



SEAMEO STUDENT NETWORKING “LEARNING SCIENCE AND MATHEMATICS TOGETHER” (LeSMaT) IN THE BORDERLESS WORLD INITIATIVE

Introduction

Background and Overview

SEAMEO Student Networking for ‘Learning Science and Mathematics Together’ (LeSMaT) in the Borderless World [also abbreviated as SEAMEO LeSMaT (Borderless)] project initiative was renamed from SEAMEO Borderless School project since ‘Critical Success Factor’ (CSF) workshop in November 2015. This project was an area identified under the vision of Golden SEAMEO in the next decade and was endorsed by High Official Meeting (HOM) in 2012. The 37th High Officials (HOM) Meeting held on 25-27 November 2014 (Bangkok) and the 48th SEAMEO Council Conference held on 6-9 May 2015 (Chonburi, Thailand) also took note of the development of the SEAMEO Borderless School. Likewise, the SEAMEO LeSMaT (Borderless) Work including Budget plan was presented and endorsed during the SEAMEO Centre Directors’ Meeting (CDM) to be held on 27-29 July 2016 in S31 Sukhumvit Hotel, Bangkok, Thailand.

The LeSMaT (Borderless) initiative is in line with the SEAMEO Education Agenda or priority area No.7 “Adopting a 21st Century Curriculum” that states to pursue a radical reform through systematic analysis of knowledge, skills, and values needed to effectively react to changing global contexts. It also particularly responds to the ever-increasing complexity of the Southeast Asian economic, socio-cultural, and political environment, developing teacher imbued with ASEAN ideals in building ASEAN community within 20 years (2015-2035).

Aim and Objectives

The main aim of the LeSMaT (Borderless) project is to prepare students to become global players with moral values who are enterprising, creative, innovative, equipped with 21st century skills and lifelong learners in cross-cultural learning environment. The following are more specific objectives:

- The learners from diverse background are expected to be actively involved in sharing resources through blended-mode learning environment rich with easy access information mainly from Open Education Resources (OERs) including interdisciplinary and cross-curricular studies.
- The essential skills that encompass mainly the 21st century skills of global citizenship with moral values and ethics to be developed from early years’ education include thinking, technology and life (work/entrepreneurial/survival) skills.

Phases and Series of Events Conducted

Series of Events Conducted including Workshops and Seminars/Colloquium

SEAMEO RECSAM as the lead centre had conducted a series of workshops from 2013 to 2016, in collaboration with Malaysian Ministry of Education (MOE) and guided by SEAMEO Secretariat as

well as supported by various national/regional/international institutions including SEAMEO QITEP in Science/Mathematics and SEAMEO SEAMOLEC from Indonesia as well as SEAMEO Innotech from Philippines. The workshops included the development of OERs (2013-15) as well as Open and Distant Learning (ODL) modules (2015-16). Further Training of Trainers (TOT) activities using the ODL modules are also targetted to be implemented starting 2017.

With the financial support from RECSAM's short term research grant and part of the Science across the World (SAW) project fund, RECSAM had implemented series of workshops in Phase 1 and part of Phase 2. The dates of the series of workshops for SEAMEO Borderless School, 1BestariNet Virtual Learning Environment (VLE) and LeSMaT were: 19-20 June 2014; 1-3 October 2014; 9-10 February 2015; 27-29 May 2015; 26 November, 2015; 23-26 May 2016; and the recent 10-14 October 2016. These workshops involved the consultants; science and mathematics master teachers from Penang State; curriculum experts in science and mathematics from Ministry of Education; representatives from some SEAMEO centres; local and international educational institutions. The following are phases of completed LeSMaT (Borderless) workshops and draft output.

Series of Workshops Conducted

Phase 1 – Workshops to develop blended-mode OERs with Pilot Studies (2013 to 2015)

This phase consists of series of workshops to promote cross-cultural understanding through development of Open Educational Resources (OERs) incorporating values-based Science/Mathematics/Social Science education and blended learning activities that enhance: (1) knowledge acquisition and promotion of thinking skills; and (2) knowledge sharing, promotion of technology and life skills. The activities under this phase included piloting of research instrument entitled 'Survey on knowledge/attitudes towards sustainable living in the borderless world' and trialling of e-platforms involving several groups of science and mathematics educators from various nationals in SEAMEO (Malaysia, Indonesia, Thailand and Philippines) and associate member (Germany) countries who provided feedback to improve the instruments and refine the Borderless School framework. The pilot studies continued in FY2014/15 with the following R&D:

- (a) Administration of research instrument on 'Attitudes towards Use of Technology to Enhance Sustainable Living' (ATUTESL) among student and teacher delegates from nine SEAMEO member countries during the 9th 'Search for SEAMEO Young Scientists' (SSYS) Regional Congress held at RECSAM from 3-7 March 2014.
- (b) Involvement of groups of in-service training course participants from nine SEAMEO member countries for the trialling of various e-learning and m-learning tools e.g. WebQuest, e-forum and social networking sites (e.g. Facebook and Edmodo) during and after in-service course in April 2015.
- (c) The piloting of web-conferencing tools such as Webinar and WebEx during the seminar on 27 May 2015 for the colloquium (series 1/2015) entitled: "*The development of Malaysian Science Teacher Quality Standards (MSTQS) from SEARS-ST: How can this affect science teachers' performance to raise students' achievement in TIMSS and PISA*".

Phase 2 – Workshops (module writing/editing, training of trainers) and Fieldwork (2015 to 2018):

The implementation under this phase included the following R&D activities:

- (a) The 'Critical Success Factor' (CSF) workshop in 26 November 2015 in which the project was renamed as Learning Science and Mathematics Together (LeSMaT) in the Borderless world [in brief LeSMaT(Borderless)] after much deliberation with planning of more comprehensive framework and future direction.
- (b) The CSF (1/2016) workshop from 23-26 May 2016 included meeting with LAMS experts to prepare sustainable e-learning platforms; LAMS workshop, colloquium/ seminar on "Developing ODL modules and tools to promote ESD and values-based education:
- (i) Experience with ODL institutions and international organisations;
- (ii) Use of d-book and Edmodo social learning platforms to promote LeSMaT (Borderless); as well as the writing of ODL modules to promote LeSMaT focusing on the following themes incorporating various pedagogical content knowledge (PCK) approaches."

