ON-LINE CONFERENCE 2021

East-Asian Association for Science Education

ASIAN COLLABORATION TOWARDS THE DEVELOPMENT OF NEW SCIENCE EDUCATION FOR THE FUTURE; WISE PREPARATION WITH SDGS/STEM

Photo by Dr. Yoshisuke KUMANO

JUNE 18 (FRI) - 20 (SUN), 2021

Main Host Server: Shizuoka University, Shizuoka, JAPAN

E·A·S·E
East-Asian Association for Science Education

East-Asian Association for Science Education
EASE
2021
ON-LINE
CONFERENCE

2021 International Conference of East-Asian Association for Science Education

E·A·S·E
East-Asian Association for Science Education

=Host University=

静岡大学
Shizuoka University

=Co-Host University=

SRINAKHARINWIROT UNIVERSITY

=Special Supporter=

聖光

静岡聖光学院中学校・高等学校

=Supporters=

静岡大学
Shizuoka University

STEAM Education Institute,
Shizuoka University

=Sponsors=

AOKI Co.,Ltd.

Dainippon tosho Co., Ltd.

Gakko Tosho Co.,Ltd.

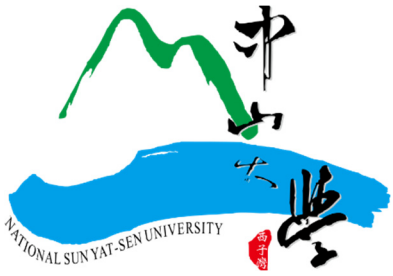
GASTEC Corporation

Japan Educational Mutual Aid Association of Welfare Foundation, Shizuoka Branch.

Narika Corportaion

*Alphabetical Order

=Collaborating Universities=



*Alphabetical Order

2021 International Conference of East-Asian Association for Science Education

Greetings!! It is my great honor to announce the 2021 International Zoom Conference East-Asian Association for Science Education, Shizuoka, Japan. As all of you have known that 2020 ICEASE at Korea was canceled because of COVID 19. We are all straggling with the unbelievable difficulties in all of the activities as human beings. We are all living in the middle of historical epoch within the time of great changes of Global community.

Our theme this time is settled down as "Asian Collaboration Towards the Development of New Science Education for the Future; the Wise Preparation with SDGs/STEM" This theme has strong connection not only with the COVID 19, but also with rapid changes of Science, Technology, Engineering, Liberal Arts, and Mathematics toward SDGs. We will be able to find good solutions towards many issues that coming up globally. Those issues and problems cannot find proper solutions without good collaborations among all of the countries in the world.

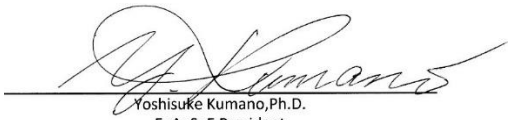
I would express my great thanks to all of the participants for 2021 International Zoom Conference EASE. Your presentations, your ideas, your questions and our discussions will be able to elaborate super solutions for the future!!

We will have six keynote speakers including myself, who will be able to provide stimulated ideas and research results for our researches in science education. I strongly wish that all of the participants should listen to their keynote speakers carefully.

Let us enjoy by joining EASE. New members and old members should attend the all-member meeting and please vote for the new president and new executive members from each region. Also, we will welcome new country members for EASE. They are the researcher from Thailand and Indonesia! Welcome to EASE!! In a near future, I would like to propose that we should upgrade the name from EASE to Asian Association of Science Education (AASE). This is one of the tasks for the New President!

Best Wishes

President of EASE, 2018-2021



Yoshisuke Kumano,Ph.D.
E・A・S・E President

SPONSORS

AOKI Co.,Ltd.

大日本図書

GAKKO TOSHO CO.,LTD.

GASTEC

Japan Educational Mutual Aid Association of
Welfare Foundation, Shizuoka Branch.

