ด่วนมาก

ที่ มท ๐๘๙๓.๒/ว ๒๓๗๕

กรมส่งเสริมการปกครองท้องถิ่น
ถนนนครราชสีมา กทม. ๑๐๓๐๐

๓ พฤศจิกายน ๒๕๕๘

เรื่อง   ทุนฝึกอบรมของศูนย์เรคแซม ประจำปี ๒๕๕๘ – ๒๕๕๙

เรียน   ผู้ว่าราชการจังหวัด ทุกจังหวัด

สิ่งที่ส่งมาด้วย   รายละเอียดหลักสูตรฝึกอบรม และแบบฟอร์มใบสมัครรับทุน   จำนวน ๑ ชุด

ด้วยสำนักงานปลัดกระทรวงศึกษาธิการแจ้งว่า ศูนย์ระดับภูมิภาคว่าด้วยการศึกษาวิทยาศาสตร์และคณิตศาสตร์ของซีมีโอ (ซีมีโอเรคแซม) เมืองปีนัง ประเทศมาเลเซีย จะดำเนินการจัดหลักสูตรฝึกอบรมประจำปี ๒๕๕๘ – ๒๕๕๙ ให้แก่ประเทศสมาชิกซีมีโอ รวม ๔ หลักสูตร ระหว่างวันที่ ๔ – ๒๙ เมษายน ๒๕๕๙ ดังนี้

๑. หลักสูตร RC-SS-140-1 : Inquiry-Based Learning in Secondary Science Education ผู้เข้าอบรมควรเป็นครูวิทยาศาสตร์ระดับมัธยมศึกษา หรือนักการศึกษาด้านวิทยาศาสตร์

๒. หลักสูตร RC-PM-140-2 : Mathematical Problem Solving in Real-World Situation for Primary Mathematics Classrooms ผู้เข้าอบรมควรเป็นครูคณิตศาสตร์ระดับประถมศึกษา หรือนักการศึกษาด้านคณิตศาสตร์

๓. หลักสูตร RC-SS-140-3 : Technology-Enhanced Learning (TEL) : Enhancing Secondary Science Teaching and Learning through Technology ผู้เข้าอบรมควรเป็นครูวิทยาศาสตร์ หรือผู้สอนด้านเทคโนโลยีสารสนเทศและการสื่อสารระดับมัธยมศึกษา หรือนักการศึกษาด้านวิทยาศาสตร์หรือเทคโนโลยีสารสนเทศและการสื่อสาร

๔. หลักสูตร RC-PM-140-4 : Meaningful Primary Mathematics Learning in the STEM Environment ผู้เข้าอบรมควรเป็นครูคณิตศาสตร์ระดับประถมศึกษา หรือนักการศึกษาด้านคณิตศาสตร์
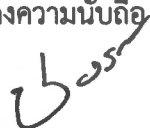
ในการนี้ สำนักงานปลัดกระทรวงศึกษาธิการได้ขอความร่วมมือกรมส่งเสริมการปกครองท้องถิ่นพิจารณาเสนอชื่อครูสังกัดองค์กรปกครองส่วนท้องถิ่นที่มีคุณสมบัติเหมาะสมสมัครขอรับทุนหลักสูตรละ ๒ คน โดยผู้สมัครจะต้องมีอายุไม่เกิน ๕๐ ปี มีสุขภาพแข็งแรง และมีความรู้ความสามารถด้านภาษาอังกฤษเป็นอย่างดี หากมีผลคะแนนสอบ IELTS เท่ากับ ๔.๕ หรือเทียบเท่า จะได้รับการพิจารณาเป็นพิเศษ สำหรับผู้สมัครที่ได้รับการคัดเลือกให้ได้รับทุนดังกล่าว ศูนย์เรคแซมจะรับผิดชอบค่าบัตรโดยสารเดินทางระหว่างประเทศ (ไป-กลับ ชั้นประหยัด) ค่าที่พัก และค่าอาหารระหว่างเข้ารับการฝึกอบรม

/กรมส่งเสริม...