Participation, Objectives, Themes Identified and Curriculum Developed

Participation as well as Involvement of Experts and Educators

1. The dates of the series of workshops to develop Open and Distant Learning (ODL) module to promote LeSMaT in the Borderless World at RECSAM, Penang are:

- 26 November 2015
- 23-26 May 2016
- 10-14 October 2016

2. The series of workshops (including meeting and colloquium) involved the following:

(a) Experts from various institutions from SEAMEO region and beyond namely;

(i) November 2015 only

- Mr. Shamsul Anuar Abdul Wahid from MIMOS, Kulim Hi Tech Park (KHTP), Kedah, Malaysia. (Advisor for LeSMaT)

(ii) May 2016 only

- Mr. Alan Loe Wai Lit from Lee Kong Chian School of Medicine (LKCSM), Nanyang Technological University (NTU)(LAMS expert)
- Mr. Gary Tham Weng Nung from Malaysia, in Macau (LAMS expert)
- Mr. Ernie Ghiglione from Argentina, now in Singapore (LAMS expert)
- Assoc. Prof. Dr. Nabilah Abdullah from Universiti Teknologi Mara (UiTM)(Review editor for SEARS-ST and Outdoor Learning Guide)
- Mr. Tan Khan Aun, ex-Master Teacher from Penang (Group leader and Chapter writer)
- Mr. Ch'ng Yeang Soon, Mater Teacher from Penang (Group leader and Chapter writer)

(iii) May and October 2016

- Dr. Suma Parahakaran from Sathya Sai Academy, Malaysia (Speaker who spoke on ESD/values-based education during colloquium 1/2016; Group Leader TeleHeal)
- Dr. Devadason Robert Peter from IPG Malaysia Kampus Ipoh [Speaker who spoke on d-book during colloquium 1/2016; Co-editor for Blended Learning (BL) book publication]
- Dr. Chin Phoi Chin from Research & Innovation (RNI) Unit, IPGM Penang (Chapter writer)
- Dr. Parvinder Singh from Science Unit, IPG Penang, Malaysia (Chapter co-writer for TeleHeal and Review editor for ConWUR)
- Ms. Linda Toh (Group Leader CADRRED, Chapter writer for ConWUR, Associate editor)

- Mr. Chin Chee Keong, doctoral student in School of Biology, USM (Review editor for SEARS-ST, Chapter writer for ConWUR, Assoc. editor for BL book publication)

(iv) October 2016 only

- Dr. Woo Huay Lit from Meridian Junior College, Singapore (Speaker who elaborated on the instructional design of ODL during colloquium 2/2016)
- Mr. Lim Chee Leong from Taylor's University (Speaker who elaborated on 'Redesigning student-centred learning in the borderless world')
- Assoc. Prof. Dr. Lay Yoon Fah from Universiti Malaysia Sabah (UMS) (Co-editor for Blended Learning book publication; one of the facilitator for SPSS and Smart PLS workshop conducted)
- Dr. Sherlyne Almonte-Acosta from SEAMEO Innotech, Philippines (Group Leader ConWUR; Review editor for ConWUR and BL book publication)
- Pn. Nor Ruzaini Jailani from IPG Ilmu Khas, Malaysia (Chapter writer and Review editor for OLG; Leader of SE4ALL)
- Pn. Hariton from IPG Pulau Pinang, Malaysia (Chapter writer for OLG)

(b) Among other workshop participants included: (1) Twelve (12) (in May) and estimated twelve (12) (in October) Science and Mathematics Master/excellent/ experienced teachers from Penang State; (2) estimated eight Science and Mathematics specialists from SEAMEO RECSAM who are from Malaysia, Philippines and Japan for May and October 2016.

(c) The academic staff from various educational institutions and SEAMEO centres were also involved as: (1) consultant in the editing workshop also as reviewer editor during prior to the workshop in October i.e. (i) University Malaysia Sabah (UMS) and Curriculum Development Division, Malaysia; (ii) Innotech from Philippines; (iii) SEAMEO QITEP Mathematics/Science from Indonesia; (iv) SEAMEO SPAFA from Thailand; (v) OUM, WOU, to name a few.

The following are list of online advisors/consultants/review editors

- Prof. Masami Isoda from Japan (Online advisor for SE4ALL and CADRRED)
- Dr. Mark Windale from Sheffield Hallam University (Online advisor and Chapter writer for OLG)
- Dr. Awangku Hassanah Bahar Pengiran Bagul (Review editor for ConWUR)
- Mr. Punang Amaripuja from SEAMEO QITEP Mathematics (or abbreviated as SEAQIM) (Online Review editor for CADRRED)
- Ms. Retzy Noer Azizah from Center for Development and Empowerment of Teachers and Education Personnel (CDETEP), ex-SEAQIS, Indonesia (Online Review editor for ConWUR)
- Mr. Lim Chee Leong from Taylor's University (Review editor for CADRRED)
- Datin Dr. Ng Soo Boon (Review editor for OER, BL book publication MSTQS from SEARS-ST)
- Mr. Azmi Harun (Review editor for OER curriculum and MSTQS from SEARS-ST)
- Mr. Chang Jook Ee from Chung Ling Butterworth (Review editor for ConWUR)
- Ms. Hatthaya Siriphatthanakun from SEAMEO SPAFA (Online Review editor for CADRRED)

The following are list of BL book commentators

- Prof. Zoraini Wati Abas, advisor of Zeta Academy and Associate Research Fellow at the National Higher Education Research Institute, Universiti Sains Malaysia; Ex-OUM professor.
- Dr. Soon Seng Thah, Deputy Dean, Faculty of Education and Languages, Open University Malaysia (OUM); Ex-Deputy Director, Technology Education Division, MOE Malaysia.
- Prof. Santhiram R. Rahman, Dean, School of Education, Language and Communication (SELC), Wawasan Open University; Ex-USM Assoc. Professor.

Objectives, Themes Identified and Curriculum Developed for LeSMaT (Borderless)

The main objectives of the series of LeSMaT workshops are to prepare participants with comprehensive knowledge and skills in (a) writing (workshop held in May); (b) editing workshop held in October 2016 on Open and Distant Learning (ODL) modules that can be used to guide teachers in promoting LeSMaT in the Borderless World.

Hence the content of the CSF (1/2016) workshops/events included the following:

- (a) To meet with experts on 'Learning Activity Management System' (LAMS):
 - (i) To gain overview of the benefits of digital tool to promote students-centred learning with enhanced thinking skills; and
 - (ii) To prepare sustainable platform for the planning of learning sequences and uploading of teaching and learning resources.
- (b) Workshop on 'Learning Activity Management System' (LAMS) by three experts.
- (c) Input by three experts during colloquium on 'Developing ODL modules and tools to promote ESD and values-based education: (1) Experience with ODL institutions and international organisations; (2) Use of d-book and Edmodo social learning platforms to promote LeSMaT in the borderless world.
- (d) Writing/Editing workshops to develop four main themes for LeSMaT curriculum.

The themes identified for Learning Science and Mathematics Together (LeSMaT) incorporating transdisciplinary approaches in the ODL modules include:

- (1) 'Telecare and Healthy Lifestyle' (TeleHeal);
- (2) 'Climate Awareness and Disaster Risk Reduction/Preparedness Education' (CADRRED);
- (3) 'Conservation and Wise Use of Resources' (ConWUR); and
- (4) 'Sustainable Energy for All' (SE4ALL).

The main themes identified for LeSMaT incorporating transdisciplinary approaches aiming at addressing the SEAMEO priority areas No.3 (Resiliency in the face of emergencies) and No.7 (Adopting a 21st century curriculum). These include:

- (1) 'Telecare and Healthy Lifestyle' (TeleHeal);
- (2) 'Climate Awareness and Disaster Risk Reduction Education' (CADRRED);
- (3) 'Conservation and Wise Use of Resources' (ConWUR); and
- (4) 'Sustainable Energy for All' (SE4ALL).

