Terengganu

List of Facillitators

No.	Facilitators	Faculty
1	ABDUL WAFI BIN MOHD ALI	FTSM
2	ARIF HAIKAL BIN AHMAD HASSAN AYOPPAN	FKAB
3	BAKRUDEEN ALI AHAMAD MOHAMED HASANUTHIN	FTSM
4	FITRI HAKEEM MOHD SALIH	FST
5	IZZAT AIMAN BIN AZLI	FKAB
6	MAHATHIR HARRIS ESHAK	FTSM
7	MOHD AIZUDDIN SAARI	FPEND
8	MUHAMAD FADHLI RAMLEE	SERI
9	MUHAMAD HELMIE LANGMERI	FTSM
10	MUHAMAD RABANI ABU HASAN	FPEND
11	MUHAMMAD HAFIZ BIN RUSLAN	FKAB
12	MUHAMMAD HANIF B. SAINORUDIN	SERI
26	MUHAMMAD LUQMAN HAKIM AZHARI	FST
13	MUSLIZAINUN MUSTAPHA	SERI
14	NOOR ATIKAH ABDULLAH	FKAB
15	NUR ATHIRAH ABDULLAH	SERI
16	NUR ATIQA H JALALUDIN	FST
17	NUR IZZAH FARHANA BT MOHD SHAFIE	FTSM
18	NUR NAJIHAH BINTI NIZARUDDIN	FTSM
29	NUR QURRATUL AIN ADANAN	FPEND
27	NURIN ASYIKIN AHMAD	FPEND
19	NURIZATY BINTI HASNUSAN	FKAB
20	NURUL NAZLI ROSLI	SERI
21	SAYYIDAH NUSAIBAH MOHD SALEHUDIN	FPEND
22	SHUHHIB MAMAT	SERI
23	SITI AISHAH BINTI IKSAN	FKAB
24	SITI NUR AIN SULAIMAN	FST
28	SITI NURLIYANA AHMAD	FPEND
25	WAN NUR MADIHAH WAN ABDUL HALIM	FST

Faculty/Institute: **FPEND** (Faculty of Education); **FKAB** (Faculty of Engineering and Built Environment); **FST** (Faculty of Science and Technology); **FTSM** (Faculty of Technology and Information Science); **SERI** (Solar Energy Research Institute)

List of Participants (STEM Master Trainers)

NO.	PARTICIPANT	SCHOOL	DISTRICT	UNIT
1	KHAIRIL ANUAR BIN KAMARULZAMAN	SMKA WATANIAH	BESUT	WC
2	MOHD KHAIRI BIN MUHAMAD NOR	SMK TENGKU MAHMUD	BESUT	AI
3	NURUL AIN JAFFAR	SMK RENEK	BESUT	AI
4	SURINA BINTI MOHAMAD	SMK TENGKU MAHMUD 2	BESUT	AI
5	NUR IZYAN AQILAH BINTI AHMAD KAMIL	SMKA NURUL ITTIFAQ	BESUT	CR
6	SUZANA ASMIDA BINTI NAWI	SMK SERI NERING	BESUT	WC
7	FAUZIAH BINTI DERAMAN	SMK NASIRUDDIN SHAH	BESUT	CR
8	MOHD HAFIZUL IZWAN MOHAMAD ZAIDI	SM IMTIAZ YT BESUT	BESUT	CR
9	HISAMULLAH BIN HARUN	SM IMTIAZ DUNGUN	DUNGUN	WC
10	MOHD SAPAWI BIN ABD GHANI	SMK TG INTAN ZAHARAH	DUNGUN	AI
11	ZURAINI BINTI ABDUL KADIR	SMK BUKIT BESI	DUNGUN	WC
12	HASLEEN BINTI KADIR JELANI	SMK SERI RASAU	DUNGUN	CR
13	CHE HASIDAH BINTI CHE HAMZAH	SMK PADANG PULUT	DUNGUN	WC
14	HASHIMAH BINTI HASHIM	SMKA KUALA ABANG	DUNGUN	AI
15	SITI AISHAH BINTI TAIB	SMK PAKA	DUNGUN	CR
16	NUR HAZIMAH BINTI MOHD YUSOF	SMK PULAU SERAI	DUNGUN	CR
17	MD. SAIFUL HAFIZ BIN MUHAMAD	SM SAINS HULU TERENGGANU	H.TERENGGANU	AI
18	WAN ZABYAWATI WAN BAKAR	SMK TG AMPUAN INTAN	H.TERENGGANU	WC
19	AZRA FAZEERA BT AZMAN	SMK MENERONG	H.TERENGGANU	CR
20	WAN NORAINI WAN MOHD NOR	SMA MAHMUDIAH	H.TERENGGANU	WC
21	RUSITA BINTI SOHOK	SMK BUKIT DIMAN	H.TERENGGANU	AI
22	HAIRUSASMI JULIANA BINTI SOHAIMI	SMK TUN INDERA	H.TERENGGANU	WC
23	KHATIJAH BINTI ABU BAKAR	SMK TAPU	H.TERENGGANU	AI
24	ROHAYA BINTI ABD WAHAB	SMK MATANG	H.TERENGGANU	CR
25	MUHAMMAD HANIF GILL BIN ABDULLAH@NOJEY	SMK KOMPLEKS MENGABANG TELIPOT	K.NERUS	AI
26	WAN HASNAH BINTI WAN DRANI	SMK TG MIZAN ZAINAL ABIDIN	K.NERUS	WC
27	M. SAIFULKHAIR B. OMAR	SMK KOMPLEKS SEBERANG TAKIR	K.NERUS	CR