    กรมส่งเสริมการปกครองท้องถิ่นจึงขอความร่วมมือจังหวัดแจ้งองค์กรปกครองส่วนท้องถิ่น
ที่จัดการศึกษาประชาสัมพันธ์ทุนฝึกอบรมของศูนย์เรคแซม ประจำปี ๒๕๕๘ – ๒๕๕๙ ให้ครูในสังกัดทราบ
และสมัครขอรับทุนดังกล่าว ทั้งนี้ ให้ผู้ประสงค์สมัครขอรับทุนจัดส่งใบสมัครและสำเนาใบสมัคร รวมจำนวน ๕ ชุด
ไปยัง กรมส่งเสริมการปกครองท้องถิ่น ภายในวันที่ ๑๗ พฤศจิกายน ๒๕๕๘ เพื่อกรมส่งเสริมการปกครองท้องถิ่น
จะได้ดำเนินการพิจารณาคัดเลือกผู้สมัครรับทุนที่มีคุณสมบัติเหมาะสมหลักสูตรละ ๒ คน เสนอให้สำนักความสัมพันธ์
ต่างประเทศ สำนักงานปลัดกระทรวงศึกษาธิการ ภายในวันที่ ๒๐ พฤศจิกายน ๒๕๕๘ สำหรับกำหนดการ
สอบข้อเขียนและการสอบสัมภาษณ์ผู้สมัครรับทุน สำนักความสัมพันธ์ต่างประเทศ สำนักงานปลัดกระทรวง
ศึกษาธิการ จะแจ้งให้ทราบในภายหลัง

    จึงเรียนมาเพื่อโปรดพิจารณาดำเนินการต่อไป

<div align="center">
ขอแสดงความนับถือ
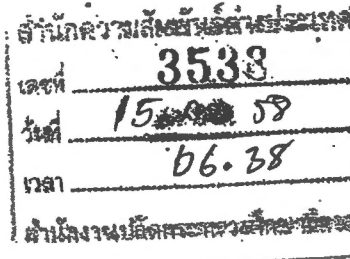
(นายชัยวัฒน์ ชื่นโกสุม)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมส่งเสริมการปกครองท้องถิ่น
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สำนักประสานและพัฒนาการจัดการศึกษาท้องถิ่น
ส่วนวิชาการและมาตรฐานการศึกษาท้องถิ่น
โทร. ๐ ๒๒๔๑ ๙๐๐๐ ต่อ ๕๓๔๙
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Southeast Asian Ministers of Education Organization
Regional Centre for Education in Science and Mathematics

Our Ref: RCP/GEN/157/V.22(210)
Date: 8 September 2015

Assoc. Prof. Kamjorn Tatiyakavee M.D.
Permanent Secretary
Ministry of Education
Rajdamnern Nok Avenue
Dusit, Bangkok 10300
THAILAND

Dear Sir/Madam,

REGULAR COURSES OFFERED BY SEAMEO RECSAM FOR FISCAL YEAR 2015/2016 (4 – 29 APRIL 2016)

We are honored to inform you that SEAMEO RECSAM will be offering courses for senior educators and teacher trainers to SEAMEO member countries. Attached herewith are the information and condition that will assist the various Ministries of Education in their selection of nominees to attend RECSAM Regular Courses.

2.0 NOMINATION OF PARTICIPANTS

2.1   Please send the list of Nominees, Participants' Application Forms and Scholarship Agreements for the courses as stipulated in the following table. It is much appreciated if the Ministries of Education could cooperate to meet with the deadlines suggested (**27 November 2015**). The participants may be nominated to the courses according to the allocations as stated below:

Title of Courses	No. of Scholarships offered per country	Deadline for documents to reach RECSAM
RC-SS-140-1: Inquiry-Based Learning in Secondary Science Education	2	27 November 2015
RC-PM-140-2: Mathematical Problem Solving in Real-World Situation for Primary Mathematics Classrooms	2	27 November 2015
RC-SS-140-3: Technology-Enhanced Learning (TEL): Enhancing Secondary Science Teaching and Learning through Technology	1	27 November 2015
RC-PM-140-4: Meaningful Primary Mathematics Learning in the STEM Environment	2	27 November 2015

Member Countries are welcome to send fee-paying participants for the above courses (see item 5.0 for conditions). Applications for places could be made earlier through telephone call or e-mail at director@recsam.edu.my followed by an official letter to Director, SEAMEO RECSAM, Jalan Sultan Azlan Shah, 11700 Gelugor, Penang, Malaysia.

2.2 The qualifications required for the course participants are described in the annexures of the different courses. **Please follow the required qualifications as strictly as possible in your selection** of participants for the respective courses. This is to ensure active participation during the course and to allow participants to derive full benefit from the courses. In addition, to enhance the impact of these courses it is suggested that the nominated participants are key personnel who are/will be likely to effect considerable multiplier effects upon their return to their respective positions.