The development of ODL modules include interactive curriculum resources on Edmodo social learning platform and LAMS that serve as comprehensive guide for teachers to facilitate students' networking blended learning activities through Learning Science and Mathematics Together (LeSMaT) in Borderless world. Various students-centred teaching and learning approaches were introduced in the ODL modules, such as values-based Project-based Activities (PBA), Problem-based Learning (PBL), Inquiry-based Learning integrating Science/Technology/ Environmental Education/Economics/Engineering/Arts/Mathematics/Social Science (STEEAMS) approaches supported by interactive digital tools.

Numerous Research and Development (R&D) activities were also conducted to pilot the project implementation especially the development of instruments and sustainable blended learning platforms with evidence of research findings presented in conferences/competitions at regional and international levels. Among the platforms shared with winning of acclaims and appreciation include International Conference on Distance Education (ICDE)(16-18 October, 2013), International Exposition on Syariah Compliant Idea, Invention, Innovation and Design (ISCIID)(26-27 November, 2014) the first (7-9 April, 2014) and second (7-8 April, 2015) Regional Conference on Campus Sustainability (RCCS), Innovative Practices in Education and Industry Exhibition (I-PEINX) (14 March, 2016), the first Hyderabad Asia Summit on Educational Technology (2 July,

2016) organized by Global Educators Association for Educational Research and Development (GEAERD), to name a few.

1. Various students-centred teaching learning approaches were introduced, such as Project-based Activities (PBA), Problem-based Learning (PBL), Inquiry-based Learning supported by interactive digital tools including mainly 'Learning Activities Management Systems' (LAMS) and other digital and/or video conferencing tools that are suggested for networking such as Edmodo, FB, Skype and webinar.
2. Using the LeSMaT ODL modules as main guide as well as adapting the curriculum identified in the common core regional standards as the output of SEAMEO Basic Education (SEA-BES) initiative, selected teachers/educators may subsequently undergo 'Training of Trainers' (TOT) or in-service training courses to be organized by RECSAM in collaboration with collaborative partners. They may also be involved in 'Learning Science and Mathematics Teaching integrating Technology' (LeSMaTIT) to explore Science teaching integrating Transdisciplinary or cross curricular approaches supported by Technology-enhanced Learning (TEL).
3. Following the structured curriculum in the ODL modules developed, the teachers could further facilitate self-access/self-directed/self-paced learners who are enterprising, motivated, creative and always strive forward as successful contributors or producers of new knowledge through the following paths for Lifelong learning in Science integrating Transdisciplinary subjects.
 - (a) Alternatively, teachers could also opt for the opportunity to do further studies such as Master Degree (M.Ed.) or Ph.D in Education for Sustainable Living (ESL) under the proposed '**Enhancing Teachers' CPD with Higher-learning-opportunities'** (EnTeaCH) programme in collaboration with local and/or international public and/or private higher learning institutions.
 - (b) Students and adult learners could also opt for the opportunity to do further studies and/or lifelong CPD through 'Learning Transdisciplinary Science integrating Mathematics/Arts/Engineering/Technology-knowledge/attitudes/skills Together in the Borderless World' (LearnT-SMaRET): A project initiative to be explored by RECSAM in collaboration with ODL institutions

Implications and the Way Forward

Implications and Future Direction

The SEAMEO LeSMaT in the Borderless World is one of the 12 areas identified under the vision of Golden SEAMEO 'Basic Education and Student Networking' initiative in the next decade. Hence concerted/collaborative efforts among all participating SEAMEO countries to ensure the success of the project is very much appreciated. The main concerns include the development of viable blended learning platforms and active involvement of stakeholders to develop values-based cross-curricular/interdisciplinary curriculum to be disseminated on-line. These output documents with the abovementioned four curriculum topics are posted in the Edmodo social networking platform that is hyperlinked to the main portal entitled LeSMaT in the BORDERLESS World hosted at RECSAM.

Specifically, the SEAMEO LeSMaT in the BORDERLESS initiative will support SEAMEO Member Countries to fulfil priority areas No. 3, No. 5 and No. 7 in the following ways:

- a) promotion of student networking with the strengthening of SEAMEO collaboration through teaching, learning and assessment across educational systems;
- b) enhancement of thinking, technology, life (work/entrepreneurial/survival) skills;

- c) development of enriched cross-cultural/interdisciplinary curricula with emphasis on values education, global citizenship as well as Education for Sustainable Development (ESD) and Education for Sustainable Living (ESL); and
- d) gathering of critical mass or pool of educators who are trained through structured LeSMaT curriculum that will be prepared in the form of d-book or blended-mode ODL module to be the expert and/or advocate for the promotion of ESD and ESL.

The interdisciplinary curriculum resources developed in these values-based ODL modules are targeted to enhance: (a) knowledge acquisition and promotion of thinking skills; (b) knowledge sharing with promotion of technology and life (work/entrepreneurial/survival) skills for sustainable living in the borderless world among learners from diverse backgrounds in the region and beyond. The draft output may be prepared in the form of interactive d-book.

From the valuable inputs by consultants and discussions output generated from the active participation of workshop members, the following key recommendations are also explored:

- a) More effort should be made to promote LeSMaT through in-service education or Training of Trainers (TOT) workshops to reach out to wider audience and obtain critical mass of teachers who could be advocate/experts to promote ESD or ESL.
- b) Some local schools can be piloted and subsequently recognized nationally with students' involvement in LeSMaT blended learning as part of their co-curriculum activities that will be appraised and/or rewarded with co-curriculum marks.
- c) More curricular areas should be incorporated as identified under SEABES initiative incorporating more digital tools for student blended learning networking activities;
- d) Teachers/educators and/or key trainer/trainee should be informed about the opportunities to further their studies through EnTeaCH programme.
- e) Programme mapping and action plan should be prepared to promote online learning courses through existing digital tools and platforms e.g. LAMS, Edmodo, Webinar, in collaboration with international networking partners, e.g. UNESCO and GEAERD.

Plans for the Way Forward in Research and Development

The following activities were also conducted recently and are proposed to be undertaken to further complete and refine the LeSMaT (Borderless) project initiative:

- i. The review of ODL modules were made between May to September before the editing workshop from 10 to 13 October 2016 (CSF 2/2016). A workshop on Edmodo and/or introduction to LAMS was also scheduled to be conducted (26 October) as one of the activity in conjunction with the 4th International Conference on ESD (4th ICESDev) with the theme: "Collaboration and Linkages: Keys for Global Educational Inclusion for Sustainability" (25-27 October).
- ii. Facilitators who are mostly in-service teachers attended the Continuing Professional Development (CPD) or Training of Trainers (TOT) programmes following the guide in the ODL module may choose any one or more of the suggested blended learning tools to promote students' networking online exchange activities. These include 'Learning Activities Management Systems' (LAMS), 1BestariNet Virtual Learning Environment (VLE) and other digital and/or video conferencing tools that are suggested for networking such as Edmodo, Facebook (FB), WhatsApp, Skype, Webinar, to name a few. This additional values-added initiative is in line with the SEAMEO Education Agenda or priority area No. 5 "Revitalising Teacher Education"

iii. Students guided by teachers as part of their co-curriculum activities are also expected to produce research data and/or evidence-based learning output that can be in the form of e-portfolio, project/research report, posts/responses to e-forum, online quiz and/or e-survey, to name a few.

iv. Educational partners from SEAMEO Member Countries and beyond will be encouraged to pilot the revised LeSMaT curriculum, possibly conduct programmes for 'Training of Trainers' (abbreviated as LeSMaTOT) and 'Teaching incorporating Technology' (abbreviated as LeSMaTIT)(Refer the following Glossary). These activities could be planned further to enhance numerous skills in using ODL modules developed that promote CPD of teachers who are expected to facilitate students' networking activities through LeSMaT (Borderless) project initiative.

v. RECSAM with the guidance of SEAMEO Secretariat will source out funds from donor-agencies and international organizations to support implementation of the aforementioned new initiatives (e.g. LeSMaTOT, LeSMaTIT and LearnT-SMArET) incorporating R&D activities. Further refinement of LeSMaT ODL module (CSF 3/2017) would also be recommended taking into consideration OER issues and the Common Core Regional Learning Standards (CCRLS) developed through SEA-BES project initiative (Refer Framework in Appendix).