28	FAZLIANY BINTI DAUD	SMKA DATO' HAJI ABBAS	K.NERUS	CR
29	A'AINA WAJIAH BINTI MOHD ZAMANI	SMK KOMPLEKS GONG BADAK	K.NERUS	AI
30	SAUTY HASAN	SMK IBRAHIM FIKRI	K.NERUS	WC
31	NOR ZAINI BINTI ABDUL RAHMAN	SMK BATU RAKIT	K.NERUS	WC
32	ROHANA BINTI RAMLI	SMK BUKIT TUNGGAL	K.NERUS	CR
33	ABDUL MANAF B. MOHAMAD	SMK MANIR	K.TERENGGANU	WC
34	HANARIAH BINTI NGAH	SMK PADANG NEGARA	K.TERENGGANU	AI
35	NUR MARLIA BINTI MUDA	SMK BELARA	K.TERENGGANU	CR
36	AMALINA BINTI IDRIS	SMK DATO' HAJI MOHD SAID	K.TERENGGANU	WC
37	SHARIFAH HIDAYAH BINTI SYED TAUFIK IDID	SMK SULTAN SULAIMAN	K.TERENGGANU	CR
38	PARIDAH BINTI IBRAHIM	SMK DATO' RAZALI ISMAIL	K.TERENGGANU	WC
39	SITI NUR KAMALIYAH BINTI SHAIKH AHMAD	SMA (ATAS) SULTAN ZAINAL ABIDIN BATU BURUK	K.TERENGGANU	AI
40	WAN NORHIDAYAH BINTI W. IBRAHIM	SMK TENGGU BARIAH	K.TERENGGANU	CR
41	SURYANI SAHAMUDIN	SMK KIJAL	KEMAMAN	WC
42	SITI SALMAH BINTI TAWANG	SMK RANTAU PETRONAS	KEMAMAN	AI
43	AZHAR BIN ISMAIL	SMK SULTAN ISMAIL	KEMAMAN	WC
44	MUHAMMAD AINUDDIN BIN MUDA	SMK RASAU KERTEH B5	KEMAMAN	AI
45	FEBING AYU BINTI MARJOHAN	SMK CHUKAI	KEMAMAN	AI
46	RUZITA BINTI JUSOH	SMK BANGGOL	KEMAMAN	WC
47	HANISAFWA BINTI MD HANIFAH	SMK BUKIT KUANG	KEMAMAN	CR
48	RAHAYU BINTI RADZALI	SMK SULTAN ISMAIL 2	KEMAMAN	CR
49	NURUL KHAIRIN RAZAK	SMK BUKIT SAWA	MARANG	AI
50	AZMAWATI BINTI ABD AZIZ	SMK RUSILA	MARANG	AI
51	RAZEHAN RAZALI	SMK SERI SERATING	MARANG	AI
52	ROMAIZOM BINTI MOHAMED ZIN	SMK SEBERANG MARANG	MARANG	WC
53	ROHAIDA BINTI MOHAMAD	SMKA DURIAN GULING	MARANG	WC
54	ZUWAINAH BINTI MUHAMMAD	SMK TUN TELANAI	MARANG	CR
55	ROZITA BINTI MAT ALI	SMK MERCHANG	MARANG	CR
56	RINA HASLIZA BINTI ABD RASHID	SMK TG LELA SEGARA	MARANG	CR
57	ABDULALLAH @ABDULLAH BIN CHE YACCOB	SMK CHALOK MODEL KHAS	SETIU	AI