2.3 The nominated participants must be in good health both physically, mentally and certified medically fit in order to complete the course (Applicants must submit his/her **medical certificate** together with the application form).

2.4 Nominations would normally be considered only upon receipt of the duly completed application forms of the nominees. Please notify RECSAM soonest possible if your country is unable to fill the number of the scholarships specified. The vacant places may be offered to other member countries with due notice.

2.5 Applicants should also submit a photocopy of the front page of their passports with their particulars clearly printed. Applicants who do not have a passport at the time of application will need to submit the documents **two weeks** after notification of acceptance.

2.6 **Attention**. Application forms are to be completed in duplicates by each candidate. Kindly reproduce more copies of the forms if necessary. Completed application forms and scholar agreement, medical report, photocopy of international passport and other relevant documents of the nominated candidates must sent to RECSAM before the deadline given (see table). If this is not possible, then a list of the names of potential candidates with the certified copy of their qualifications in Science/Mathematics must be sent in advance to RECSAM. All member countries are expected to NOMINATE AT LEAST THREE NAMES as candidates for each course. RECSAM will select two candidates from these nominees for courses RC-SS-140-1, RC-PM-140-2 and RC-PM-140-4, and one candidate from these nominees for course RC-SS-140-3. If any of the candidate's qualification does not meet the requirements stated, RECSAM has the right to reject that particular candidate and the scholarship be given to candidate and the scholarship be given to candidates from other member countries.

3.0 COURSE INFORMATION

3.1 Details of the Courses
Please refer to attached booklet on course descriptions.

3.2 Compulsory Requirement
All participants must have a good working knowledge of spoken and written English in order to get the maximum benefit out of the courses. **A certified copy of their proficiency in English must be attached with the participants' form.**

4.0 GENERAL INFORMATION

4.1 Air Travel and Personal Accident Insurance
Participants should secure their own air-travel and personal insurance themselves throughout the duration of the course. RECSAM will not be responsible for taking insurance to cover air-travel and personal insurance accidents. **No responsibility for any form of insurance or any other expenses such as passport fee, visa fee, exit fee, airport tax, insurance premium, etc. will be assumed by RECSAM, SEAMEO Secretariat or the Government of Malaysia.**

4.2   Health and Age Limit

The nominated participant must be in excellent health and should **not be more than 50 years of age.**

4.3   Expectant Mothers

Because of the intensive nature of the training programme, it may not be advisable for female participants who are in the family to attend these courses. Moreover, most airlines generally do not accept passengers who are in an advanced stage of pregnancy, normally around 7 months and above. As such, nominating Ministries should ensure that participants will not face this problem particularly on their homeward journey. RECSAM reserves the right to terminate the training programme of any participant who likely to face such a problem. However, the termination procedure will, as usual, be made in consultation with the nominating Ministry.

4.4   Terms of Scholarships

Participants from SEAMEO countries on SEAMEO Scholarships will be provided with:

i)   Economy class air-ticket **from capital city** International Airport from participant's work station to Penang and back (excluding any air-travel tax). As soon as nominations are received and accepted by RECSAM Office, airline tickets will be dispatched to the respective Ministries of Education unless otherwise requested by the Ministries of Education to be sent to the nearest city where the participants live. If, for any reasons whatsoever, the Centre wishes to alter these terms and conditions in any way, we reserve the right to do so entirely at our discretion. Any alterations, amendments or additions to these terms and condition of service shall be advised to you in writing.

ii)   Food and accommodation on twin-sharing basis are provided at RECSAM International House for the duration of the course.

Attention: Any fee incurred by a participant due to last minute cancellation of ticket or replacement of participant, after the ticket is issued, **should be borne** by the **Ministry of Education of that nominating country**. SEAMEO RECSAM will not take on the responsibility for such penalty charge or extra charge of any kind pertaining to the above.

4.5   Each participant is requested to complete and sign 3 copies of the "SEAMEO RECSAM Scholar Agreement" Forms. Kindly reproduce more copies of the agreement if necessary. Two fully completed copies are to be returned following the date as specified in 2.1 and one copy to be kept by the Ministries of Education for reference.