Appendix

Glossary/Definition of terms related to Students' Networking and LeSMaT(Borderless)

Terms	Definition <i>(for the terminologies/abbreviations/acronyms used in this document)</i>
BORDERLESS	B lueprint on Lifelong-learning(L ³); O bjective/organization; R ich in diverse cultural studies; D erived from value-based research; E ducational opportunities for all; R esults in diverse group talent; L ifelong learners; E nterprising; S kills (technology/thinking/life); S triving forward as producers of new knowledge: A framework for BLOOFAT coined by the proponet to promote BL in borderless world
CADRRED	Climate Awareness and Disaster Risk Reduction EDucation: An acronym coined by the author as part of LeSMaT(Borderless) project to promote awareness/education on climate change and disaster risk issues.
CCRLS	'Common Core Regional Learning Standards' developed in SEABES project
ConWUR	Conservation and Wise Use of Resources: An acronym coined by the author as part of LeSMaT(Borderless) project to promote conservation/preservation
CPD	Continuing Professional Development
EnTeaCH	Enhancing Teachers' Continuing-professional-development (CPD) with Higher-learning-opportunities: An acronym coined by the author for RECSAM's CPD
LSM	Learning Science and Mathematics: An online journal of SEAMEO RECSAM
LeSMaT (Borderless)	Learning Science and Mathematics Together in the Borderless World, part of Golden SEAMEO's Basic Education and Students' Networking initiative
LeSMaTIT (or LeSMaT ^{2a}) (Borderless)	Learning Science and Mathematics Teaching Integrating Technology-enhanced-learning Together, part of Golden SEAMEO's Basic Education and Students' Networking and EnTeaCH initiatives
LeSMaTOT (or LeSMaT ^{2b})	Learning Science and Mathematics Teaching 'Training of Trainers', part of EnTeaCH and LeSMaT initiative
Learnt-SMArET (or LeSMaT ³)	Learning Transdisciplinary Science integrating Mathematics/Arts/Engineering/Technnology-knowledge/attitudes/skills Together in the Borderless World.
ODL	Open and Distant Learning
OERs	Open Educational Resources
PAJSK	Pentaksiran Aktiviti Jasmani Sukan dan Kokurikulum (or 'Assessment/Evaluation on co-curriculum and sports activities'): A programme by MOE Malaysia to encourage and reward students' participation in co-curriculum and sports
PCK	Pedagogical Content Knowledge
SEA-BES	SEAMEO Basic Education Standards
SEARCH	South East Asia Regional Capacity-enhancement Hub: An acronym coined by the author as one-stop learning centre with 6 subportals linking global resources
SE4ALL	Sustainable Energy for ALL: An acronym coined by the author as part of LeSMaT(Borderless) project initiative to promote sustainable energy education
SP3ACEMAN	Science Project/problem/programme-based Activities inCorporating Experiment MANagement: An acronym coined by the author as part of LeSMaT(Borderless) project initiative to promote thinking/technology/life skills
TEL	Technology-enhanced Learning
TeleHeal	Telecare and Healthy Lifestyle: An acronym coined by the author as part of LeSMaT(Borderless) project initiative to promote healthcare/healthy lifestyle
VaBSE	Values-based Sustainable Education: An acronym coined by the author as part of SEAMEO's networking project through social learning platform
VABSEE	Values-based Sustainable Energy Education: An acronym coined by the author as part of research project to study on Sustainable Energy Education

LeSMaT (Borderless) Project Management Team and Members

SEAMEO RECSAM Project Management

Dr. Hj Mohd Johan bin Zakaria (Centre Director)
 Mr. Shamsul Azha B.MD Yusuf (Deputy Director, Administration)
 Dr. Nur Jahan Ahmad (Deputy Director, R & D – from March 16, 2016 to present)
 Dr. Suhaidah Tahir (Deputy Director, R & D – until February 29, 2016)
 Ms. Khor Sim Suan (Deputy Director, TPD from April 1, 2016)
 Ms. Rashidah Hj Othman (Accountant)
 Dr. Ng Khar Thoe [R&D Specialist, Project Leader/Coordinator, Chief Editor LeSMaT (Borderless) Blended Learning (BL) book and ODL modules/resources]

INVOLVEMENT OF CONSULTANTS/SPEAKERS AND PROJECT COORDINATOR

No	Name	Designation/Organisation	Involvement in SEARCH for LeSMaT (Borderless) ^{(A)-(D)}
(Pilot Phase) Southeast Asia Regional Capacity Enhancement Hub (SEARCH)(2010-present)			
	Prof. Zoraini Wati Abas	Professor of ODL institutions including OUM	As forum speaker during the launching of 'SEARCH' portal. Also as commentator of BL book publication. ^(C)
	Assoc.Prof. Dr. Kim Phaik Lah	Ex-USM Assoc. Prof., Director Vision Academy (M) Sdn. Bhd. and MAAYS.net	As forum speaker during the launching of 'SEARCH' portal by Dr. Azian Abdullah, ex-director of SEAMEO in 2012. ^(C)
(Phase 1) SEAMEO Borderless School (2011-2015)			
	Prof.Rozhan M. Idrus	Professor of ODL at USIM, ex-USM Distant Ed Prof.	As facilitator for LAMS workshops (2012) ^(C) , plenary speaker at CoSMEd and Review Editor for BL book.
	Prof. Fong Soon Fook	Professor in UMS, ex-Prof. in Sch of Education, USM	As seminar/colloquium (1 October 2014) speaker entitled ' <i>Enhancing Blended Learning (BL) with Interactive Learning Technology</i> ' ^(C)
	Dr. Soon Seng Thah	Deputy Dean, Faculty of Education and Languages, OUM; ex-Deputy Director, Educational Techology Division, MOE Malaysia.	As seminar/colloquium (3 October 2014) speaker entitled ' <i>Challenges and direction of Blended Learning (BL)</i> ' ^(C) and commentator of BL book publication.
	Dr. Mark Windale	Principal Lecturer in Science Education and Director of International Programme, Centre for Science Education, Sheffield Hallam University, UK	As online advisor for curriculum development of OER and ODL module; Chapter writer for Outdoor Learning Guide (OLG). ^(A) As speaker during the development of 'Southeast Asia Regional Standards for Science Teachers' (SEARS-ST)
	Prof Masami Isoda	Professor, Faculty of Human Science; Director of the Centre on International Cooperation in Educational Development (CRICED), University of Tsukuba, Japan	As online advisor ^(B) for SE4ALL (Coordinator for Crossborder Energy Efficiency Education) and CADRRED [http://www.criced.tsukuba.ac.jp/math/apec/apec2016/ as well as apec2014/ and apec2013/] [http://www.criced.tsukuba.ac.jp/en/]
	Prof.Lindsey Conner	Professor from New Zealand. Currently residing in Australia	As advisor and assoc. editor of OER adapted from Science across the World (SAW) curriculum. As speaker during the workshop to develop SEARS-ST ^(A)
	Mr. Sham-sulbahri Muhammad	MOE officer from Brunei Darussalam	As assoc. editor for development of OER adapted from 'Science across the World' (SAW) and SEARS-ST document considering SEAMEO's curriculum.

