# PESERTA SUMMER SCHOOL 2022
# STUDENT EXHANGE PRODI PENDIDIKAN IPA S-2
**Agustus, 2022**

| NO. | NAMA PESERTA SUMMER SCHOOL | INSTANSI |
|---|---|---|
| 1 | Legian Selyorini (s2) | Universitas Negeri Semarang |
| 2 | Ariyatun (S3) | Universitas Negeri Semarang |
| 3 | Sigit Subagja (s2) | Universitas Pakuan |
| 4 | Ina Anna Khoeriah (s2) | Universitas Pakuan |
| 5 | Nikmatil Hasanah (S3) | Universitas Negeri Jember |
| 6 | Fitri Amaliah (S2) | Universitas Negeri Jember |
| 7 | Annisa Nurramadani (s3) | Universitas Pendidikan Indonesia |
| 8 | Rendi Restiana Sukardi (s3) | Universitas Pendidikan Indonesia |
| 9 | Adinda Siwi Utami (s2) | Universitas Pendidikan Indonesia |
| 10 | Putu Anindita Widhiya Putri (s3) | Universitas Negeri Malang |
| 11 | Wachidah Hayuana (s2) | Universitas Negeri Malang |
| 12 | Mr. Khaifatulloh Fiel'ardh | Okayama University, Jepang |
| 13 | Ms. Karen Onodera | Okayama University, Jepang |
| 14 | Mr. Mikiharu Ishitobi | Hiroshima University, Jepang |
| 15 | Mr. Kousuke Shimada | Hiroshima University, Jepang |
| 16 | Hua LUO (Doctoral Students) | The Education University of Hong Kong |
| 17 | Zeyu HAN (Master Student) | The Education University of Hong Kong |
| 18 | Roseleena Anantanukul Wong | Kasesart Universuty,Thailand |
| 19 | Wenkai LIN (Doctoral Student), | The Education University of HongKong |
| 20 | Salomey Tardy HACKMAN (S3) | The Education University of HongKong |
| 21 | Ju Yeon Lee (s3) | Seoul National University, Korea |
| 22 | Eun-Jeong Kim (s3) | Gyeongin National University, Korea |
| 23 | Daeun Jung (s2) | Kyungpook National University, Korea |
| 24 | So Yeon Park (s3) | Seoul National University, Korea |
| 25 | Yun-An Chen (s3) | National Sun Yat-Sen University, Taiwan |
| 26 | Liuyan Wu | Guangxi Normal University, Mainland China |
| 27 | Thidaporn Souysaart | Khon Kaen University, Thailand |
| 28 | Piyatida Supa | Srinakharinwirot University, Thailand |

Bogor, 31 Agustus 2022
Kaprodi Pendidikan IPA

Prof. Dr. Indarini Dwi Pursitasari, M,Si

E·A·S·E

East-Asian Association for Science Education

# SUMMER SCHOOL 2022

2 – 6 AUGUST 2022

# BOOK OF PROGRAM

# WELCOMING ADDRESS

Ladies and Gentleman,

Research in science education meet its merit recently, especially in facing post pandemic Covid-19 era. Lost learning became big issues in science education. Many researchers and scholars are trying to find out solution toward those issues. On the other hand, researchers cannot work alone in conducting their research. We need collaboration to gain more impacts. East Asian Association for Science Education (EASE) conducted Summer School Program to initiate research collaboration.

EASE Online Summer School Program 2022 aim to empowering science education through research sharing and collaboration. It creates scholar community of doctorate and master program students for sharing research experiences and initiating future research collaboration. The theme is "**Finding out STEM (Science, Technology, Engineering, and Mathematics) Education for SDG's**". However, other research themes on science education are welcome. This program is in correlate to EASE International Conference. Therefore, the participant can come from perspective doctorate/master students who participated into EASE International Conference

EASE Summer School 2022 hosted by Indonesia region, followed by 24 students from 6 EASE region member. It is coached by 17 professor/assistant, and led by eight speakers (lectures) from different region. It also has "guest lecture" from Prof. Dr. Krestin Kremer (Justus-Liebig-Universität Gieβen, Germany).

I hope all participant enjoy the program and start collaborate.

Thank you for your participation!

Prof. Dr Anna Permanasari, M.Si

Chair of EASE Summer School 2022 Program

# PARTICIPANT GUIDELINE

## Professor (Lecturer)

The professor give lecture to students related to his/her research area. The aim is to share research experience in science education. The research experience will be the discussion topic on group session. It will be delivered around 60 minutes that divided into 50 minutes presentation and 10 minutes Q & A session. Professor can join the group of discussion based on his/her interest during the group discussion session. The lecture material should give to the organizer up to August 1st 2022, or one day before presentation. The format can be in pdf format.

＝Displayed name setting＝

The lecturer should set the display name as follow:

Name_Region

Prof. Anna Permanasari_Indonesia

*Please prepare 50 minutes lecture and share your pdf. Presentation file to the students

## Coach

Coach is professor/assistant who led the group discussion and give advice to students in preparing their research collaboration. Coach can give explanation about research method, design and theme.

＝Day 1＝

Coach asks each participant to present their research proposal

The coach and the participants discussed the possibility of collaboration related to the theme presented by the speakers.

At the end of FGD, coach wrap up the discussion results and give advice for further step of research plan development.

＝Day 2 - 4＝

The coach and students participant discussed the possibility of collaboration related to the theme presented by the speakers.

At the end of FGD, coach wrap up the discussion results and give advice for further step of research plan development.

＝Displayed name setting＝

The Participants should set the display name as follow:

Coach_Group name_Name_Region

Coach_Group A_Dr. Ida Kaniawati_Indonesia

*Please put your tittle: Prof/Dr

## Student

Student participant is master or doctoral students who is developing research proposal for completing his/her study. He/ she should present research plan on group session, discuss, and create research collaboration plan. Student also should participate in I AM STEM International Conference to get more knowledge from keynote speakers and other participants.

＝Day 1＝

present the research proposal

Discuss the possibility of collaboration related to the theme presented by the speakers.

＝Day 2, 3, and 5 ＝

Discuss their RC plans and discuss the lecture with coach and other students in group

＝Day 4 ＝

Participate in I AM STEAM International conference

＝Displayed name setting＝

The Participants should set the display name as follow:

Group name_Name_Region

Group A_Legian_Indonesia

# SUMMER SCHOOL 2022

## Program Schedule

| Date Time(Western part of Indonesia time) | August 2nd | August 3rd | August 4th | August 5th | August 6th |
|---|---|---|---|---|---|
| 08:00 - 09:00 | Opening Remarks | Prof. Dr. Toshinobu Hatanaka (Japan) | Professor Baohui Zhang (Mainland China) | Participating I AM STEAM International conference | Design methodology to initiate RC |
| 09:00 – 09:20 | Break & Cultural Performance | | | | |
| 09:20 – 10:20 ( | Prof. Peter Zhihong Wan (Hong Kong) | Prof. Mei-Hung Chiu (Taiwan) | Prof. Sri Rahayu, M.Ed, Ph.D (Indonesia) | | Creating draft research collaboration proposal<br><br>Lead by coach in each group |
| 10:20 – 12:00 | FGD Problem identification to initiate RC<br><br>(7 group in parallel)<br><br>Lead by coach in each group | FGD Problem identification to initiate RC<br><br>(7 group in parallel)<br><br>Lead by coach in each group | FGD Problem identification to initiate RC<br><br>(7 group in parallel)<br><br>Lead by coach in each group | | |
| 12:00 – 13:00 | | Lunch Break | | | |
| 13:00 – 14:00 | Prof. Dr. Anna Permanasari, M.Si (Indonesia) | Prof. Phil Seok Oh (Korea) | Guest Lecture<br>Prof. Dr Kerstin Kremer From Justus-Liebig-Universität Gießen | Participating I AM STEAM International conference | RC Presentation |
| 14:00 – 15:30 | FGD Problem identification to initiate RC<br><br>(7 group in parallel)<br><br>Lead by coach in each group | FGD Problem identification to initiate RC<br><br>(7 group in parallel)<br><br>Lead by coach in each group | FGD Problem identification to initiate RC<br><br>(7 group in parallel)<br><br>Lead by coach in each group | | RC Presentation |
| 15:30 – 16:00 | wrap-up | | | | Closing ceremony Cultural Performance |

Cultural Performance:

Indonesia : Angklung live performance

Participant Group

| Group | Coach | Group member |
|---|---|---|
| **A** | Prof. Dr. Hiroki Fujii<br>Prof. Dr. Toshihide Hirano | 1. Wenkai LIN (The Education University of Hong Kong)<br>2. Legian Selyorini (s2), Universitas Negeri Semarang, Indonesia<br>3. Putu Anindita Widhiya Putri (s3) Universitas Negeri Malang, Indonesia<br>4. Yun-An Chen (s3) (Taiwan)<br>5. Thidaporn Souysaart (Khon Kaen University, Thailand) |
| **B** | Dr. Heesoo Ha<br>Irma Rahma Suwarma, Ph.D | 1. Salomey Tardy HACKMAN (The Education University of Hong Kong)<br>2. Karen Onodera (Okayama University, Jepang)<br>3. Ina Anne Khoeriah (s2) (Universitas Pakuan)<br>4. Rendi Restiana Sukardi (s3) (universitas pendidikan Indonesia)<br>5. Roseleena Anantakuluwong (Kasesart University, Thailand) |
| **C** | Prof. Kuay-Keng Yang<br>Arif Widyatmoko, Ph.D in Ed | 1. Mikiharu ISHITOBI (Hiroshima University, Japan)<br>2. So Yeon Park (s3) (Seoul National university, Korea)<br>3. Annisa Nurramadani (s3) (Universitas Pendidikan Indonesia))<br>4. Wachidah Hayuana (s2) (Universitas Negeri Malang, Indonesia) |
| **D** | Professor Baohui Zhang (Mainland China)<br>Prof. Chong Ping Chiou (Taiwan)<br>Prof. Indarini<br>Nurul F Sulaiman, Ph.D<br>Pramudya Dwi Aris Putra , Ph.D | 1. Zeyu HAN (The Education University of Hong Kong)<br>2. Daeun Jung (s2) (Kyungpook University, Korea)<br>3. Khalifatulloh Fiel'ardh (Aldi) (Okayama University Japan)<br>4. Sigit Subagja (s2)(Universitas Pakuan, Indonesia) |

| | | |
|---|---|---|
| **E** | Dr. Yu CHEN, The University of Macau (Hong Kong)<br>Prof. Sudarmin | 1. Eun-Jeong Kim (s3) (Gyeongin National University, Korea)<br>2. Kousuke Shimada (Hiroshima University, Japan)<br>3. Fitri Amaliah (S2) (Universitas Jember, Indonesia)<br>4. Ariyatun (s3) (Universitas Negeri Semarang, Indonesia) |
| **F** | Dr. Riandi<br>Prof. Indrawati<br>Dr. Ida Kaniawati, M.Si | 1. Ju Yeon Lee (s3)(Seoul National University, Korea)<br>2. Hua LUO (The Education University of Hong Kong)<br>3. Adinda Siwi Utami (s2) (Universitas Pendidikan Indonesia)<br>4. Nikmatul Hasanah (s3)(universitas Jember, Indonesia) |

**Day 1 - Tuesday, August 2nd, 2022**

Link Zoom:

https://zoom.us/j/97366172845?pwd=TVZPaXJzUkNRbWw2MW5FcUNwWGVGdz09

Meeting ID: 973 6617 2845

Passcode: EASE2022

| Time | Activities | Duration |
|---|---|---|
| **07.30 – 08.00** | Registration Via Zoom and Google Form by seminar host<br>Link Zoom:<br><br>https://zoom.us/j/97366172845?pwd=TVZPaXJzUkNRbWw2MW5FcUNwWGVGdz09<br><br>Meeting ID: 973 6617 2845<br>Passcode: EASE2022 | 30 mins |
| **08.00 – 08.05** | Online seminar opening | 5 mins |
| **08.05 – 08.10** | Listening National Anthem Indonesia Raya 2 Stanza directed by MC | 5 mins |
| **08.10 – 08.15** | Conference Report by Head of Executive Committee | 5 mins |
| **08.15 – 08.20** | Welcoming Remarks by Dean of FPMIPA UPI:<br>Prof. Dr. Tatang Herman, M.Ed. | 5 mins |
| **08.20 – 08.30** | Welcoming Remarks and Official Opening of EASE Summer School by Rector of UPI:<br>Prof. Dr. H.M. Solehudin, M.Pd., M.A. | 10 mins |
| **08.30 – 08.35** | Closing session of the opening ceremony by MC | 5 mins |
| **08.35 – 09.00** | Cultural Performance | 25 mins |
| **09.00 – 09.05** | Inviting moderator for I keynote speaker session by MC<br>Moderator:<br>Pramudya Aris Dwi Putra, Ph.D | 2 mins |
| **09.05 – 09.10** | Introduction of 1st keynote speaker by a moderator | 5 mins |
| **09.10 – 10.00** | Keynote Session<br>1st Keynote Speaker:<br>Prof. Peter Zhihong Wan (Hong Kong) | 50 mins |
| **10.00 – 10.10** | Question and Answer Session directed by the moderator | 15 mins |
| **10.10 – 10.15** | Welcoming participants to join the parallel session by moderator and then participants were distributed to the 7 breakout room to FGD | 5 mins |
| **10.15 – 12.00** | Parallel session to present research proposal of each students | 1 hours 45 mins |

| | | |
|---|---|---|
| **12.00 – 13.00** | Lunch Break | 1 hours |
| **13.00 – 13.02** | In the main room inviting moderator for II keynote speaker session by MC | 2 mins |
| **13.02 – 13.05** | Introduction of 2nd keynote speaker by a moderator<br>Moderator:<br>Irma Rahma Suwarma, Ph.D | 3 mins |
| **13.05 – 13.50** | Keynote Session<br>2nd Keynote Speaker:<br>Prof. Dr. Anna Permanasari (Indonesia) | 45 mins |
| **13.50 – 14.00** | Question and Answer Session directed by the moderator and then participants were distributed to the 7 breakout room to FGD related to RC Plan | 10 mins |
| **14.00 – 15.30** | Parallel session to Problem identification to initiate RC | 1 hours<br>30 mins |
| **15.30 – 16.00** | Wrap up by Coaches | 30 mins |

**Day 2 - Wednesday, August 3rd, 2022**

Link Zoom:

https://zoom.us/j/97366172845?pwd=TVZPaXJzUkNRbWw2MW5FcUNwWGVGdz09

Meeting ID: 973 6617 2845

Passcode: EASE2022

| Time | Activities | Duration |
|---|---|---|
| **07.30 – 08.00** | Registration Via Zoom and Google Form by seminar host<br>Link Zoom:<br><br>https://zoom.us/j/97366172845?pwd=TVZPaXJzUkNRbWw2MW5FcUNwWGVGdz09<br><br>Meeting ID: 973 6617 2845<br>Passcode: EASE2022 | 30 mins |
| **08.00 – 08.05** | Online seminar opening and inviting moderator for I keynote speaker session by MC | 5 mins |
| **08.05 – 08.10** | Introduction of 1st keynote speaker by a moderator<br>Moderator:<br>Nurul F. Sulaiman, Ph.D | 5 mins |
| **08.10 – 08.50** | Keynote Session<br>1st Keynote Speaker:<br>Prof. Sri Rahayu, M.Ed, Ph.D (Indonesia) | 40 mins |
| **08.50 – 09.00** | Question and Answer Session directed by the moderator | 10 mins |
| **09.00 – 09.10** | Break/Cultural Performance | 20 mins |
| **09.10 – 09.12** | Inviting moderator for II keynote speaker session by MC | 2 mins |
| **09.12 – 09.15** | Introduction of 2nd keynote speaker by a moderator<br>Moderator:<br>Rendi Restiana Sukardi, M.Pd | 3 mins |
| **09.15 – 10.05** | Keynote Session<br>2nd Keynote Speaker:<br>Prof. Dr. Toshinobu Hatanaka (Japan) | 50 mins |
| **10.05 – 10.15** | Question and Answer Session directed by the moderator | 10 mins |
| **10.25 – 10.30** | Welcoming back participants to join the parallel session by moderator and then participants were distributed to the 7 breakout room to FGD related RC Plan | 5 mins |
| **10.30 – 12.00** | Parallel session to Problem identification to initiate RC | 1 hours 30 mins |
| **12.00 – 13.00** | Lunch Break | 1 hours |

| | | |
|---|---|---|
| **13.00 – 13.02** | In the main room inviting moderator for III keynote speaker session by MC | 2 mins |
| **13.02 – 13.05** | Introduction of 3rd keynote speaker by a moderator<br>Moderator:<br>Annisa Nurramadani | 3 mins |
| **13.05 – 13.50** | Keynote Session<br>3rd Keynote Speaker:<br>Prof. Phil Seok Oh (Korea) | 45 mins |
| **13.50 – 14.00** | Question and Answer Session directed by the moderator and then participants were distributed to the 7 breakout room to FGD related to RC Plan | 10 mins |
| **14.00 – 15.30** | Parallel session to Problem identification to initiate RC | 1 hours 30 mins |
| **15.30 – 16.00** | Wrap up day 2 by Coach | 30 mins |

**Day 3 - Thursday, August 4th, 2022**

Link Zoom:

https://zoom.us/j/97366172845?pwd=TVZPaXJzUkNRbWw2MW5FcUNwWGVGdz09

Meeting ID: 973 6617 2845

Passcode: EASE2022

| Time | Activities | Duration |
|---|---|---|
| **07.30 – 08.00** | Registration Via Zoom and Google Form by seminar host<br>Link Zoom:<br><br>https://zoom.us/j/97366172845?pwd=TVZPaXJzUkNRbWw2MW5FcUNwWGVGdz09<br><br>Meeting ID: 973 6617 2845<br>Passcode: EASE2022 | 30 mins |
| **08.00 – 08.05** | Online seminar opening and inviting moderator for I keynote speaker session by MC | 10 mins |
| **08.05 – 08.10** | Introduction of 1st keynote speaker by a moderator<br>Moderator:<br>Legina Setianingrum | 5 mins |
| **08.10 – 08.50** | Keynote Session<br>1st Keynote Speaker:<br>Prof. Baohui Zhang (Mainland China) | 40 mins |
| **08.50 – 09.00** | Question and Answer Session directed by the moderator | 10 mins |
| **09.00 – 09.10** | Break/Cultural Performance | 10 mins |
| **09.10 – 09.12** | Inviting moderator for II keynote speaker session by MC | 2 mins |
| **09.12 – 09.15** | Introduction of 2nd keynote speaker by a moderator<br>Moderator:<br>Adinda Utami | 3 mins |
| **09.15 – 10.05** | Keynote Session<br>2nd Keynote Speaker:<br>Prof. Mei-Hung Chiu (Taiwan) | 50 mins |
| **10.05 – 10.15** | Question and Answer Session directed by the moderator | 10 mins |
| **10.15 – 10.20** | Welcoming back participants to join the parallel session by moderator and then participants were distributed to the 7 breakout room to FGD | 5 mins |
| **10.20 – 12.00** | Parallel session to Problem identification to initiate RC | 1 hours 40 mins |
| **12.00 – 13.00** | Lunch Break | 1 hours |

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|---|---|---|
| **13.00 – 13.02** | In the main room inviting moderator for III keynote speaker session by MC | 2 mins |
| **13.02 – 13.05** | Introduction of 3rd keynote speaker by a moderator<br>Moderator:<br>Khalifatulloh Fiel'ardh (Aldi) | 3 mins |
| **13.05 – 13.50** | Keynote Session<br>3rd Keynote Speaker:<br>Prof. Dr. Krestin Kremer | 45 mins |
| **13.50 – 14.00** | Question and Answer Session directed by the moderator and then participants were distributed to the 7 breakout room to FGD | 10 mins |
| **14.00 – 15.30** | Parallel session to Problem identification to initiate RC | 1 hours 30 mins |
| **15.30 – 16.00** | Wrap up day 3 by Coaches | 30 mins |

**Day 4 - Friday, August 5th, 2022**

**Participating I AM STEM Conference**
The 5th IAMSTEM 2022 for August 5-6th
https://us06web.zoom.us/j/85452450052?pwd=Nmw4RE5VWEdUK1N5K1lJaDlZZXE5UT09
Meeting ID: 854 5245 0052
Passcode: 217153

**Day 5- Saturday, August 6th , 2022**

Link Zoom:
https://zoom.us/j/97366172845?pwd=TVZPaXJzUkNRbWw2MW5FcUNwWGVGdz09
Meeting ID: 973 6617 2845
Passcode: EASE2022

| Time | Activities | Duration |
|---|---|---|
| **07.30 – 08.00** | Registration Via Zoom and Google Form by seminar host<br>Link Zoom:<br>https://zoom.us/j/97366172845?pwd=TVZPaXJzUkNRbWw2MW5FcUNwWGVGdz09<br>Meeting ID: 973 6617 2845<br>Passcode: EASE2022 | 30 mins |
| **08.00 – 08.03** | Online seminar opening by MC<br>Welcoming back participants to join the parallel session by moderator and then participants were distributed to the 7 breakout room to FGD | 3 mins |
| **08.00 – 09.00** | Design methodology to initiate RC | 60 mins |
| **09.00 – 12.00** | Creating draft research collaboration proposal (presentation preparation)<br>Lead by coach in each group | 3 hours |
| **12.00 – 13.00** | Lunch Break | 20 mins |
| **13.00 – 13.05** | MC welcoming all participants into the main room, explaining presentation rules. Moderator: Prof. Dr. Anna Permanasari, M.Si | 5 mins |
| **13.05 – 13.25** | RC presentation of group 1 | 20 mins |
| **13.25 – 14.05** | RC Presentation group 2 | 20 mins |
| **14.05 – 14.25** | RC Presentation of group 3 | 20 mins |
| **14.25 – 14.45** | RC Presentation group 4 | 20 mins |
| **14.45 – 15.05** | RC Presentation of group 5 | 20 mins |
| **15.05 – 15.25** | RC Presentation of group 5 | 20 mins |
| **15.25 -15.40** | Closing Ceremony: Prof. Anna Permanasari, M.Si<br>Cultural Performance (live Angklung) | 15 mins |

# Organizer Committee

Chair: Prof. Dr. Anna Permanasari, M.Si

Secretary:
Irma Rahma Suwarma, Ph.D (Universitas Pendidikan Indonesia),
Nurul F. sulaeman, Ph.D (Universitas Mulawarman)
Pramudya Dwi Aris Putra, Ph.D (Universitas Jember)

Reviewer Coordinator:
Prof. Sri Rahayu, M.Ed, Ph.D (Universitas Negeri Malang)
Dr. Ida Kaniawati, M.Si (Universitas Pendidikan Indonesia),
Dr. Sutopo, M.Si (Universitas Negeri Malang)
Editor :
Dr. Parmin, M.Pd, Universitas Negeri Semarang)
Lecture Coordinator:
Prof. Dr. Sudarmin, M.Si (Universitas Negeri Semarang)
Group Discussion Coordinator:
Prof. Dr. Indrawati, M.Pd (Universitas Jember)
Prof. Dr. Supriyono Koes Handayanto, M.A (Universitas Negeri Malang)

# LAPORAN

## KEGIATAN EASE SUMMER SCHOOL
## PROGRAM TH. 2022


**PROGRAM STUDI PENDIDIKAN IPA**

**SEKOLAH PASCASARJANA**

**UNIVERSITAS PAKUAN**

Yayasan Pakuan Siliwangi
Universitas Pakuan
Sekolah Pascasarjana
*Kejujuran, Integritas, Kreativitas, Kualitas, Harmoni*
Jln. Pakuan PO BOX 452 Bogor Telp./Fax (0251) 8320123 E-mail: pasca@unpak.ac.id
Web: www.pasca.unpak.ac.id

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2003120010012IK001

# LEMBAR PENGESAHAN

# LAPORAN PERTANGGUNGJAWABAN

KEGIATAN EASE (EAST ASIAN ASSOCIATION FOR SCIENCE EDUCATION)
"Finding out STEM (Science, Technology, Engineering, and Mathematics)
Education for SDG's"

Diselenggarakan oleh:

**Program Studi Pendidikan Ilmu Pengetahuan Alam**
**Sekolah Pascasarjana Universitas Pakuan Bogor**

Disahkan pada:

Hari : Selasa
Tanggal : 02 Agustus 2022

Mengetahui,

| Ketua Prodi, | Dekan, |
|---|---|
| Prof. Dr. Indarini Dwi Pursitsari, M.Si. | Prof. Dr. H. Ing. Soewarto Hardhienata |

BERITA ACARA

**KEGIATAN EASE (EAST ASIAN ASSOCIATION FOR SCIENCE EDUCATION)**
**"Finding out STEM (Science, Technology, Engineering, and Mathematics) Education for SDG's"**

Pada hari ini, ***Selasa*** tanggal ***Dua*** bulan ***Agustus*** tahun ***Dua Ribu Dua Puluh Dua*** pukul ***08.00 WIB*** hingga pukul ***16.00 WIB***, telah dilaksanakan kegiatan EASE hari pertama. Kegiatan ini akan berlangsung dari tanggal 2-6 Agustus 2022. EASE Summer School 2022 diselenggarakan oleh tuan rumah wilayah Indonesia, diikuti oleh 24 siswa dari 6 EASE wilayah anggota. Dibimbing oleh 17 profesor/asisten, dan dipimpin oleh delapan pembicara (dosen) dari wilayah yang berbeda. EASE juga memiliki "kuliah tamu" dari Prof. Dr. Krestin Kremer (Justus-Liebig Universität Gießen, Jerman). Dengan informasi kegiatan sebagai berikut:

**TEMA DAN TEMPAT KEGIATAN**

Tema Kegiatan : **Finding Out STEM Education for SDGs**
Bentuk Kegiatan : Seminar dan *Pemaparan Rencana Penelitian serta Pembuatan Kolabarasi Penelitian.*
Tempat : *Zoom Meeting (online)*

