Event
The 11th SEAQIS Governing Board Meeting

Article
Learning Science at Home Science - Our Life, Our Future

Research Paper
The Learning Activity of Scientific Imagineering through Social Media in Order to Enhance Competencies for Learners

SCIENCE LEARNING AT HOME
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Dear readers,

It’s been seven months we are in the pandemic situation, and it is not getting better now. This situation forced us to come up with initiatives to keep the teaching and learning alive to feed the students with the food of knowledge and skills. The situation changes also force the world citizen to get used to with the problem. Many people have discussed the new normal in society as the COVID-19 pandemic continues to spread in countries around the world. In the education sector, teaching and learning activities in the New Normal faces many challenges. During this situation, SEAQS conducts many programmes and activities both using online and offline modes, including a series of webinars, training on STEM Learning, training on the use of online learning application, and learning units writing.

This edition covers Centre’s activities in the last six months including the Undecafiesta, a celebration of Centre’s 11th anniversary. This programme had the theme of Science Learning at Home consisting of three competitions, namely, Photography, Video Blog, and Popular Science Writing Competitions. This kind of event was the very first time conducted by the Centre, and gladly, gained positive receptions from teachers and students across the region.

To conclude this foreword, I would like to wish that this pandemic situation will be over soon, and everything could be back to the normal condition as we had before the COVID. Thank you very much, and have a pleasant reading.

Dr Indrawati
Director
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KI HAJAR DEWANTARA AWARD

31 AUG 2021
YOGYAKARTA, INDONESIA

Registration
http://s.id/KHD20
Welcome to our third edition of Q Science Magazine. Firstly, we would like to express our gratitude to God Almighty upon the publishing of this third edition. Secondly, we also would give our high appreciation to our editorial staff and contributors who had worked so hard in making this magazine. Mistakes and errors in this publication might exist; therefore, critics, comments, and suggestions are very much welcome as they will help us improve the next edition. In this edition, we bring up our activities during the pandemic, including webinars, training, and also staff capacity building activity. There are also best practices from teachers from SEAMEO member countries. We hope this magazine provides you with new information regarding the current issues in science.

Thank you very much, and have a good read.
TRAINING COURSE ON MARINE-BASED STEM LEARNING FOR KINDERGARTEN, PRIMARY, AND SECONDARY TEACHERS FROM PANGANDARAN REGENCY

Today, students are faced with the challenges of the 21st century. In line with the changing times and speedy technological developments, it is acceptable that learning must adapt and follow the demands of the times. Learning should be directed to equip or teach students how to be problem solvers introduced through problem-solving process-based learning designs. For this reason, students need to be equipped with skills or abilities (1) how to think by providing students with critical, creative, innovative thinking skills, solving problems and making responsible decisions; (2) ways to work by equipping students with the skills of working together, communicating, collaborating, (3) using tools to do by preparing students to have information literacy and ICT literacy, and (4) skills and attitudes to become global citizens, by equipping participants students with nationalism, the ability to manage careers and life, and the ability to have a personal and social responsibility, these things are included in the demands of 21st-century education.

Various reforms and innovations have been carried out by several developed countries to realize 21st-century skills-oriented education skills. These reforms and innovations include STEM education. Currently, STEM education is becoming an important issue in educational trends (Kuenzi, 2008). STEM was launched by the National Science Foundation (NSF) in the United States which then developed in several other countries. In Indonesia, school curriculum reform has been directed to equip students with the characteristics of 21st-century citizens; however, the STEM approach, in particular, has not been published in the 2013 curriculum.

SEAMEO QITEP in Science (SEAQIS), as one of the regional centres of the Southeast Asian Ministers of Education Organization (SEAMEO), has the task and function of increasing the competence of science teachers and education personnel. In supporting the implementation of the 21st-century skills, SEAQIS has developed the Adopting a 21st-century Curriculum programme as one of the seven priority areas (SEAMEO 7 Priority Areas).

SEAQIS in carrying out its duties based on its Enabling Instrument aims to improve the quality of school principals and science education personnel in the Southeast Asia region. The quality of science learning, which is an area of SEAQIS has an essential role in shaping student competence in the 21st century. Referring to SEAMEO 7 Priority Areas number 7 and supporting the strategic plan of the Ministry of Education and Culture in developing 21st-century skills, SEAQIS makes STEM education as the focus of the study. Starting in 2018, SEAQIS was appointed to be the leading sector in the development of science learning with the STEM approach and the implementation of STEM in the 2013 Curriculum. In its implementation, SEAQIS collaborates with the Technical Units within the Ministry of Education and Culture and other relevant SEAMEO Centres. One of the agendas agreed with Balitbang, and the Directorate General of Primary and Secondary Education is to socialize STEM as a strengthening of the scientific approach in implementing the 2013 curriculum to accommodate the achievement of 21st-century skills and strengthening character education which is the goal of the 2013 curriculum.
Since 2018 SEAQIS has implemented many collaborative programmes with several Education Offices in programming the integration of STEM Learning into 2013 curriculum in the form of socialization, training and mentoring activities for teachers, school principals, and supervisors at the primary and junior secondary school levels. Most schools that already know the implementation of STEM learning have begun to integrate STEM learning into the classroom, including several SMA and SMK. In line with the programme's sustainability, in 2020, SEAQIS develops a STEM learning programme oriented to the local context. For the implementation of the programme, SEAQIS conducts several teacher training in several districts, and one of which is Pangandaran District.

Pangandaran Regency was chosen as the place for implementing the STEM learning development programme based on the local context because Pangandaran Regency has great marine potential to be developed. The education sector is expected to make a significant contribution to the preparation of human resources to build this potential so that it is expected to improve the welfare of the community. Through STEM learning, it is hoped that students can generate creative and innovative ideas in developing marine potential in Pangandaran Regency. In the long term, it can create excellent STEM schools based on local wisdom of the community in the utilization of tourism and marine potential.

**Implementation**

The training course on marine-based STEM learning was conducted from 24 to 28 August 2020 in several hotels in Pangandaran. The participants of the programme were 100 teachers consisting of kindergarten, primary, junior secondary, and senior secondary teachers. The facilitators of the training were Dr Indrawati and Mr Gunawan Muhammad for Kindergarten class; Dr Poppy Kamalia Devi, Dr Elly Herliani, Mr Reza Setaiwan, and Mr Dian Purnama for Primary Class; Lukma Nulhakim and Mr Heri Setiadi for Junior Secondary class; and Mr Haidar Helmi and Mr Septian Karyana for Senior Secondary class.

This programme consisted of 50 credit hours. The topics delivered in this training were training orientation, government policy, STEM Learning and 21st-century skills, sustainable marine governance, characteristics of STEM Learning, Analysis of STEM Topic and Project Plans, STEM Learning, STEM Learning Assessment, Review, Pre and Post-Tests, and Action Plan.

STEM Learning and 21st-century skills discussed why STEM is important, and what is the correlation between STEM and 21st-century skills. During this session, it was also concerned that STEM is an approach integrating Science, Technology, Engineering, and Mathematics into
a learning process to improve students' problem-solving ability. Through STEM learning, students are expected to improve their 21st-century skills, including innovation skills. In sustainable marine governance, the facilitators discussed coastal ecosystems, ecosystem services, benefits and threats to coastal ecosystem services, as well as the concept of sustainability for marine management. Meanwhile, during the characteristics of STEM session, facilitators discussed how the Engineering Design Process is implemented in the learning. Facilitators asked participants to do a hands-on activity, including Super Boat Challenge and Eco print.