NaRiKa
SCIENCE IS JUST THERE

＊Alphabetical order

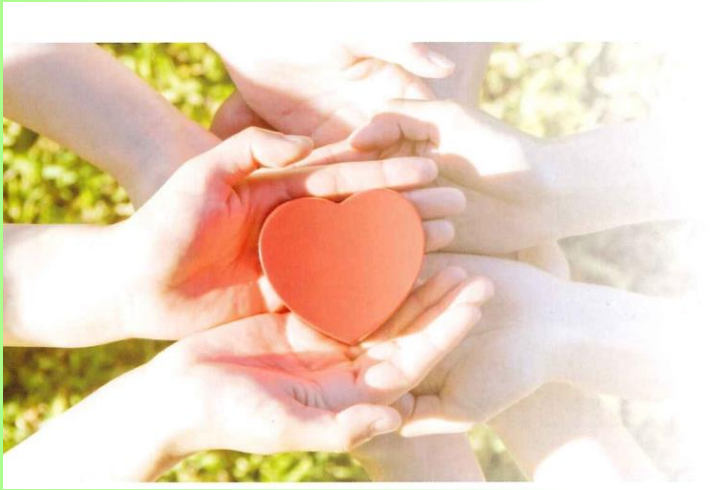
Japan Educational Mutual Aid Association of Welfare Foundation

We are supporting students, a guardian, and the educational personnel!

We have been contributing in terms of educational promotion at Shizuoka Prefecture according to the scholarship enterprise (student-loan and student-loan grant), educational research promotion services (educational activity encouragement / training assistance / educational practice research papers reports, etc.), and education cultural projects (parents-and-teachers-association activities support, area training culture support, etc.).

Moreover, we strive for the substantial welfare works (gifts of happiness as the family, gifts for the memorial events, etc., discount coupon for the hotels, complete physical examination assistance, etc.) to you, the educational persons who are the members, and we provide grace to the life.

These enterprises are developed by the policy dividend of the Nikkokyo insurance which are carrying out as a mutual aid project (cooperated insurance foundation). Those projects send you lifelong relief, a source of revenue, and, support the educational fullness and development for the children who challenge tomorrow.



zip: 420-0856

Shizuoka Prefecture Education Hall 4F,
1-12, Aoiku, Sunnpu-machi, Shizuoka-shi, Shizuoka Pref., Japan TEL 054-205-5130

Conference Program 1

Keynote Speech 3

Dr. Jeff Weld 4
Dr. Myeong kyeong SHIN 7
Dr. Pradeep Maxwell Dass 10
Dr. John Stiles 13
Dr. Gillian Roehrig 15
Dr. Yoshisuke KUMANO 17

Oral Session

Oral Session 1 Room 1 22

James Green (Chosun University) 23
Indarini Dwi Pursitasari (Universitas Pakuan) 25
Wai Wai Kyi (Hiroshima University) 27
Nanda Syah Putra (Universitas Pendidikan Indonesia) 29

Oral Session 1 Room2 31

Nobuyuki KAWAI (Kobe Municipal Junior High School) 32
Rogelio Bañares Lacorte, Jr. (PHINMA University of Iloilo) 34
Shang Lingling (Northwest Normal University) 36
Kousuke SHIMADA (Hiroshima University) 38

Oral Session 1 Room3 40

WENHUA CHANG (Grad. Inst. of Sci. Ed., National Taiwan Normal University) 41
Daiki Nakamura (Hiroshima University) 43
Yuyu Rahayu (Science Education, Indonesia University of Education, Indonesia) 45
ANNA PERMANASARI (UNIVERSITAS PENDIDIKAN INDONESIA) 47

Oral Session 1 Room4 49

Ratiporn Munprom (Kasetsart university) 50
Roseleena Anantanukulwong (Kasetsart University) 52

Qingchen Yao (Xian Middle School of Shaanxi Province,) 54
Naoko KOSAKA (Graduate School of Science and Technology, Shizuoka University) 56