(continued)

No	Name	Designation/Organisation	Involvement in SEARCH for LeSMaT (Borderless) ^{(A)-(D)}
	Mr. See Sin Tion	MOE officer from Brunei Darussalam	As assoc. editor for OER from SAW curriculum and SEARS-ST adapting/considering SEAMEO's aspects.
	Mr. Mam Chansean	MOE officer from Cambodia	As assoc. editor for OER from 'Science across the World' (SAW) curriculum and SEARS-ST.
	Prof. Ismundar	Ex-SEAMEO QITEP Science director	As assoc. editor for OER from SAW curriculum and SEARS-ST adapting/considering SEAMEO's aspects.
	Mr. Kandi Do and Ms. Retzy	MOE officers from Indonesia, ex-SEAMEO QITEP in Science (SEAQIS) officers	As assoc. editor for OER from SAW curriculum and SEARS-ST adapting/considering SEAMEO's aspects.
	Mr. Rhenaldo Rhesky Nosyafri	SEAMEO Regional Open Learning Centre (SEAMOLEC)	As technical advisor for use of technological tools such as WebEx and Edmodo for Open and Distant Learning (ODL) ^(C)
	Mr. Dona Octanary	SEAMEO SEAMOLEC	As technical advisor for use of technological tools such as Edmodo and WebEx for ODL ^(C)
	Mr. Timbul Pardede	SEAMEO SEAMOLEC	As technical advisor for use of technological tools such as Edmodo and WebEx for ODL ^(C)
	Dr. Thongloon Vilaythong	MOE officer from Lao PDR	As assoc. editor for OER from 'Science across the World' (SAW) curriculum and SEARS-ST.
	Datin Dr. Ng Soo Boon	Deputy Director, Curriculum Development Division (CDD), MOE Malaysia.	As assoc. editor for OER curriculum; Review editor for BL book publication; As speaker for colloquium on "The development of MSTQS from SEARS-ST" (Dimension 1) and Co-editor for MSTQS from SEARS-ST.
	Mr. Azmi Harun	Science officer in CDD, MOE Malaysia	As assoc. editor for OER from SAW curriculum and MSTQS from SEARS-ST.
	Dr. Devadason Robert Peter	Ex-RECSAM's Acting Director and DD R&D from Malaysia	As assoc. editor for OER from 'Science across the World' (SAW) curriculum and MSTQS from SEARS-ST.
	Dr. Hazura Ab Bakar	Ex-RECSAM specialist in R&D from Malaysia	As assoc. editor for OER from 'Science across the World' (SAW) curriculum and SEARS-ST.
	Dr. Suhaidah Tahir	Ex-RECSAM's DD R&D from Malaysia	As assoc. editor for OER from 'Science across the World' (SAW) curriculum and MSTQS from SEARS-ST.
	Prof. Datuk T. Subahan Mohd. Meerah	Ex-Professor from Universiti Kebangsaan Malaysia (UKM), Malaysia.	As assoc. editor for OER from SAW curriculum and MSTQS from SEARS-ST. Speaker during the MSTQS from SEARS-ST workshop.
	Dr. Shirley Tay Siew Hong	Excellent Principal in secondary school, Sabah, MOE Malaysia.	As participant and assoc. editor during workshops for the development of OER from 1Bestari.net Frog VLE platform and from SAW curriculum.
	Mr. Kyaw Ahr Kar Nyunt	Chief Executive Officer (CEO), Core AI Sdn Bhd.	As assoc. editor and ICT advisor for OER from 'Science across the World' (SAW) curriculum and SEARS-ST.
	Dr. Luz E. Osmena	MOE officer from Philippines	As assoc. editor for OER from 'Science across the World' (SAW) curriculum and SEARS-ST.
	Mr. Dominador D. Mangao	Ex-RECSAM staff in TPD from Philippines	As assoc. editor for OER from 'Science across the World' (SAW) curriculum and SEARS-ST.
	Mr. Marmon Pargunsan	Ex-RECSAM staff in TPD from Philippines	As assoc. editor for OER from 'Science across the World' (SAW) curriculum and SEARS-ST.
	Dr. Kusalin Misukul	IPST officer from Thailand	As assoc. editor for OER from 'Science across the World' (SAW) curriculum and SEARS-ST.
	Dr. Duong Quang Ngoc	MOE officer from Vietnam	As assoc. editor for OER from 'Science across the World' (SAW) curriculum and SEARS-ST.

(continued)

No	Name	Designation/Organisation	Involvement in SEARCH for LeSMaT (Borderless) ^{(A)-(D)}
	Mr. Lee Tan Luck	Ex-UiTM senior lecturer, Johor, Malaysia	As co-writer of BL article and assoc. editor for OER from 'Science across the World' (SAW) curriculum.
	Ms. Rhea Febro	MSU-Iligan Institute of Technology (MSU-IIT), Mindanao, Philippines	As co-writer of BL article and assoc. editor for OER from 'Science across the World' (SAW) curriculum.
	Mr. Egbert Weisheit	Ex-lecturer and SAW National Coordinator, Germany	As co-writer of BL article and assoc. editor for OER from 'Science across the World' (SAW) curriculum.
	Dr. John Oversby	Ex-Lecturer and Honorary fellow/Research Assoc. Reading and Brunel Univ.; ASE council member; Investigator-Climate EU Network.	As advisor and assoc. editor during the development and editing of OER adapted from the curriculum of 'Science across the World' (SAW), an international project initiated by Assoc. of Sc. Ed (ASE). As Review editor for LeSMaT (Borderless) CADRRED module.
(Phase 2) SEAMEO LeSMaT (Borderless)(2015-present)			
	Dr. Suma Parahakaran	Consultant, Sathya Sai Academy and part-time tutor/module writer, WOU.	As speaker during SSYS 2014 forum topic " <i>Human factor during the impact of natural disaster: Reflective perspectives</i> " ^(A) and colloquium (CSF2/16) on " <i>Developing ODL modules and tools to promote ESD and values-based education: Experience with ODL institutions and international organisations</i> "; Group leader (TeleHeal); Chapter writer and Associate editor for BL book.
	Dr. Devadason Robert Peter	Senior Lecturer, IPGM Kampus Ipoh; ex-Acting director and DD R&D	As speaker for colloquium " <i>The development of MSTQS from SEARS-ST: How can this affect science teachers' performance to raise students' achievement in TIMSS and PISA?</i> " (Dimension 2) and " <i>Use of d-book to promote LeSMaT in the borderless world</i> " ^(C) (CSF2/16); Co-editor for MSTQS and Review and Co-editor for BL book publication.
	Dr. Woo Huay Lit	Advisor for 'curriculum and instruction' at Meridian Junior College Singapore.	As colloquium speaker entitled ' <i>Considering ID of BL in module writing</i> ' ^(C) ; Co-writer and Review editor of BL book; Assoc. editor for ODL module on SE4ALL.
	Mr. Lim Chee Leong	Assoc. Director of e-learning Academy (eLA), Taylor's University	As colloquium speaker entitled ' <i>Redesigning student-centred learning in the borderless world</i> ' ^(C) ; Review editor of BL book; Assoc. editor for CADRRED module.
	Assoc. Prof. Dr. Lay Yoon Fah	A.P. of science education at the Faculty of Psychology and Education (FPE), UMS, Sabah.	As forum speaker for " <i>The development of MSTQS from SEARS-ST: How can this affect science teachers' performance to raise students' achievement in TIMSS and PISA?</i> " (Dimension 3) ^(A) ; facilitator for 'SPSS and Smart PLS' workshop; Review editor of chapter and Co-editor for BL book publication; Assoc. editor for ODL module on CADRRED.
	Assoc. Prof. Dr. Nabilah Abdullah	A.P. at UiTM (University Teknologi Mara Malaysia)	As Chapter writer for ConWUR ^(A) ; Reviewer for BL book publication and ODL module on CADRRED.
	Assoc. Prof. Dr. Mageswary Karpudewan	A.P. at School of Educational Studies, Universiti Sains Malaysia (USM).	As content editor during the development of OER from SAW curriculum workshop; Review editor and Chapter writer for CADRRED ^(A) during LeSMaT curriculum editing workshop.