The participants also learnt how to analyze STEM topics and project plans. They, in the group, plan a project that will be conducted in their respective schools. The projects are seawater filtration and desalination equipment, manufacturing liquid organic fertilizers, processing food from golden snails, and processing a rose hip into snacks.

Furthermore, the participants were asked to make an instrument in accordance with the planned project, whether it was related to the material content or their engineering skills. At the end of the session, the participants presented the results and then discussed with other participants to get input from other groups.

**Evaluation**

Evaluation is an essential part of a programme. It aims to determine the effectiveness of a training programme. Evaluation model used in the programme is The Four Levels Evaluation Model developed by Kirkpatrick. The four levels are reaction, learning, behaviour, and result. This programme employed two levels of evaluation, including reaction and learning evaluations.

Based on the evaluation questionnaire shared to the participants, for content assessment, the average score is 3.55, meaning that the participants consider the contents delivered during the training were very good. Details information is shown in the chart below. From the chart above, we can see that the highest score was about material preparation. It means that facilitators prepared the materials very well. On the other hands, the lowest score was about Work’s Ethics Improvement. Even though the score is the lowest among other indicators, it can still be categorized as very good, which means that participants considered their work’s ethic improved after joining the programme. Facilitators evaluation displays an assessment by participants toward each facilitator. The items assessed were relevance, contents arrangement, teaching ability, attitude and behaviour, and classroom interaction. It can be seen from the chart below. From the chart above, it can be seen that facilitators’ attitude and behaviour gained the highest score. It means that during the programme, facilitators displayed an excellent manner. However, from the four aspects, the Contents Arrangement is the aspect need to be improved since gaining the lowest score from the participants. Overall, the average score for facilitators is 3.59, which means very good.

**Conclusion**

The training course on Marine-based STEM learning for kindergarten, primary, secondary teachers from Pangandaran has met its objectives. After participating in the training, participants improve their understanding of STEM learning. They also possess a positive mindset towards STEM learning, and they also produce STEM analysis of the Curriculum 2013. Besides, the participants are also able to create STEM learning scenario and its assessment.
HUMAN BLOOD CELLS TAKE ABOUT 60 SECONDS TO MAKE A COMPLETE CIRCUIT OF THE BODY

We, humans, have at least about 5 litres of blood in our bodies (at least, most people) and the average heart pumps about 70 mL of blood out with every beat. A healthy heart also beats about 70 times a minute. So, if humans multiply the amount of blood that the heart can pump by the number of beats in one minute, we actually get about 4.9 liters of blood pumped per minute, which is almost the price of our entire body’s blood.
In order for food to have a taste, the chemicals from the food must first dissolve in saliva. Only once they are dissolved in a liquid can these chemicals be detected by the taste receptors. During this process, some of the constituents of saliva interact chemically with flavouring substances. For example, bicarbonate ions, these substances can reduce the concentration of free hydrogen ions (sour taste), and some saliva proteins can bind to bitter-tasting substances.
The human body is indeed designed to be complex to solve individual problems. The human body has the ability to perform unthink-able processes, such as how our stomach can digest food because its hydrochloric acid is exceptionally corrosive with a pH level of 2-3. This acid can also attack the borders of your stomach, so the stomach will protect itself by producing alkaline bicarbon fluid. The walls and boundaries of the stomach will always change continuously, it will renew itself every 4 days.
SEAQIS has successfully convened the 11th Governing Board (GB) Meeting at Holiday Inn Bandung Pasteur Hotel on 16 – 17 September 2020. The GB Meeting is an essential event for the GB Members to evaluate the Centre’s activities of the last fiscal year as well as reviewing the proposed programme and activities of the incoming fiscal years. The GB Meeting is also a forum to discuss the current issues related to the development of science education in the region. Due to the current situation that prevents many GB Members from travelling abroad, the 11th GB Meeting was convened in a blended mode, offline and online modes. The online mode was conducted using a video conference platform attended by GB Member from Cambodia, Lao PDR, Malaysia, Myanmar, Singapore, Timor-Leste, and Vietnam, the representative of GB Member from Brunei Darussalam and Thailand, and the representative of SEAMEO Secretariat. During the opening ceremony, the meeting was also attended virtually by Prof Ainun Na’im, Ph.D., the Secretary-General of Ministry of Education and Culture of the Republic of Indonesia, and the Head of Bureau of Cooperation and Public Relation, the Ministry of Education and Culture of the Republic of Indonesia.

On the other hand, the offline meeting was attended by GB Member from Indonesia, the Director of SEAMEO QITEP in Science as an ex-officio member, and staff members of SEAMEO QITEP in Science. The observers at the meeting were from Bureau of Cooperation and Public Relation, Centre for Data and Technology Information, and Centre for Development and Empowerment of Teachers and Education Personnel (CDETEP) in Science, the Ministry of Education and Culture of the Republic of Indonesia.

The meeting was officially opened by Prof Ainun Na’im, Ph.D., the Secretary-General of Ministry of Education and Culture of the Republic of Indonesia. In his remarks, Prof Ainun Na’im stated that almost all countries across the world are shocked by the COVID-19 pandemic. The pandemic is not only a public health emergency but also aggravated societal challenges such as unemployment and starvation. He pointed out that the crisis is only one of the challenges that must be solved by science. He also expressed his admiration upon the achievement of the Centre, particularly in developing STEM learning in the region.
SEAMEO Secretariat was represented by the Deputy Director (Programme and Development), Dr Wahyudi. In his speech, he expressed his appreciation for the convening of the 11th GB Meeting of SEAQIS. He then congratulated the Centre for all significant achievements in enhancing the quality of science education in the region. He then mentioned some significant achievements of fostering efficiency, effectiveness, and harmonization of education in and for Southeast Asia done by SEAQIS.

In this year meeting, the GB Meeting was chaired by Mr Enang Ahmadi, GB Member from Indonesia, discussing 13 working papers including the in-camera session. The meeting went very effective, efficient and productive. The GB Meeting approved all the reports and proposed programmes proposed by the Centre. The meeting also agreed that the next GB meeting would be conducted in Lombok, Nusa Tenggara Barat in the second week of September 2021. The meeting adjourned on 17 September 2020 at 09.30hrs.
SEAQIS held creativity contests to celebrate its 11th anniversary. The contests consisted of the photography competition, video blog competition, and popular science writing competition. The theme for these contests was Science Learning at Home. These competitions aimed to provide a forum for teachers and students in the region to show their creativity at home during this pandemic period.

After three weeks of the submission period, there were 414 works submitted by participants across the region, mostly from Indonesia and the Philippines. Students submitted one hundred forty-eight works, and teachers submitted 246 works. From the three contests, photography contest was the most favourite since more than half of the submitted works were photos. To assess the works, SEAQIS formed a board of jurors consisted of expert, practitioners, and SEAQIS' staff.