Oral Session I Room5 58

Riandi RIANDI (Universitas Pendidikan Indonesia) 59
Ngoc-Huy Tran (National Kaohsiung Normal University) 61
HU TAO (East China Normal University colledge of teacher education) -
Eni Nuraeni (Universitas Pendidikan Indonesia) 63
Yu Lei (National Engineering Laboratory For Educational Big Data,Central China Normal University) 65

Oral Session2 Room I 68

Yamashita Shuichi (Chiba National University) 69
PINIT KHUMWONG (Srinakharinwirot University) -
NURUL FARACH (Indonesian Education university) 71
Yuki Aono (Hiroshima University) 73

Oral Session2 Room2 75

PONGPRAPAN PONGSOPHON (Kasetsart University) 76
Hina Morishige (Graduate School of Education, Chiba University) 78
Supansa Khansumrit (Srinakharinwirot University) 80
Heesoo Ha (Center for Educational Research, Seoul National University) 82

Oral Session2 Room3 84

Chanyah Dahsah (Srinakharinwirot University) 85
Indrawati (The University of Jember) 87
Arizaldy (Science Education, Indonesia University of Education, Indonesia) 89
Yuya Nakanishi (Hiroshima University) 91

Oral Session2 Room4 93

Erkki T. Lassila (University of Oulu) 94
Hsuang-Ming Tseng (National Changhua University of Education) 96
Sucie Nuryani (Student, Indonesia University of Education) 98

Ujang Fahmi Abdillah (University of Jember) 100

Oral Session2 Room5 102

Tomotaka KURODA (Shizuoka University) 103
Wanpen Kamtet (Kasetsart University, Kamphaeng-Saen Campus, Thailand) 105
Duangjan Kaewkongpan (Kasetsart University, Kamphaeng Saen Campus) 107
Yong XIE (Beijing normal university) 109

Oral Session3 Room 1 112

Rossama Lumputha (Srinakharinwirot University) 113
Wei Hung, Huang (NTNU Univwesity) 115
Yu Wang (Hefei No.6 Middle School, Anhui Province, China) 117

Oral Session3 Room2 119

Hasan Uştu (Turkish Ministry of Education) 120
SHIH-JUNG HUANG (Department of Science Education, National Taipei University of Education) 122
Audchara Onpan (Srinakharinwirot University) 124

Oral Session3 Room3 126

SRI WAHYUNI (University of Jember) 127
Hui-Shan Lin (National Changhua University of Education) 129
Chen-Chen Yeh (Sanxia Junior High School, New Taipei City, Taiwan, R.O.C.) 131

Oral Session3 Room4 133

Chaninan Pruekpramool (Srinakharinwirot University) 134
Ippei MINETA (University of Tsukuba) 136
Santy Nurmalasari (Science Education, Indonesia University of Education, Indonesia) 138
Hisashi OTSUJI (Toyo University) 140

Oral Session3 Room5 142

Younkyeong Nam (Pusan National University) 143
Idris Solola (Ehime University) 145
Go Tanaka (Shizuoka University) 147

Apiradee Pansing (Srinakharinwirot University) 149

Oral Session3 Room6 151

Cheng-Chueh Liu (Graduate Institute of Science Education, National Taiwan Normal University) 152
Waralee Sinthuwa (Faculty of education, Kasetsart university) 154
Yi Liu (Central China Normal University) 156
Pingping Wang (Northwest Normal University) -

Oral Session3 Room7 158

Siriporn Kruatong (Kasetsart University, Kamphaeng Saen Campus) 159
Wenhua Zhang (Central China Normal University) 161
Zhu-yan Song (No. 6 Middle School of Harbin) 163
R. Ahmad Zaky El Islami (Kasetsart University) 165