4.6   Accommodation, Food and Attire

Participants will be accommodated at RECSAM International House and food will be provided at RECSAM Cafeteria. On occasions when meals are not catered for, food allowance will be given. The rooms are of double occupancy with bathroom attached. RECSAM has the right to allocate room-mates to the participants. All participants are expected to be **formally dressed for classes** – no T shirts and jeans during class sessions. Participants should also wear **proper attire while travelling to Malaysia and back.**

4.7   Early Issue of Exit Permits and Entry Visas to Malaysia

It is requested that the following be done as early as possible:

i.   **Exit permit** for nominated participants (except for Malaysians and Singaporeans) must be obtained from their own Government, and

ii.   **Entry visa** for nominated participants (except for Malaysians, Singaporeans and Bruneians) into Malaysia must be obtained from the Malaysian Embassy in the participants' own country. The visa should be a minimum of 6 weeks to cover the 4 week period of the course, with multiple entries for the participants, should they require to go back in case of emergencies.

RECSAM will send the participants a letter of offer to help expedite the visa application process when we receive the participants' names from the Ministries of Education.

4.8   *National Costume for Closing Ceremony*
It is requested that each participant from the various member countries bring along with him/her the **country's national costume to be worn during the Closing Ceremony.**

4.9   *Cultural Performance*
It is a normal practice in RECSAM that at the end of every batch of courses, there will be a cultural performance held after the closing ceremony and certificate presentation. Participants from different SEAMEO countries are expected to give a cultural presentation (eg. Dance, drama, and the like) that depicts the culture of their countries. It would certainly be very helpful if they could come prepared with the necessary items such as costumes, musical instruments, etc. related to their culture.

4.10   *Gifts Exchange*
Before the participants leave for their home countries, there will usually be the exchanging of souvenirs and gifts among participants. It is advisable that the participants bring along souvenirs for this purpose.

5.0   PARTICIPANTS FROM MEMBER COUNTRIES ON FEE-PAYING BASIS
The following are the conditions for participants from Member Countries on fee-paying basis:

i.   They will also abide by the stipulations of the RECSAM Scholar Agreement and follow the requirements of the programme;
ii.   They are physically fit and meet the necessary qualifications to attend the course;
iii.   They pay a minimum course fee which does not cover airfare, medical expenses, insurance, and extension of visa fees. (For further enquiries, kindly write to Director, SEAMEO RECSAM, Jalan Sultan Azlan Shah, 11700 Gelugor, Penang, Malaysia, or email director@recsam.edu.my; Fax: +604-6522737 or + 604-6522742).

Thank you.

Yours sincerely,

Dr. HJ. MOHD JOHAN BIN ZAKARIA
Centre Director
SEAMEO RECSAM

Copies to:
Chairman & Members of RECSAM Governing Board
SEAMEO Affairs Officers, Ministries of Education, SEAMEO Member Countries.
Director, SEAMEO Secretariat, Bangkok 10110, Thailand

* Enclosed please find the following documents for your kind perusal and action:
i.   Application form
ii.   Course description for fiscal year 2015/2016
iii.   Checklist for the documents to be submitted to SEAMEO RECSAM by each participants

COURSE DESCRIPTION

REGULAR COURSES FOR FISCAL YEAR 2015/2016

4 – 29 April 2016

COURSE CODE	COURSE TITLE
RC-SS-140-1	INQUIRY-BASED LEARNING IN SECONDARY SCIENCE EDUCATION
RC-PM-140-2	MATHEMATICAL PROBLEM SOLVING IN REAL-WORLD SITUATION FOR PRIMARY MATHEMATICS CLASSROOMS
RC-SS-140-3	TECHNOLOGY-ENHANCED LEARNING (TEL): ENHANCING SECONDARY SCIENCE TEACHING AND LEARNING THROUGH TECHNOLOGY
RC-PM-140-4	MEANINGFUL PRIMARY MATHEMATICS LEARNING IN THE STEM ENVIRONMENT

SOUTHEAST ASIAN MINISTERS OF EDUCATION ORGANISATION
REGIONAL CENTRE FOR EDUCATION IN SCIENCE AND MATHEMATICS
Jalan Sultan Azlan Shah, 11700 Gelugor, Penang, Malaysia
Telephone: 604-6522700
Fax: 604-6522737
Website: http://www.recsam.edu.my/

REGULAR COURSES FOR FISCAL YEAR 2015/2016

4 – 29 April 2016

Course Code	Course Title	No. of Scholarships Offered Per Country	Deadline for Documents to Reach RECSAM
RC-SS-140-1	Inquiry-Based Learning in Secondary Science Education	2	27 November 2015
RC-PM-140-2	Mathematical Problem Solving in Real-World Situation for Primary Mathematics Classrooms	2	27 November 2015
RC-SS-140-3	Technology-Enhanced Learning (TEL): Enhancing Secondary Science Teaching and Learning through Technology	1	27 November 2015
RC-PM-140-4	Meaningful Primary Mathematics Learning in the STEM Environment	2	27 November 2015