The winners of each competition were announced by Dr Ethel A.P Valenzuela, the Director of SEAMES, during the opening of SEAQIS' Webinar. Based on this independent body's assessment, the winners of each contest are as follows.
Photography contest The winners of the teacher’s category with the theme Science Learning at Home are: (1) Triwibowo, SMA Negeri 17 Palembang, Indonesia (2) Dwi Puspaparini, MI At-Taqwa Bandung, Indonesia (3) Hanifah, SMPN 2 Rongga, Indonesia (4) The favourite Photo of teacher’s category is given to Ayomi Palupi Irawati, SMP N 8 Salatiga, Indonesia. The winners of the student’s category with the theme Science Learning at Home are: (1) Hanif Al-Farizi Muhammad, SMAIT Thariq Bin Ziyad, Indonesia (2) Inaes Mailatul Aisjah, SMK Bayt Al-Hikmah, Indonesia (3) Laica F. Ramirez, Emigdio A. Bondoc High School, the Philippines (4) The favourite Photo of student’s category is given to Gilbert D. Soriano III, Lingayen 1 Central School, the Philippines, Video Blog Contest The winners of the teacher’s category with the theme Science Learning at Home are: (1) Fauji Rezki, SD Negeri 1 Waluyojati, Indonesia (2) Surya Arif Kartono, S.Pd., M.Pd., SMA Xin Zhong Surabaya, Indonesia (3) Nikmatur Rohmaya, MAN Buleleng, Indonesia (4) The favourite Video Blog of teacher’s category is given to Dharyl Del Mundo, Cayetano Arellano High School, the Philippines. The winners of the student’s category with the theme Science around Me are: (1) Olivia Ridhotul Marita, SMAN 1 Puri, Indonesia (2) Attar Gibran, SMAN Cahaya Madani Banten Boarding School, Indonesia (3) Riane Athaila Talita, SMPN 14 Bandung, Indonesia (4) The favourite Video Blog of student’s category is given to Diah Agustine P. Balani, Governor Feliciano Leviste Memorial National High School, the Philippines, Popular Science Writing Competition The winners of the Popular Science Writing Competition are: (1) Ms Sundari, M.Pd, SMP Negeri 2 Selomerto, Indonesia (2) Ms Lee Saw Im, SMK Seri Bintang Utara, Malaysia (3) Ms Rian Pratiwi, SMAN 5 Malang, Indonesia.

The decisions of the Board of Jurors are final and cannot be appealed and contested. Not only for the winners, but SEAQIS also provided merchandise for the Top Ten of each category. SEAQIS then sent all the prizes and merchandises using an expedition company due to the pandemic situation.
The Covid-19 pandemic has influenced many aspects in countries of the world. All states have implemented strategies to control their spread by minimizing physical interaction of people to prevent the spread and spread of a pandemic. Education is one of the fields affected by this pandemic, the impact of which is the interaction of teachers and students in teaching and learning activities directly stalled. The hard work of the teachers during the covid-19 pandemic really deserves appreciation. Amid social restrictions due to the covid-19 outbreak, we must keep the spirit of pursuing and teaching science. Almost no one thought the face of education would change drastically due to the covid-19 pandemic. The concept of home-schooling has never been mainstreaming in national education discourse. Although increasingly popular, the application of online learning (online learning) has also been limited to the Open University, lecture programmes for employees at many universities, tutoring, and additional courses (online courses). However, physical policies are directed at deciding the spread of the epidemic, forcing a change from formal education in school to learning from home, with an online system, on a national scale. In fact, the national exam this year had to be abolished.

This situation inevitably forces teachers to apply new ways of teaching, such as by maximizing digital technology and the internet in teaching and learning activities. In responding to this situation, SEAQIS provided a forum for teachers and education personnel to share knowledge and best practices in teaching and learning science that can be applied to adaptation new habit (New Normal). The form of its activities was accommodated in a series of online seminars (Webinars). The theme was good practices and lessons on teaching science during the pandemic as innovative teaching and learning of science in the implementation of New Normal Adaptations in Southeast Asia.
The first webinar was conducted on Wednesday, 17 June 2020 and attended by 175 participants through a Google Meet platform. This series was also broadcasted live on SEAQIS Youtube channel. Ms Dini Siti Anggreni, the third winner of the second of Ki Hajar Dewantara Award, was one of the speakers of the webinar sharing her experience in joining the event held two years ago. She explained the stages of writing a scientific paper and the benefit she obtained after participating in the Ki Hajar Dewantara Award. Ms Lili Indarti and Dr Harry Firman also took part as the speakers in this webinar. The webinar was opened by the Director of SEAMEO QITEP in Science, Dr Indrawati, as well as opening the Webinar series. This webinar series was moderated by Mr Zuhe Safitri. The second webinar was attended by 478 participants through a Zoom meeting platform and was also broadcasted in SEAQIS’ Youtube channel. The speakers of the webinar were Mr Bryant C Acar, the second winner of the second Ki Hajar Dewantara Award, from the Philippines, Ms Lee Saw Im, the first winner of the first Ki Hajar Dewantara Award, from Malaysia, and Dr Harry Firman, the expert of SEAQIS, from Indonesia. This series was moderated by Mr Rizwan Darmawan.

In this series, the three speakers shared their best practice on how to teach science from home. They shared their knowledge, insight, and thought about teaching in the middle of the pandemic situation. They also provided tips and trick in facing the new norm period. The third webinar was to find out how teachers and education personnel apply their strategies in teaching science and mathematics during the Pandemic period. The speakers were Dr Indrawati, the Director of SEAQIS, Dr Sandi Budi Iriawan, an expert in the field of mathematics education as well as the lecturer at UPI, and Ms R. Siti Gamma Sita Dewi, an elementary school teacher. The webinar was attended by 230 participants through the Zoom platform. This webinar was devoted to teachers in IOA’s target areas. The first speaker, Dr Indrawati, presented the dimensions of science learning. She also suggested how to address COVID 19 as an opportunity to carry out active learning and utilize distance resources that can be used in this pandemic period.
The second speaker, Dr Sandi Budi Iriawan, talked about Mathematics learning methods during the pandemic period. He presented the AMORA, an education conception-based learning model. AMORA itself stands for Amati, Ngemong, Ngarasake, and Among. He also conveyed the relationship between the AMORA learning model and learning activities in the New Normal.

The last speakers, Ms R. Siti Gamma Sita Dewi, shared her best practices during the pandemic period. She explained the online learning model that she used in school.

SEAQIS continued the Webinar Series on 8 July 2020. The first speaker was Dr Agus Fany Chandra, a lecturer from the Indonesia University of Education. He presented about Teaching and Learning from Home (T & L-FH), New Normal or Accelerated Normal. He discussed what is the teaching-learning in the
new normal, the obstacles that may come, and also the media that can be used during this pandemic period.

The second speaker was Mr. Koh Chee Kiang, the first winner of the second Ki Hajar Dewantara Award. He is also a physics teacher at Victoria School, Singapore. He discussed the focus of teaching Physics in his school is how to foster the joy of learning. He stated that he tries to make learning meaningful and engaging so that students become engaged learners and life-long learners.

The third speaker was Mr. Norhaimi bin Abdul Mutalib from Malaysia. He was one of the nominees of the second Ki Hajar Dewantara Award, and the Top 50 finalist of Global Teacher Prize. He also shared his experience in the teaching-learning process after the pandemic since schools in Malaysia are already reopened. He shared the current situation in Malaysia regarding the spread of COVID-19. He discussed the possible strategies used by the teacher during this period. He concluded his presentation by presenting the SOP conducted by his school to prevent the spread of the virus.