Oral Session3 Room8 167

Takekuni YAMAOKA (Tokai Gakuen University) 168
Nurul F. Sulaeman (Mulawarman University) 170
Nina Rosliana (Universitas Pendidikan Indonesia) 172
Phattraporn Thongkesorn (Srinakharinwirot University) 174

Oral Session4 Room1 177

Jing-Wen Lin (Department of Science Education, National Taipei University of Education) 178
Vipavadee Khwaengmek (Kasetsart University (Bangkhen Campus) FY4N-LU6T-DG021 180
Titisan Rumchatsakul (Srinakharinwirot University) 182

Oral Session4 Room2 184

Winnie Wing Mui SO (Department of Science and Environmental Studies, The Education University of Hong Kong, Hong Kong Special Administrative Region, the People's Republic of ChinaCentre for Education in Environmental Sustainability, The Education University of Hong Kong, Hong Kong Special Administrative Region, the People's Republic of China) 185
Tawinan Saengkhattiya (Brunel University London) 187

Oral Session4　Room3 189

Hung Ming CHEN (Taichung Municipal Shi-Yuan Senior High School) 190
Pramudya Dwi Aristya Putra (The University of Jember) 192
NIKMATIL HASANAH (University of Jember) 194
THANAWAT NGAODA (Faculty of Education, Kasetsart University (Bangkhen Campus)) 196

Oral Session4　Room4 198

BIBIN RUBINI (PAKUAN UNIVERSITY) 199
Nindy Lestarie (Indonesia University of Education) 201
Pedro DE PAULA TERRA (Chiba University) 203
Liang Sanxia (Northwest Normal University) 205

Oral Session4　Room5 207

Irvan Permana (Universitas Pakuan) 208
Jirawan Nucharoen (Srinakharinwirot University) 210
Indah Juwita Sari (Kasetsart University) 212
Junye Gao (Hiroshima University) 214

Oral Session4　Room6 216

Tomoki Saito (Juntendo University) 217
Tepkanya Promkatkeaw (Srinakharinwirot University) 219
Guo-feng Zhang (Wentao Middle School, Hangzhou, Zhejiang Province, China) 221
Pei-Chen Wu (National Dong Hwa University) 223

Oral Session5　Room1 226

Jirayute Ruennakarn (Srinakharinwirot University) 227
Tian-Da Hsieh (National Taipei University of Education) 229
Suppamai Promkaew (Kasetsart University) 231
Yuan-Li Liu (Graduate Institute of Science Education, National Taiwan Normal University) 233

Oral Session5　Room2 235

DongYoung Lee (Pusan National University) 236

LIN MEIHUI (National Taipei University of Education Department of Natural Science Education) 238
Ying-Tai Hsu (National Changhua University of Education) 240
Tetsuya YAMADA (Minatogawa College) 242
Pattaraporn Pikunkwan (Kasetsart University) 244

Oral Session5 Room3 246

Ka Lok Cheng (The University of Hong Kong) 247
Sunisa Numdee (Srinakharinwirot University) 249
Xie Xiaoyu (Beijing Normal University) 251
Gao Ling (Capital Normal University) 253

Oral Session5 Room4 255

Stephen Okonkwo (Faculty of Education, Chiba University) 256
Naphat Suknarusaithagul (Kasetsart University) 258
Ying-Ju Chen (The National Kaohsiung Normal University) 260
Mengyun Xie (Beijing Normal University) 262

Oral Session5 Room5 264

Nuryani Rustaman (Universitas Pendidikan Indonesia) 265
Witchayada NAWANIDBUMRUNG (Waseda University) 267
Sudarmin (Universitas Negeri Semarang) 269
Wanting Qiao (Central China Normal University) 271

Oral Session5 Room6 273

Shelly Efwinda (Mulawarman University) 274
Ting-Hsuan Huang (Tatung University) 276
Anupong Praisri (Kasetsart University) 278
Hsin-Yi Chiu (National Kaohsiung Normal University) 280