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No	Name	Designation/Organisation	Involvement in SEARCH for LeSMaT (Borderless) ^{(A)-(D)}
	Mr. Chin Chee Keong	Doctoral student at School of Biology, USM; Ex-lecturer IPGMTB.	As Chapter writer for ConWUR ^(A) and BL book publication; Review editor for MSTQS from SEARS-ST and ODL module on ConWUR.
	Mr. Tan Khan Aun	Ex-Mathematics Master Teacher from SMSTSSS	As Group Leader and Chapter writer for ConWUR ^(B)
	Ms. Nor Ruzaini Jailani	Senior Science Lecturer, IPG Kampus Ilmu Khas	As Group Leader for SE4ALL ^(A) ; Review Editor for BL book publication; Co-editor for OLG publication.
	Dr. Corrienna Abdul Talib	Senior Lecturer at Dept of Educational Science, Maths and Creative Multimedia, Univ. Teknologi Malaysia.	As LAMS coordinator and chapter co-writer for TeleHeal ^(A) ; Review Editor for BL book publication
	Dr. Sherlyne A. Acosta	Senior Specialist, Ed. Research Unit, Innotech	As Group Leader and Assoc. editor for ConWUR ^(D) ; Review Editor for BL book publication.
	Mr. Alan Loe Wai Lit	Deputy Director of e-learning/IT systems and service, Lee Kong Chian School of Medicine, NTU, Singapore.	As technical advisor and facilitator during the workshop introducing the use of ICT tool Learning Activity Management System (LAMS) in science/mathematics teaching and learning ^(C)
	Mr. Gary Tham Weng Nung	Education Technology Specialist, Macau, China; Ex-NTU specialist, S'gapore	As technical advisor and facilitator during the workshop introducing the use of ICT tool LAMS for Blended Learning (BL) ^(C)
	Mr. Ernie Ghiglione	Project Manager, LAMS foundation, Australia	As technical advisor and facilitator for the use of ICT tools such as LAMS for Blended Learning (BL) ^(C)
	Mr. Punang Amaripuja	HoD, Teaching & Learning Resources and Materials Development, SEAQIM	As online review editor for ODL module entitled 'Climate Awareness and Disaster Risk Reduction Education' (CADRRED) ^(B)
	Ms. Retzy Noer Azizah	Center for Development and Empowerment of Teachers and Education Personnel (CDETEP), ex-SEAQIS.	As online review editor for ODL module entitled 'Conservation and Wise Use of Resources' (ConWUR) ^(A)
	Ms. Hatthaya Siriphatthanakun	Specialist in Cultural Heritage Conservation, SEAMEO SPAFA	As online review editor for ODL module entitled 'Climate Awareness and Disaster Risk Reduction Education' (CADRRED) ^(D)
	Prof. Munirah Ghazali	Professor in Mathematics Education, Universiti Sains Malaysia (USM).	As advisor ^(B) and coordinator for RSEN organized Sustainable Lifestyle Carnival (28-29 November 2015) participated by LeSMaT (Borderless) as exhibitor.
	Prof. Lilia Halim	Professor of Science Education at Faculty of Education, Universiti Kebangsaan Malaysia.	As speaker ^(A) during the 10 th SSYS regional congress (7 th March 2016) forum on forum on 'Preparing young entrepreneurs for innovative invention meeting societal needs for sustainable living'.
	Dr. Daniel Loy	Director of the Centre of Learning and Innovation at PetroSains.	As speaker ^(D) during the 10 th SSYS regional congress (7 th March 2016) on forum as abovementioned.
	Dr. Awangku Hassan Bahar bin Pengiran Bagul	Director of Education for Sustainable Cities and Senior Lecturer at Faculty of Business, Economics and Accountancy, UMS.	As chief judge ^(C) for digital poster competition during 6 th CoSMEd 2015; speaker during the 10 th SSYS regional congress (7 th March 2016) forum as abovementioned; Online review editor for ConWUR.

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No	Name	Designation/Organisation	Involvement in SEARCH for LeSMaT (Borderless) ^{(A)-(D)}
	Mr. Shamir Jemain	Assistant Director, Co-curriculum Unit, Penang State Education Department	As officer from Ministry of Education (MOE) Malaysia who coordinate the approval letter granting permission for students' participation in co-curricular activities.
	Mr. Chang Jook Ee	Vice Principal and science educator from Chung Ling Butterworth (CLBW)	As coordinator for CLBW's participation as Borderless pilot school and being nominated as one of the 50x3 networking school. As review editor for ConWUR ^(A) .
	Prof. Santhiram R. Rahman	Dean, SELC (School of Education, Language and Communication), WOU	As advisor of ODL module development ^(D) at tertiary levels and commentator of BL book publication.
	AP. Dr. Goh Lay Huah	Associate professor in SELC, WOU	As Reviewer and Associate editor ^(C) in ICT content and language for Blended Learning (BL) book publication.
	Mr. Ong Cheng Teik	Senior Lecturer in SELC, WOU	As Associate editor for Outdoor Learning Guide (OLG) book publication, a reference resource for ConWUR ^(D) .
	Ms. Arathai a/p Din Eak	Lecturer in SELC, Wawasan Open University(WOU)	As Associate editor for ODL module on ConWUR ^(D) .
	Mr. Ooi Li Hsien	Lecturer in SELC, WOU	As Associate editor for BL book publication ^(D) .
	Ms. Tan Saw Fen	Lecturer in SELC, WOU	As Associate editor for BL book publication ^(B) .