58	SUHAIZA BINTI MAT SAID	SM SAINS SULTAN MAHMUD	K. NERUS	WC
59	NOOR AZIZAH BINTI ENDUT	SMK PENAREK	SETIU	CR
60	FAZLY MAS FAUIZZUDDIN BIN RAMLI	SMK LEMBAH BIDONG	SETIU	WC
61	NURUL ASMA' BT MOHD SHAFIE	SMK SUNGAI TONG	SETIU	AI
62	NORASYIKIN BINTI JUMAEN	SM SAINS SETIU	SETIU	WC
63	FADZELINA BINTI MOHD ZAIN	SMK PELONG	SETIU	CR
64	AZMI BIN JAAFAR	SMK TENGKU IBRAHIM	SETIU	CR
65	UMMEE FATIAH BT DATUK AZIH	SEKOLAH KEBANGSAAN KUBANG IKAN	K. TERENGGANU	EE
66	NUR KAMIZA BT RAZAK	SEKOLAH KEBANGSAAN SULTAN SULAIMAN 1	K. TERENGGANU	EE
67	SURIA BT ABDUL WAHAB	SEKOLAH KEBANGSAAN KOMPLEKS SEBERANG TAKIR	K. NERUS	EE
68	AZHAR B. SALIM@A. GHANI	SEKOLAH KEBANGSAAN PAGAR BESI	K. NERUS	EE
69	SHAHIDAWATI BT ABDULLAH	SEKOLAH KEBANGSAAN PADANG MENGGUANG	MARANG	EE
70	HADIRAH BT WAHAB	SEKOLAH KEBANGSAAN GONG NANGKA	MARANG	EE
71	MOHD FAIRUS HARUN	SEKOLAH KEBANGSAAN SERI LANGKAP	SETIU	EE
72	MOHD MAHADI BIN MUSTAPHA	SEKOLAH KEBANGSAAN SAUJANA	SETIU	EE
73	MAHIRAN MOHAMAD	SEKOLAH KEBANGSAAN PUSAT JERTEH	BESUT	EE
74	MOHD TARMIZI BIN HUSSIN	SEKOLAH KEBANGSAAN JABI	BESUT	EE
75	SAFIAH BINTI AWANG	SEKOLAH KEBANGSAAN BUKIT APIT	H. TERENGGANU	EE
76	NORMA BINTI YUSOF	SEKOLAH KEBANGSAAN PADANG SETEBU	H. TERENGGANU	EE
77	ROBIAH BINTI ABDULLAH	SEKOLAH KEBANGSAAN KG. BARU RASAU KERTEH 5	KEMAMAN	EE
78	SHAHUDA BIN ALIAS	SEKOLAH KEBANGSAAN BANDAR BAHARU	KEMAMAN	EE
79	SALBIAH BINTI MOHD	SEKOLAH KEBANGSAAN DURIAN MAS 2	DUNGUN	EE
80	ROSMAWATI BINTI AHMAD RAZALI	SEKOLAH KEBANGSAAN SERI PAKA	DUNGUN	EE
81	ROSELI BIN MAT NOR	IPGK DATO RAZALI ISMAIL		CR
82	DR. HAZLINA BINTI AWANG LAH	IPGK SULTAN MIZAN		AI
83	CHE AHMAD RIZAL BIN CHE RAHIM	IPGK KOTA BHARU		EE
84	DR. NOR KAMILAH BINTI MAKHTAR	IPGK KOTA BHARU		AI
85	CHE ABDUL MUTALLIB BIN ISMAIL	IPGK DATO RAZALI ISMAIL		CR
86	ROSLIZA BINTI AWANG	IPGK SULTAN MIZAN		CR
87	DR. HJ. HAZRAM BIN ISMAIL	IPGK SULTAN MIZAN		CR