Oral Session5 Room7 282

Chatree Faikhamta (Kasetsart University) 283
Young-Shin Park (Chosun University) 285
Yue-jiong Su (Taiyuan No.61 Middle School) 287

Poster Session 289

Yuhei Yamane (Graduate School of Education, Nippon Sport Science University) 291
Kazushige Mizobe (Hyogo University of Teacher Education) 292
Yau Yan Wong (Kasetsart University) 293
Chao-Fang Yang (Taipei Private Tsai Hsing School) 294
Thanyarat Suwannatrai (Srinakharinwirot University) 295
Tharuesean PRASOPLARB (Kasetsart University) 296
Didit Ardianto (Pakuan University) 297
Galih Albarra Shidiq (Kasetsart University) 298
Eugene KANG (Pusan National University) 299
Jina Yoon (Pusan National University) 300

Member Group Session 301

Book Review 306

Junior Session 309

Organizing Committee
Executive Board Members in Japan 310
Student Supporters

SCIENCE CONTEXT-BASED INQUIRY LEARNING MODEL: FEASIBILITY STUDY TO DEVELOP STUDENTS' CRITICAL THINKING SKILLS AND SCIENCE LITERACY

Indarini Dwi Pursitasari[1], Annisa Nurramadhani[2]

[1]*Unversitas Pakuan,Bogor,Indonesia*

ABSTRACT

Science Context-Based Inquiry Learning (SCOIL) is a learning model that involves students through investigation and problem-solving. The purpose of this research is to develop SCOIL learning model and make a feasibility study to develop students' critical thinking, and science literacy. The method that is used in this research is descriptive by collecting teacher's opinion in FGD forum to make a judgment and advises based on that learning model design after it is tested in one of middle school in Bogor. Data collecting which is used in this research is questionnaire from 18 middle schools' teacher in Bogor. The judgment results are made quantitative, so that they were categorized to gain feasibility criteria of the learning model. The research result of this study is a draft SCOIL model that has been developed has five stages, namely Observation, Investigation, Representation, Conclusion, and Communication. Based on its stages, it is figuring out that the learning model can facilitate the students to improve their science literacy and critical thinking skills. A feasibility study expels the results 3,51. It can be concluded that SCOIL learning model is able to implemented in science learning.

Keywords*: Science Context, Inquiry Learning Model, Critical Thinking Skills, Science Literacy*

INTRODUCTION

Science education in 21st century era has high demanding to develop students' critical thinking and problem-solving skills, creative thinking skills and innovation, communication, and also collaboration as it called Higher Order Thinking Skills (HOTs) in order to students are able to compete in this global society era (Erdogan, 2019; Zohar and Dori, 2003). Science education are implemented with integrated, holistic and contextual ways especially in middle school (Rubini., et.al, 2016), so that students are able to improve their experience in their daily life through the concept that they have already had in classroom. Science teaching learning process can trigger a critical thinking skill which provide students a chance to seek any information, asking a question, and leads to curiosity. Besides that, science literacy of students is also important to develop. It is to know their knowledge about science, how the use of science in different context, and relation with scientific ways of thinking or rational thinking. Students are not only making their decision based on their only experiences or personal interest, neither information of others belief (Osborne & Dillon, 2008; Harlen, 2010; ICSU, 2011;), but based on the data and fact. Both of them are the major component of science education, especially in middle school to make students think and responsible in their action at the society (Vieira and Tenreiro-Vieira, 2014).

The preliminary results based on Pursitasari, et.al. (2020) said that students' critical thinking skills in Bogor were still low which are 46,3 for average. Those are caused teacher cantered learning, then students cannot explore the content by themselves and less experiment that implemented in daily life. So that, this research is conducted to develop students' critical thinking skills and science literacy by developing Science Context-Based Inquiry Learning (SCOIL) learning model.