**NARASUMBER KEGIATAN**

1. Prof. Peter Zhihong Wan (Hongkong)
2. Prof. Dr. Anna Permanasari, M.Si (Indonesia)
3. Prof. Dr. Toshinobu Hatanaka (Japan)
4. Prof. Mei-Hung Chiu (Taiwan)
5. Prof. Phil Seok Oh (Korea)
6. Prof. Baohui Zhang (Mainland China)
7. Prof. Sri Rahayu,M. Ed, Ph. D (Indonesia)
8. Prof. Dr Kerstin Kremer From Justus-Liebig-Universität Gießen (Narambur Tamu)

***Moderator/MC:***

1. Santy Nurmalasari
2. Pamudya Aris Dwi Putra, Ph. D
3. Irma Rahma Suwarna, Ph.D
4. Nurul F. Sulaiman, Ph. D
5. Rendi Resiana Sukardi, MPd.
6. Annisa Nurramadani M. Pd
7. Legian Setyoningrum
8. Adinda Utami
9. Khalifatulloh Fiel'ardh (Aldi)

**PESERTA KEGIATAN**

Peserta Kegiatan : Mahasiswa S2 dan S3 peserta EASE 2022 dan Para Dosen Undangan
Jumlah Peserta terdaftar : 24 mahasiswa S2/S3 dari 6 negara (Indonesia, Korea Selatan, Jepang, Hongkong, Taiwan, Thainland)
Jumlah Peserta yang hadir : 54 Orang di ahri 1 (Narasumber, Dosen Undangan, Tamu Undangan, dan Peserta EASE)

# CATATAN INFORMASI KEGIATAN

## KEGIATAN EASE SUMMER SCHOOL 2022

“

Tema Kegiatan : “Finding out STEM (Science, Technology, Engineering, and Mathematics) Education for SDG’s”Materi Kegiatan
Hari, Tanggal : Selasa, 2 Agustus 2022
Waktu : 08.00 WIB – 16.00 WIB
Tempat : *Zoom Meeting, Breakout Room*
Narasumber hari 1 : Prof. Peter Zhihong Wan (Hongkong) dan Prof. Dr. Anna Permanasari, M.Si (Indonesia)

**Catatan Hasil Kegiatan:**

| |
|---|
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**Lampiran Dokumentasi:**

1. **Acara Pembukaan**

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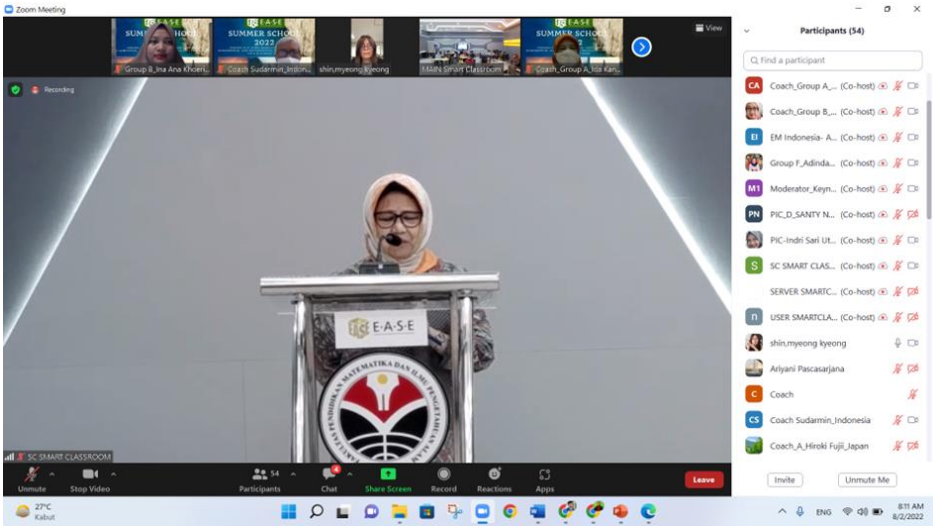
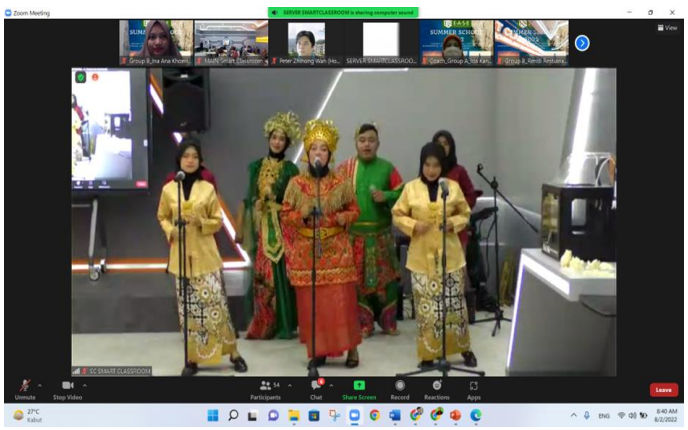
  EASE Online Summer School Program 2022 bertujuan untuk memberdayakan pendidikan sains melalui berbagi penelitian dan kerjasama. Ini menciptakan komunitas sarjana doktor dan master memprogram siswa untuk berbagi pengalaman penelitian dan memulai kolaborasi penelitian di masa depan.Temanya adalah “Mencari tahu STEM (Science, Technology, Engineering, and Mathematics) Pendidikan untuk SDG’s”. Program ini berkorelasi dengan Konferensi Internasional EASE. Oleh karena itu, peserta bisa datang dari perspektif mahasiswa doktor/master yang berpartisipasi dalam EASE International Konferensi. EASE Summer School 2022 diselenggarakan oleh wilayah Indonesia, diikuti oleh 24 siswa dari 6 EASE anggota wilayah. Dibimbing oleh 17 profesor/asisten, dan dipimpin oleh delapan pembicara (dosen) dari wilayah yang berbeda.




Sambutan berikutnya disampikan oleh Dekan UPI Prof. Dr. Tatang Herman, M.Ed.. Setelah itu smabutan sekaligus pembukaan secara resmi oleh Rektor Universitas Pendidikan Indonesia (Prof. Dr. H.M. Solehudin, M.Pd., M.A). Ucapan selamat datang, terimakasih dan penyemangat untuk semua narasumber, panitia dan peserta pada EASE Summer School 2022. Membuka secara resmi dan menyampaikan harapan terbaik untuk kolaborasi penelitian yang akan di dibuat agar bermanfaat bagi pendidikan baik sekala nasional maupun internasional.

**Acara pembukaan ditutup dengan penampilan budaya dan foto bersama di ruang utama (offline) maupun di zoom meeting (online)**



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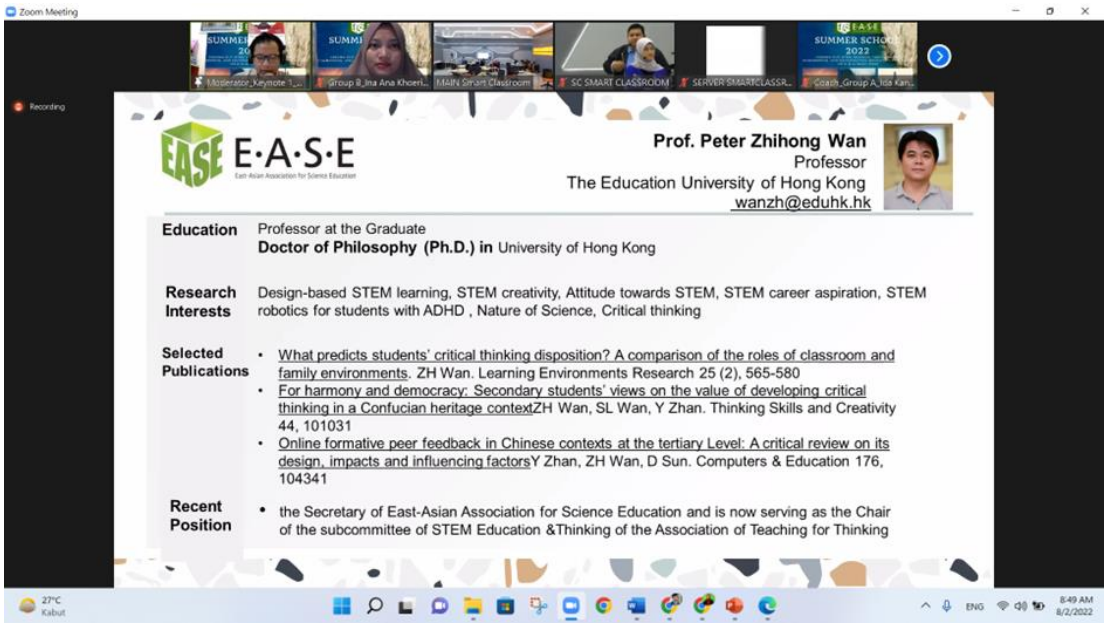
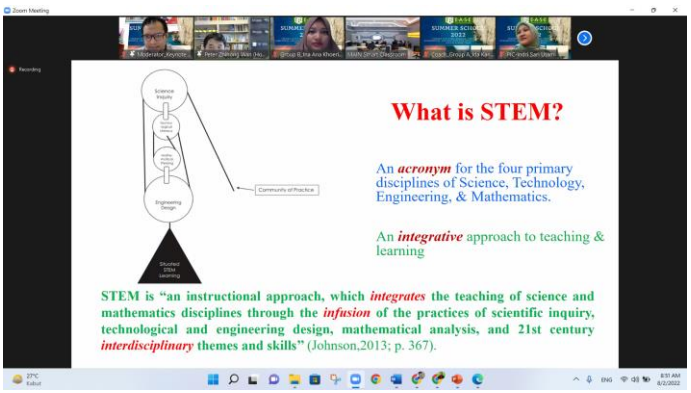
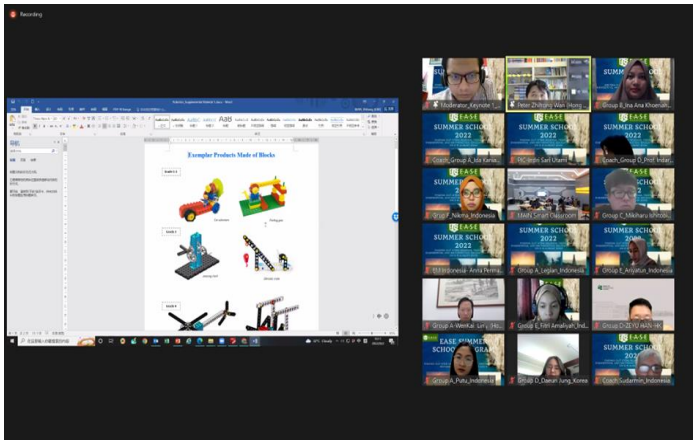
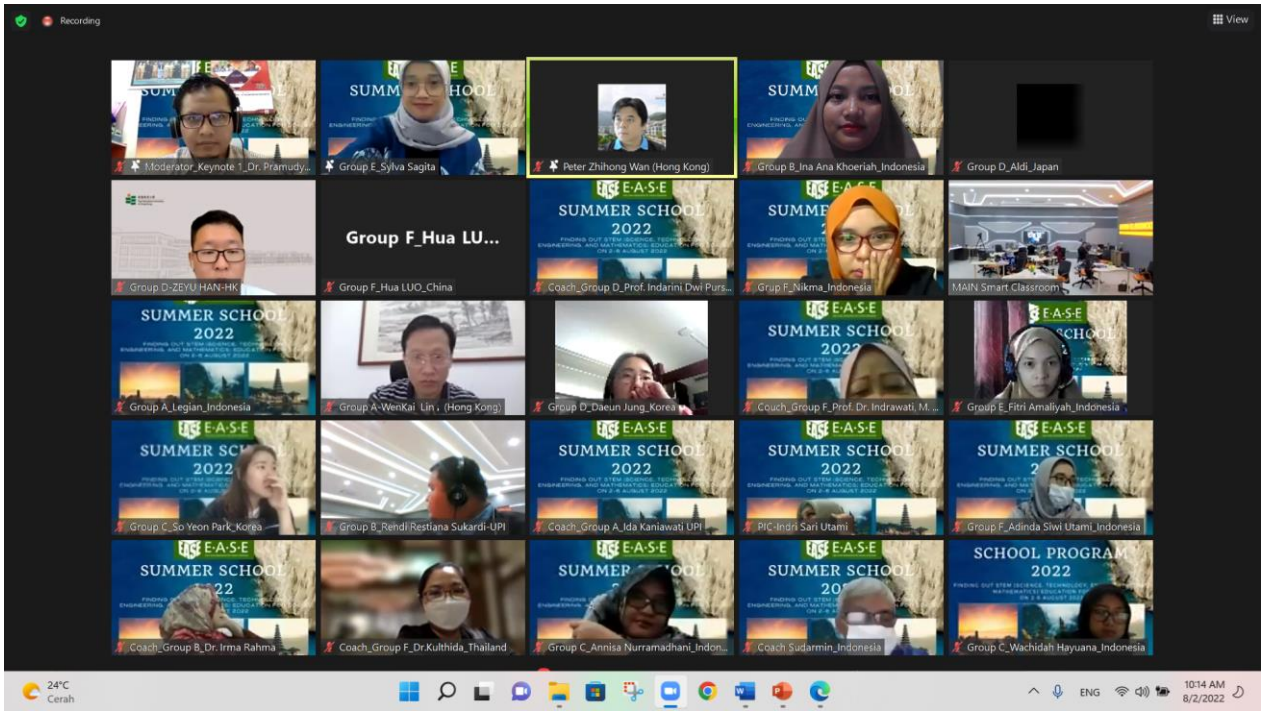
Moderator : Pamudya Aris Dwi Putra, Ph. D







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Coach_Group B_Dr. Irma Rahma
Coach_Group F_Dr.Kulthida_Thailand
Group C_Annisa Nurramadhani_Indon...
Coach Sudarmin_Indonesia
Group C_Wachidah Hayuana_Indonesia
24°C
Cerah
ENG
10:14 AM
8/2/2022

**Kegiatan Parallel Session (Room B)**

Kegiatan dilakukan dengan memaparkan rencana penelitian, dan dilanjutkan dengan diskusi rencana kolaborasi penelitian.

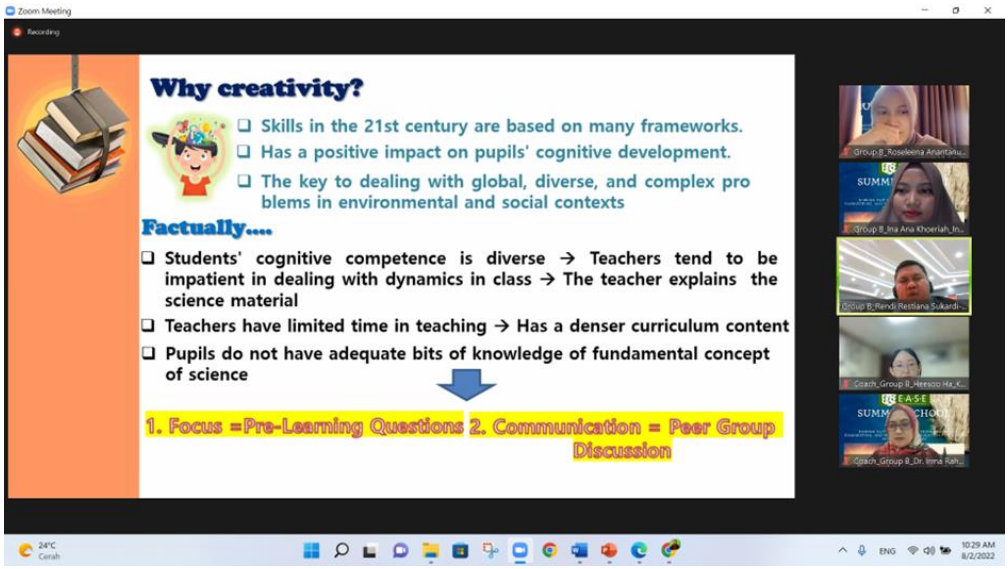
Coach:

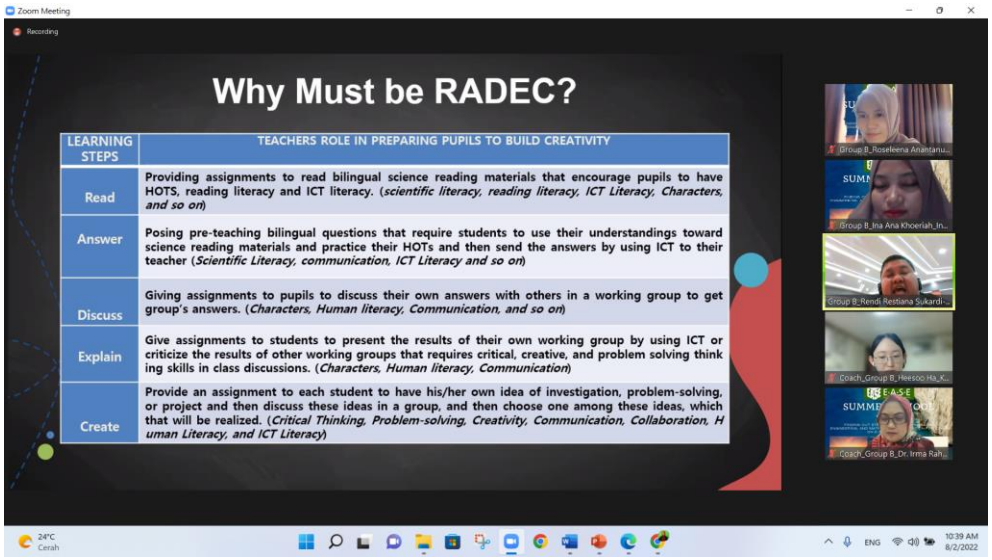
Dr. Heesoo Ha (Korea Selatan)

Irma Rahma Suwarma, Ph.D (Indonesia)

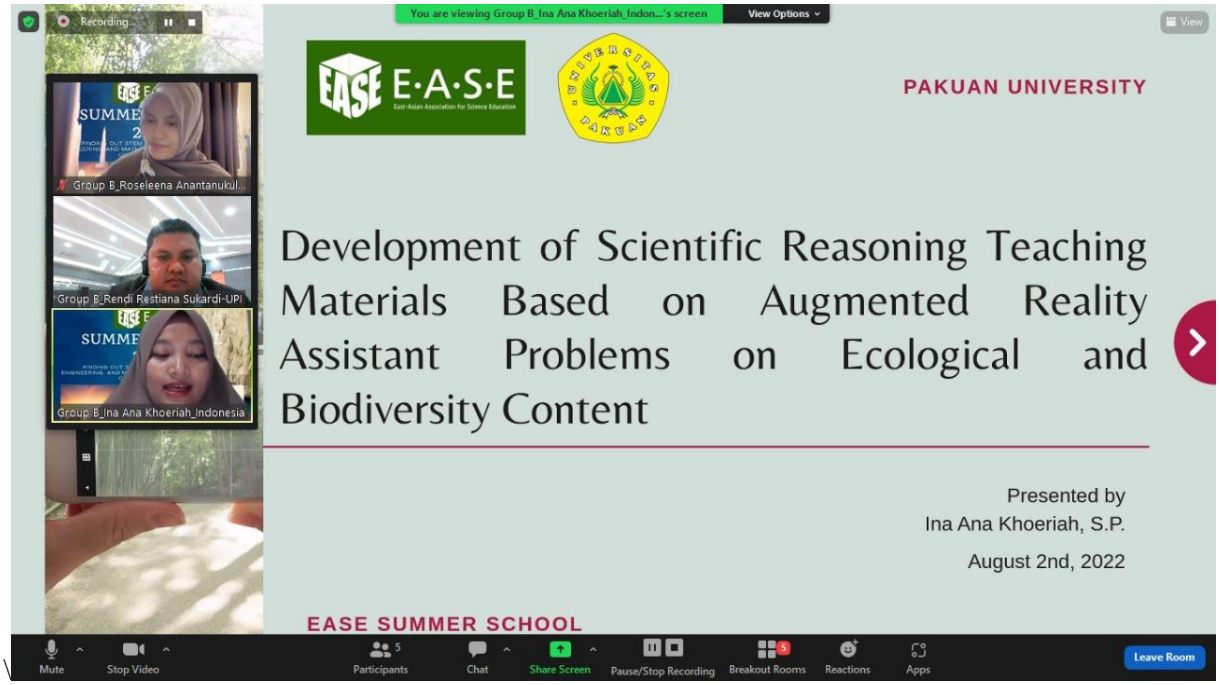
Participant 1.

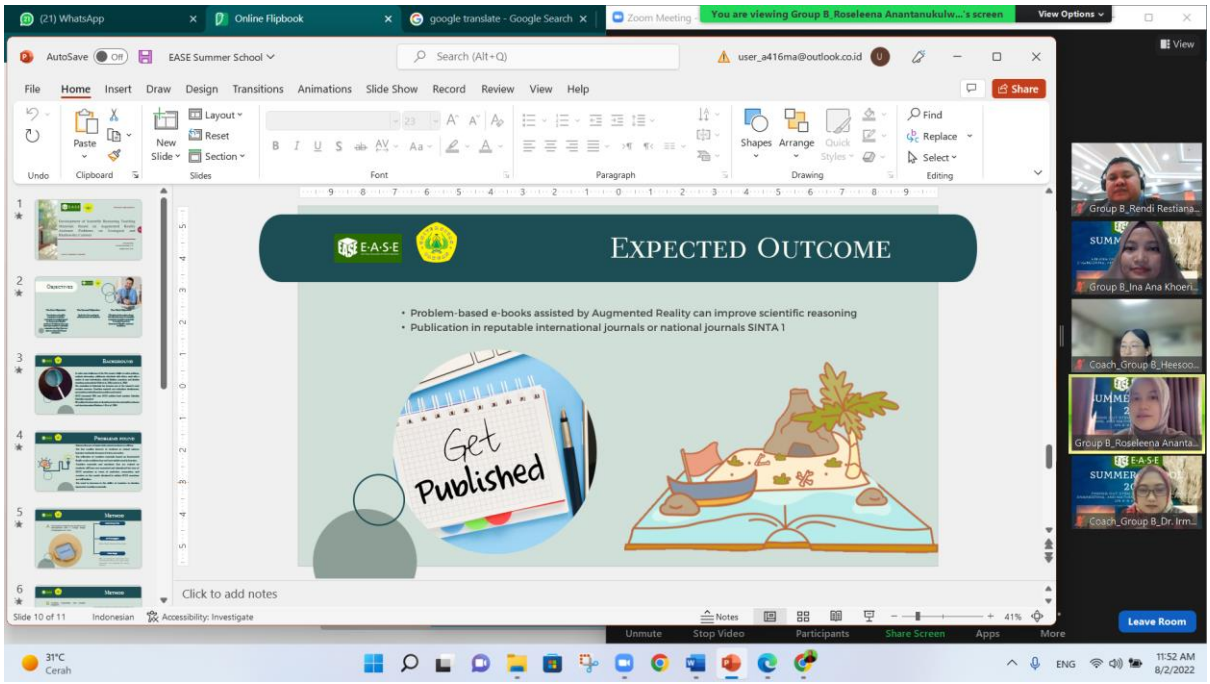
Rendi Restiana Sukardi (S3) (universitas pendidikan Indonesia)



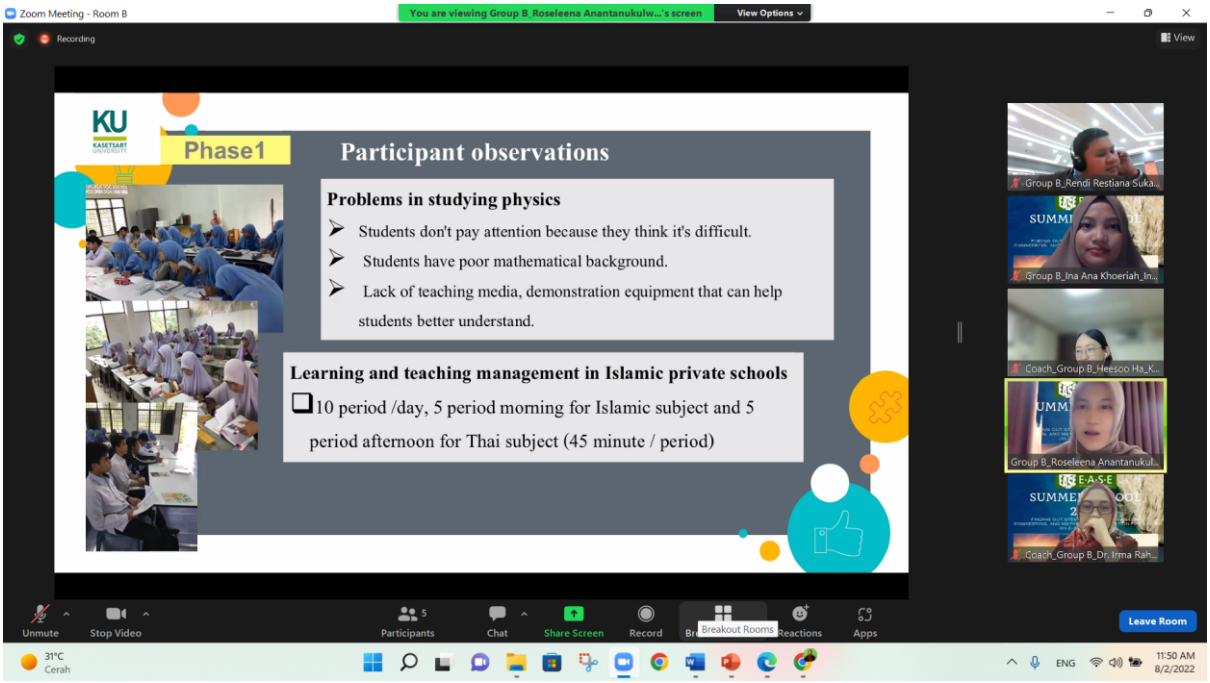



Participant 2. Ina Ana Khoeriah (S2) Universitas Pakuan



Participant 3 : Roseleena Anantakuluwong (Kasesart University, Thailand)




Pukul 13.00-16.00 di lanjutkan dengan seminar dan diskusi di ruang paralel membicarakan rencana riset kolaborasi.