88	DR. HJ SHAMSUDDIN BIN MUHAMMAD	IPGK KOTA BHARU	CR
89	DR. PAJUZI BIN AWANG	IPGK DATO RAZALI ISMAIL	EE
90	BIAMIN BIN AHMAD	IPGK DATO RAZALI ISMAIL	EE
91	ROSHIDAH BINTI MAT	IPGK SULTAN MIZAN	EE
92	DR. AZMAN BIN OMAR	IPGK SULTAN MIZAN	EE
93	NOOR ASYIKIM BINTI NOOR IBRAHIM	IPGK KOTA BHARU	EE
94	SABRI BIN AWANG SOF	IPGK KOTA BHARU	EE
95	MOHD ZAMRI BIN ABDULLAH	IPGK KOTA BHARU	EE
96	DR. YUSMINAH BINTI MOHD YUSOF	IPGM	EE
97	YUSALINA YUSOF	IPGM	EE
98	ABD HAKIM BIN ABDUL MAJID	IPGK SULTAN MIZAN	WC
99	NORHASLIZA BINTI ABDULLAH	IPGK SULTAN MIZAN	WC
100	TAN HWE KEE @ TAN GEK KEE	IPGK SULTAN MIZAN	WC
101	DR. ZIKRI BIN AWANG	IPGK KOTA BHARU	WC

WC: Wireless Communication; AI: Artificial Intelligence; CR: CRYsTal; EE: Early Engineering

List of Participants Selected for Final TExMIC 2019

Mentoring program involved 30 selected participants with 30 best project proposal, developed using GSP (Geometer's Sketchpad) for final competition, 10 participants from each category.

No.	Category	Participants	Project Title
1	Upper Secondary School	SM IMTIAZ YT BESUT	INTELLIGENT BOAT WITH SMART FLOTATION DEVICE
2		SM SAINS SULTAN MAHMUD	AQUAMATIC
3		SM SAINS DUNGUN	HYDRO MINI GREENHOUSE
4		SBP INTEGRASI BATU RAKIT	GREEN TECHNOLOGY (SOLAR AIRPLANE)
5		SMK DATO' RAZALI ISMAIL	ROOM ADIUTOR
6		SMK SULTAN ISMAIL 2	AQUA FEEDING HOUR
7		SMK TENGKU LELA SEGARA	TE-HYDRILLA
8		SMK BELARA	SEMBARA AQUAPONIC GARDEN
9		SMK BUKIT SAWA	REHAL AD-DIN
10		SMK MERCHANG	BARBEQUE THERMOELECTRIC FAN
11	Lower Secondary School	SMKA DATO' HAJI ABBAS	SMART WINDOW
12		SM SAINS SETIU	THINK GLOBAL
13		SMK CHUKAI KEMAMAN	FENKLINER
14		SMK DATO' RAZALI ISMAIL	FOODDECT
15		SMK SERI BERANG	SMART REPELLENT
16		SMK RANTAU PETRONAS	BIOMIMICRY
17		SMK TG INTAN ZAHARAH	TECHNOBOYS
18		SMK SULTAN OMAR	BIOMASS
19		SMK PULAU SERAI	SESERAI BIODIVERSITY AQUANEO
20		SMK TENGKU MIZAN ZAINAL ABIDIN	DUAL AUTO WINDOW DAW
21	Primary School	SK TANJUNG GELAM	INTELLIGENT WATERING SYSTEM
22		SK KUBANG IKAN	EZBIN
23		SK PADANG SETEBU	MURIDAE REPELLER
24		SK BINTANG	SMART HOME
25		SK SERI PAKA	PENGAWAS LADANG
26		SK SULTAN SULAIMAN 1	SMART RACK
27		SK TELUK KETAPANG	I BIN
28		SK SAUJANA	SMART FOOD CONTAINER
29		SK PAGAR BESI	SISTEM FERTIGASI SOLAR

30		SK GONG NANGKA	ANTABAT
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