Level
P: Primary
S: Secondary

Subject
S: Science
M: Mathematics

Course Code: RC-SS-140-1

Course Title: INQUIRY-BASED LEARNING IN SECONDARY SCIENCE EDUCATION

Rationale:

Science educators are confronted with great challenge and responsibility especially in making students learn. A considerable number of students are not motivated towards science learning hence the low academic achievement. There is a need to re-orient the way science teaching and learning is done. Inquiry-based science education (IBSE) is one of the effective researched-proven teaching and learning approach. It is an innovative educational method which has strong motivational impact on students and teachers (Trna, 2014). Also, it emphasizes the development of higher-order cognitive skills that have been identified as critical for the development of scientific thinking (Hughes, 2014). As such, students generally do not learn by memorizing the facts but instead it is about working with living things, observing natural phenomena, formulating investigable questions, giving explanation with evidence and providing suitable solutions to explain observed phenomenon and address questions and problems. Thoron and Burleson (2014) confirmed the work of Gibson and Chase (2002) that students who learn science using an inquiry approach score higher on science achievement tests, have improved science process skills, and have more positive attitudes towards science.

Objectives:

The main objectives of this course are to provide the participants with necessary knowledge and skills required to carry out inquiry-based learning in science.

At the end of the course, participants should be able to:
1   acquire knowledge and philosophy of carrying-out inquiry-based science learning;
2   use research-based innovative inquiry-based learning approaches;
3   adopt current teaching skills necessary to enhance students' learning and interest in science through inquiry-based learning;
4   identify various entities that can support inquiry-based learning; and
5   collaboratively plan, design and implement inquiry-based science lesson.

Course Contents:

This course highlights the exemplary pedagogy and good classroom practices. Participants will have the opportunity to actively immerse into the philosophy of inquiry-based science education. Participants are encouraged to participate actively in the intellectual discourse and collaboration in designing and carrying-out an inquiry-based lesson. Furthermore, it will provide a platform for the participants to practice good global citizenship in learning together with fellow Southeast Asian citizens.

The major areas Include:
1.   Fundamentals of Science Inquiry
    1.1   What is Inquiry-based Science Education
    1.2   Hands-on Science Learning: Inquiry versus Non-Inquiry.
    1.3   Science Process Skills
    1.4   Formulating Investigable Questions

Duration: Four Weeks

Participants: Science Educators or Key Secondary Science Teachers

English Proficiency: Minimum IELTS Band of 4.5 or Equivalent

Expected Output: 1.   Group Project Work Report
                      2.   Individual Multiplier Effect Action Plan

References:

Hughes, P. W. (2014). *Teaching Scientific Inquiry: Inquiry-based Training for Biology Graduate Teaching Assistants Improves Undergraduate Learning Outcomes.* Toronto:Higher Education Quality Council of Ontario.

Thoron, A. C. & Burleson, S. E. (2014). Students' Perceptions of Agriscience When Taught through Inquiry-based Instruction. *Journal of Agricultural Education,* 55 (1), 66-75.

Trna, J. (2014). IBSE and Gifted Students. *Science Education International,* 25 (1), 29-39.

Course Code: RC-PM-140-2

Course Title: MATHEMATICAL PROBLEM SOLVING IN REAL-WORLD SITUATION FOR PRIMARY MATHEMATICS CLASSROOMS

Rationale:

Problem solving is the heart of mathematics. It is an activity where students are given the opportunities to do mathematics: to construct, conjecture, explore, test, and verify (Lester, Masingila, Mau, Lambdin, Santon, & Raymond, 1994). It has a long history in the teaching and learning of mathematics. It is also an instructional approach, which provides a context for students to learn and apply mathematics in the real-world situation.

A student's mathematical education is simply not complete if that student has not experienced the usefulness of mathematics in the real world. This experience comes through real-world problem solving. This course focuses on teaching and learning mathematics through problem solving in the real-world context and enquiry-oriented environment which are characterised by the teacher who facilitates students to construct a deep understanding of mathematics ideas and processes by engaging them mathematically in real-world situations.

Objectives:

The main objectives of this course are to provide the participants with the necessary knowledge and skills required to carry out problem solving in the real-world context and enquiry-oriented environment in the learning of mathematics.