METHOD

The method that is used in this research is descriptive by collecting teacher's opinion in FGD forum to make a judgment and advises based on that learning model design after it is tested in one of middle school in Bogor. Data collecting which is used in this research is questionnaire from 18 middle schools' teacher in Bogor. There are 10 judgment categories by likert scale (1-5), for instance: Model rational, Purposes, Benefits, Model description, The relationship between model and science literacy aspect, The

relationship between model and critical thinking skills, evaluation, and follow-up. The judgment results are made quantitative, so that they were categorized to gain feasibility criteria of the learning model.

RESULT AND DISCUSSION

Science Context-Based Inquiry Learning (SCOIL) learning model has already tested in one of middle school in Bogor with the steps: Observation, Investigation, Representation, Conclusion, and Communication. Eighteen science teachers gave the appraisal and discuss in FGD forum. The results of FGD forum can be shown on Figure 1.

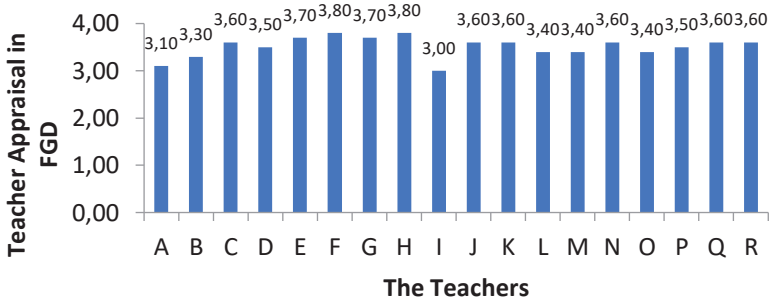


Figure 1. Teacher Appraisal in FGD Forum

The average results of teacher's appraisal in FGD forum are 3,51 means that this learning model in very appropriate category with some advises it is necessary to emphasize the stages in science literacy, it is needed time management when implement this learning model, need teacher training for Higher Order Thinking Skills (HOTs) before implementing this learning model, and this learning model which is initiated by contextual problem make students easy to comprehend the topic. The tested results of students' critical thinking skills by using SCOIL learning model are in middle category. That is the reason that before it is disseminated, it should be judged by the teachers in FGD forum.

CONCLUSION

It can be concluded that Science Context-Based Inquiry Learning (SCOIL) learning model is appropriate with the component and the aspect learning model judgement and able to develop students critical thinking and science literacy, and also it is able to implemented in science learning.

REFERENCES

Erdogan, V. (2019). Integrating 4C Skills of 21st Century into 4 Language Skills in EFL, Classes. *International Journal of Education and Research*, 7(11), 113–124.

Harlen, W. (Ed.). (2010). Principles and big ideas of science education. Hatfield, England: Association for Science Education.

International Council for Science (2011). Report of the ICSU ad-hoc review panel on science. Paris, France: Author. Retrieved from http://www.icsu.org/publications/reports-and-reviews/external-review-of-icsu.

Osborne, J. & Dillon, J. (2008). Science education in Europe: Critical reflections. London, England: Nuffield.

Pursitasai, I. D., Suhardi, E., Putra, A.P., & Rachman, I. (2020). Enhancment of Student's Critical Thinking Skill through Science Context-based Inquiry Learning. Jurnal Pendidikan IPA Indonesia, 9(1), 97–105.

Rubini, B., Ardianto, D., Pursitasari, I. D., & Permana, I. (2016). Identify scientific literacy from the science teachers' perspective. Jurnal Pendidikan IPA Indonesia,5(2),299–303.
Science Education.

Vieira, R. M., & Tenreiro-Vieira, C. (2014). Fostering Scientific Literacy and Critical Thinking in Elementary Science Education. *International Journal of Science and Mathematics Education*, 14(4), 659–680.

Zohar, A. & Dori, Y.J. (2003). Higher order thinking skills and low achieving students: Are they mutually exclusive? *The Journal of the Learning Sciences*, 12, 145–18