The webinar was attended by 668 participants from the region using a video conference platform. The webinar was also broadcasted widely in SEAQIS’ YouTube channel. Mr. Lukman Nulhakim, the head of Information, Data, and Evaluation Division, moderated the programme.

Continuing the four previous webinars, SEAQIS conducted webinar series 5 on Wednesday, 15 July 2020. The webinar presented Dr. Anggraini Barlian, a Biology lecturer at the Bandung Institute of Technology, Ms. Lia Laela Sarah, a Physics teacher from UPI Laboratory School, and Mr. Rikki Mohamad Ramdhani, a Chemistry teacher from SMA Negeri 1 Bandung, as the speakers. The webinar was attended by 189 participants in Zoom platform and also watched by hundreds of teachers on the YouTube channel.

Dr. Anggraini Barlian talked about the role of Biology in the new normal lifestyle. She also stated that we can introduce COVID-19 to students as early as possible from elementary school. At the elementary school grade 5, there is a subject of science explaining respiratory organs and its functions. Dr. Anggraini Barlian also explained the transmission process of Covid-19. At the end of her presentation, she strongly advised everyone to obey the health protocol issued by the government.

The second presenter, Ms. Lia Laela Sarah, shared her experience in teaching Physics during the pandemic period. She used the flipped learning model assisted by the Google Suites for Education. The third presenter was
Rikki Mochamad Ramdhani talking about his experience in online teaching and learning activities using the Moodle portal.

The sixth webinar was the last series of SEAQIS’ Webinar Series under the theme Science Teaching and Learning Innovation in the New Normal: Lesson Learn from Southeast Asian Countries. The webinar series 6 was conducted on 15 July 2020 moderated by Mr Zuhe Safitra, the head of partnership and publication division. The webinar presented three speakers, including Dr Ingriani Liem, Ms Desy Merisa Susanti, and Mr Herwin Hamid. This webinar was attended by participants through a Zoom Meeting and also was broadcasted live on SEAQIS’ YouTube channel.

Dr Ingriani Liem is the chief of Bebras Indonesia, an organization focusing on developing computational thinking in Indonesia, presenting about Computational Thinking Learning. She stated that in this modern era, teachers must be able to integrate technology, content, and pedagogy in the learning process. In Computational Thinking, students are required to think critically. She then exemplified a computational thinking learning that it can be done through problem-solving strategy games.

The second speaker was Ms Desy Merisa Susanti, a primary school teacher from SDN 196 Sukarasa Bandung, presenting about her best practices in the teaching-learning process during the pandemic period. She shared her experiences in applying a learning method that creates challenges for her students.

The last speaker was Mr Herwin Hamid, a physics teacher of SMPN 6 Kendari, presenting about the Strategy and Content Knowledge of Science Learning in the New Normal Era. He shared his experiences teaching science using various digital applications. He also shared his achievements after developing several applications for science learning. The webinar was concluded by Ki Hajar Dewantara presentation presented by the moderator as well as completing SEAQIS’ webinar series.

From the webinar series, it is expected that the participants can adopt and adapt the best practices shared by the speakers regarding the distance learning model used during this pandemic period, so students can continue to hone their abilities and creativities.
MODIFICATION OF A SIMPLE CROSSWORD PUZZLE BASED ON ETHNOBOTANY STUDY OF GARDENS AS A JOYFUL LEARNING RESOURCES FOR STUDENTS

Learning activity in all education levels is now implemented using a distance education method during COVID-19 pandemic. Learning material which is usually delivered face-to-face is replaced through social media. This situation creates a new challenge, especially for science teachers, to be creative and innovative in presenting learning that is usually accompanied by experiment activities.

The author took the initiative to make a breakthrough in science learning activities with distance learning experiment through modifying crossword Puzzle based on ethnobotany study of the garden and house yard. This modification lies in the implementation and output of learning activities. It also is to introduce the environment around us that there are plants that have benefits both in food security and health, to survive in this pandemic. The game modification has also been adjusted to the Basic Competencies (KD) set in semester 1, which is classifying living things and objects based on observed characteristics as well as paying attention to the learning patterns of students grade VII as the implementation targets which are still in a transition period to recognize science further.
The following is the stages of learning activities with game modification by referring to the Natural Exploration learning syntax. **Exploration Phase** (giving essential material such as document, audio, video, and image about the classification of living things with an emphasis on plant group through WhatsApp media), **Interaction Phase** (giving a Simple Crossword Puzzle game with a certain period, including grouping fruit, food, vegetable and decorative plant (picture 1))

**Picture 1. Example of a crossword puzzle**

**Vertical:** 1. Momordica charantia, contains vitamin B complex, C, E and K, famous for its bitter taste and as a remedy for constipation, 2. Artocarpus heterophyllus contains vitamin A and C, for healing the external wound, 3. Oryza sativa as our daily food

**Horizontal:** 1. Carica papaya contains vitamin A and good for our digestion, 2. Durio zibethinus contains vitamin C and famous for its unique smell, 3. Communication Phase (giving an assignment to students to observe kind of plants after solving the crossword puzzle, accompanied by making video according to the classification and ethnobotany concept, which uploaded to YouTube channel SMP Negeri 2 Selomerto.)

4. Reflection Phase (Concluding the learning result about living things and all kind of plants that have been observed in the garden and house yard, that give benefits on food security and health which are orange, bitter melon, papaya, moringa, cardamom, pandanus, durian, guava, corn, cassava, sapodilla, star fruit, carambola, mangosteen, soursop, rice, jackfruit, aloe vera, banana and Bougainville.

5. Evaluation Phase (giving multiple-choice question items and share questionnaire on students’ learning satisfaction evaluation)

As a result, students’ learning achievement was 80% which indicates that the learning was successful. Besides, its primary purpose is to provide a joyful science learning during the pandemic. Based on the results of the questionnaire on student satisfaction with the learning process, the percentage of student satisfaction was 85.42%, classified as very satisfied. Ethnobotany-based learning by utilizing gardens and yards as a source of knowledge makes students can develop themselves and be creative, which supports the formation of students’ critical thinking.
LEARNING

SCIENCE AT HOME

SCIENCE - OUR LIFE, OUR FUTURE

Whenever we see a rainbow shine, listen to lightning strikes, inhale fragrance from perfume, and experience chilly vibes in an area with air conditioning, we all know these are related to science. Science helps with our understanding of the world around us. The knowledge and application of science are inseparable from our daily activities. As children naturally like to explore, introducing children to science at an early age helps to build their ingrained curiosity. Science learning can be conducted formally in schools and informally at home involving parents and the community.

In line with 21st-century learning, science can also be taught at home from teachers through planned learning to utilise curiosity and investigation among students. Simple and safe activities that are not costly to the students can be considered as science learning activities at home. Why does my hair stand after I rub it with a balloon? Why do we feel a small shock of electricity when we shut the car door? These are caused by static electricity. A homemade electroscope allows us to see the action from static electricity by just using mineral bottles, iron wire, and aluminium foil. However, learners may find out this electroscope works on a dry, airy day but not during a raining day. 'The important thing is never to stop questioning.' Albert Einstein.