Keynote Session 2:
Narasumber: Prof. Dr. Anna Permanasari (Indonesia)
Moderator: Irma Rahma Suwarma, Ph.D


PowerPoint Slide Show - [Summer School EASE 2022 2_6 Agst 22 [Compatibility Mode]] - Microsoft PowerPoint (Product Activation Failed)
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Science Education Program
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Slide 40 of 87
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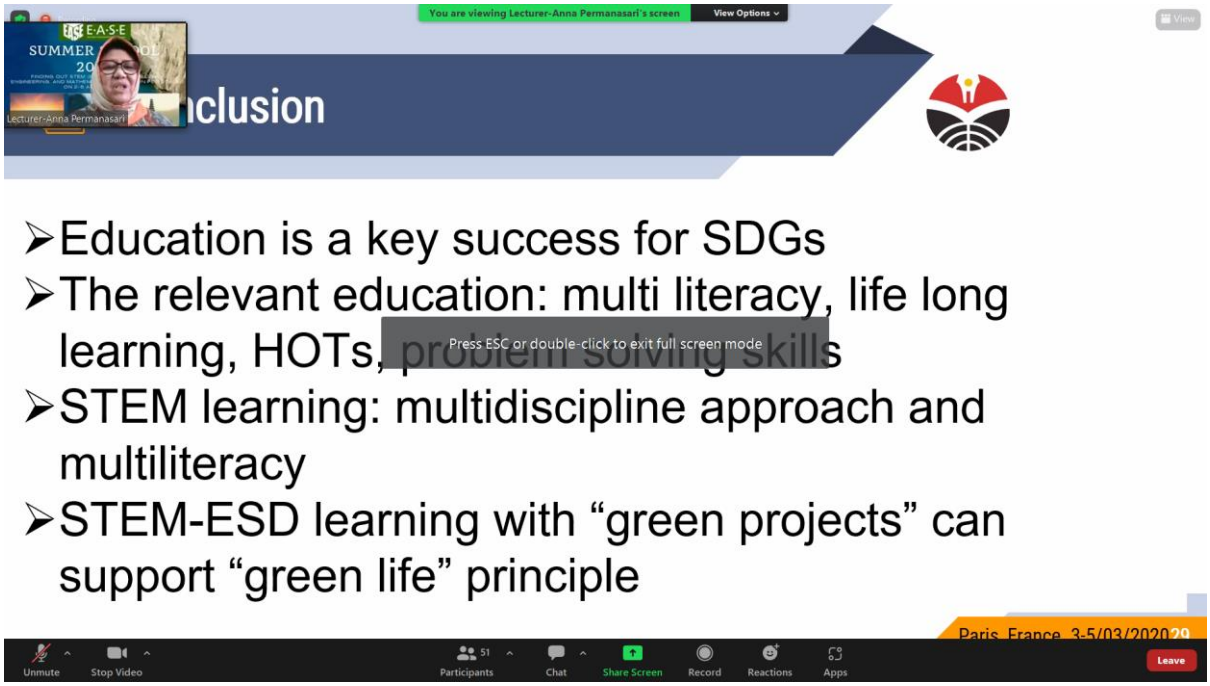
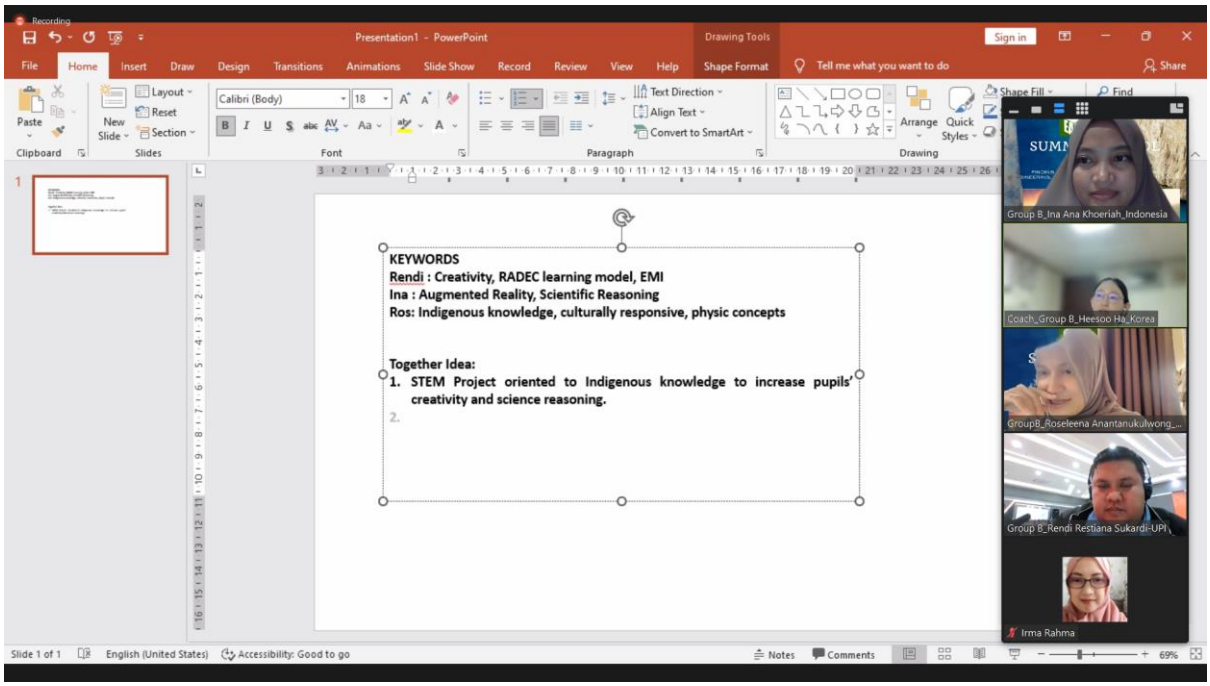
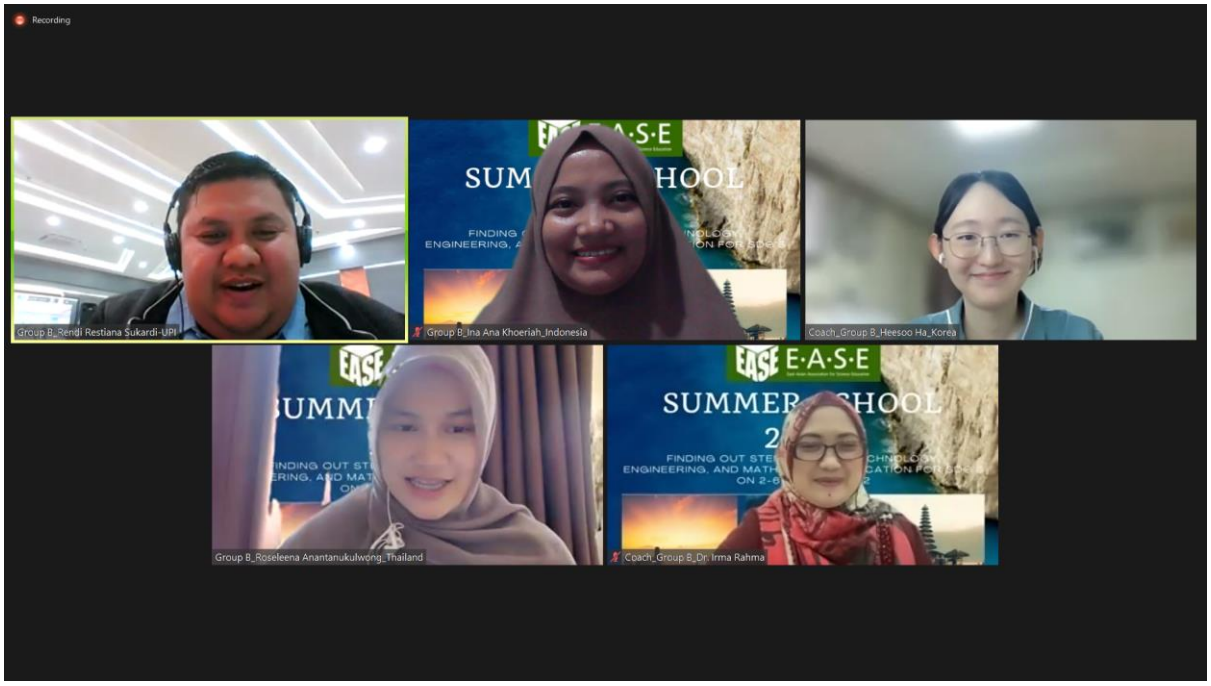



Parallel Session: Pembahasan rencana penelitian kolaborasi






Bogor, 2 Agustus 2022

Mengetahui,
Ketua Program Studi P.IPA S2/S3

Prof. Dr. Indarini Dwi Puspitasari, M.Pd.
NIP. 196909041996032001

# CATATAN INFORMASI KEGIATAN

## KEGIATAN EASE SUMMER SCHOOL 2022

“

Tema Kegiatan : “Finding out STEM (Science, Technology, Engineering, and Mathematics) Education for SDG’s”Materi Kegiatan
Hari, Tanggal : Selasa, 2 Agustus 2022
Waktu : 08.00 WIB – 16.00 WIB
Tempat : *Zoom Meeting, Breakout Room*
Narasumber hari 1 : Prof. Peter Zhihong Wan (Hongkong) dan Prof. Dr. Anna Permanasari, M.Si (Indonesia)

**Catatan Hasil Kegiatan:**

| |
|---|
| Kegiatan EASE Summer School hari pertama berjalan dengan baik dan lancar. Kegiatan diikuti 54 peserta yang terdiri dari peserta EASE 24 orang dari 6 negara, dosen undangan , keynote speaker maupun panitia di ruang zoom meeting. Acara dilaksanakan secara online dengan diawali pembukaan sekaligus sambutan dari ketua EASE Summer School dan Rektor UPI. Pembicara di hari pertama (keynote speaker) di sesi 1 Prof. Peter Zhihong Wan (Hongkong) dengan moderator Pamudya Aris Dwi Putra, Ph. D. Pukul 10.30-12.00 di lanjutkan dengan paralle session yaitu persentasi rencana penelitian dari peserta EASE Summer School 2022 di setiap room yang sudah ditentukan panitia. Pukul 13.00-14.00 dilanjutkan materi pada sesi 2 oleh keynote speaker Prof. Dr. Anna Permanasari, M.Si (Indonesia) dengan moderator Irma Rahma Suwarna, Ph.D. Di sesi terkahir parallel section (peserta memasuki breakout room masing-masing) membicarakan rencana kolaborasi penelitian. Peserta begitu antusias terlihat dalam jalannya sesi seminar (materi) dan pemaparan pertanyaan pada materi yang disampaikan narasumber maupun saat sesi paralel |

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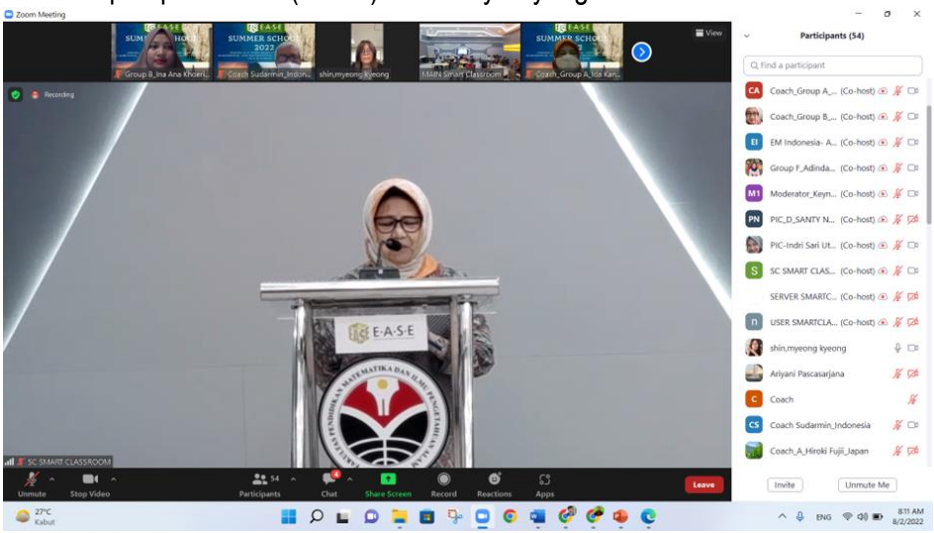


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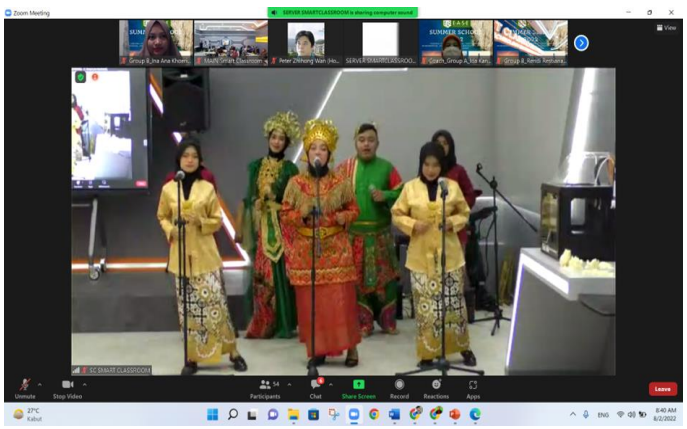

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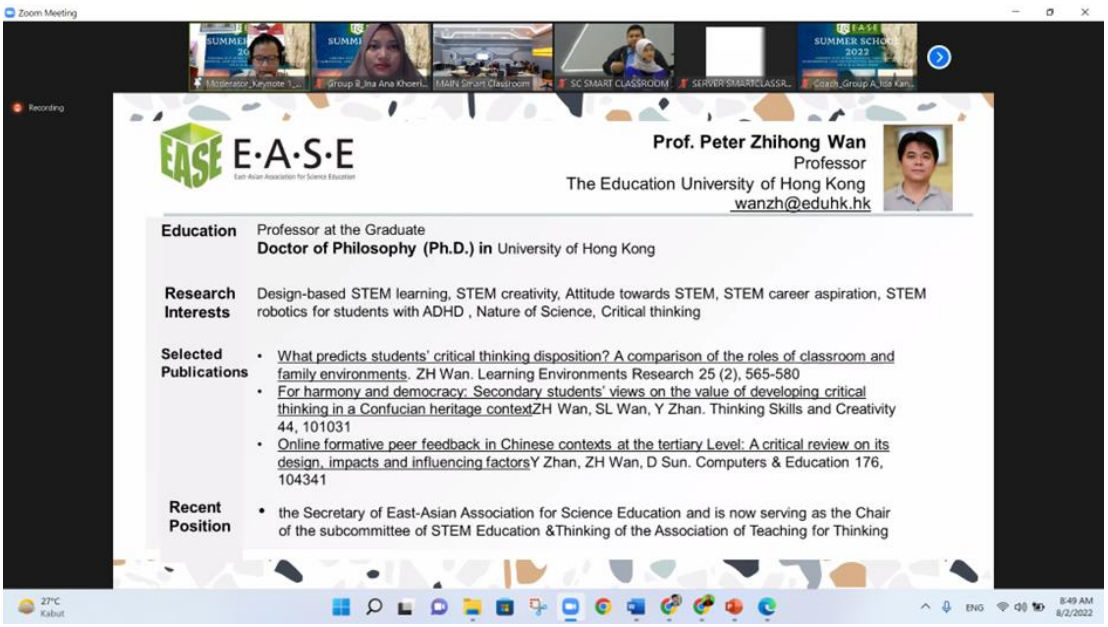



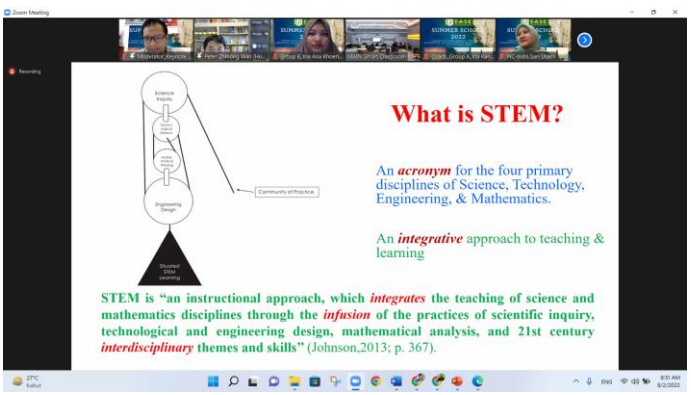

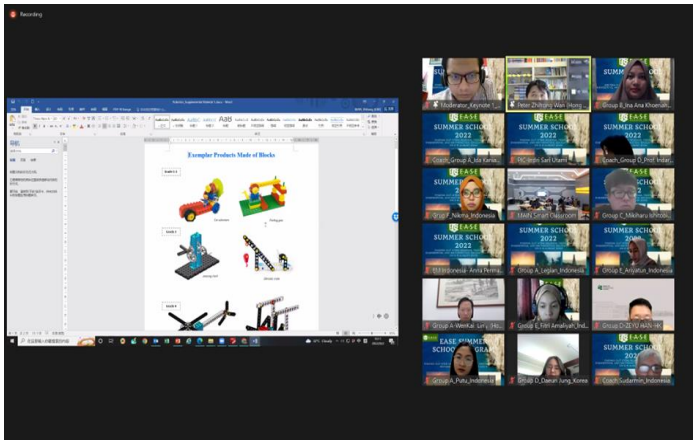

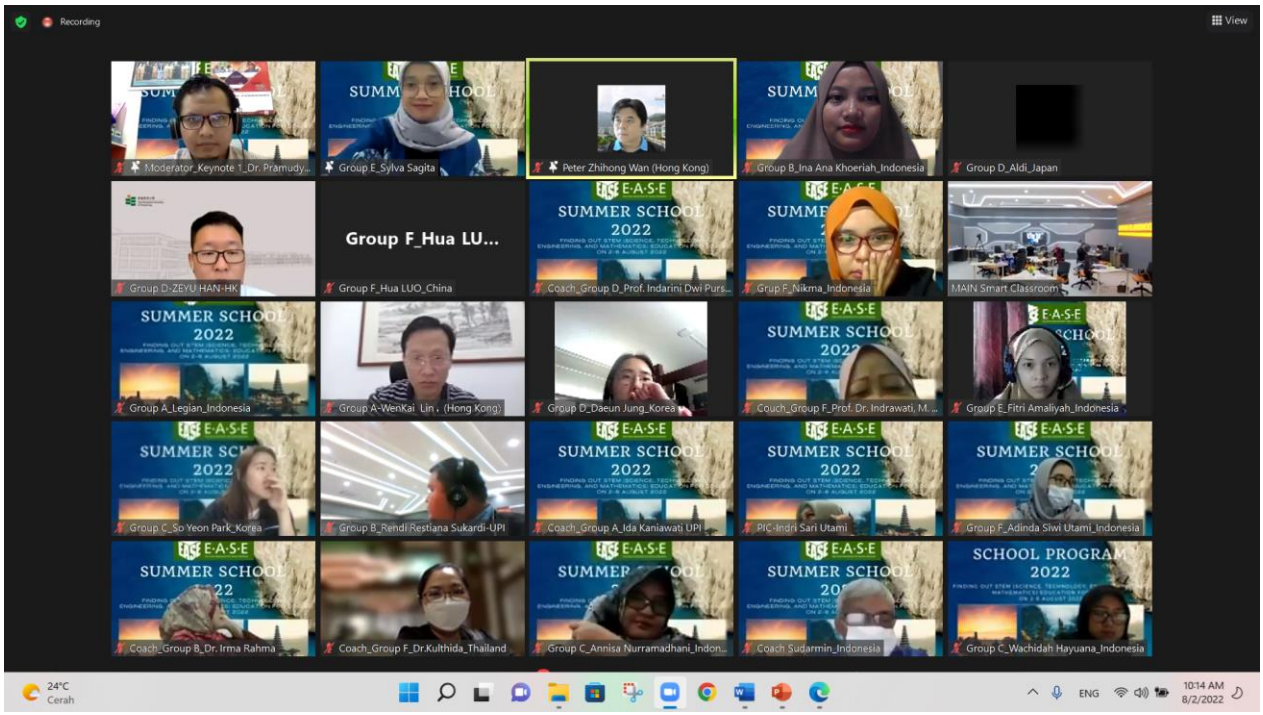
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Coach:

Dr. Heesoo Ha (Korea Selatan)

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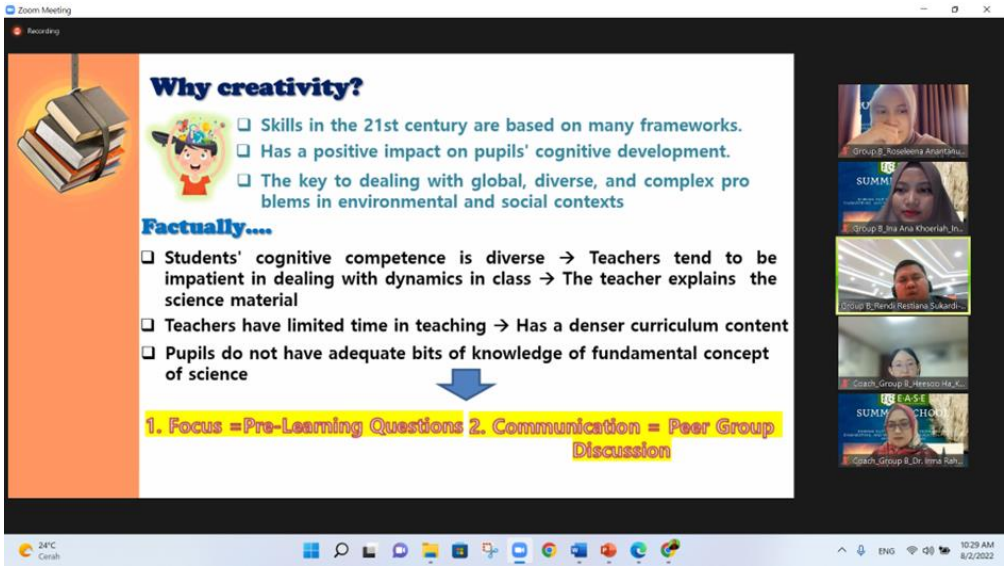


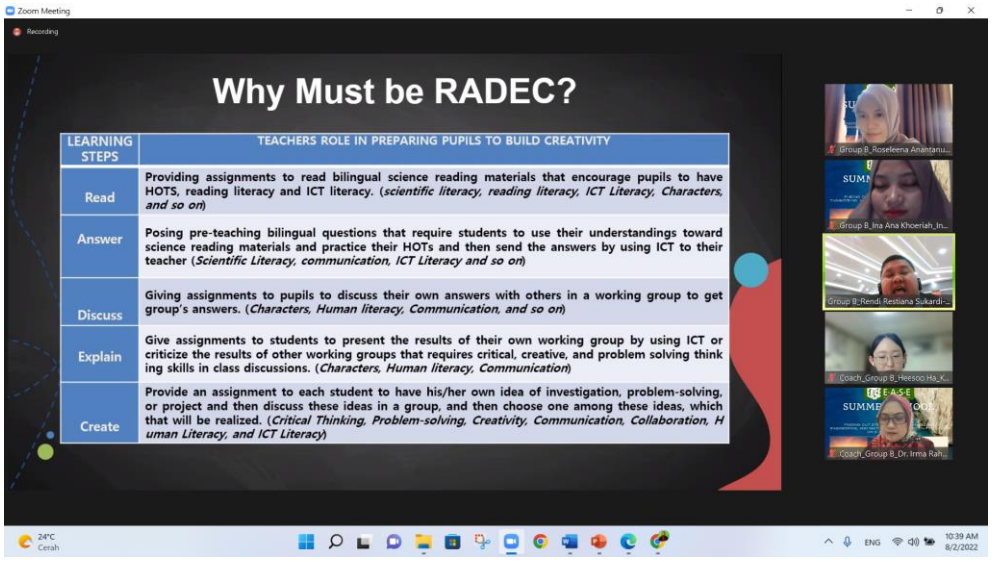

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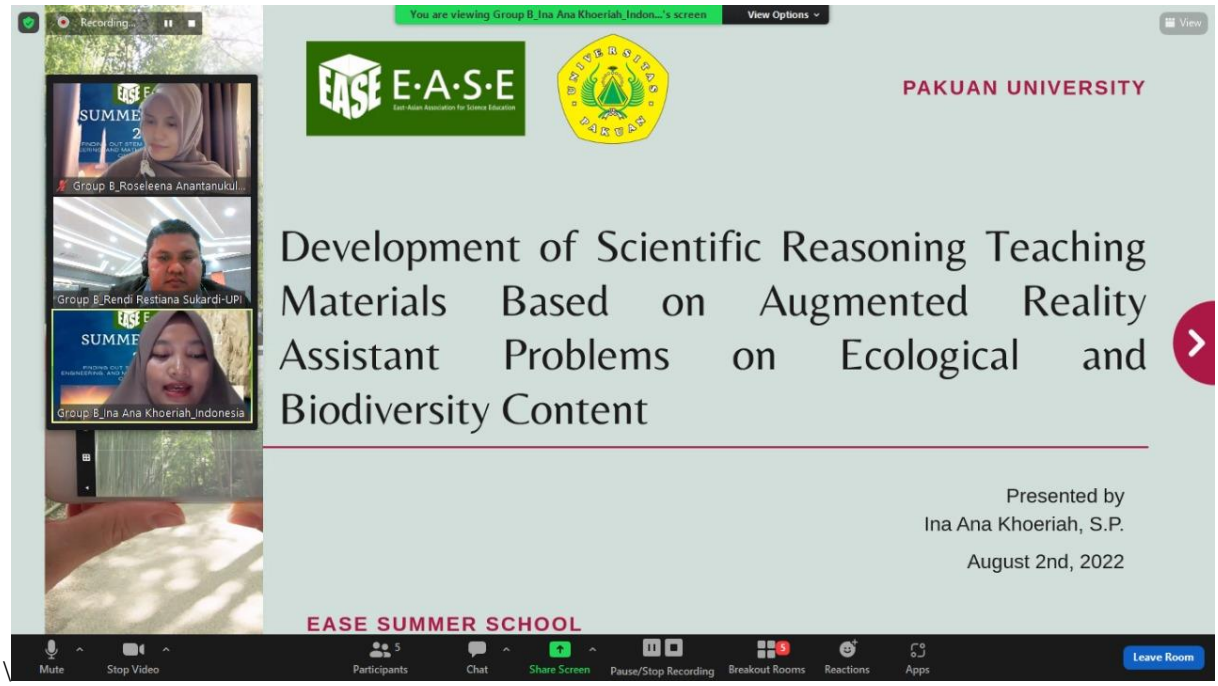