Category of consultants' involvement in SEARCH for LeSMaT (Borderless)^{(A)-(D)}

(A) Science and Environmental Education

(B) Mathematics Education

(C) Technology-Enhanced Science/Mathematics/Social Science Education

(D) Life (Work/Survival/Entrepreneurship) Skills, Values education, Curriculum Development, Instructional Design, Language, Culture and Miscellaneous:

MASTER/EXPERIENCED SCIENCE/MATHEMATICS TEACHERS FROM PENANG STATE

No	Name of Teacher	Name of School
1.	Ms. Linda Toh (Science/Physics/ICT)	SMK Penang Free, Penang
2.	Mr. David Ch'ng Yeang Soon (Maths/ICT)	SMK Penang Free, Penang
3.	Ms.Boey Mei Li (Social Sc/Geography/ICT)	SMK(P) Sri Mutiara, Penang
4.	Ms. Sofiazan Mohd Yusof (Science/Bio)	SMK Agama Al Irshad Pokok Sena, Penang
5.	Ms. Loo Say Leng (Science/Bio)	SMJK Chung Hwa Confucian
6.	Dr. Hazura Ab Bakar (Science/Biology)	SMK Tun Syed Sheh Barakbah Sungai Bakap, 14200 Sungai Jawi, P.Pinang.
7.	Dr. Kong Sow Lai (Science/Chemistry)	SMK Sungai Ara, Penang
8.	Mr. Han Kaw Sey (Science/Biology)	SMK Teluk Bahang, Penang
9.	Mr. Wan Mohd Azam bin Wan Mohamad (Science/ICT/Frog VLE)	SK Minden Height, Penang
10.	Ms. Tang Shiau Cheng (Sc/Physics)	SMK Bagan Jaya, Butterworth
11.	Ms. Noorhafizah Rashid (Primary Sc)	SK Kampong Selamat, Penang.
12.	Ms. Ling Ah Hong (ICT/LAMS/Frog)	SMK Air Itam, Penang.
13.	Ms. Lim Yoon Khim (Primary Science)	SJK(C) Kwang Hwa, Penang
14.	Ms. Komala Devi (Science/Chemistry)	SMK Convent Butterworth, Penang.
15.	Ms. Danaletchumy (Science/Biology)	SMK(P) St. George, Penang
16.	Ms. Ng Lee Lee (Mathematics/Science)	SMK Convent Green Lane, Penang
17.	Mr. Lim Eng Guan (Physics)	SMJK Chung Ling Butterworth, Penang
18.	Ms. Beh Hooi Koon (Science)	SMK Convent Green Lane, Penang

19.	Ms. See Bee Khim (Science)	SMK Jelutong, Penang
20.	Ms. Habibha bt. Shaik Dawood (Science)	SK Convent Lebu Light
21.	Ms. Noor Sarfina (Science)	SM Teknik Tunku Abdul Rahman Putra, Penang.
22.	Ms. Norizan bt. Abu Bakar (Science)	SMK(P) St. George, Penang
23.	Mr. Heng Kiang Huat (Science)	SJK(C) Kong Min Satu, Penang
24.	Ms. Heng Boon Kee (Science) no Teleg	SMJK Heng Ee, Penang.
25.	Ms. Saraswathy Sinnasamy (Mathematics/Smart PLS)	SM Sains Tun Syed Sheh Shahabudin (SMSTSSS).
26.	Ms. Peggy Tan (Science/Smart PLS)	SJK(C) Sacred Heart, Penang.
27.	Mr. Lee Khiam Seng (Maths/Science)	SMJK Heng Ee, Penang.
28.	Ms. Vikaneswari (Science)	SMK Bukit Jambul, Penang.
29.	Mr. Mohd. Ab. Rahman b. Ibrahim (Primary Science)	SK Taman Selasih, Kedah
30.	Ms Savanee Sararaks (Science/Biology)	SMK Abdullah Munshi, Penang
31.	Ms. Nurun Najah bt Elias (Sc/Chemistry)	SMK Al-Mashoor (P), Penang

SCIENCE/MATHEMATICS/SOCIAL SCIENCE LECTURERS *(not mentioned above)*

No	Name of Lecturer	Name of Institution
1.	Dr. Parvinder Singh A/L Amar Singh (Science/Biology)	Science Department, IPG Kampus Pulau Pinang, Penang
2.	Dr. Chin Phoi Ching (Soc.Sc/Geography.Language)	Rni Department, IPG Kampus Pulau Pinang, Penang
3.	Ms. Hariton bt. Sharif (Sc/Biology)	Science Department, IPG Kampus Pulau Pinang

SEAMEO RECSAM SCIENCE/MATHEMATICS SPECIALISTS IN R&D AND TPD

No	Name of Specialist	Division
1.	Dr. Nur Jahan Ahmad	Research & Development (R&D)
2.	Dr. Ng Khar Thoe	Research & Development
3.	Mr. Julito C. Aligaen	Research & Development
4.	Dr. Hj. Mohd. Sazali Khalid	Research & Development
5.	Dr. Thien Lei Mee	Research & Development
6.	Mr. Dominador Dizon Mangao	Ex-R&D Division, DepEd, Philippines
7.	Ms. Khor Sim Suan	Training Programme Division (TPD)
8.	Mr. Pedro Lucis Montecillo	Training Programme Division
9.	Dr. Fazzlijan Mohd.bt. Mohamad Adnan Khan	Training Programme Division
10.	Ms. Teh Kim Hong	Training Programme Division
11.	Mr. Lee Shok Mee	Training Programme Division
12.	Mr. Hideo Nakano	Training Programme Division
13.	Mr. Yuji Otsuka	Training Programme Division

SEAMEO RECSAM SUPPORT STAFF

No	Name of Staff	Name of Division/Unit
1.	Ms Faridah Abdul Hamid	Personal Assistant to the Director, Office of the Centre Director
2.	Mr. Mohd. Faizal Zainoldin	ICT Manager, Publication Unit of Administration (Admin.) Division
3.	Ms. Wong Lai Cheng	Publication Manager, Publication Unit of Admin. Division
4.	Mr. Baharulnizam Baharum	Marketing Manager, Marketing Unit of Administration Division
5.	Ms Jenny Ong Lay Sim	Admin Assistant, Research & Development
6.	Ms Tiana Mohamad	Programme Officer, Research & Development
7.	Ms Ong Mei Yean	Research Officer, Research & Development