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A
HOMEMADE ELECTROSCOPE

Aluminium ball
Iron wire
Aluminium leaf

When an apple is cut and exposed to oxygen, the apple undergoes the oxidation process and turns brown. This can be done at home by studying the changes the three apples after twenty-four hours, from left to right: The apple in water, the apple in water containing the vitamin C tablet and the apple in water containing the A-Z multivitamins and minerals tablet. The result shows vitamin C acts as an antioxidant.

Investigations regarding the chemical properties of acids reacting with metal carbonates can also be carried out at home by using vinegar as an acid and eggshells which contain calcium carbonate. The carbon dioxide gas released can be tested with lime water.

Studying the food preservation process in theory alone is less effective unless the students do it hands-on. Learning becomes more effective when students make chilli, fruits, or vegetable pickles at home. Students can then select appropriate preservatives, describe their function accurately and calculate the cost for such tedious preparation. Through these activities, they can also be trained to behave like young entrepreneurs.

HOMEMADE PICKLED MANGO
Recycled materials such as mineral bottles, rubber band cardboard and straw can also be used as science learning materials at home such as making a rubber band car. This activity can apply science concepts such as friction, kinetic energy and energy as well as digging into creativity.

In a nutshell, learning science at home can help to increase the interest in learning science among students. This learning process has provided space and opportunities for students to conduct investigations to strengthen their understanding of a theory and its application, and I hope it can be used more broadly in the future.

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Covid-19 pandemic changes many aspects of life, including education. The distance learning using online mode becomes the choice to protect the young generation from the virus. Nevertheless, students often feel bored in online mode, and it also makes students’ creativity and interest decrease. According to Mariana & Praginda (2009), science is a concept, principle, law, and theory formed through a continuously empirical observation process involving mental operation based on curiosity, determination, perseverance, and can be tested. Physics, as a part of science, can be learned from home. A quote says “A teacher is a profession that creates another profession,” it can be translated that a teacher should be able to accommodate various students’ ability. Thus, it needs an exciting science lesson plan. The PABALIMO (Pahami-understand, Coba-try, Latihan-practice, and Modifikasi-modify) could be one of the solutions to teach science from home.
It started from the understanding phase. At the dynamic electricity, the teacher asked the students to take a picture with a resistor. Five fastest students to submit the photo was granted a point. The teacher then provided comments on the image and offered prior knowledge. Students learned the topic presented by the teacher.

The next phase was to try. The teacher provided a worksheet to identify the electrical circuits at their house. Then, students mentioned the difference between parallel and series circuits. It can increase students concern to the home environment.

The third phase was to practice. The teacher provided an example of question items and discussion. Then she did a live quiz using Quizizz. Live quiz could develop students' good characteristics, for instance, honest and self-confidence. Besides, the teacher also directly found out students weaknesses. The live quiz improved students motivation to learn, as students participation reached 100% in this quiz.

The phase was to modify. The teacher provided question items that relate to real-life problems. For instance, students modify the resistor to get the combined resistance values with the available resistors. This activity developed students' creativity and innovativeness.

The teaching-learning process was concluded by a zoom meeting. In this activity, the teacher and students altogether made conclusions of the material. Besides, reflection about the process also increased the quality of the learning.

From the discussion above, it can be concluded that learning science at home could be conducted joyfully. The PABALIMO learning could be one of the solutions, and it can change student perspective from focusing on the grade to process and life skill.

Ju Byung-woo and Ju Byung-ki are smugglers in Seoul who discover that illegal immigrants have died in a shipping container due to an unknown disease. They retrieve the only survivor, Monssai and the body’s cell phone video to show their superiors in Budang, but Byung-woo becomes ill, and Monssai runs away. The brothers went to a clinic where the transmission was passed onto others who spread it throughout the city.

At the Contagion Centre in Budang, Dr Kim In-hae was reprimanded for losing critical data when his car crashed into a mine shaft the previous day. His bag was taken off the shaft by Emergency Response Team (ERT) members Kang Ji-goo and Bae Kyung-ub. Ji-goo answers the phone and hands the bag to In-hae Mi-reu's daughter.

Byung-woo’s condition worsened and he started coughing up black blood. His brother took him to the emergency room, where he was isolated with the unknown flu. Called for help, In-hae finds a cell phone video and theorizes that the conditions in the shipping container allowed the virus to mutate. Byung-ki refuses to answer questions about the container. Byung-woo dies, and Byung-ki exposes some of the hospital staff while struggling to get to his brother.

The next day, more people showed clear symptoms. With help from the Korea Centers for Disease Control and Prevention (KCDC), hospital staff found and burned shipping containers. However, the mice that had eaten the corpse fled to the city. Staff determines that the aggressive virus is a mutated HSN1 strain that can kill within 36 hours, and calls for city quarantine.

**Similar to the current covid-19 pandemic**

This medical thriller genre film is predicted to be similar to the pandemic situation that the world is currently facing, namely the Covid-19 pandemic. This film is also inspired by the film Contagion which was released earlier in 2011.

At the end of the film’s story, even the quarantined residents began to worry and revolt coupled with the government’s plan to eliminate the virus by killing infected citizens. This triggered a rebellion and it was also against the Korean President who wanted to find antibodies and save his citizens. Finally, everything was under control when Kim Mi-Reu (Park Min-Ha) who was previously infected with the virus managed to recover and finally they managed to find the virus antibody.

This film earned revenue of 19.8 million USD after being shown in theatres in 2013 ago. This film together with the contagion is being discussed after the world is currently faced with the Covid 19 pandemic.
THE LEARNING ACTIVITY OF SCIENTIFIC IMAGINEERING THROUGH SOCIAL MEDIA IN ORDER TO ENHANCE COMPETENCIES FOR LEARNERS

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ABSTRACT

The objectives of this research were 1) to develop the learning activity of Scientific Imagineering through social media to enhance competencies for learners; 2) to evaluate the development of competencies for learners who participated in the learning activity of Scientific Imagineering. The sample group consisted of 31 Matthayom 5 (equivalent to 11th grade) students in the Science-Technology program in the academic year 2017 at Kasetsart University Laboratory School centre for Educational Research and Development. Students used the learning activity of Scientific Imagineering through social media, which had been assessed by ten experts, to learn about the electromagnetic spectrum in Physics class. After carrying out the learning activity of Scientific Imagineering through social media, students performed self-evaluation on their competency development. The results of this research showed that 1) the learning activity of Scientific Imagineering through social media to enhance competencies for learners consisted of 6 steps, namely imagine, study, design, develop, present and evaluate and according to the quality evaluation done by experts, the learning activity was extremely suitable; 2) according to the students’ assessment of their competency development, they strongly agreed that the learning activity of Scientific Imagineering through social media helped them develop their competencies for learners.

Key Words: Scientific Imagineering, competencies for learners, Social Media, STEM Literacy

INTRODUCTION

Rapid advancement in computer technology and network system, the continuous growth of the knowledge-based economy, as well as expectation of personal service with added value, have been the driving force behind dramatic changes at present [1]. Social and economic development requires an educational system which equips the young with a new set of skills and competencies that would allow them to benefit from the learning society they are in now full and to actively contribute to the development of the economy under the principle of knowledge as assets. These skills and competencies are referred to as 21st-century skills and competencies which are more suitable for the emerging model of economic and social development than the skills and competencies required in the past century which were more suitable for industry and production [2].