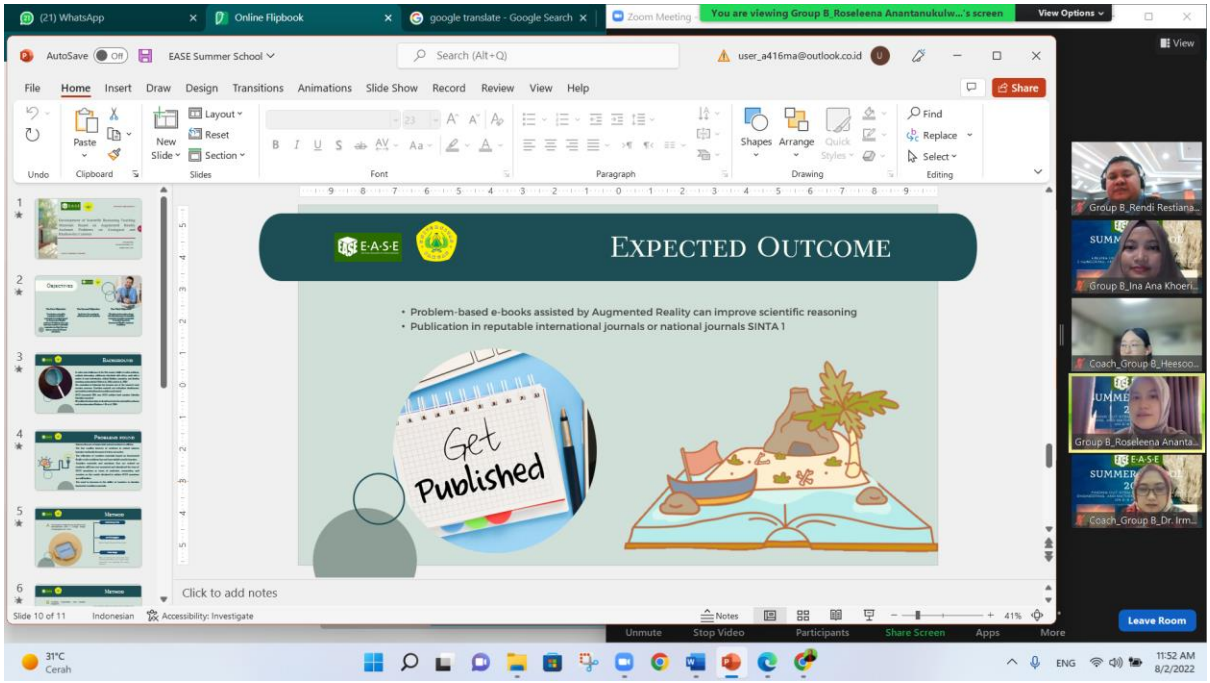

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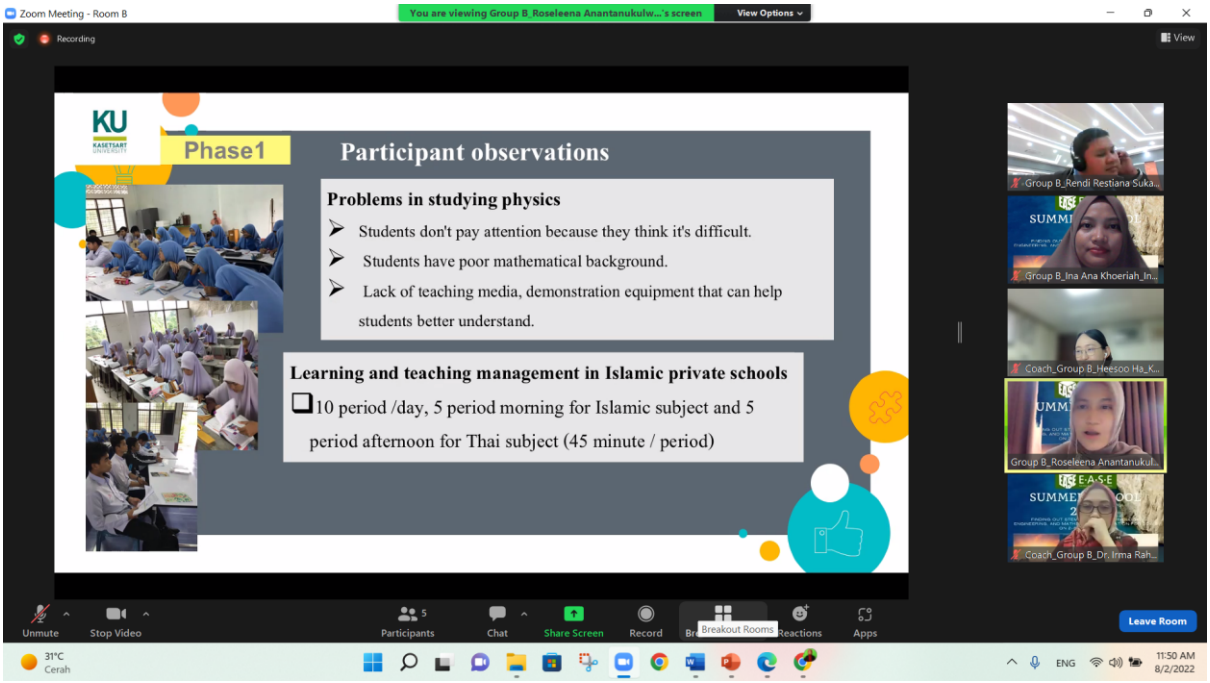


Pukul 13.00-16.00 di lanjutkan dengan seminar dan diskusi di ruang paralel membicarakan rencana riset kolaborasi.

Keynote Session 2:
Narasumber: Prof. Dr. Anna Permanasari (Indonesia)
Moderator: Irma Rahma Suwarma, Ph.D


PowerPoint Slide Show - [Summer School EASE 2022 2_6 Agst 22 [Compatibility Mode]] - Microsoft PowerPoint (Product Activation Failed)
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Slide 40 of 87


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Lecturer-Anna Permanasari
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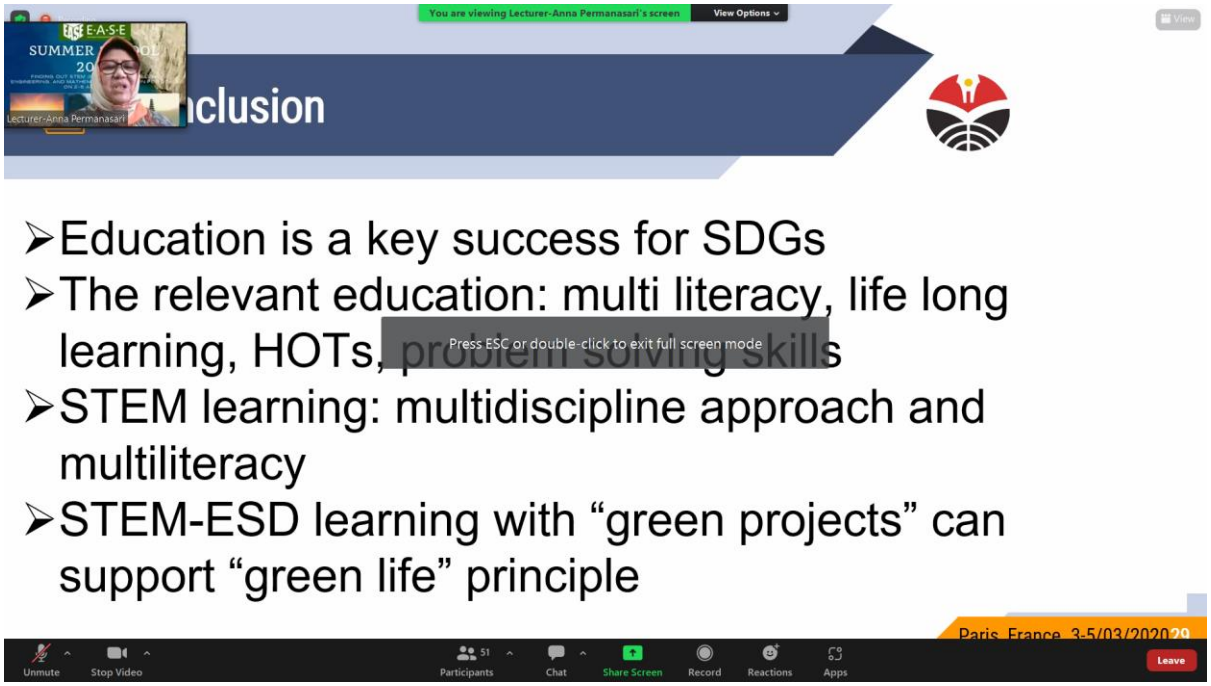
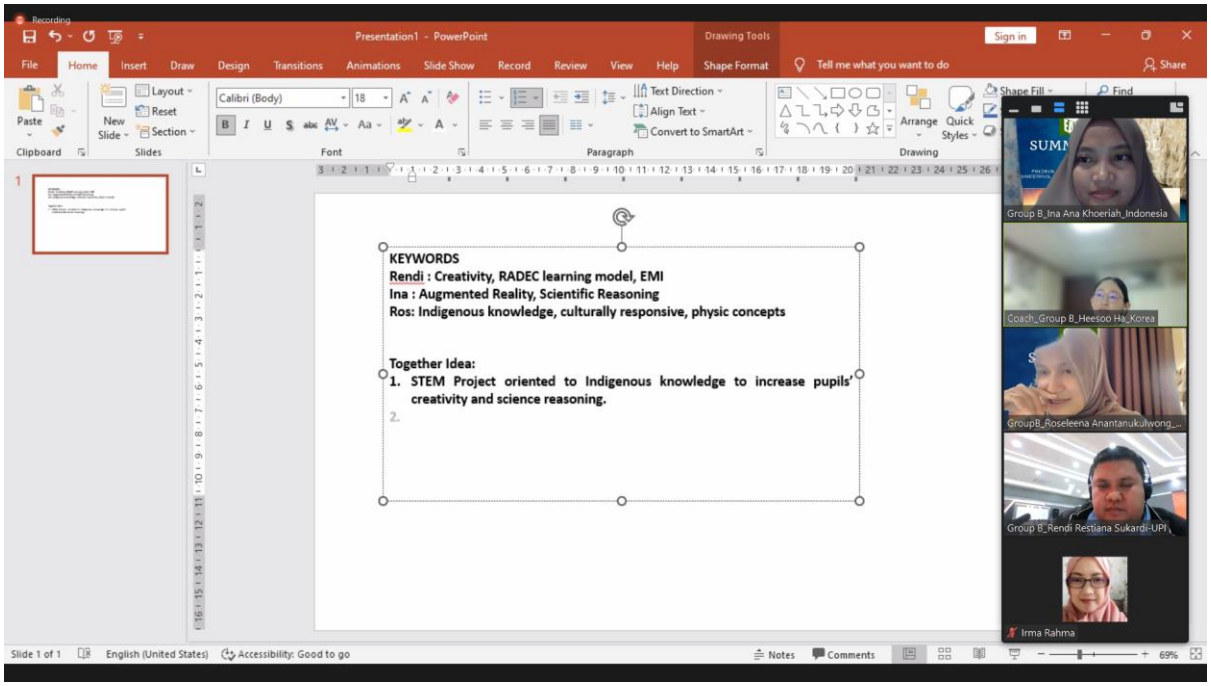
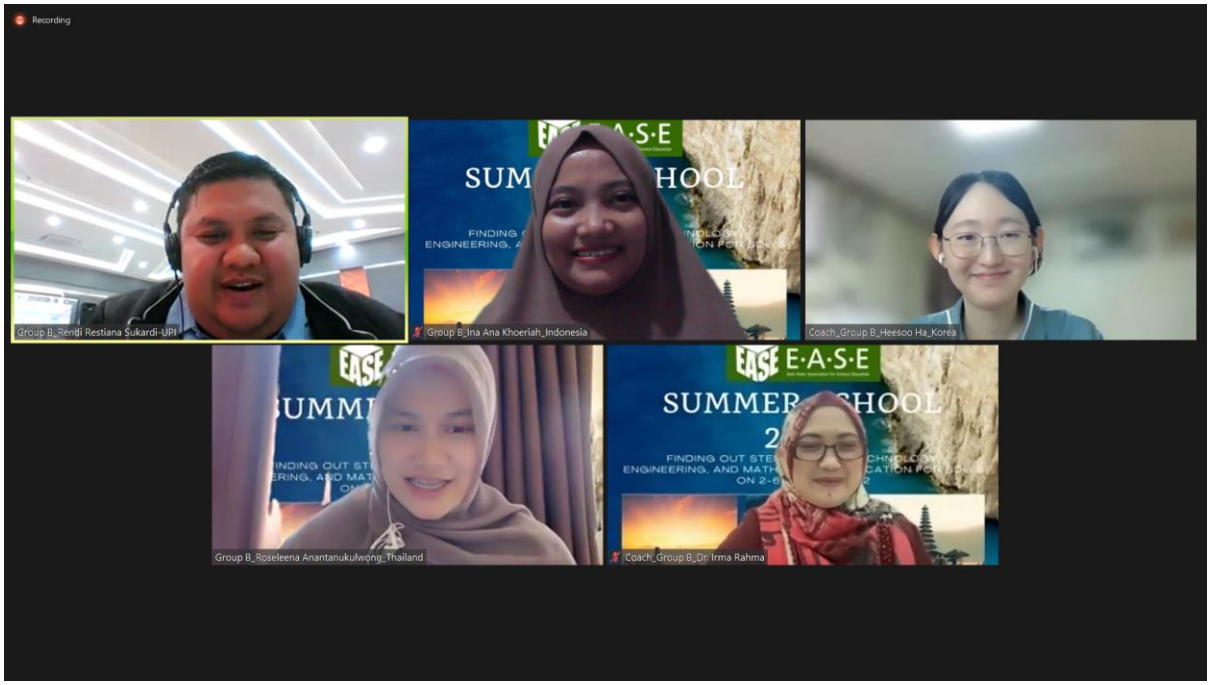