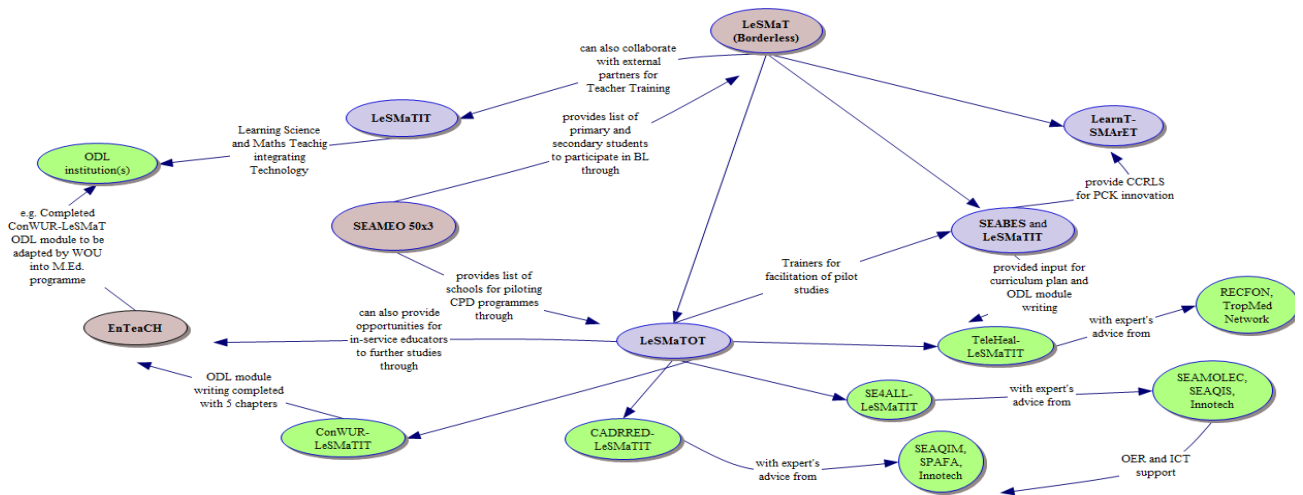


Figure A. Conceptual framework of LeSMaT (Borderless) and its offshooting projects.

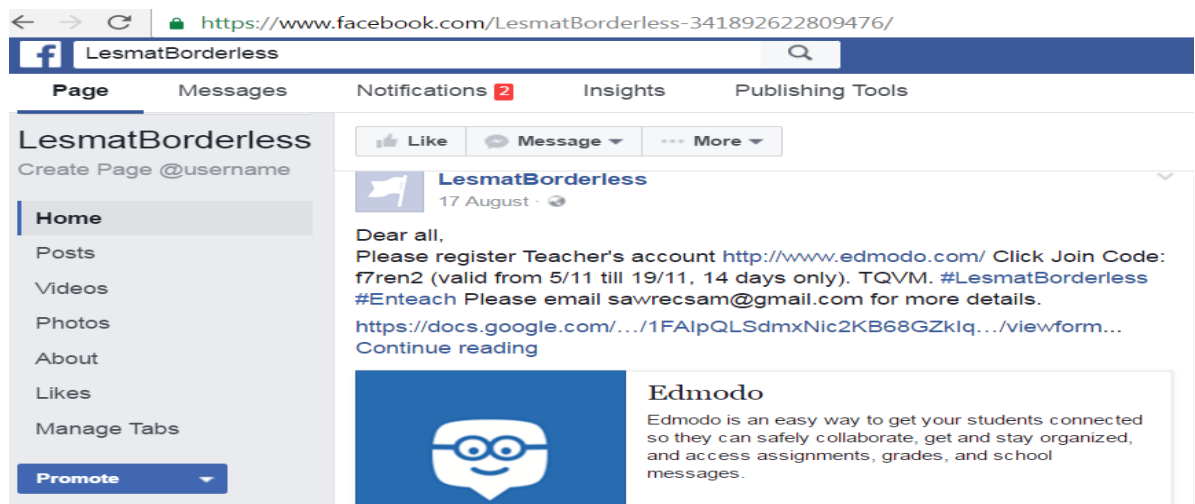


Figure B. One-stop link to disseminate information related to registration of Edmodo [<https://www.facebook.com/LesmatBorderless-341892622809476/>]

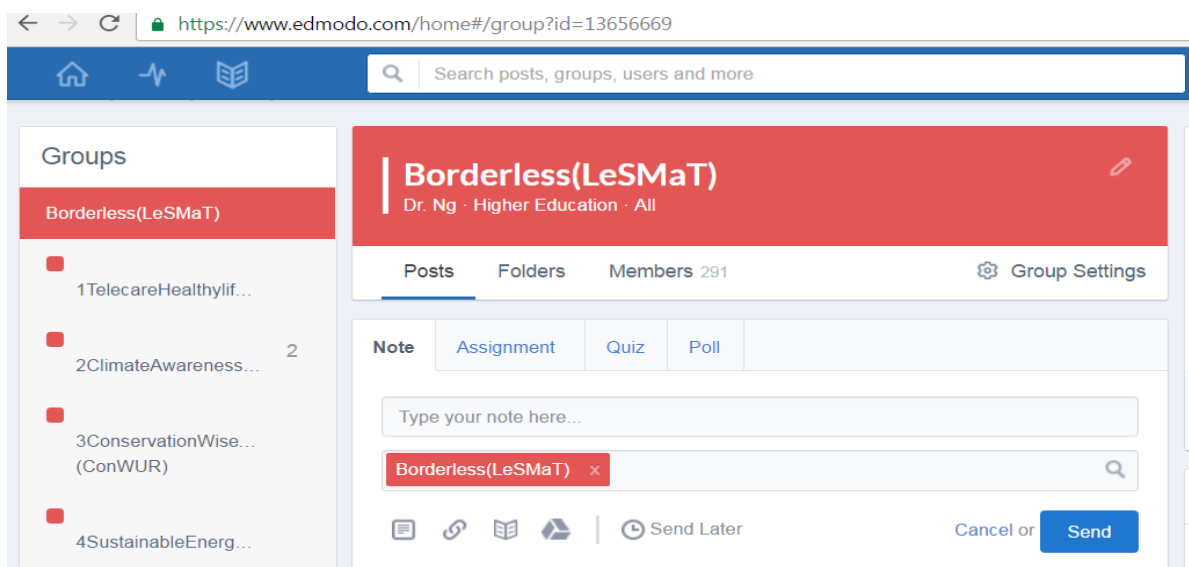


Figure C. Borderless (LeSMaT) and its subportals on Edmodo social learning platform [<https://www.edmodo.com/home#/group?id=13656669/>]



Figure D. 'Critical Success Factor' (CSF) workshop (25 November 2015)



Figure E. CSF workshop including LAMS workshop and colloquium (23-27 May 2016)

Figure F. Workshops on promoting blended learning activities in the borderless world using (1) Frog VLE platform (9 to 10 February 2015 at Malaysia Room) in collaboration with MOE Malaysia and FrogAsia; (2) Learning Activity Management System (LAMS) (11 February 2015 at R&D Division) in collaboration with IAMS Foundation Australia



Figure F. (A) 'Science across the World' (SAW) curriculum re-writing workshop (19-20 June) followed by 'Learning Activity Management System' (LAMS) colloquium (23 June), LAMS workshop (26 June) and Informal meeting with Prof. Dr. Rozhan M. Idrus (18 August); (B) SAW curriculum editing workshop (1-3 October) including Colloquium on (a) 'Enhancing blended learning with interactive learning technology' by Prof. Dr. Fong Soon Fook (1 October) and (b) 'Challenges and direction of blended learning' by Dr. Soon Sena Thah (3 October 2014).

Prepared by:
 Research & Development Division,
 SEAMEO RECSAM, Penang,
 Malaysia (9 November 2016)