Competency refers to knowledge, skills and characteristics which help the young to unlock their full potential. It is an important foundation for building the ability to read, write, calculate and learn other subjects. The student's ability to learn will naturally increase from the learning experience in school. Therefore, schools established competencies as the criteria for graduating from school and practising specific profession [3], [4], [5], [6].

Student's competencies are like the root of strong ability to learn. Still, they do not get enough attention because they are not visible while knowledge and skills are like green leaves which are visible and thus, receive more attention. Lack of encouragement to develop compe-
encies naturally exerts an empirical impact on learning of knowledge and skills [6]. Basic Education Core Curriculum BE 2551 (AD 2008) is Thailand’s core curriculum. Its objectives are to develop learners to be decent, intelligent and have the capability to study at a higher level and practice profession. One of the goals is that learners, after completing the basic education, have the knowledge as well as the ability to communicate, think, solve problems and use technologies, as well as ability to use life skills [7]. These are called the five competencies for learners.

As Facebook has become a popular social media which allows users to interact and co-work in a virtual community [8], teachers can also use Facebook as an educational tool [9]. Students have a positive attitude toward learning with Facebook as the educational tool [10], and they use Facebook to deliver course material and support learning [11]. The learning model of Scientific Imagineering is a scientific learning process integrated with the engineer’s innovation process. It consisted of 6 learning steps, which are 1) imagine 2) study 3) design 4) develop 5) present and 6) evaluate [12].

Techakosit & Nilsook [13] found that the learning model of Scientific Imagineering could develop STEM Literacy, which consists of 6 elements, as shown in Picture 2:

As seen in Picture 2, STEM literacy consists of 1) the ability to identify STEM problems 2) the ability to seek new knowledge 3) the application of the STEM concept 4) the ability to solve problems using STEM 5) the ability to communicate information relating to STEM and 6) the ability to make decisions based on STEM. These elements were similar to the five competencies for learners. Therefore, the researcher was interested in studying the enhancement of competencies for learners through the use of the learning model of Scientific Imagineering. This research would establish guidelines for teachers in primary education level in planning classes to develop and evaluate competencies for learners.

**RESEARCH OBJECTIVES**

2.1 To develop the learning activity of Scientific Imagineering through social media to enhance competencies for learners in Matthayom 5 (equivalent to 11th grade) on the subject of the electromagnetic spectrum.

2.2 To evaluate the development of competencies among Matthayom 5 students who learned through the learning activity of Scientific Imagineering.
METHODOLOGY

3.1 The group of learners studied in this research consisted of 31 Matthayom 5 students in Science-Technology program in the academic year 2017 at Kasetsart University Laboratory School centre for Educational Research and Development.

3.2 Data collection tools were learner's competency development evaluation form to evaluate the competencies of students who learned through the use of the learning activity of Scientific Imaginingering.

3.3 Research Procedure
1. Review literature about Scientific Imaginingering and competencies for learners. (2) Design the learning activity of Scientific Imaginingering through social media to enhance competencies for learners based on content about the electromagnetic spectrum. (3) Design a tool to assess the quality of the learning activity of Scientific Imaginingering through social media to enhance competencies for learners. (4) Present the learning activity of Scientific Imaginingering through social media to enhance competencies for learners to 10 experts in learning design for Science and subjects relating to STEM and ask them to evaluate the quality of the learning activity. (5) Revise the learning activity according to experts' comments. (6) Design a tool for evaluating the competencies of learner. (7) Present the evaluation form for the competencies of learners to 3 experts in measurement and evaluation to evaluate the content validity of the evaluation form. (8) Revise the evaluation form according to experts' comments. (9) Apply the learning activity of Scientific Imaginingering through social media to enhance competencies for learners to the studied group, consisting of 31 Matthayom 5 students in Science-Technology program during January to March 2018 in the academic year 2017 at Kasetsart University Laboratory School centre for Educational Research and Development. (10) Have the students in the studied group complete self-evaluation form on the development of their competencies for learners through the learning activity of Scientific Imaginingering.

3.4 Analyze the result of self-evaluation form on the development of competencies for learners using mean and standard deviation (SD). The interpretation of the mean value is as follows: 4.50 - 5.00 means extremely suitable/strongly agree. 3.50 - 4.49 means suitable/agree. 2.50 - 3.49 means neither suitable nor unsuitable/neither agree nor disagree. 1.50 - 2.49 means unsuitable/disagree. 1.00 - 1.49 means extremely unsuitable/strongly disagree.

RESULT AND DISCUSSION

The design of the learning activity of Scientific Imaginingering through social media to enhance competencies for learners in Matthayom 5 on the subject of electromagnetic spectrum consisted of 6 phases of activities as shown in Picture 3. “Imagine” is the first step of the learning activity of Scientific Imaginingering. It is the beginning of the inspiration step. This step takes one period (50 minutes) in the classroom to explain. “Study” is a step in the quest for knowledge. Students spend three weeks outside the classroom to find relevant content and then post it on Facebook. The teacher follows the post of the students and encourages them by “linking” the content. “Design” is the process of changing what is imagined into reality. This step takes two periods in the classroom with each group of students brainstorming a way to plan and design the cartoon. The teacher determined that the length of the cartoon must not exceed six pages. Each group of students drafts a storyboard. “Develop” is the process of making the storyboard from the design step into a real cartoon. This step takes four periods. “Present” is the step in which students post their comics on Facebook. Teacher and students read and
study the spectrum of the electromagnetic wave from all of the cartoon. Students spend three weeks outside the classroom to study. The last step is evaluation. Teacher and students are allowed to rate the comics by clicking on Facebook. During “study” and “present” steps when students spend time outside the classroom, the teacher can teach other content.

The outcome of the development of the learning activity of Scientific Imagineering through social media to enhance competencies for learners consisted of 6 steps, namely imagine, study, design, develop, present and evaluate. The steps were in alignment with the learning process of Scientific Imagineering through AR to enhance STEM literacy presented by Techakosit & Nilsook [12]. The difference was that the technology used to support learning in this research was Facebook. The result of quality evaluation for the learning activity of Scientific Imagineering through social media by experts is as shown in Table 1.