Parallel Session: Pembahasan rencana penelitian kolaborasi



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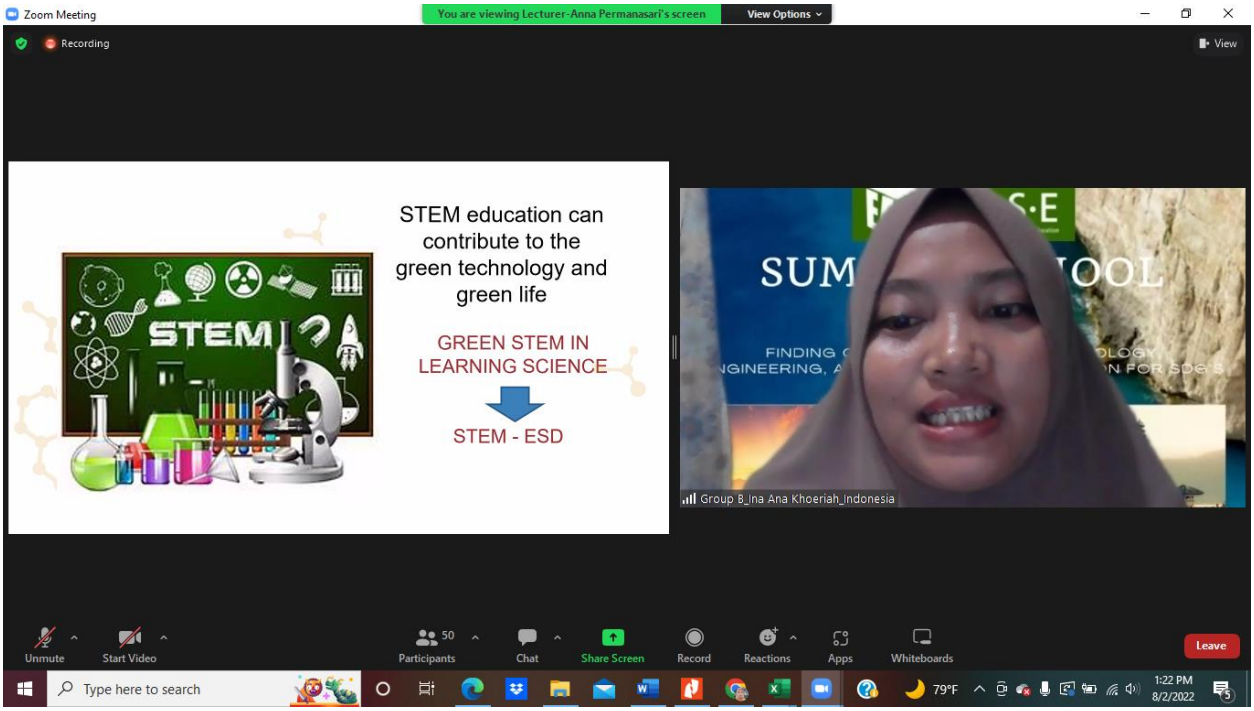
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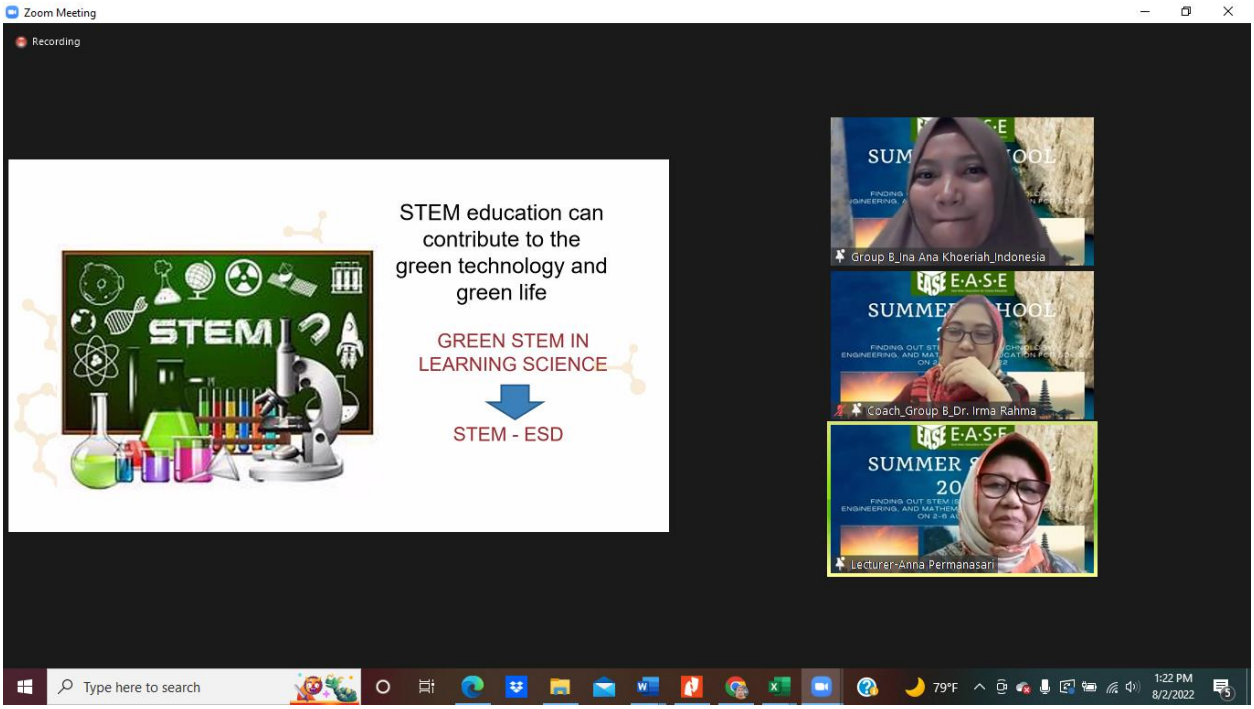
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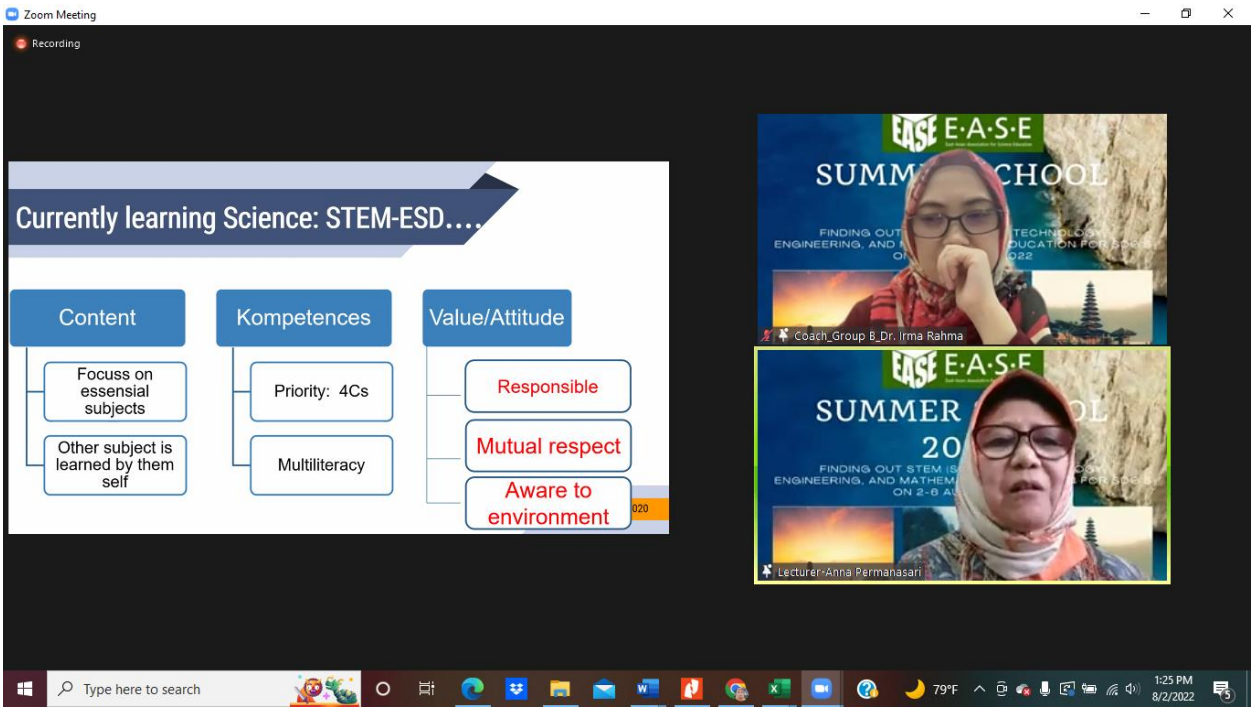
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Content
Focuss on essensial subjects
Other subject is learned by them self
Kompetences
Priority: 4Cs
Multiliteracy
Value/Attitude
Responsible
Mutual respect
Aware to environment
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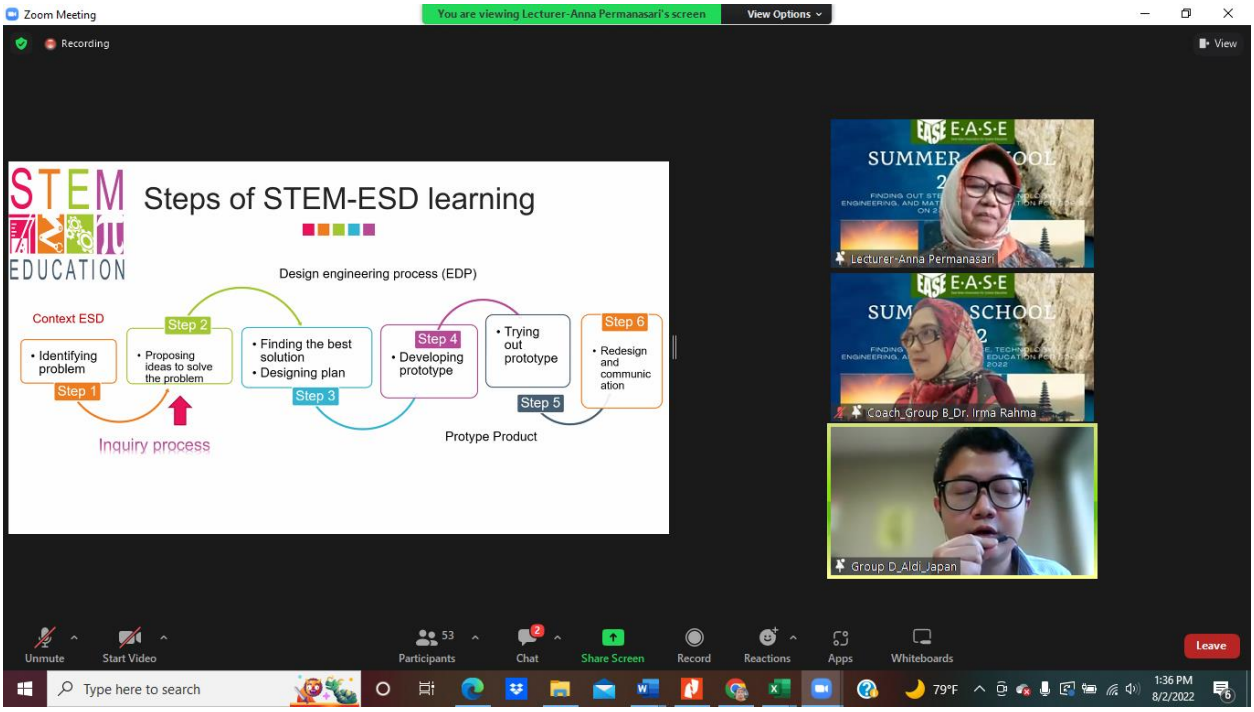
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STEM EDUCATION
Steps of STEM-ESD learning
Design engineering process (EDP)
Context ESD
Identifying problem
Step 1
Step 2
Proposing ideas to solve the problem
Finding the best solution
Designing plan
Step 3
Step 4
Developing prototype
Trying out prototype
Step 5
Step 6
Redesign and communication
Inquiry process
Protype Product
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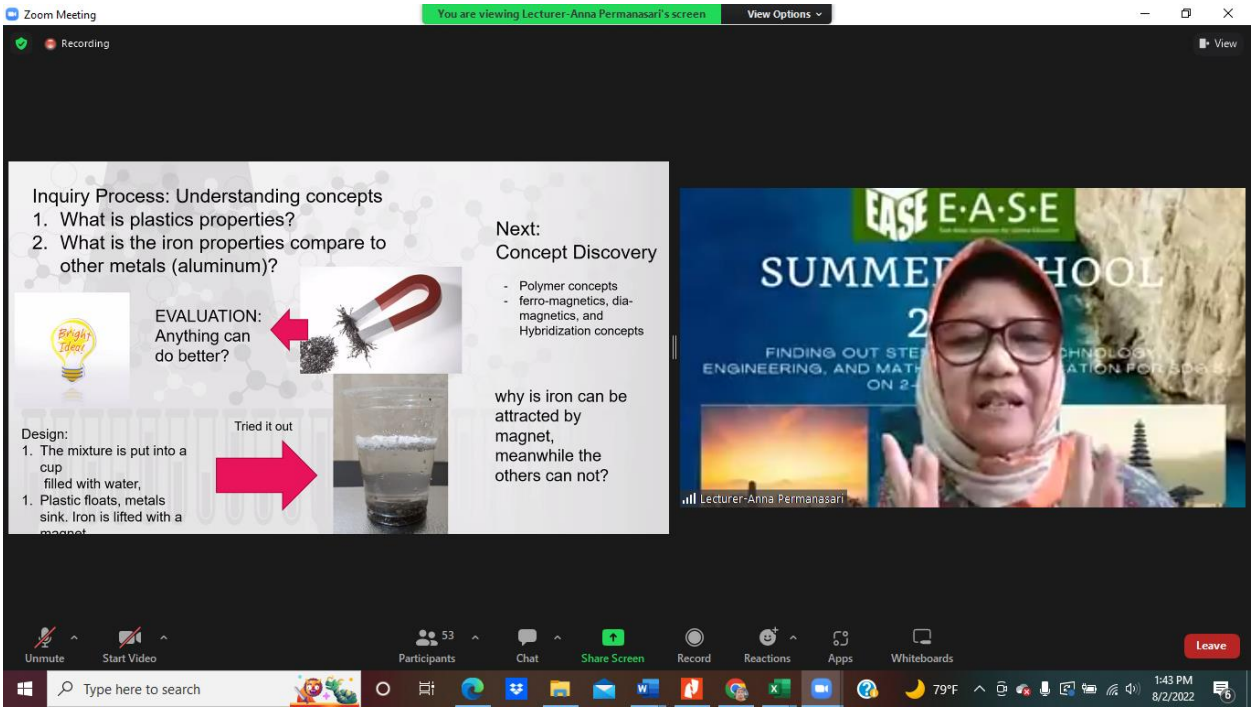
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Inquiry Process: Understanding concepts
1. What is plastics properties?
2. What is the iron properties compare to other metals (aluminum)?
EVALUATION: Anything can do better?
Next: Concept Discovery
- Polymer concepts
- ferro-magnetics, dia-magnetics, and Hybridization concepts
why is iron can be attracted by magnet, meanwhile the others can not?
Design:
1. The mixture is put into a cup filled with water,
1. Plastic floats, metals sink. Iron is lifted with a magnet
Tried it out
E·A·S·E
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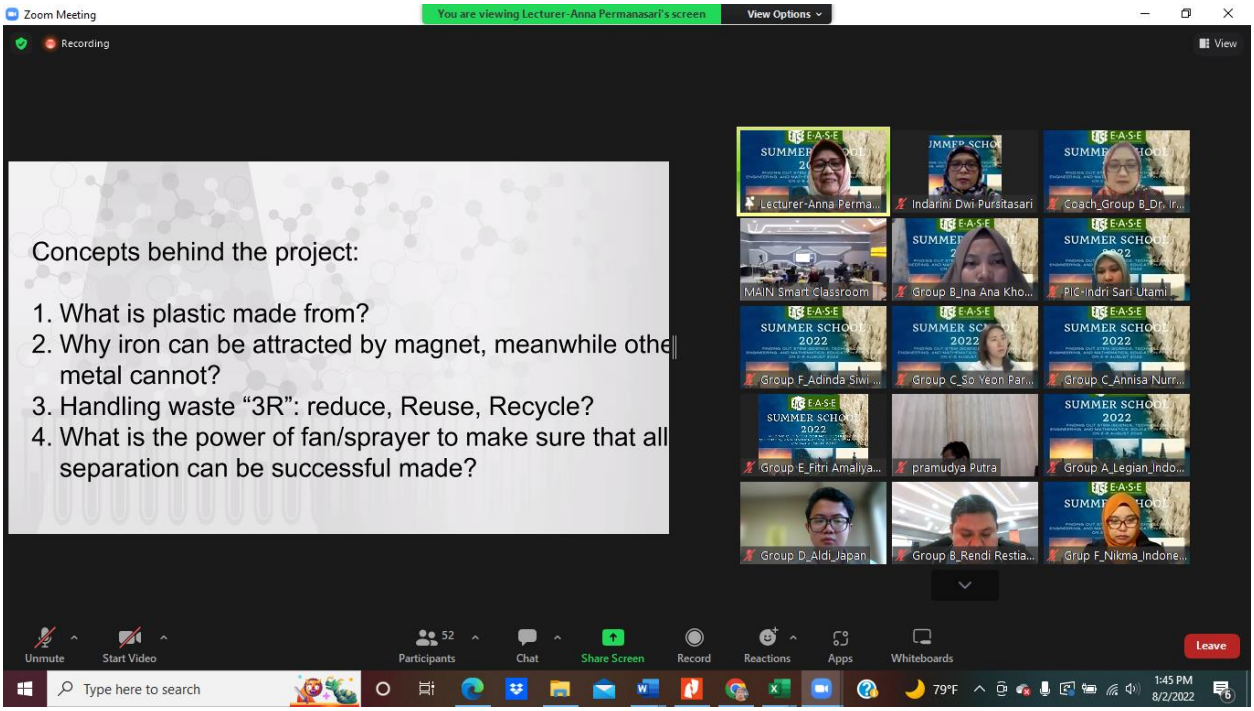
Zoom Meeting
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Concepts behind the project:
1. What is plastic made from?
2. Why iron can be attracted by magnet, meanwhile othe
metal cannot?
3. Handling waste “3R”: reduce, Reuse, Recycle?
4. What is the power of fan/sprayer to make sure that all
separation can be successful made?
Lecturer-Anna Perma...
Indarini Dwi Pursitasari
Coach_Group B_Dr. Ir...
MAIN Smart Classroom
Group B_Ina Ana Kho...
PIC-Indri Sari Utami
Group F_Adinda Siwi ...
Group C_So Yeon Par...
Group C_Annisa Nurr...
Group E_Fitri Amaliya...
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Group A_Legian_Indo...
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Group B_Rendi Restia...
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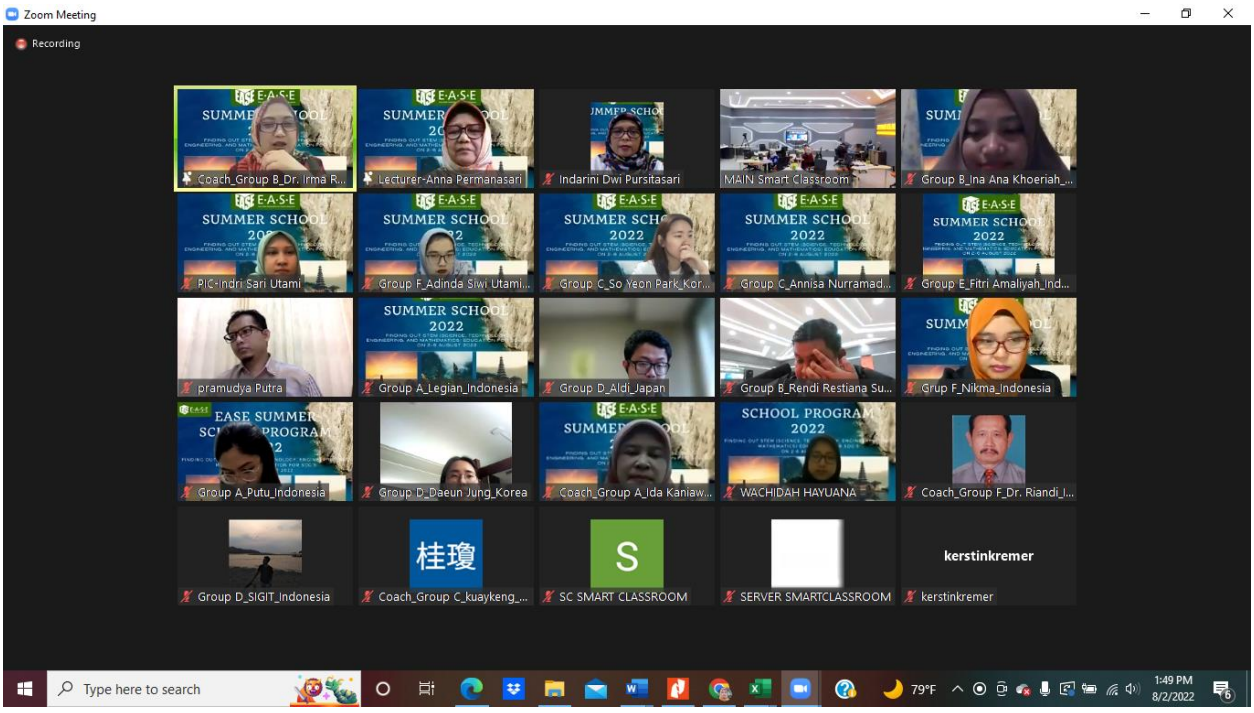
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Group C_Annisa Nurramad...
Group E_Fitri Amaliyah_Ind...
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Group A_Legian_Indonesia
Group D_Aldi_Japan
Group B_Rendi Restiana Su...
Grup F_Nikma_Indonesia
Group A_Putu_Indonesia
Group D_Daeun Jung_Korea
Coach_Group A_Ida Kaniaw...
WACHIDAH HAYUANA
Coach_Group F_Dr. Riandi_I...
Group D_SIGIT_Indonesia
Coach_Group C_kuaykeng_...
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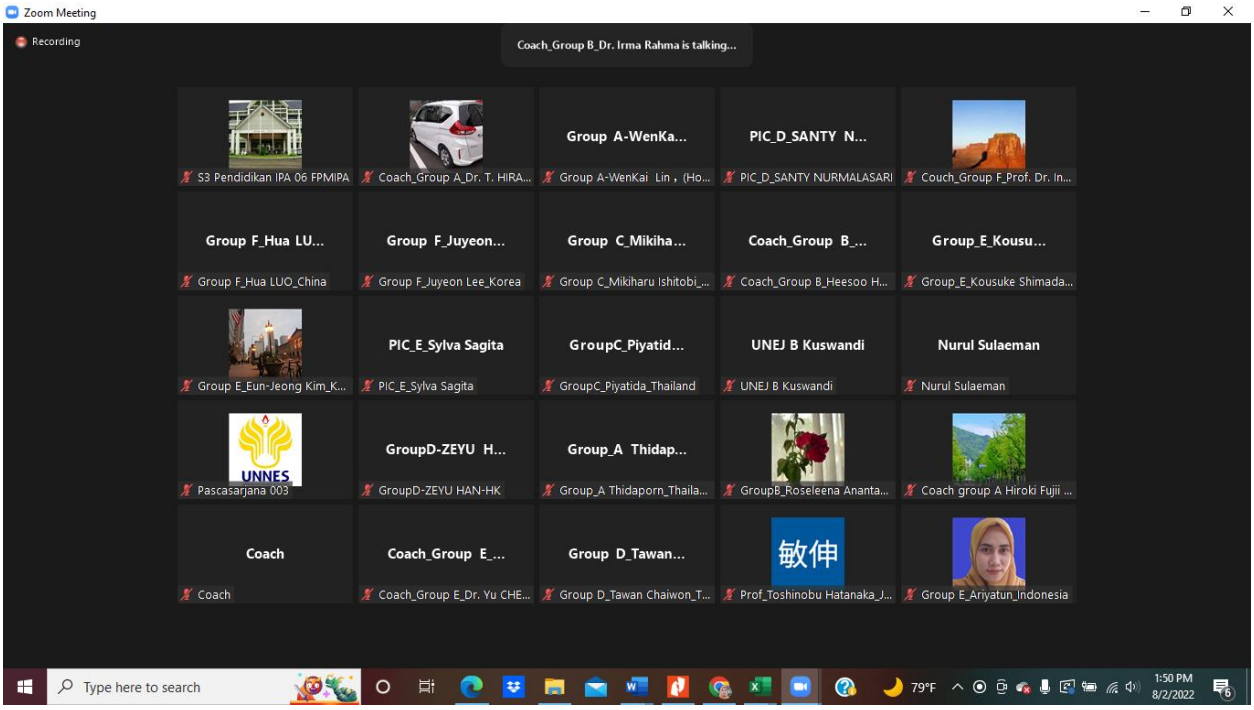
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Group A-WenKa...
Group A-WenKai Lin , (Ho...
PIC_D_SANTY N...
PIC_D_SANTY NURMALASARI
Couch_Group F_Prof. Dr. In...
Group F_Hua LU...
Group F_Hua LUO_China
Group F_Juyeon...
Group F_Juyeon Lee_Korea
Group C_Mikiha...
Group C_Mikiharu Ishitobi_...
Coach_Group B_...
Coach_Group B_Heesoo H...
Group_E_Kousu...
Group_E_Kousuke Shimada...
Group E_Eun-Jeong Kim_K...
PIC_E_Sylva Sagita
GroupC_Piyatid...
GroupC_Piyatida_Thailand
UNEJ B Kuswandi
UNEJ B Kuswandi
Nurul Sulaeman
Nurul Sulaeman
Pascasarjana 003
GroupD-ZEYU H...
GroupD-ZEYU HAN-HK
Group_A Thidap...
Group_A Thidaporn_Thaila...
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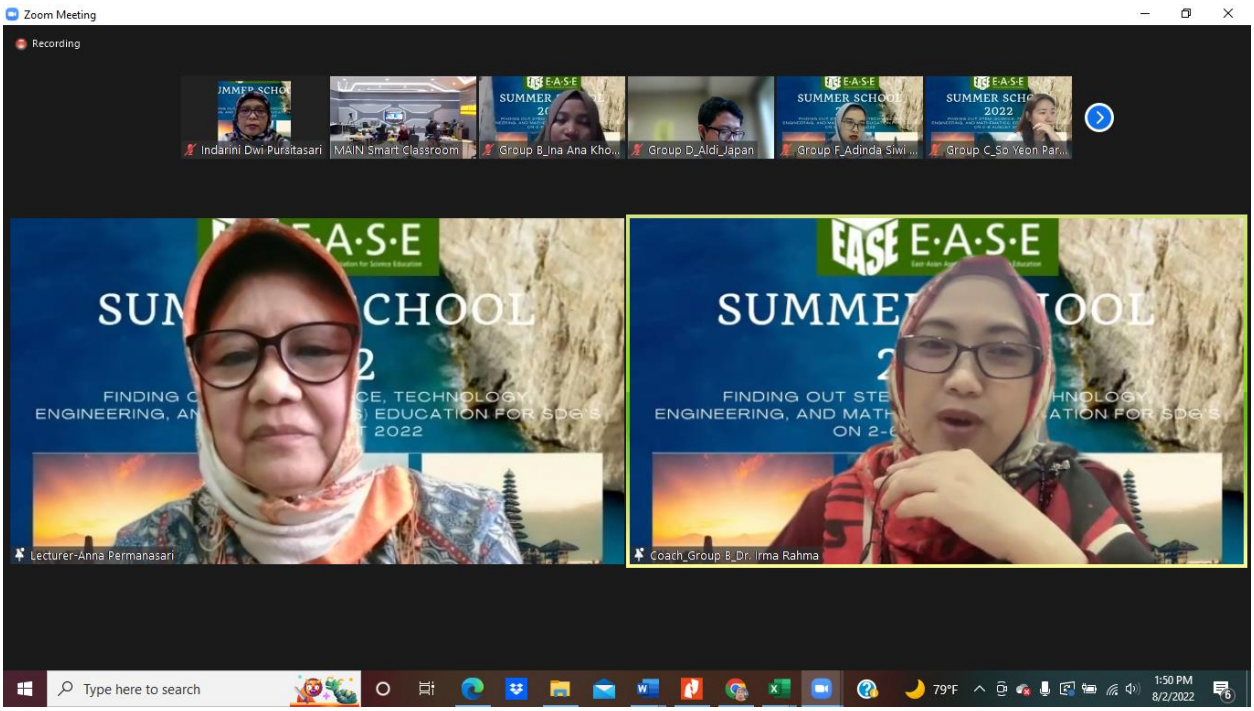
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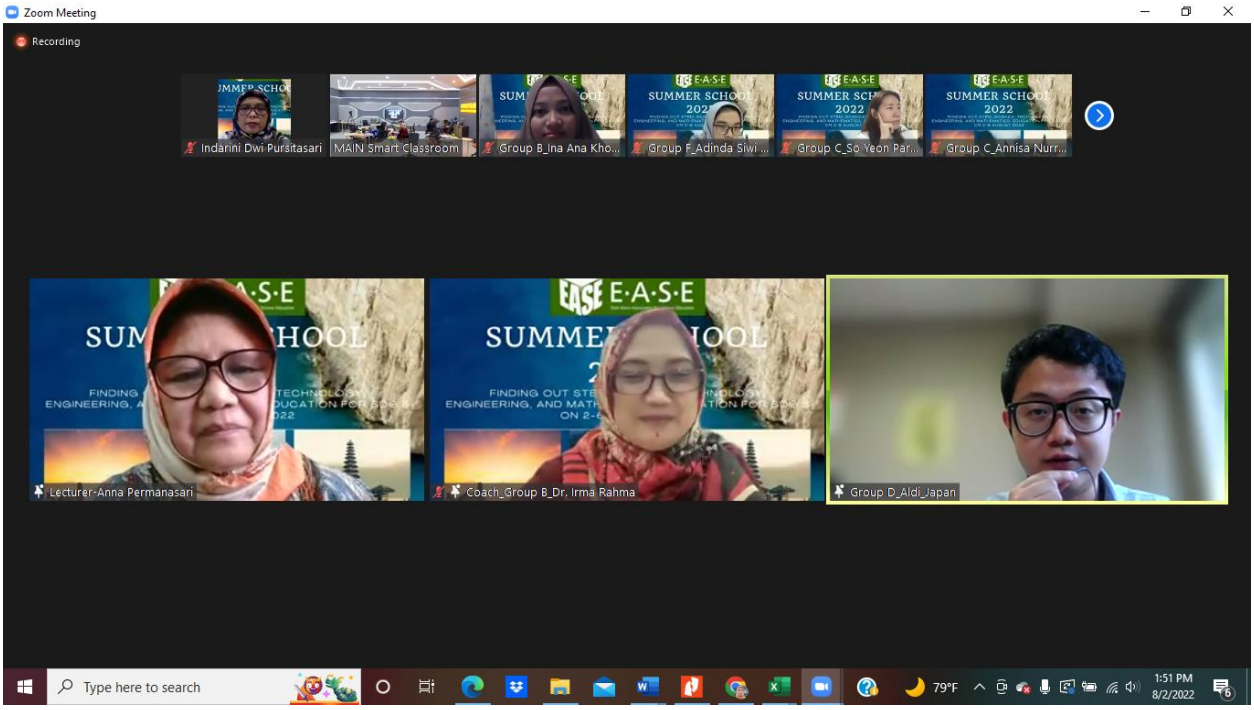
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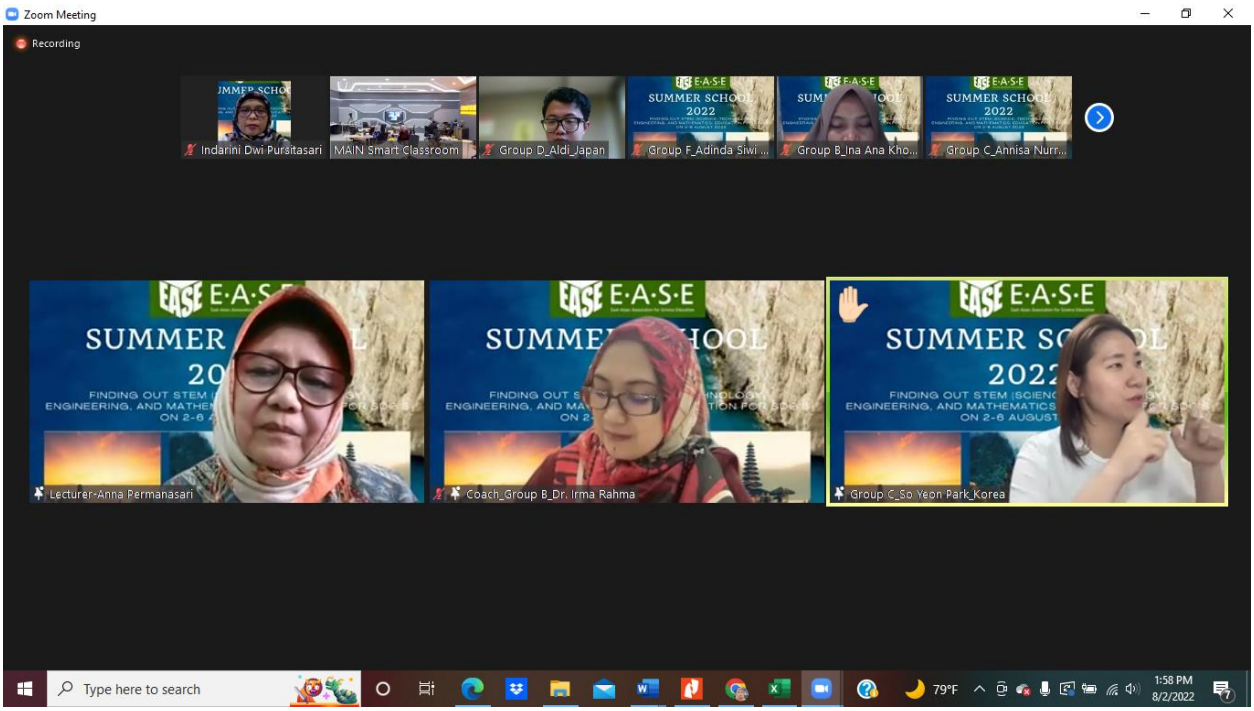
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Lecturer-Anna Permanasari
Coach_Group B_Dr. Irma Rahma
Group C_So Yeon Park_Korea
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# LAPORAN KEGIATAN EASE SUMMER SCHOOL 2022

**Dibuat oleh:**

**Sigit Subagja**

**NPM.072621001**

**PROGRAM STUDI PENDIDIKAN IPA**

**SEKOLAH PASCASARJANA**

**UNIVERSITAS PAKUAN**

**2022**

**PROPOSAL RISET KOLABORASI**

# Future Food: Development of Phenomenon-Based Learning (PhBL) Module to Foster Scientific Creativity

## Collaboration Research Proposal

**Daeun JUNG[1], Khalifatulloh Fiel'ARDH[2], Sigit SUBAGJA[3], Tawan CHAIWON[4], Zeyu HAN[5]**
1) Kyungpook National University, Korea, 2) Okayama University, Japan, 3) Pakuan University, Indonesia, 4) Kasetsart University, Thailand, 5) The Education University of Hong Kong PRC

## 1. Objectives

One of the goals of STEM Education is to equip students with creativity and other 21st century skills, that will prepare them for a real-world employment. Advancement of science and technology had made food industry one of the fastest growing industry. Yet, there is a shortage of expert in food science. Recent developments in a number of unexpected global events have brought to light the fragility of our food system. In light of the impending threat posed by climate change, it is absolutely necessary to educate of resilient leaders in food science.

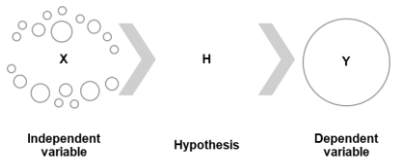
To grow enrollment in food science programs and filling the need in the job market, introducing students to food science is critical (Stringer et. al., 2018). Studies reveal that incorporating food science may improve mathematical literacy (Roseno et.al., 2015), nutrition knowledge, (Carraway-stage, 2015), and multi-disciplinary science knowledge (Hovland et. al., 2013) Lesson on food science has the potential to benefit not only the academic and professional skills of students, but also broader societal needs (Macbeth, et. al., 2021).

Consequently, the lesson planning or curriculum development should show the connections between the variety disciplines and the real-world (Setiawan et al., 2021). Phenomenon (PhBL)-based learning is one of the established pedagogies that focuses on 21$^{st}$ century skills by focusing on real-world problems. The success of Finnish students on the PISA may be attributed to the PhBL, which has been implemented for decades (Symeonidis & Schwarz, 2016). Incorporating PhBL in STEM education resulted in a higher increase of creativity in comparison to traditional approach (Tongsoong & Jermtaisong, 2020).

Based on the above background this study is aimed to develop innovative phenomenon-based module to enhance scientific creativity. Validate the innovative module through implementation in East Asian regions, and Disseminate the innovative module throughout Asia and beyond.

## 2. Problem Formulation

### Research Questions and hypotheses




**Assumption:** Open-endedness of PhBL lesson module combined with familiarity of food topic will enable students to engage students in the lesson, thus stimulating their creativity in face of real-world problem

| | |
|---|---|
| X | Intervention lesson with the future food PhBL module (Independent variable) |
| Y | Students' scientific creativity before and after the intervention lesson (Dependent variable) |
| RQ1 | How to develop **PhBL Lesson Module (x)** on the topic of future food? |
| RQ2 | How effective is the **lesson plan (x)** in fostering **scientific creativity (y)**? |
| H0 | There is **no significant difference** in students' scientific creativity before and after intervention lesson |
| H1 | There is **a significant difference** in students' scientific creativity before and after intervention lesson |

### Operational Definitions

**a.** **The PhBL (Phenomenon-Based Learning) lesson module**, is a collection of learning content structured around contemporary, real-world topics and themes (Chaiwon & Nugultam, 2021).