At the end of the course, participants should be able to:

1. acquire basic knowledge and philosophy of carrying out mathematical problem solving in real-world situations during the process of learningmathematics;
2. use creative and innovative problem solving strategies;
3. adopt current teaching skills necessary to enhance students' learning and interest in mathematics through problem solving in real-world situation;
4. develop skills to utilise problem solving strategies and approaches necessary to create mathematics lesson that promote and enhance mathematics learning using real-world situation;
5. assess the learning of mathematics; and
6. collaboratively plan, design and implement problem solving in the real-world context and enquiry-oriented environment lesson.

Course Contents:

This course highlights exemplary problem solving strategies and approaches, and effective classroom practices. It is activity-oriented and participants are encouraged to engage actively in initiating activities that facilitate discussions, sharing of experiences, demonstrations, designing and carrying out a problem solving inquiry-based lesson. Furthermore, it provides a platform for the participants to practice good global citizenship in learning together with fellow Southeast Asian teacher educators.

The major areas include:
1   Fundamentals of Problem Solving in Mathematics Education
       1.1   Nature and Basics of Mathematics Education

1.2 Problem Solving, Real-World Context and Enquiry-oriented Environment
1.3 Sustainable and Life-long Learning
1.4 Learner-centred Learning
2 Strategies and Approaches to Enhance and Promote Mathematics Learning Utilising Real-World Context
2.1 Problem Solving
2.2 Structured Problem Solving and the Management of the Blackboard (Bansho)
2.3 Model and Heuristics approaches
2.4 Problem-based Learning (PBL4C)
2.5 Realistic Mathematics Education
2.6 Questioning Techniques and Facilitation
3 Assessment for Mathematics Learning
3.1 Assessment for Learning
3.2 Observation Skills
3.3 Instruments and Techniques of Assessment for Learning
4 Theory into Practice
4.1 Planning, Designing, Implementing and Improving Lessons Plans and Strategies with Emphasis on Promoting and Enhancing Mathematical Thinking using the Lesson Quality Improvement Processes.

Duration: Four Weeks

Participants: Mathematics Educators or Key Primary Mathematics Teachers

English Proficiency: Minimum IELTS Band of 4.5 or Equivalent

Expected Output:
1. Group Project Work Report
2. Individual Multiplier Effect Action Plan

References:

Lester, F.K.Jr., Masingila, J.O., Mau, S.T., Lambdin, D.V., dos Santon, V.M. and Raymond, A.M. (1994). 'Learning how to teach via problem solving'. InAichele, D. and Coxford, A. (Eds.) *Professional Development for Teachers of Mathematics*, pp. 152-166. Reston, Virginia: NCTM.

Course Code: RC-SS-140-3

Course Title: TECHNOLOGY-ENHANCED LEARNING (TEL): ENHANCING SECONDARY SCIENCE TEACHING AND LEARNING THROUGH TECHNOLOGY

Rationale:

For the last two decades digital technologies have become inseparable from development and research in the science education. However, it has not been fully integrated into the field of teaching and learning of science. "Billions of dollars have been invested to equip schools with educational technological tools, yet the vast majority of the teachers do not use technology in meaningful ways in their instruction (Guzey&Roehrig, 2012, p.162)". There is a potential for supporting and enabling learning through exploring the use of animations, simulations and games of scientific phenomena. Therefore, technology-enhanced learning (TEL) should be maximised to improve the hands-on and minds-on activities in science classrooms.

The TEL, which is organized around the types of learning technologies to make science learning authentic and to provide the tools to sustain engaged participation in making sense of the real world. There is a growing importance of technological applications that will improve the students' understanding of teaching and learning of science contents. There is a need to understand various strategies and effective learning approaches to implement learning technologies. TEL complements well with constructivist teaching approaches and assessment for developing higher order thinking skills (HOTS).

Objectives:

The main objective of this course is to provide participants opportunities to use technology to enhance science pedagogical content knowledge and skills.

At the end of the course, participants should be able to:
1   acquire basic knowledge on types of TEL;
2   develop skills in using TEL applications and tools to improve teaching and learning in secondary science;
3   adopt strategies such as project-based learning, active learning, life-long learning for enhancing effective teaching and learning of secondary science; and
4   collaboratively plan, design, implement, and make conclusion of a secondary TEL lesson study.