<table>
<thead>
<tr>
<th>The Learning Activity of Scientific Imagineering through Social Media in order to enhance competencies for Learners</th>
<th>MEAN</th>
<th>SD.</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imagine</td>
<td>4.90</td>
<td>0.32</td>
<td>Extremely suitable</td>
</tr>
<tr>
<td>Study</td>
<td>5.00</td>
<td>0.00</td>
<td>Extremely suitable</td>
</tr>
<tr>
<td>Design</td>
<td>4.90</td>
<td>0.32</td>
<td>Extremely suitable</td>
</tr>
<tr>
<td>Develop</td>
<td>4.80</td>
<td>0.42</td>
<td>Extremely suitable</td>
</tr>
<tr>
<td>Present</td>
<td>4.90</td>
<td>0.32</td>
<td>Extremely suitable</td>
</tr>
<tr>
<td>Evaluate</td>
<td>4.80</td>
<td>0.42</td>
<td>Extremely suitable</td>
</tr>
</tbody>
</table>

Table 1. The result of quality evaluation for the learning activity of scientific Imagineering through social media in order to enhance competencies for learners done by experts

According to Table 1, the experts found that the learning activity of Scientific Imagineering through the social network was extremely suitable for enhancing competencies for learners (Mean = 4.88 and SD. = 0.87). This finding was in alignment with Techakosit & Nilsook [12], who stated that the learning model of Scientific Imagineering was extremely suitable for enhancing STEM literacy. STEM literacy is a set of abilities which are similar to some of the competencies for learners. Therefore, the experts’ opinion was that the learning activity of Scientific Imagineering through the social network was extremely suitable for promoting the development of competencies for learners.
The result of the students' evaluation on the development of their competencies for learners in Mathtayom five for students who participated in the learning activity of Scientific Imagineering is presented aspect by aspect as follows.

<table>
<thead>
<tr>
<th>Ability to Communicate</th>
<th>MEAN</th>
<th>SD.</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I practiced storytelling, or I was able to explain the knowledge I gained through research to my friends.</td>
<td>4.23</td>
<td>0.50</td>
<td>Agree</td>
</tr>
<tr>
<td>2. I exchanged opinions with friends while engaging in the activity.</td>
<td>4.47</td>
<td>0.51</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>3. I, together with friends, wrote a summary of the knowledge we have researched so that friends in other groups could understand.</td>
<td>4.50</td>
<td>0.63</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>4. I persuaded friends in my group to work together and finish drawing the cartoon.</td>
<td>4.27</td>
<td>0.72</td>
<td>Agree</td>
</tr>
<tr>
<td>5. I discussed with friends when any disagreement arose while working.</td>
<td>4.43</td>
<td>0.77</td>
<td>Agree</td>
</tr>
<tr>
<td>6. I have learned how to explain my reasoning to persuade them to agree with my opinion.</td>
<td>4.35</td>
<td>0.66</td>
<td>Agree</td>
</tr>
<tr>
<td>7. I verbally encouraged my friends to finish the task.</td>
<td>4.47</td>
<td>0.73</td>
<td>Agree</td>
</tr>
<tr>
<td>The overall development of the ability to communicate</td>
<td>4.40</td>
<td>0.65</td>
<td>Agree</td>
</tr>
</tbody>
</table>

According to Table 2, the students agreed that the learning activity of Scientific Imagineering through social media they took part in developed the ability to communicate an aspect of competencies for learners (Mean = 4.40 and SD = 0.65).

<table>
<thead>
<tr>
<th>Ability to Think</th>
<th>MEAN</th>
<th>SD.</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I planned and set a schedule for doing research and drawing cartoons with friends.</td>
<td>4.27</td>
<td>0.69</td>
<td>Agree</td>
</tr>
<tr>
<td>2. I followed the schedule until the objective was achieved</td>
<td>4.17</td>
<td>0.65</td>
<td>Agree</td>
</tr>
<tr>
<td>3. I think the cartoon is original and unique.</td>
<td>4.70</td>
<td>0.47</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>4. I was flexible and could adjust the plan according to changes in the situation.</td>
<td>4.60</td>
<td>0.56</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>5. I gathered knowledge from various sources and summarized it into content used to draw the cartoon.</td>
<td>4.53</td>
<td>0.57</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>6. I was able to think independently while working on the cartoon.</td>
<td>4.70</td>
<td>0.47</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>7. My friends and I solved problems rationally while working on the cartoon.</td>
<td>4.50</td>
<td>0.51</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>The overall development of the ability to think</td>
<td>4.54</td>
<td>0.59</td>
<td>Strongly agree</td>
</tr>
</tbody>
</table>

According to Table 3, the students strongly agreed that the learning activity of Scientific Imagineering through social media they took part in developed the ability to think the aspect of competencies for learners (Mean = 3.92 and SD = 0.88).
<table>
<thead>
<tr>
<th>Ability to solve the problem</th>
<th>MEAN</th>
<th>SD.</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I had the chance to think of different solutions to solve problems which occurred while working on the cartoon</td>
<td>4.53</td>
<td>0.57</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>2. The work I have done this time can be applied to other works.</td>
<td>4.60</td>
<td>0.57</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>3. I came up with different alternatives for making the cartoon.</td>
<td>4.60</td>
<td>0.55</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>4. I considered the advantages and disadvantages of each cartoon making method before making a decision.</td>
<td>4.67</td>
<td>0.35</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>5. I carefully used the information to solve problems occurred while working.</td>
<td>4.43</td>
<td>0.63</td>
<td>Agree</td>
</tr>
<tr>
<td>6. The outcome of the cartoon created as a result of adjustments made to solve problems while working on the cartoon.</td>
<td>4.57</td>
<td>0.50</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>7. A step-by-step plan was devised to prevent problems.</td>
<td>4.47</td>
<td>0.63</td>
<td>Agree</td>
</tr>
<tr>
<td>The overall development of the ability to solve the problem</td>
<td>4.55</td>
<td>0.55</td>
<td>Strongly agree</td>
</tr>
</tbody>
</table>

Table 4. The evaluation result of the ability to solve problem aspect of the learning activity of Scientific Imagineering through social media in order to enhance competencies for learners.

According to Table 4, the students strongly agreed that the learning activity of Scientific Imagineering through social media they took part in developed the ability to solve the problem which was one of the competencies (Mean = 4.55 and SD = 0.55).

<table>
<thead>
<tr>
<th>Ability to use life skill</th>
<th>MEAN</th>
<th>SD.</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I tried to do the task I have been assigned to complete the cartoon smoothly.</td>
<td>4.67</td>
<td>0.55</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>2. I am happy to share the knowledge of the cartoon, and the enjoyment one gets from reading it with friends in other groups.</td>
<td>4.47</td>
<td>0.57</td>
<td>Agree</td>
</tr>
<tr>
<td>3. I practised my patience for friends' opinions while working.</td>
<td>4.57</td>
<td>0.57</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>4. I am proud that I have helped my friends and contributed to the completion of the cartoon.</td>
<td>4.67</td>
<td>0.48</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>5. I practised my responsibility for work.</td>
<td>4.50</td>
<td>0.63</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>6. I have realized the value of the work process and the cartoon.</td>
<td>4.43</td>
<td>0.63</td>
<td>Agree</td>
</tr>
<tr>
<td>7. I exercised my patience when I waited to listen to friends with different opinions.</td>
<td>4.37</td>
<td>0.72</td>
<td>Agree</td>
</tr>
<tr>
<td>The overall development of the ability to use life skill</td>
<td>4.52</td>
<td>0.59</td>
<td>Strongly agree</td>
</tr>
</tbody>
</table>

Table 5. The evaluation result of the ability to use the life skill aspect of the learning activity of Scientific Imagineering through social media in order to enhance competencies for learners.

According to Table 5, the students strongly agreed that the learning activity of Scientific Imagineering through social media they took part in developed the ability to use life skill aspect of competencies for learners (Mean = 4.52 and SD = 0.60).