**b.** **Scientific creativity,** ability to utilize scientific knowledge fluently and flexibly to gene-rate original ideas (Adey & Hu,2002), in response to real-world phenomena

## 3. Theoretical Overview

While not absolute, PhBL (Silander, 2019) has several main features:

**Inquiry-based**

The PhBL approach promotes inquiry-based learning, problem-based learning, and project- and portfolio-based learning in formal education and the workplace. It begins with investigating the phenomenon and developing an understanding of it. Then, a problem-based learning approach can be used to discover answers and develop topic-related conclusions.

**Anchored in the real world**

The phenomenon-based approach is a form of anchored learning, though it does not necessarily involve technology. The questions asked and topics studied are based on real-world phenomena, and the skills and knowledge acquired can be applied across disciplines and beyond the learning environments to real-world situations.

**Contextual**

PhBL applies new information to a problem. This context shows the learner the immediate utility of concepts and information. Applying and using this information during learning is key to retention. Information absorbed only through listening or reading, or in the abstract (such as formulas and theories), often stays in short-term memory and isn't internalized.

**Authenticity**

PhBL can demonstrate the authenticity of learning, a key requirement for deeper learning. In a PhBL environment, cognitive processes correspond to those in the actual/real-world situations where the learned subject matter or skills are used. The intent is to bring genuine practices and processes into learning situations to allow participation in the "expert culture" of the area and practices being studied.

**Constructivism**

In PhBL, learners are active knowledge builders and information is constructed through problem-solving. Information and skills are 'pieced together' to fit the situation. When phenomenon-based learning occurs in a collaborative setting (learners work in teams, for example), it supports socio-constructivist and sociocultural learning theories, which view information as formed in a social context. Not every learner needs to reinvent the wheel; they can use information and tools transmitted by cultures.

## 4. Lesson Development Methods

Lesson will be developed by adopting steps introduced in Chaiwon & Nugultam (2021) (See **Fig.1**). The lesson consists of five phases: **(1) Phenomenon (15 mins):** Introducing contemporary issues that attract student's attention (see **Fig. 2** for examples); **(2) Exploration (75 mins)**: Concept mapping to explore students' prior knowledge; **(3) Investigation (75 mins):** Design thinking about solution to the problem in the phenomenon; **(4) Synthesis (45 mins):** Group or class discussion to calibrate the knowledge; **(5) Assessment (30 mins.):** Using open rubric to assess the learning outcome.


**Fig 1.** Phenomenon-Based Instruction

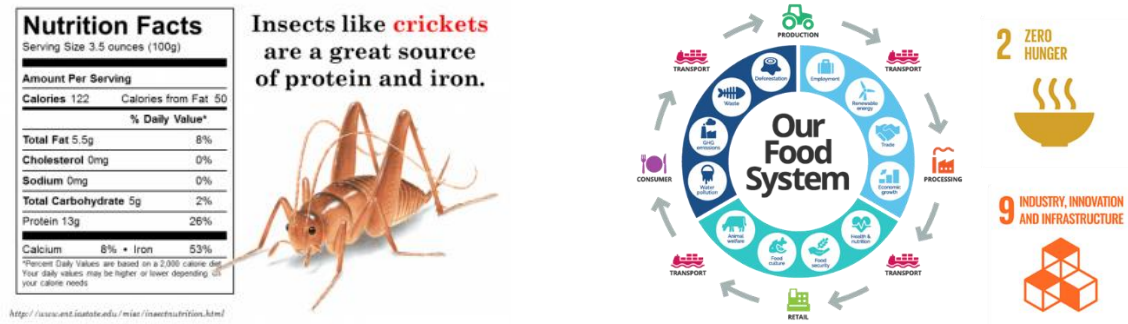



**Fig 2.** Example of phenomenon to explore (Left: insect as an alternative food source can be delivered in a cross-cutting implementation, e.g. Science: Classification of edible and inedible insect. Technology & engineering: Testing protein content of insect, discussion about food processing technology. Mathematics: Calculating nutrition facts of insect.; right: sustainability issues in the complex food system)

## 5. Lesson Evaluation Methods

### Research design and subject

Type of this research is a Parallel Mixed Method. The rationale is because by combining both quantitative and qualitative method may offset one method's weakness with the other's strength) (Creswell & Clark, 2011). Specifically, this study employs **embedded quasi-experimental design** because the sampling will be likely non-probabilistic and it include one experimental pre-test-post-test group with no control group. Research subject is determined to be students between the ages of 15 years and 3 months and 16 years and 2 months, and who are enrolled in an educational institution at grade 7 or higher (*purposive sampling as per* **PISA target** *of* $n \leq 30$, as per central limit theorem) from five different regions: 1) Bangkok, Thailand; Bogor, Indonesia; Daegu, Korea; Hong Kong, PRC and Okayama, Japan.

### Research instrument

For the quantitative data collection, **the scientific creativity test** developed by Hu & Adey (2002) will be adopted, translated into local languages (Cantonese/Mandarin, Japanese, Korean Indonesia and Thai), and then validated via pilot study in each region. This instrument consists of **seven open-ended items** including: (1) Unusual Uses, (2) Problem Finding, (3) Product Improvement, (4) Imagination, (5) Problem Solving, (6) Experiment and (7) Product Design.

For example, item 4 "Imagination" will include question such as *"Suppose there was no animal-based products (meat, eggs, fish, honey, milk etc.), describe what the world would be like?"* Scores were given for three aspects of creativity in each item, including: (1) fluency (i.e. 'How many relevant ideas are produced'); (2) flexibility (i.e. 'How different the produced ideas are'); (3) originality (i.e. 'How unique the produced ideas are'). Qualitative instrument such as semi-structured interview guide, observation checklist, student's worksheet et cetera will be developed via collaboration of the researchers.

### Data collection and processing

Qualitative data will be collected before (pre), during (peri) and after the intervention (post). While quantitative data will only be collected before and after the intervention. Qualitative data will be analyzed using content analysis method (coding, categorization), and then processed via descriptive statistics (graphs etc.) Quantitative data will be processed using inferential statistic (e.g. t-test) to see whether there the differences between pretest and posttest result of the scientific creativity are significant. Data from each region will be tested separately.

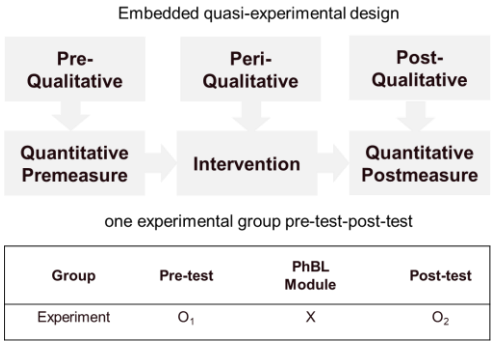



**Fig. 2** Data Collection and Processing

## 6. Expected outcomes

### 5.1 Theoretical benefit

a. As a basis for further research on the development of module utilizing phenomenon-based learning approach on other themes.
b. Provide empirical evidence on the potential of phenomenon-based learning approach to enhance scientific creativity.

### 5.2 Practical Benefit

a. Foster students' scientific creativity which is one of the 21st century skills.
b. Motivate students to pursue career in STEM-fields (including food science).
c. Facilitate teachers to enhance STEM instruction with innovative lesson plan.
d. Encourage schools to implement phenomenon-based learning curriculum.
e. Provide researchers a venue to conduct regional research collaboration

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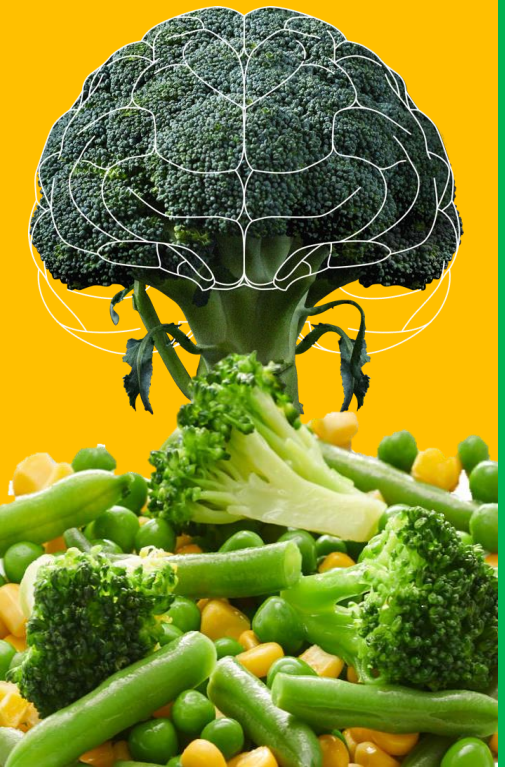


# FUTURE FOOD

## Development of Phenomenon-Based Learning (PhBL) Module to Foster Scientific Creativity

**EASE Summer School 2022 -Group D**

# Introduction

Daeun Jung

# Table of Contents

# Introduction

Sigit Subagja

# Introduction

## Background

Goal of STEM Education → *Is to foster* → Creativity (21st Century Skill)

Creativity (21st Century Skill) → *Is necessary in* → **Preparing Future STEM Workforce**

**Preparing Future STEM Workforce** → *That are resilient against* → Real-world issues (e.g. Food crisis)

Real-world issues (e.g. Food crisis) → *Is heavily focused in* → Phenomenon-Based Learning **(PhBL)**

Growing market demand and advancement of science & technology had made food industry one of the fastest growing industry in the foreseeable future. Yet, there is a **shortage of expert in food science** (Stringer,2019).

# Introduction

## Background

Goal of STEM Education → *Is to foster* → Creativity (21st Century Skill)

*Is necessary in*

Preparing Future STEM Workforce

*That are resilient against*

**Real-world issues (e.g. Food crisis)**

*Is heavily focused in*

Phenomenon-Based Learning **(PhBL)** pedagogy


Moreover, recent developments in a number of **unexpected global events (pandemic, war, heatwaves)** have brought to light the fragility of our food system. Necessitating effort to **prepare resilient leaders in food science**.

# Objectives and expected outcome

| | |
|---|---|
| **Research Objectives** | ■ **Develop** innovative phenomenon-based module to enhance scientific creativity.<br>■ **Validate** the innovative module through implementation in East Asian regions.<br>■ **Disseminate** the innovative module throughout Asia and beyond. |
| **Theoretical benefit** | ■ As **a basis for further research** on the development of module utilizing phenomenon-based learning approach on other themes.<br>■ Provide empirical evidence on the potential of phenomenon-based learning approach to enhance scientific creativity. |
| **Practical benefit** | ■ Foster students' scientific creativity which is one of the 21st century skills.<br>■ **Motivate students to pursue career in STEM-fields (including food science).**<br>■ Facilitate teachers to enhance STEM instruction with innovative lesson plan.<br>■ Encourage schools to implement phenomenon-based learning curriculum.<br>■ Provide researchers a venue to conduct regional research collaboration |

# Problem Formulation

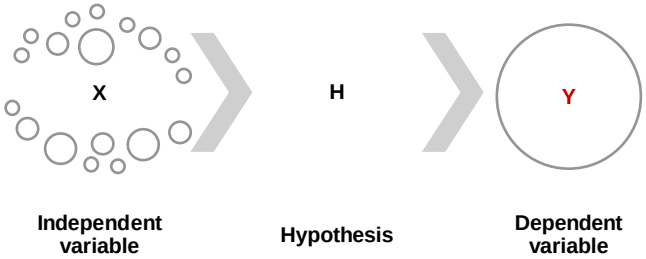
Aldi

# Problem Formulation

## Research question and hypothesis

**RQ1** How to develop **PhBL Lesson Module (x)** on the topic of future food?

**RQ2** How effective is the **lesson plan (x)** in fostering **scientific creativity (y)**?

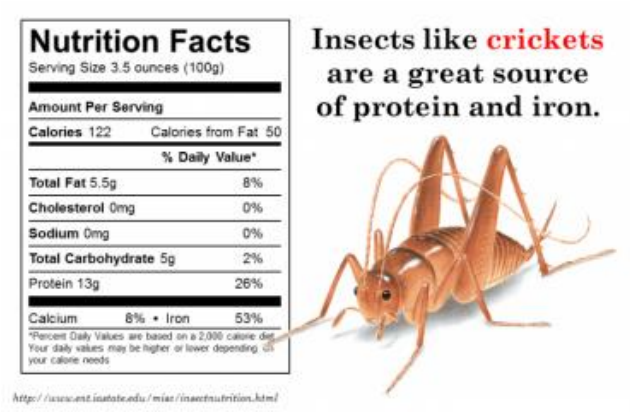



**H0** There is **no significant difference** in students' scientific creativity before and after intervention lesson

**H1** There is **a significant difference** in students' scientific creativity before and after intervention lesson

## Assumption

- Open-endedness of PhBL lesson module combined with familiarity of food topic will enable students to engage students in the lesson, thus stimulating their creativity in face of real world problem (e.g. eating insect to combat food crisis).



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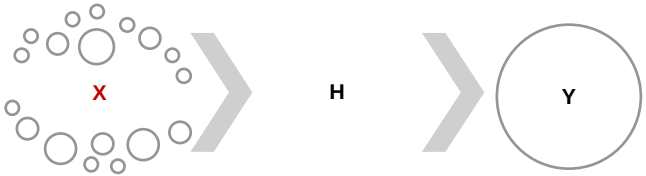


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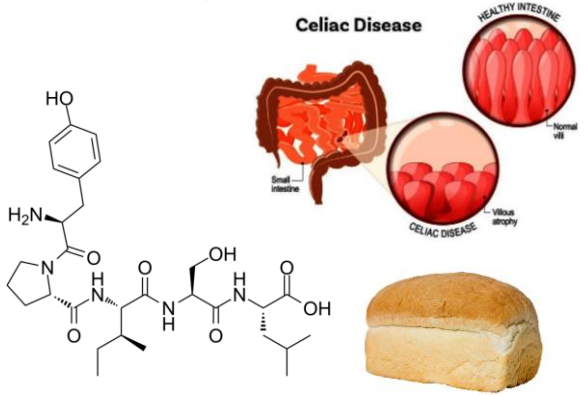
## Operational Definition

- The PhBL (Phenomenon-Based Learning) lesson module, is a collection of learning content structured around **contemporary, real-world topics and themes** (Chaiwon & Nugultam, 2021)




Example of PhBL theme: Gluten-Free foods and Celiac disease

# Problem Formulation

## Research question and hypothesis

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## Operational Definition

- Scientific creativity, ability to utilize scientific knowledge **fluently** and **flexibly** to gene-rate **original** ideas (Adey & Hu,2002), in response to real-world phenomena

*Example of Scientific Creativity: Reducing dependency to beef by enhancing plant-based meat with soy-based leghemoglobin*

# Lesson Development

Tawan Chaiwon

# Theoretical Overview of Food Science PhBL

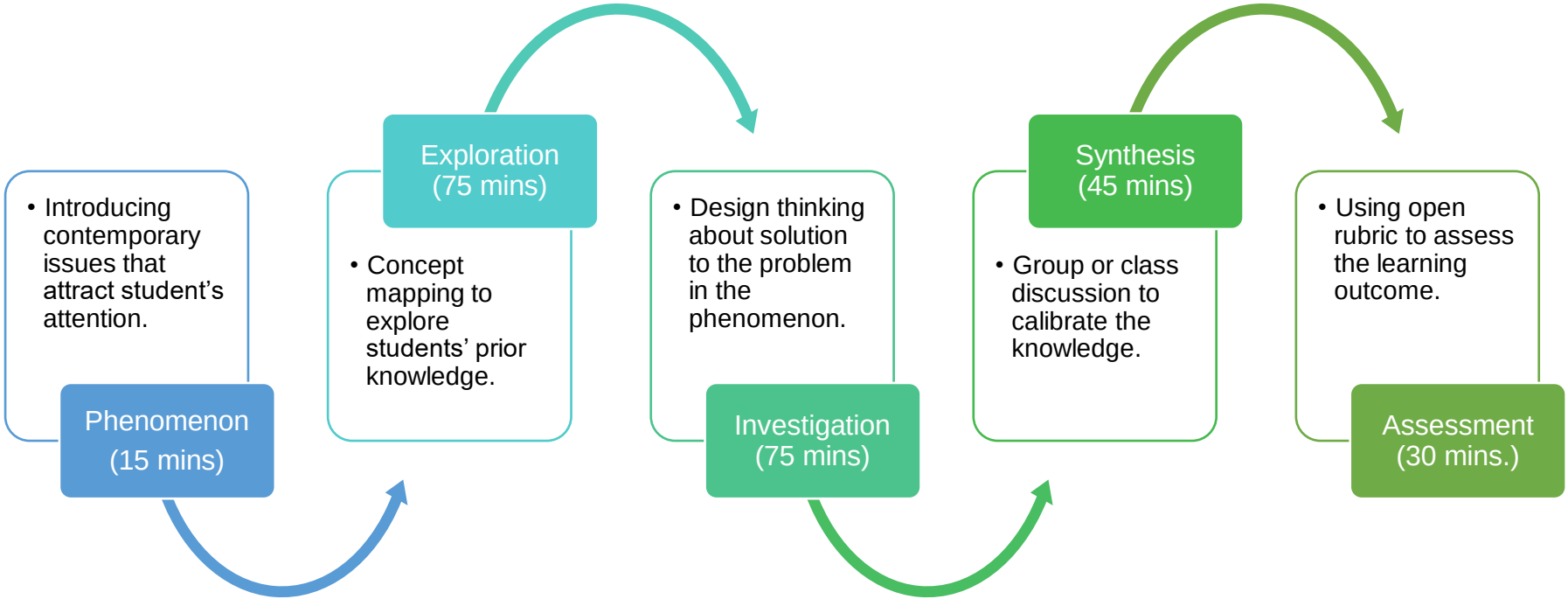
## PhBL is an established pedagogy that is able to foster 21st century skills

- The success of Finnish students on the PISA may be attributed to the PhBL, which has been implemented for decades (Symeonidis & Schwarz, 2016)
- Incorporating PhBL in STEM education resulted in a higher increase of creativity in comparison to traditional approach (Tongsoong & Jermtaisong, 2020)

## Food Science is a promising theme to explore in STEM Education

- To grow enrollment in food science programs and filling the need in the job market, introducing students to food science is critical (Stringer et. al., 2018).
- Studies reveal that incorporating food science may improve mathematical literacy (Roseno et.al., 2015), nutrition knowledge, (Carraway-stage, 2015), and multi-disciplinary science knowledge (Hovland et. al., 2013)
- Lesson on food science has the potential to benefit not only the academic and professional skills of students, but also broader societal needs (Macbeth, et. al., 2021)

# Phenomenon Based Instruction



# Lesson Evaluation
# Zeyu Han

# Lesson Implementation

## Intervention Method

- Research type: **Parallel Mixed Method** (*combining both quantitative and qualitative method may offset one method's weakness with the other's strength*) (Creswell & Clark, 2011)
- Research Design: **Embedded quasi-experimental design** (*non-probabilistic sampling, one experimental group pre-test-post-test with no control group*)

| Group | Pre-test | PhBL Module | Post-test |
|---|---|---|---|
| Experiment | $O_1$ | X | $O_2$ |

## Intervention Subject

- Students between the ages of 15 years and 3 months and 16 years and 2 months, and who are enrolled in an educational institution at grade 7 or higher (*purposive sampling as per* **PISA target** *of* $n \leq 30$, as per central limit theorem) from five different regions:
  1. Bangkok, Thailand
  2. Bogor, Indonesia
  3. Kyungpook, Korea
  4. Hong Kong, PRC
  5. Okayama, Japan

# Research Instrument

- **Quantitative Instrument:** *The Scientific Creativity Test* developed by Hu & Adey (2002) : (one of the most prestigious tests worldwide; Saptono & Hidayah, 2020) , **(modified, translated, validated version)**

- **Seven open-ended items** related to Unusual Uses, Problem Finding, Product Improvement, Imagination, Problem Solving, Experiment and Product Design;
  For example (**revised** item 4):"Suppose there was no animal-based products (meat, eggs, fish, honey, milk etc.), describe what the world would be like?"

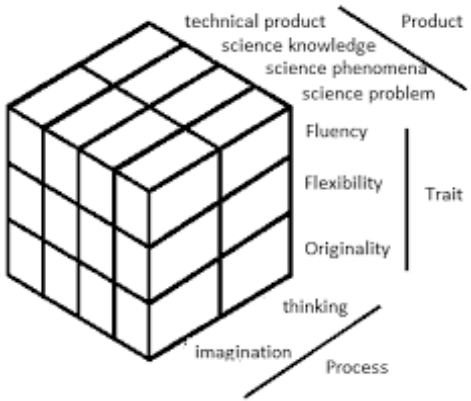
- **Scores** were given for **three aspects of creativity** in each item, including:

  (1) fluency (i.e. 'How many relevant ideas are produced')

  (2) flexibility (i.e. 'How different the produced ideas are')

  (3) originality (i.e. 'How unique the produced ideas are')

**Qualitative instrument:** Semi-structured interview guide, observation checklist, student's worksheet etc.




The Scientific Creativity Structure Model on its nature (Hu & Adey, 2002) - Theoretical Basis

# Data Collection and processing

## Data Collection

Embedded quasi-experimental design

**Pre-Qualitative** → **Quantitative Premeasure**

**Peri-Qualitative** → **Intervention**

**Post-Qualitative** → **Quantitative Postmeasure**

one experimental group pre-test-post-test

| Group | Pre-test | PhBL Module | Post-test |
|---|---|---|---|
| Experiment | $O_1$ | X | $O_2$ |

## Data Processing

- Qualitative data will be analyzed using **content analysis method** (coding, categorization), and then processed via descriptive statistics (graphs etc.)
- Quantitative data will be processed using **inferential statistic** (*e.g. t-test*) to see whether there the differences between pretest and posttest result of the scientific creativity are significant.
- Data from each regions will be tested separately.

# References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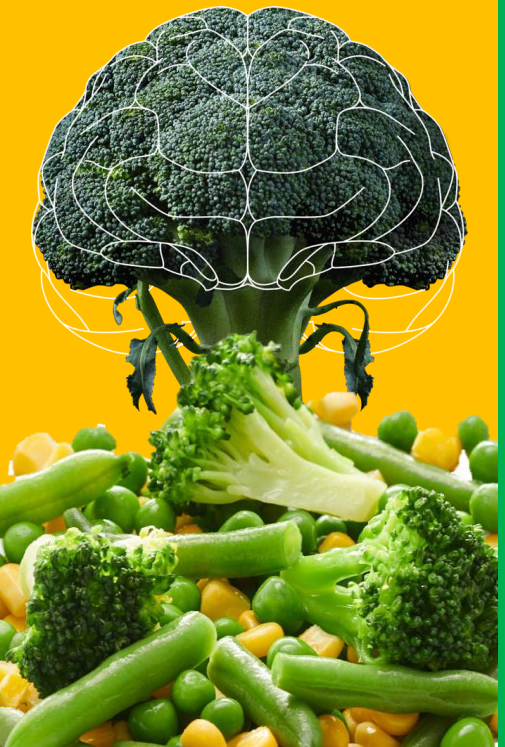

# Thank You for Listening

## Questions, Comments, Concerns, Suggestions are welcomed

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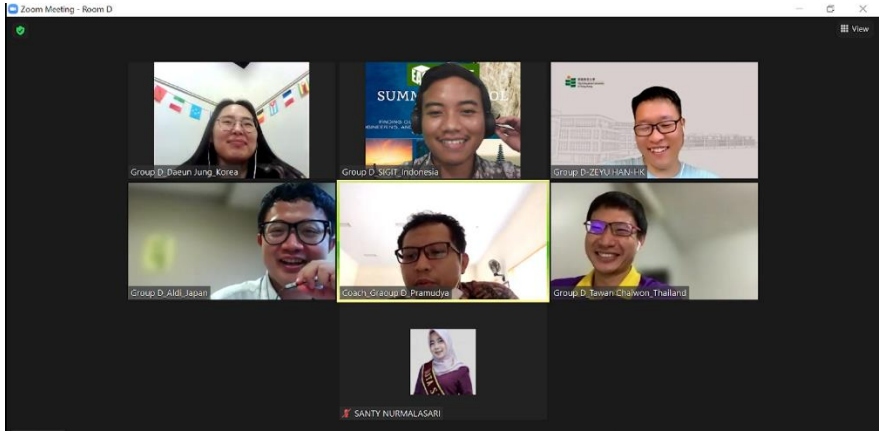