Course Contents:

This course emphasizes a good learning of theory with reflective classroom practices based on TEL. The knowledge and skills acquired would enable participants to initiate TEL for improving secondary science classroom practices in their respective schools.

The major areas include:
1   Type of Technology-enhanced Learning
    1.1   E-Learning
    1.2   Blended Learning
    1.3   Mobile Learning
    1.4   Web-based Learning
    1.5   Game-based Learning

2   Applications that Support Technology-enhanced Learning
        2.1   Animations
        2.2   Simulations
        2.3   Digital Games
        2.4   Videos
3   Tools for Technology-enhanced Learning
        3.1   Non-digital Games
        3.2   Digital Games
4   Strategic Approaches for TEL
        4.1   Project-based Learning
        4.2   Active Learning
        4.3   Problem-based Learning
5   Science Education
        5.1   Issues and Trend in Secondary Science Education
        5.2   Selected Strategies/Approaches in Teaching and Learning of Science
        5.3   Technology-based Assessment (e.g. Google Docs, Clickers, Hot Potatoes)

Duration: Four Weeks

Participants: Science/ICT Educators or Key Secondary Science/ICT teachers

English proficiency: Minimum IELTS band of 4.5 or equivalent

Expected output: 1.   Project Work Report
                        2.   Multiplier Effect Action Plan

References:

Allen, B., (2007). *Blended learning: tools for teaching and training.* London: Facet Publishing.

Becker, K., Kehoe, J. &Tennent, B. (2007). Impact of personalised learning styles on online delivery and assessment. *CampusWide Information Systems, 24*(2), 105-119.

Campbell, T., Wang, S. K., Hsu, H. Y., Duffy, A. M., & Wolf, P. G. (2010). Learning with web tools, simulations, and other technologies in science classrooms. *Journal of Science Educational Technology, 19,* 505-511.

Cooper, S. (2010). Predicting protein structures with a multiplayer online game. *Nature, 466,* 756-60.

Divaharan, S., & Lim, C. P. (2010). Secondary school socio-cultural context influencing ICT integration: A case study approach. *Australasian Journal of Educational Technology, 26*(6), 741-763.

Guzey, S. S., &Roehrig, G. H. (2012). Integrating educational technology into the secondary science teaching. *Contemporary Issues in Technology and Teacher Education, 12*(2), 162-183.

Hartley, J. (2007). Teaching, learning and new technology: A review for teachers. *British Journal of Educational Technology, 38*(1), 42-62.

Course Code: RC-PM-140-4

Course Title: MEANINGFUL PRIMARY MATHEMATICS LEARNING IN THE STEM ENVIRONMENT

Rationale:

In this 21st century, scientific and technological innovations have become increasingly important as we face the benefits and challenges of both globalisation and a knowledge-based economy. To succeed in this new information-based and highly technological society, students need to develop their capabilities in Science, Technology, Engineering and Mathematics (STEM) to levels much beyond what was considered acceptable in the past." (National Academies of Science, 2007). STEM is multidiscipline-based, incorporating the integration of other disciplinary knowledge into a new whole. STEM education is a process for teaching and learning that offers students opportunities to make sense of the world and take charge of their learning, rather than learning isolated bits and pieces of content. In the STEM environment, there is an emphasis on activities that allow students to engage in real-world problems and experiences through context-based, problem-based, enquiry-based learning activities that lead to higher order thinking. The role of STEM cannot be underestimated in preparing students for the challenges of the future. Innovation is the key to economic growth and STEM is the key driver of innovation. A STEM education provides foundations to acquire further skills as students make their lifetime transitions to the labour market.

In this course, mathematics education is intertwined with the other three areas. These areas are focussed together not only because the skills and knowledge in each discipline are essential for student's success, but also because these fields are deeply intertwined in the real world and in how students learn most effectively. The participants are guided and experience instructional models which require students to be actively engaged in cooperative environments where their instructors help facilitate creativity and inquiry learning. They are encouraged to engage in discourse, shaping arguments, solving problems, experimenting, designing, creating, and gathering supporting evidence. They will also construct a learning environment to provide students opportunity to experience discussion, debate, discovery, creation, and innovation.

Objectives:

The main objective of this course is to develop participants' knowledge and skills in the teaching of mathematics in STEM education specifically to support students learning of mathematics in a multidisciplinary environment and engage them in real-world problems and experiences.