<table>
<thead>
<tr>
<th>Ability to Use Technology</th>
<th>MEAN</th>
<th>SD.</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I used technology to present my task to the class.</td>
<td>4.57</td>
<td>0.57</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>2. I used technology to help to make the cartoon creatively.</td>
<td>4.70</td>
<td>0.53</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>3. I learned that the information retrieved from the internet must come from a reliable source, I must to refer to it.</td>
<td>4.60</td>
<td>0.57</td>
<td>Agree</td>
</tr>
<tr>
<td>4. I used technology to save cost, reduce the number of steps to solve problems.</td>
<td>4.57</td>
<td>0.63</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>5. I selected appropriate technology for communication in order to complete the cartoon.</td>
<td>4.47</td>
<td>0.57</td>
<td>Agree</td>
</tr>
<tr>
<td>6. I used technology to communicate and share information appropriately.</td>
<td>4.60</td>
<td>0.50</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>7. I noted advantages of technology for learning.</td>
<td>4.50</td>
<td>0.57</td>
<td>Strongly agree</td>
</tr>
<tr>
<td>The overall development of the ability to use technology</td>
<td>4.54</td>
<td>0.58</td>
<td>Strongly agree</td>
</tr>
</tbody>
</table>

Table 6. The evaluation result of the ability to use the technology aspect of the learning activity of Scientific Imagineering through social media in order to enhance competencies for learners.
According to Table 6, the students strongly agreed that the learning activity of Scientific Imagining through social media they took part in developed the ability to use life aspect of competencies for learners (Mean = 4.54 and SD = 0.58).

Overall, the students strongly agreed that their competencies for learners had been developed through participating in the learning activity of Scientific Imagining through social media (Mean = 4.50 and SD = 0.59). This is in line with Techakosit & Nilsook [13]'s finding that the 'develop' step of the learning model of Scientific Imagining through AR in order to enhance STEM literacy could strengthen the ability to solve the problem, which is one of the five competencies for learners. It is also in alignment with Gonçalves [14]'s finding that all students agreed that the features and capability of Facebook could contribute to the development of the ability to use technology aspect of competencies for learners.

CONCLUSION

The development of the learning activity of Scientific Imagining through social media to enhance competencies for learners showed that it consisted of 6 steps, namely imagine, study, design, develop, present and evaluate. The result of quality evaluation of the learning activity of Scientific Imagining through social media completed by ten experts showed that the learning activity was extremely suitable for enhancing the competencies of learners (Mean = 4.88 and SD = 0.87). According to the learners' self-evaluation completed by learners who had participated in the learning activity, the learners strongly agreed that the learning activity of Scientific Imagining through social media helped them develop their competencies for learners (Mean = 4.50 and SD = 0.59).

REFERENCES

COVID-19 pandemic has limited people’s lives. To reduce virus transmission, several regulations have been implemented, including physical distancing and the closure of public places, including schools. This condition forces teachers and students to hold the teaching and learning activities remotely. Even though online learning has been introduced since before the pandemic, in fact, there are still many obstacles in its implementation, including online learning facilities that students have at home, bad internet connection, and also the limited teachers’ skills to use the available online learning platforms.

Several SEAQIS alumni from Malaysia have shared their experiences related to distance education. One of them is Ms Thilagavathi Arichanan, a physics teacher from Sekolah Menengah Kebangsaan Perempuan Taman Petaling, Selangor (high school). With Hyperdocs skill she learned from YouTube, she made a worksheet and shared to her students. The material she discussed was Cartesian Diver. The Cartesian Diver is a classic science experiment demonstrating the principle of buoyancy and the law of the ideal gas.

With Google Hyperdocs, she attached various documents and other learning links (such as Youtube) that support students in understanding the material discussed, in one sheet. The embed link also contained worksheet and worksheet submission link.

Another method came from Mr Joseph Ting, a Math teacher in Malaysia. Through his Youtube Channel, he shared his best practice in teaching math. He uses Zoom meeting to deliver his presentation, and also Google Classroom to give the worksheet. He also shared some science projects which we can see on his Youtube Channel Joseph Ting/ MCO amidst MCO.
AROUND THE CENTRE

Kaina Numa Syazani
Even though the pandemic situation is still ongoing, SEAQIS still can find happiness since they welcome new members to the big family, mostly from Human Resource and General Affairs Division. The head of division, Mr Rizwan Darmawan, has just been blessed by having a new babies born, their children. Kaina Numa Syazani, a baby girl who was born on 4 September 2020, completed his family. Mr Darmawan said that the baby name means a smart and cheerful leader. A week earlier, Ms Lintang Ratri Prastika also delivered a cute baby boy on 27 August 2020. The baby was named Narthana Abyaksa Putra Faprasta. The centre would like to congratulate both upon their new baby born. May their hearts and minds swell with joy every time they think of their child.
During the pandemic, SEAQIS actively established cooperation with various institutions, including schools, universities, and Education Offices. In June and July 2020, SEAQIS collaborated with Yayasan Al-Muqarrobotin and Yayasan Baiturrahman Indonesia in conducting training on the use of digital applications for primary and secondary teachers. SEAQIS also signed a memorandum of understanding with Education Office of Pangandaran Regency and West Java Provincial Education Office, Branch XIII (Cadisdik XIII). Furthermore, SEAQIS also linked with BMPS Kab. Purwakarta and also APKS PGRI Jawa Barat to conduct several programmes to improve the competence of science teachers and education personnel in the respective area.

In September, after the 11th Governing Board Meeting, SEAQIS had an MOU signed with SMK 2 LPPMRI Majalaya and PPSI (Indonesian Science Teachers Association). The signing of MoU was witnessed by the staff of Cooperation and Public Relation Bureau, MoEC.

Alongside the MoU signing, during the pandemic, SEAQIS also built partnership by having visited by Sampoerna University, Jakarta. This visit was the continuation of the previous one and discussed several activities and programmes that can be executed by both parties.
To assist Centre performance and carry out its duties, Centre assigns Experts. This year, SEAOIS assigned Dr Harry Firman as its expert. He was a lecturer of chemistry education at Indonesia University of Education. Dr Harry Firman earns his doctoral degree from Universiti Pendidikan Sultan Idris, Malaysia in chemistry education in 2012. His latest publication was the Certainty and Uncertainty in Science published in Indonesian Philosophy Journal. His other publication was Validation of science virtual test to assess 8th-grade students’ critical thinking on living things and environmental sustainability. Apart from writing a scientific publication, he also actively participates in some training, including Training on Modern Science Teaching conducted by SEAMEO RECSAM, and Short Course of Science Education at School of Education, SUNY Albany, USA. Besides, Dr Harry also holds the copyright on STEM Virtual Lab: Alternative Practice Media in Science Learning.
PHOTO OF THE WINNER OF THE PHOTOGRAPHY UNDECAFIESTA COMPETITION
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Did You Know?

The calendar system we use in our daily life is called the Gregorian Calendar. It was a reform of the Julian Calendar, and is named after Pope Gregory XIII who introduced it in October 1582. It is a solar calendar based on a 365-day common year divided into 12 months of irregular lengths. 11 of the months have either 30 or 31 days, while the second month, February, has only 28 days during the common year. However, nearly every four years is a leap year, when one extra – or intercalary – day is added on 29 February, making the leap year in the Gregorian calendar 366 days long.

Source: https://www.timeanddate.com/calendar/gregorian-calendar.html