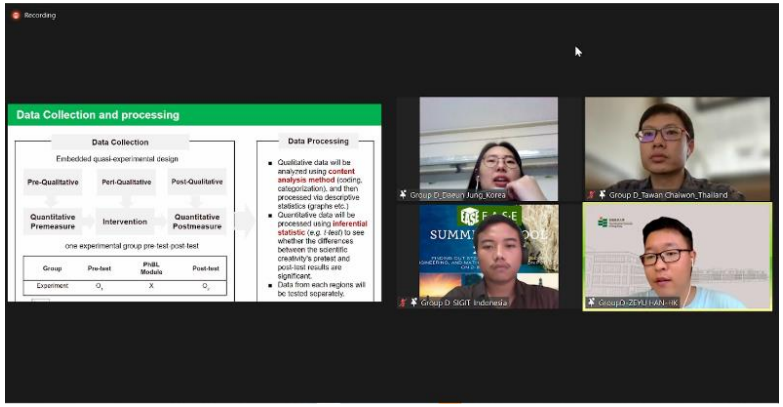


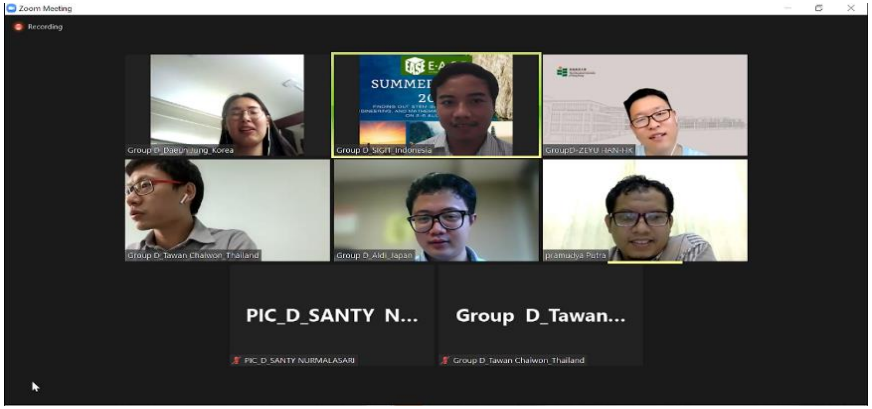


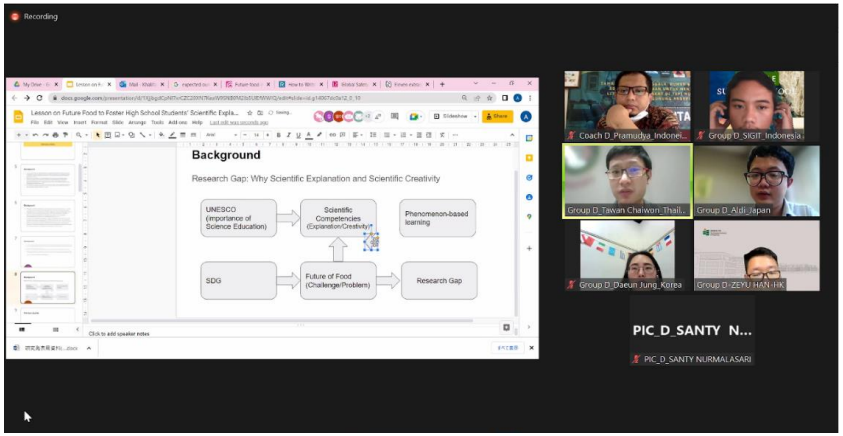

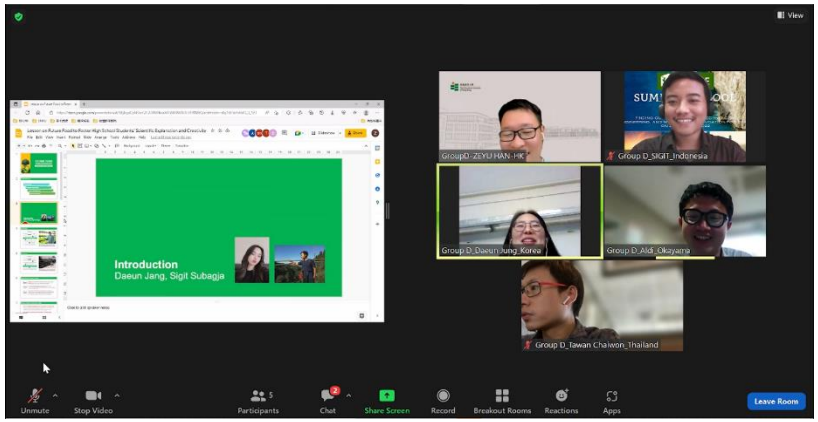
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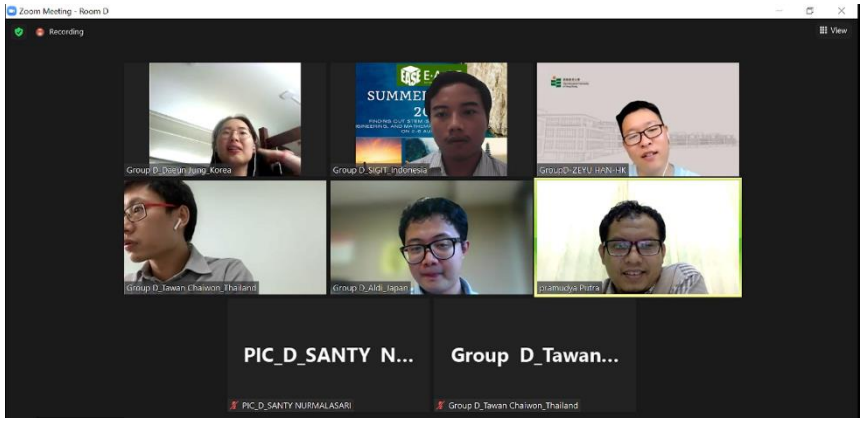
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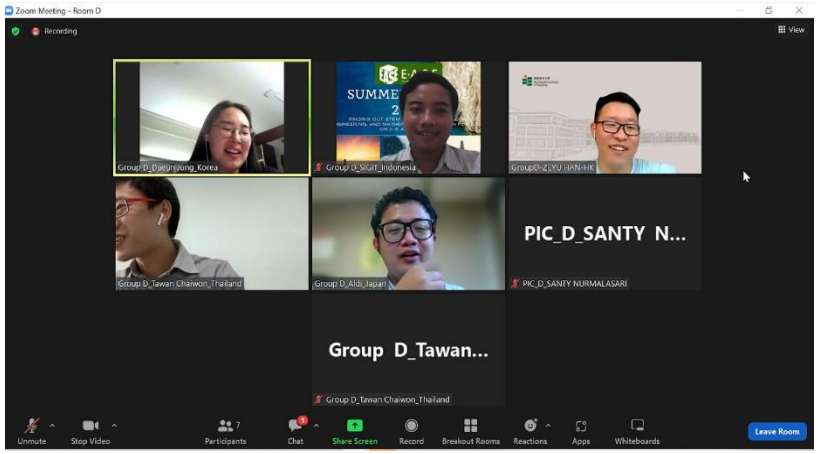
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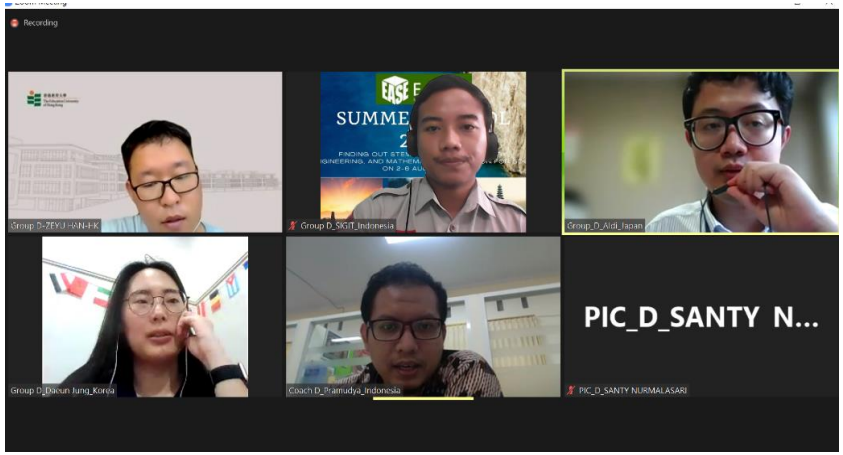
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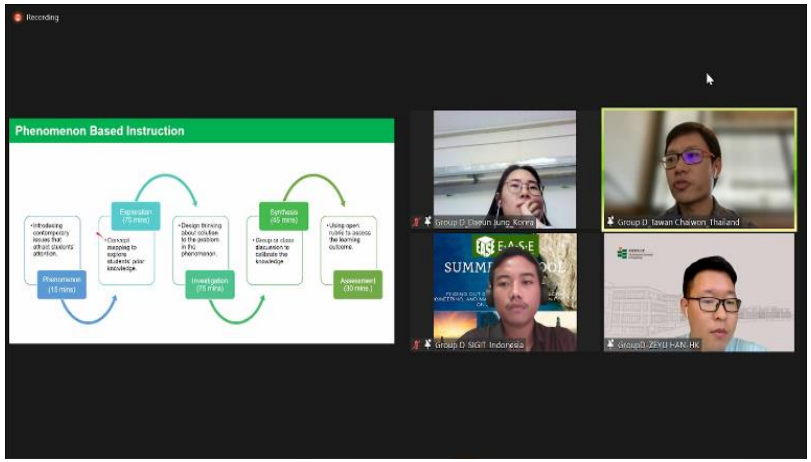
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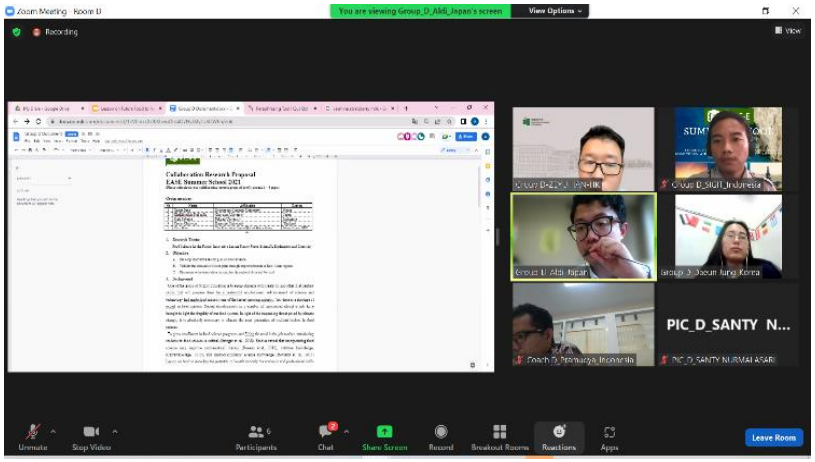
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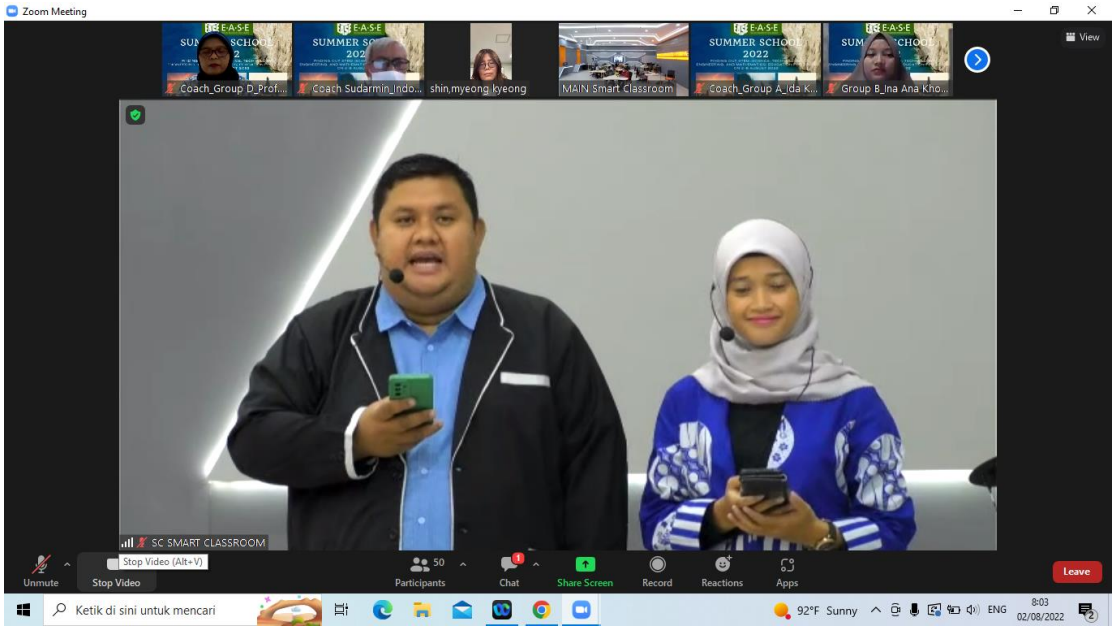
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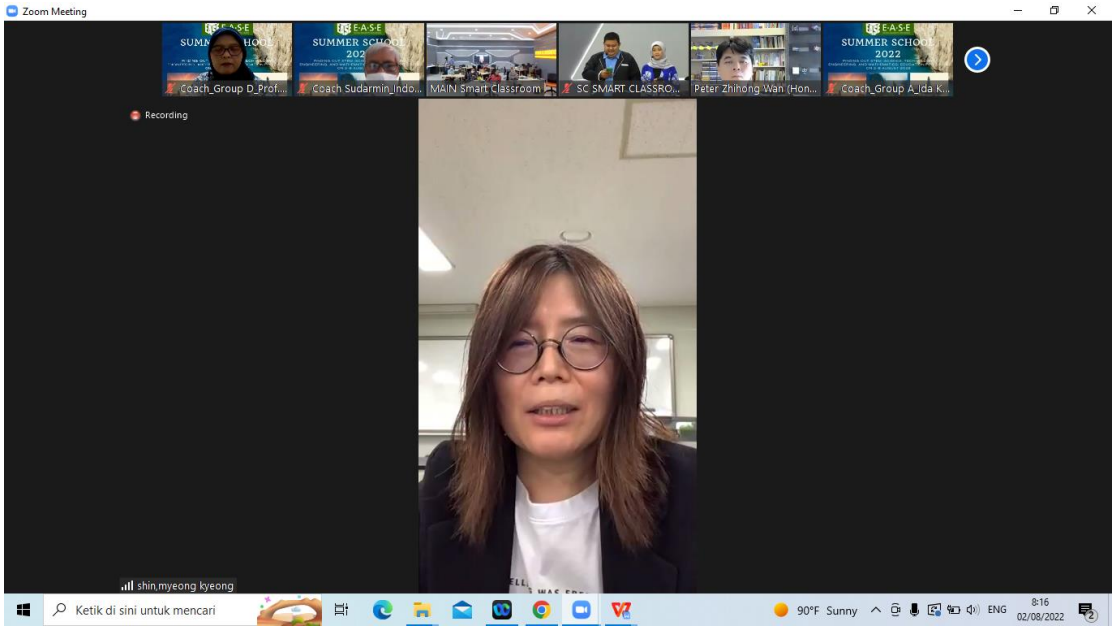


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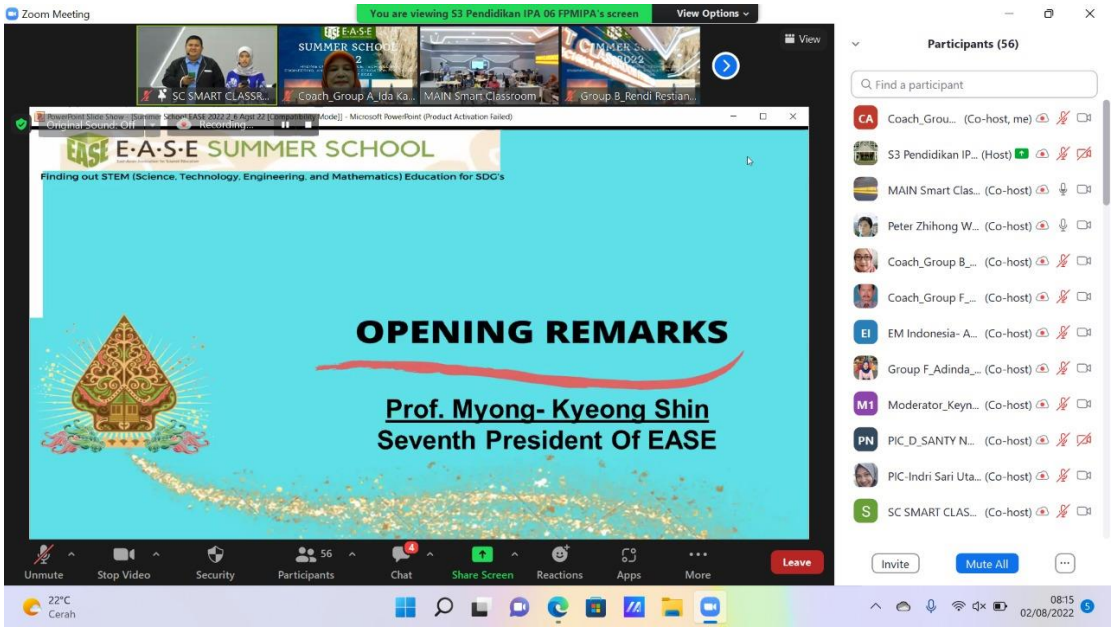


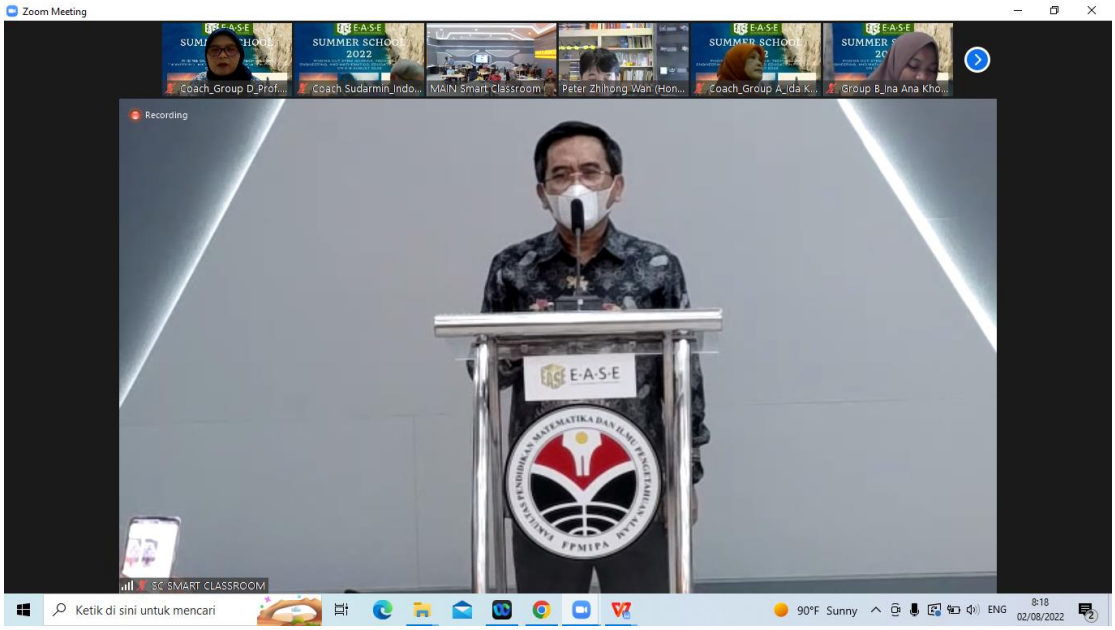


Prof. Dr. Tatang


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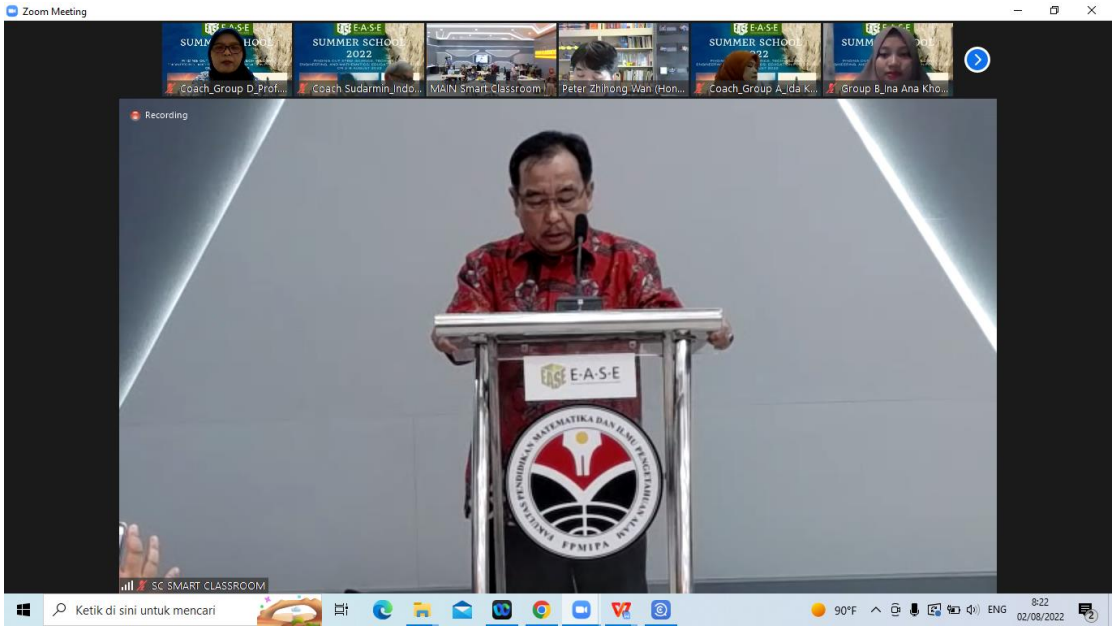
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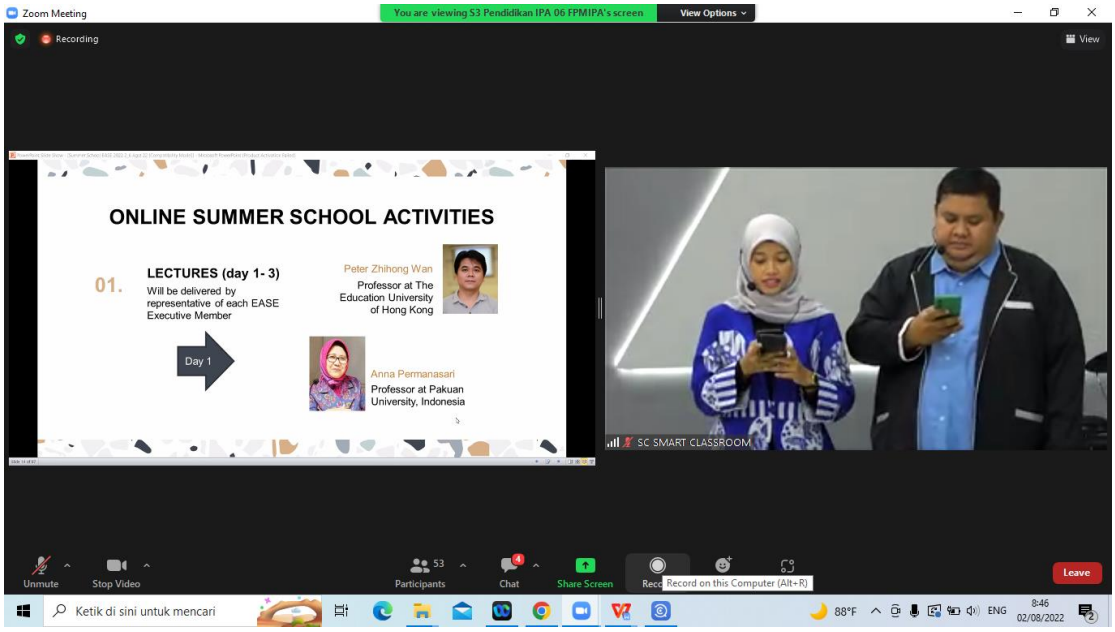
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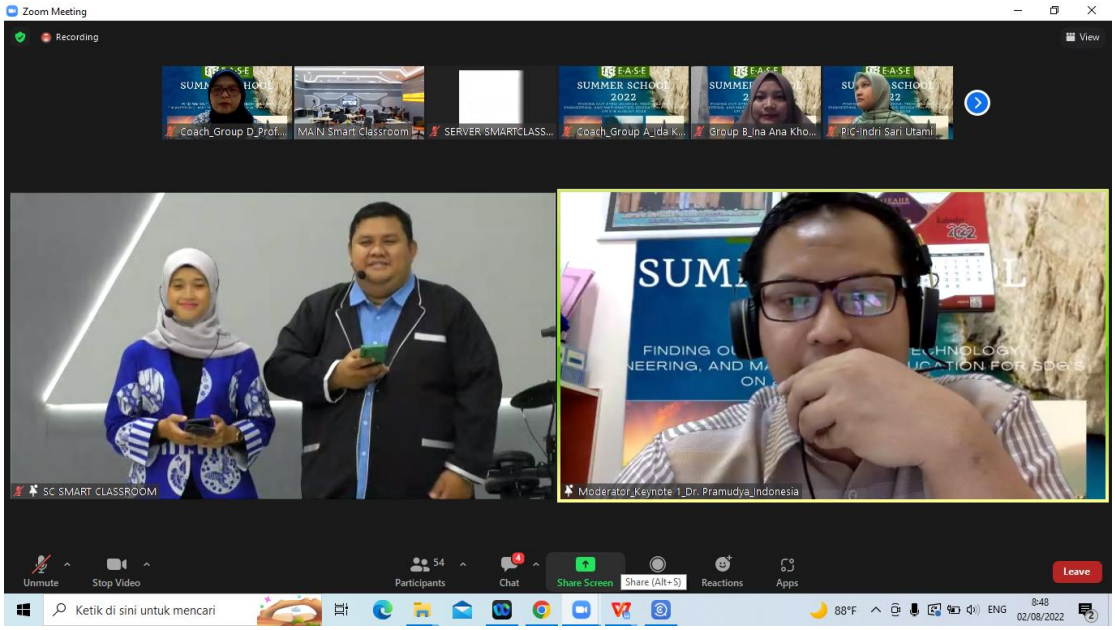
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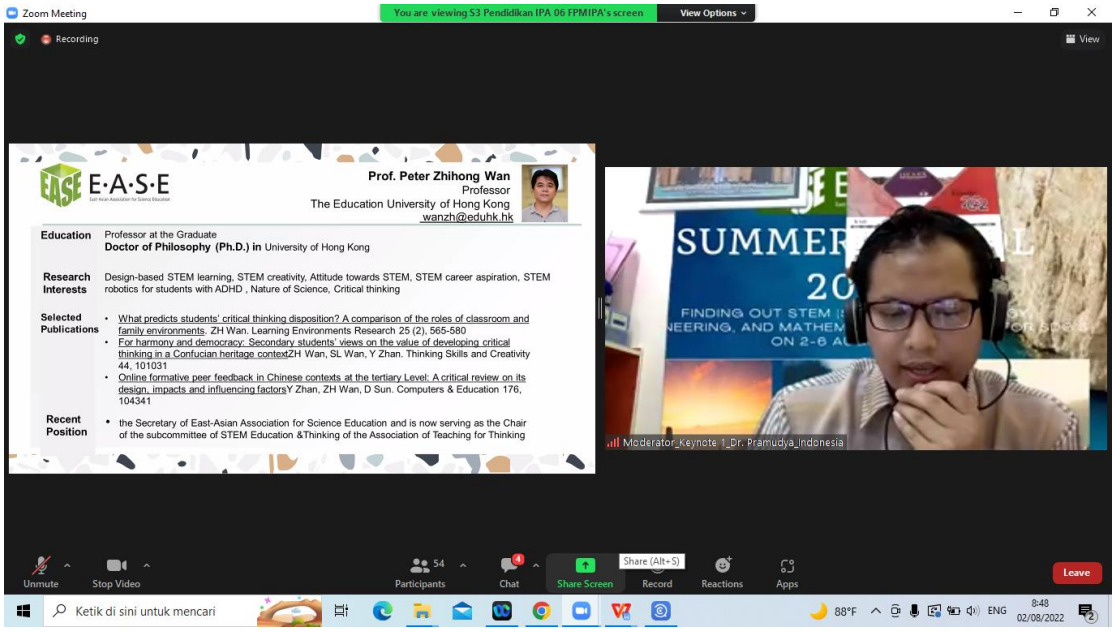
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Prof. Peter Zhihong Wan
Professor
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Education
Professor at the Graduate
Doctor of Philosophy (Ph.D.) in University of Hong Kong
Research Interests
Design-based STEM learning, STEM creativity, Attitude towards STEM, STEM career aspiration, STEM robotics for students with ADHD , Nature of Science, Critical thinking
Selected Publications
What predicts students' critical thinking disposition? A comparison of the roles of classroom and family environments. ZH Wan. Learning Environments Research 25 (2), 565-580
For harmony and democracy: Secondary students' views on the value of developing critical thinking in a Confucian heritage contextZH Wan, SL Wan, Y Zhan. Thinking Skills and Creativity 44, 101031
Online formative peer feedback in Chinese contexts at the tertiary Level: A critical review on its design, impacts and influencing factorsY Zhan, ZH Wan, D Sun. Computers & Education 176, 104341
Recent Position
the Secretary of East-Asian Association for Science Education and is now serving as the Chair of the subcommittee of STEM Education &Thinking of the Association of Teaching for Thinking
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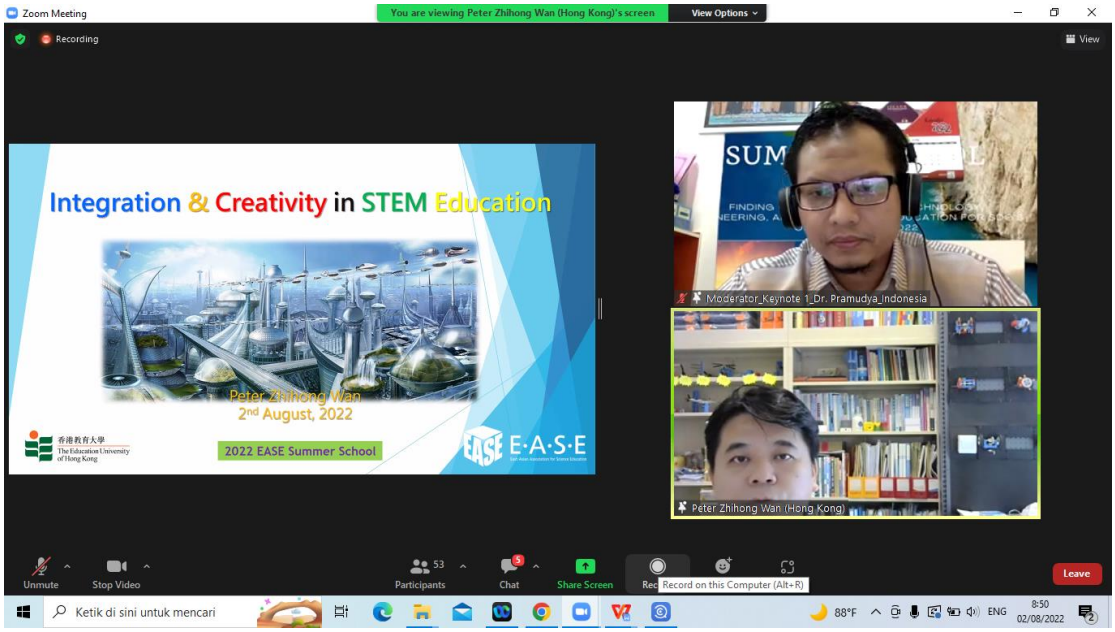
Zoom Meeting
You are viewing Peter Zhihong Wan (Hong Kong)'s screen
View Options
Recording
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Integration & Creativity in STEM Education
Peter Zhihong Wan
2nd August, 2022
2022 EASE Summer School
E·A·S·E
Moderator_Keynote 1_Dr. Pramudya_Indonesia
Peter Zhihong Wan (Hong Kong)
Unmute
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Participants
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ENG
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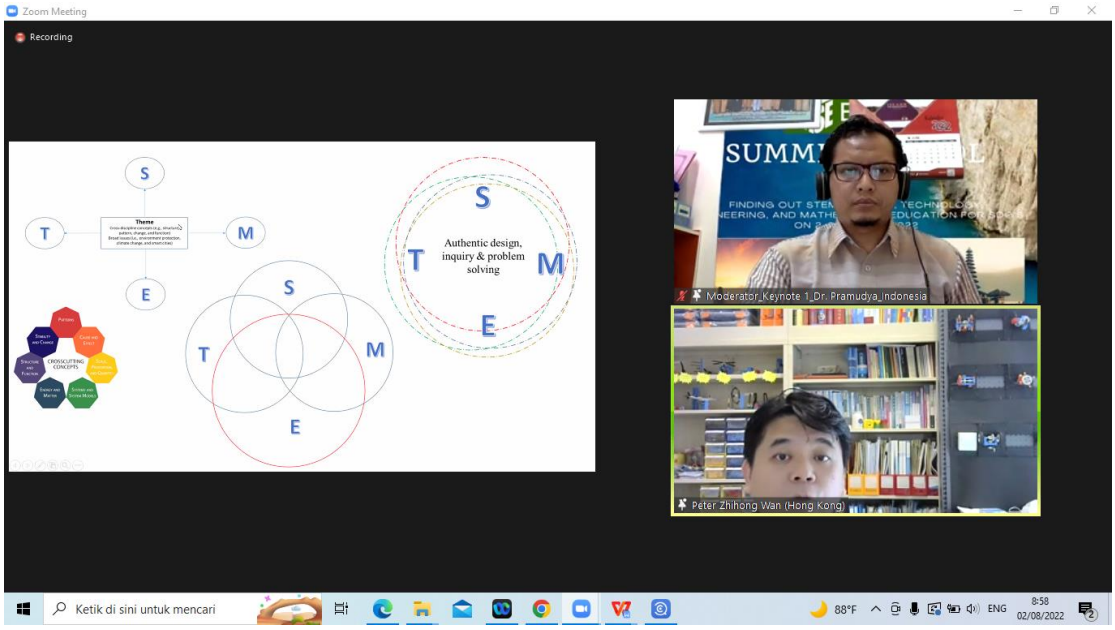
02/08/2022