At the end of the course, participants should be able to:
1. understand mathematics as the language in STEM education;
2. provide appropriate contexts to help students integrate mathematics and other subjects;
3. develop student thinking and problem solving;
4. integrate real-world issues ;
5. use assessment to inform learning; and
6. collaboratively plan, design, implement, analyse and make conclusion of a quality mathematics lesson plan.

Course Contents:

This course is activity-oriented and participants will have to engage actively in initiating activities that facilitate discussions, sharing of experiences, demonstrations, planning and developing lessons in integrating mathematics in STEM education.

The major areas include:
1   Trends and Issues in Mathematics Education
    1.1   STEM Education as a Multidisciplinary Approach to Learning
    1.2   Mathematics in STEM Education
    1.3   Key Elements of Good STEM Practice
    1.4   Key Obstacles Hindering Cross-curricular Teaching and Learning
2   Strategies and Approaches to Promote Learning of Mathematics in a Multidisciplinary Environment
    2.1   Problem Solving
    2.2   Contextual Learning
    2.3   Problem-based Learning (PBL4C)
    2.4   Project-based Learning
    2.5   Questioning Techniques and Facilitation
3   Technology as Fundamental Part of Learning
    3.1   Flexible Learning
    3.2   Dynamic Mathematics Software
4   Assessment for Mathematics Learning in STEM Education
    4.1   Assessment for Learning
    4.2   Observation Skills
    4.3   Instruments and Techniques of Assessment for Learning
5   Planning, Designing, Implementing and Improving Lesson Plans and Strategies with Emphasis on Mathematics in STEM Environment using the Lesson Quality Improvement Processes.

Duration: Four Weeks

Participants: Mathematics Educators or Key Primary Mathematics Teachers

English Proficiency: Minimum IELTS Band of 4.5 or Equivalent

Expected Output: 1.   Group Project Work Report
                   2.   Individual Multiplier Effect Action Plan

References:
National Academies of Science. (2007). *Rising above the gathering storm. Report from the Committee on Prospering in the Global Economy of the 21st Century.* Washington, DC: National Academics Press.

รายละเอียดเกี่ยวกับผู้สมัครรับทุนเรคแชม

ชื่อหลักสูตร _____

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1. ชื่อและนามสกุล _____
   Name _____
   วุฒิ _____
2. วิชาเอก _____ วิชาโท _____
3. วันเดือนปีเกิด _____ อายุ _____ ปี อายุราชการ _____ ปี
4. ตำแหน่งและที่ทำงานปัจจุบันพร้อมหมายเลขโทรศัพท์ (เขียนให้ละเอียดและชัดเจน)

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   ที่อยู่โรงเรียน _____
   โทรศัพท์ _____ โทรสาร _____ E-mail _____
5. ความรู้ภาษาอังกฤษ ☐ ดี ☐ ปานกลาง ☐ พอใช้
6. ความรู้ภาษาอื่น ๆ ☐ จีน ☐ ญี่ปุ่น ☐ อื่น ๆ โปรดระบุ _____
7. ความรู้ด้านคอมพิวเตอร์ ☐ ดี ☐ ปานกลาง ☐ พอใช้
8. ประสบการณ์และพื้นความรู้ทางด้านภาษาที่เกี่ยวข้องกับหลักสูตรการอบรมที่เสนอขอรับทุน

   8.1 _____
   8.2 _____
   8.3 _____
   8.4 _____
   8.5 _____
   8.6 _____
   8.7 _____
   8.8 _____
9. เคยเดินทางไปศึกษา/ฝึกอบรม/ ดูงาน/ประชุม/สัมมนาต่างประเทศหรือไม่

   ☐ เคย ☐ ไม่เคย

   (ถ้าเคยให้แจ้งด้วยว่า เคยไปศึกษา/ฝึกอบรม/ ดูงาน/ประชุม/สัมมนาในเรื่องใด ที่ไหน และเมื่อไร)

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10. หน้าที่การงานปัจจุบัน

    10.1 การสอนหรือการนิเทศ _____

    10.2 งานพิเศษ _____

    10.3 งานอื่น ๆ _____

11. เหตุผลที่ประสงค์จะไปอบรมที่ศูนย์เรคแซม _____

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12. งานที่จะทำเมื่อกลับจากการอบรมแล้ว (หากได้รับทุน)

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13. ข้าพเจ้าขอรับรองว่า ข้อความดังกล่าวข้างต้นถูกต้อง และเป็นความจริง

                    ผู้สมัครลงนาม _____

                    ผู้บังคับบัญชา _____

                    ตำแหน่ง _____