Zoom Meeting
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S
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Theme
Authentic design, inquiry & problem solving
CROSSCUTTING CONCEPTS
Moderator_Keynote 1_Dr. Pramudya_Indonesia
Peter Zhihong Wan (Hong Kong)
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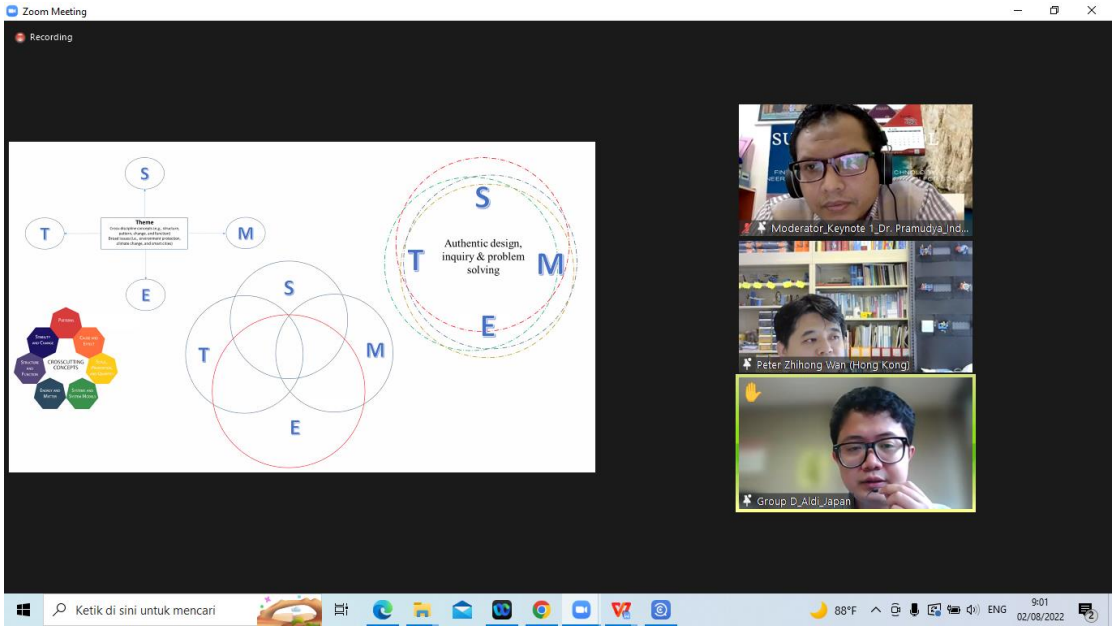
Zoom Meeting
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Theme
Authentic design, inquiry & problem solving
CROSSCUTTING CONCEPTS
Moderator_Keynote 1_Dr. Pramudya_Ind...
Peter Zhihong Wan (Hong Kong)
Group D_Aldi_Japan
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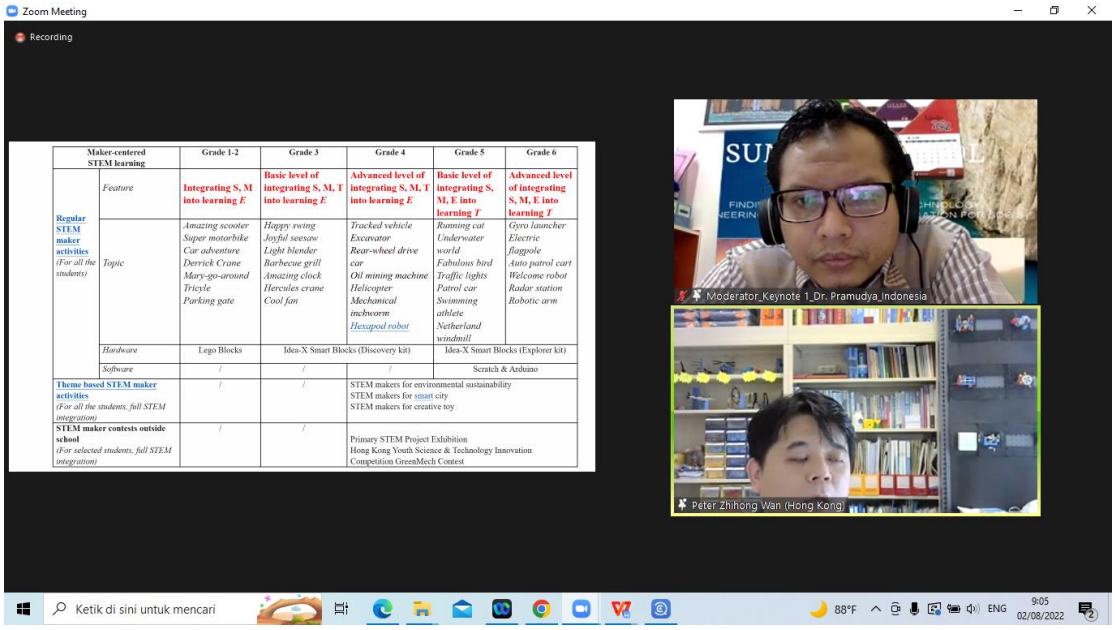
Zoom Meeting
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Maker-centered STEM learning
Grade 1-2
Grade 3
Grade 4
Grade 5
Grade 6
Feature
Integrating S, M into learning E
Basic level of integrating S, M, T into learning E
Advanced level of integrating S, M, T into learning E
Basic level of integrating S, M, E into learning T
Advanced level of integrating S, M, E into learning T
Regular STEM maker activities (For all the students)
Topic
Amazing scooter
Super motorbike
Car adventure
Derrick Crane
Mary-go-around
Tricyle
Parking gate
Happy swing
Joyful seesaw
Light blender
Barbecue grill
Amazing clock
Hercules crane
Cool fan
Tracked vehicle
Excavator
Rear-wheel drive car
Oil mining machine
Helicopter
Mechanical inchworm
Hexapod robot
Running cat
Underwater world
Fabulous bird
Traffic lights
Patrol car
Swimming athlete
Netherland windmill
Gyro launcher
Electric flagpole
Auto patrol cart
Welcome robot
Radar station
Robotic arm
Hardware
Lego Blocks
Idea-X Smart Blocks (Discovery kit)
Idea-X Smart Blocks (Explorer kit)
Software
/
/
Scratch & Arduino
Theme based STEM maker activities (For all the students, full STEM integration)
/
/
STEM makers for environmental sustainability
STEM makers for smart city
STEM makers for creative toy
STEM maker contests outside school (For selected students, full STEM integration)
/
/
Primary STEM Project Exhibition
Hong Kong Youth Science & Technology Innovation Competition GreenMech Contest
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Peter Zhihong Wan (Hong Kong)
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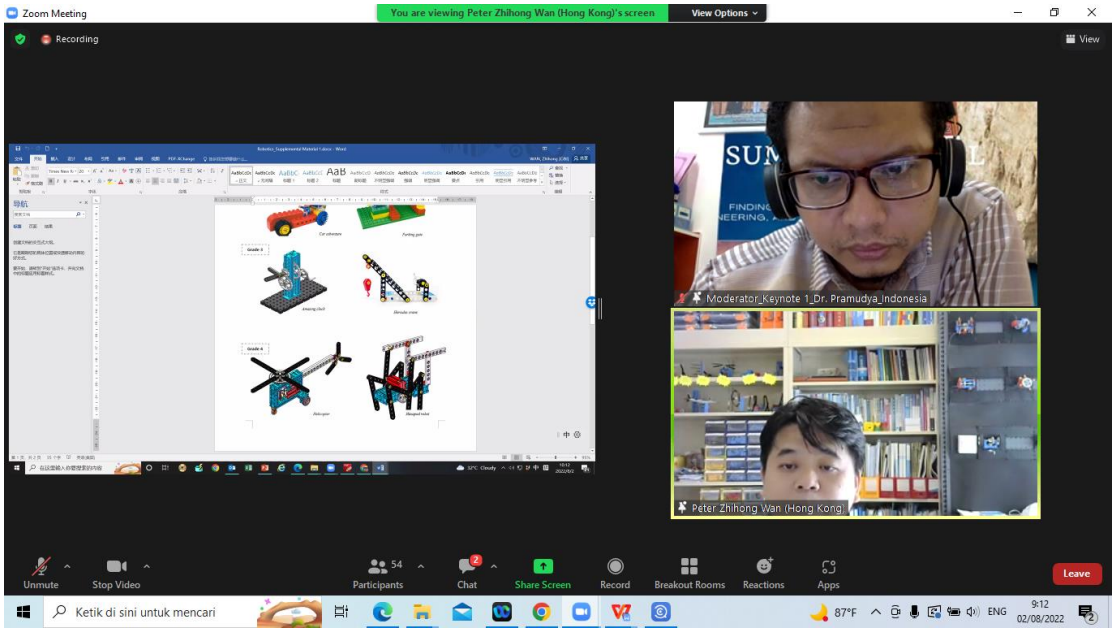
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54
Chat
Share Screen
Record
Breakout Rooms
Reactions
Apps
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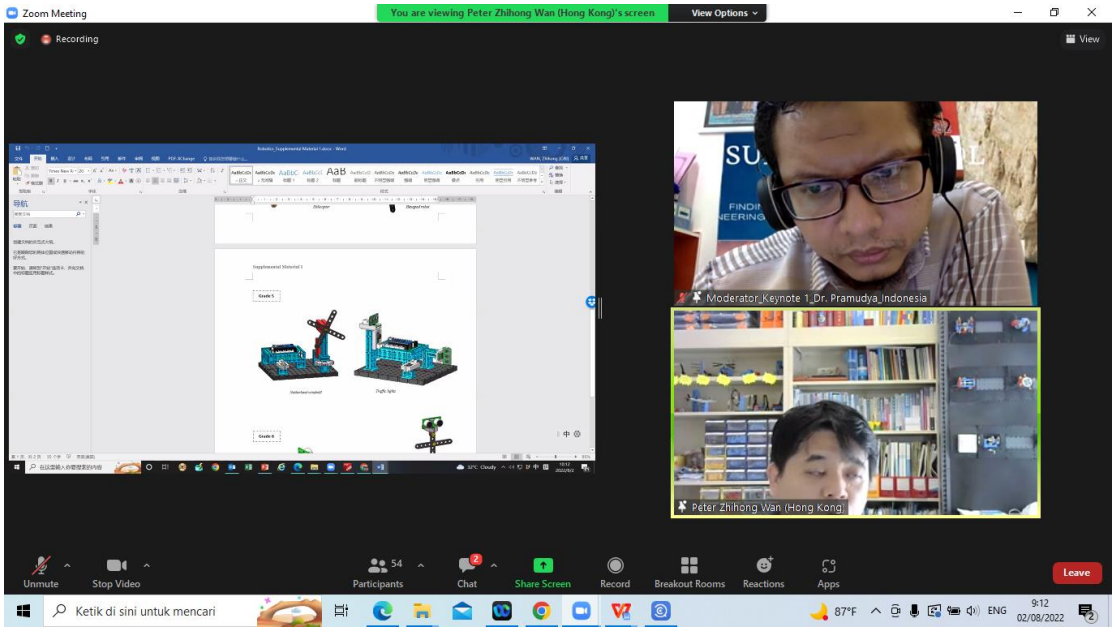
02/08/2022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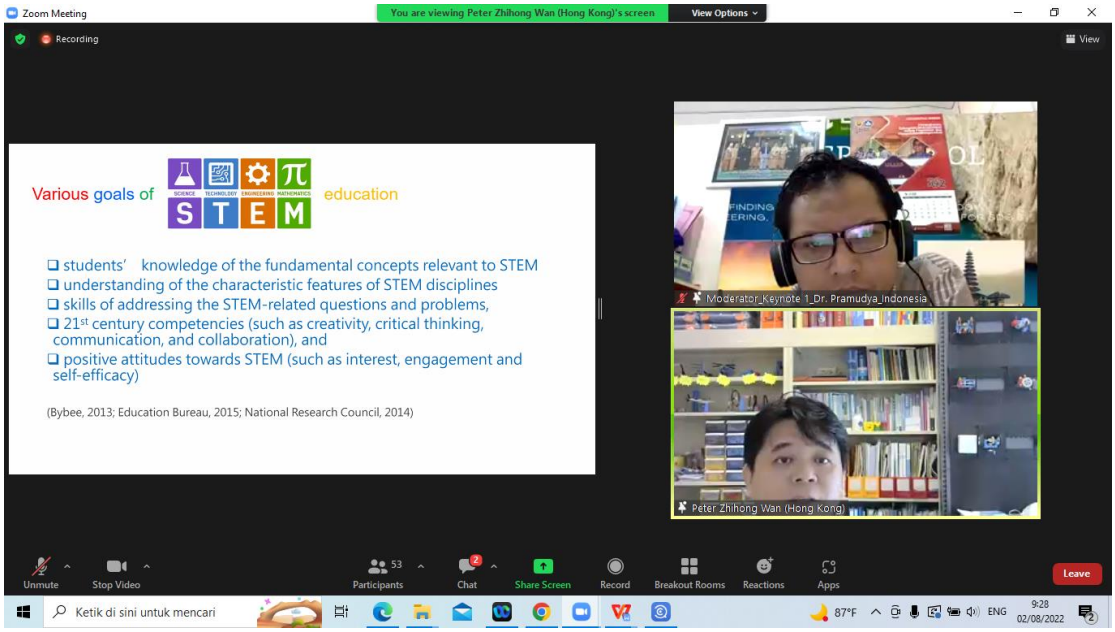
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Various goals of STEM education
❑ students' knowledge of the fundamental concepts relevant to STEM
❑ understanding of the characteristic features of STEM disciplines
❑ skills of addressing the STEM-related questions and problems,
❑ 21st century competencies (such as creativity, critical thinking, communication, and collaboration), and
❑ positive attitudes towards STEM (such as interest, engagement and self-efficacy)
(Bybee, 2013; Education Bureau, 2015; National Research Council, 2014)
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Peter Zhihong Wan (Hong Kong)
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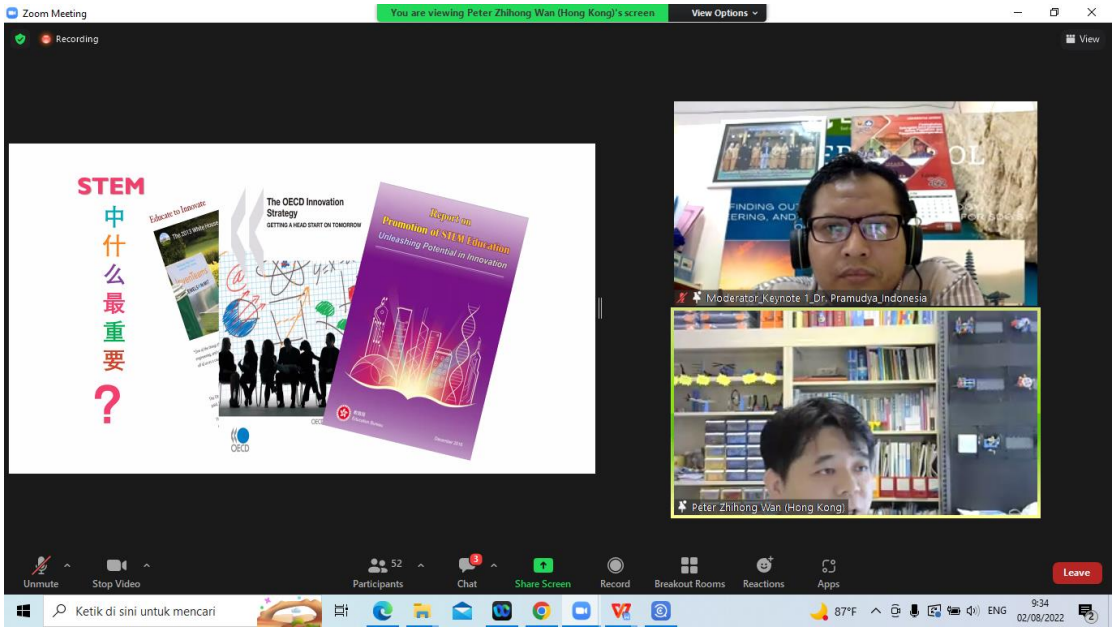
02/08/2022


Zoom Meeting
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STEM
中什么最重要
?
The OECD Innovation Strategy
GETTING A HEAD START ON TOMORROW
Report on Promotion of STEM Education
Unleashing Potential in Innovation
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Peter Zhihong Wan (Hong Kong)
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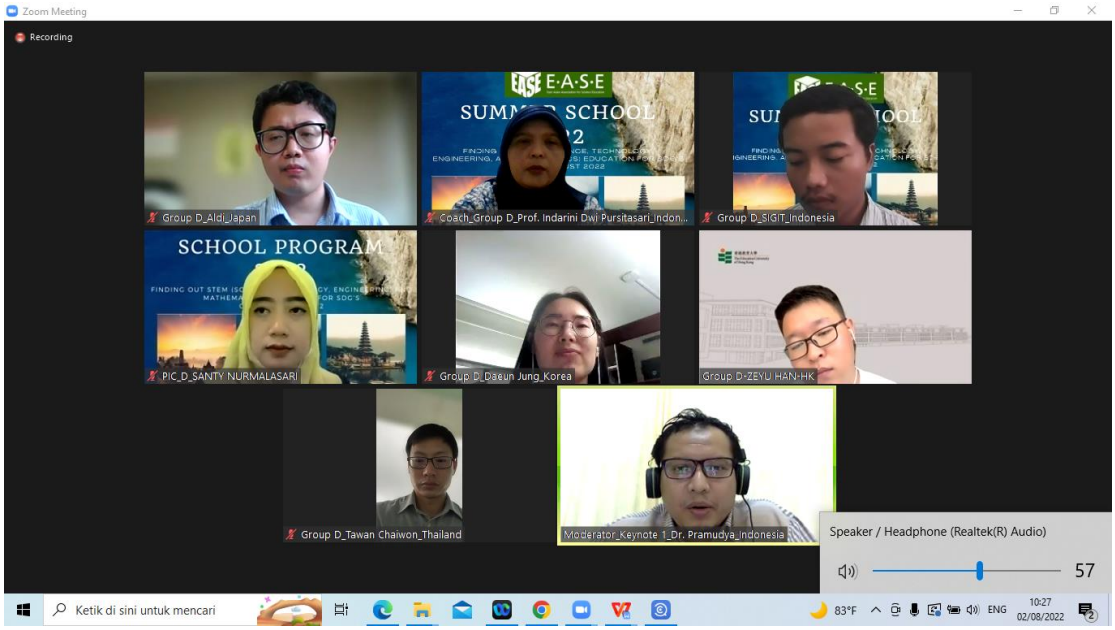
Zoom Meeting
Recording
Group D_Aldi_Japan
Coach_Group D_Prof. Indarini Dwi Pursitasari_Indon...
Group D_SIGIT_Indonesia
SCHOOL PROGRAM
PIC_D_SANTY NURMALASARI
Group D_Daeun Jung_Korea
Group D-ZEYU HAN-HK
Group D_Tawan Chaiwon_Thailand
Moderator_Keynote 1_Dr. Pramudya_Indonesia
Speaker / Headphone (Realtek(R) Audio)
57
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ENG
10:27
02/08/2022


To Mr. Aldi

Your study is interesting about climate change and ESD to fostering furture thinking. What instruments will be used to measure future thinking and what data amalysis techniques will be used?