# TRAINING-WORKSHOP IN INCLUSIVE SCIENCE EDUCATION FOR LINGUISTIC AND CULTURAL DIVERSITY

TECHNICAL REPORT 2

# TRAINING-WORKSHOP IN INCLUSIVE SCIENCE EDUCATION FOR LINGUISTIC AND CULTURAL DIVERSITY

TECHNICAL REPORT

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# ABOUT ESTA

**Background of the Project**

EU-report on science education for responsible citizenship and the Paris declaration recommend teaching all students for our better future. In Georgia, the Philippines, and Bosnia and Herzegovina, a large number of young people do not meet basic requirements in science. In international assessments of science performance all three countries scored very low. One great challenge for science education in Georgia, Bosnia and Herzegovina, and the Philippines are the countries' plurality of languages and cultures. While the education system in Georgia, and Bosnia and Herzegovina, underwent major changes after the fall of the Soviet Union and the subsequent conflicts in power relations, colonialism has left its imprint on the Philippine educational system. Science education in all three countries takes place amidst political and ethnic differences divides that translate into linguistic heterogeneity and cultural diversity.

**Main Strategy**

Building a transnational network of university science teacher educators in which evidence for the effectiveness of new approaches to science teaching and learning will be shared and discussed in order to implement only the most effective and efficient measures.

**Goals of the Project**

Improving the level of competencies in HEI in partner countries by professionalization and development of university science teacher educators regarding diversity in science classes (focus on language and culture).
Teacher educators, in turn, will share their knowledge and skills with in-service and pre-service science teachers, and thereby contribute to a more inclusive and higher quality science teaching.

# ESTA-PNU

**Description of the University**

The Philippine Normal University (PNU) was established on September 1, 1901 as Philippine Normal School, and as the first higher institute of learning organized during the American occupation. Renamed Philippine Normal College in 1949, it became a university in 1991. In 2009, PNU was designated as the National Center for Teacher Education under Republic Act No. 9647. It has four hubs located strategically in the archipelago: The Technology and Livelihood Hub in Southern Luzon, The Multicultural Hub in Mindanao, The Indigenous Peoples Hub in Northern Luzon, and The Environment and Green Technology Hub in the Visayas.

**Influence of the project to the institution (also translation for this expression)**

As the NCTE (National Center for Teacher Education), ESTA propels the University to initiate country program in teacher education curriculum to achieve teacher quality especially in the field of Sciences. This may be model science programs for pre-service and in-service Filipino teachers in all Normal Schools and government-owned Teacher Education Institutions. Furthermore, ESTA may provide significant contribution to Philippine IP (Indigenous Peoples) Education through model IP frameworks and curricula for IP teachers and to support the IP basic education (elementary and secondary) of the country.

# EXECUTIVE SUMMARY

The Philippine plurality of language and culture is sourced from the cultural and linguistic profile of the Filipino people with 110 indigenous groups and more than 170 languages spoken as first languages from a multitude of regional dialects and languages (Philippines, 28 September, 2017). Aiming at inclusivity in Science Education, the Educating Science Teachers for All (ESTA) program designed and developed the ESTA-Philippines-PNU framework. Labeled as Science Education for Linguistic and Cultural Diversity in Philippine Public Higher Education, (SELC-PhPHiEd) serves as the grounding framework for the Training Workshop in Inclusive Science Education for Linguistic and Cultural Diversity.

The participants were selected through the endorsement of each regional office of the Department of Education (DepEd) and the Commission on Higher Education (CHED). The selected 1000 science teachers underwent a training workshop that empowered them with the necessary skills to effectively handle diversity in science classrooms, considering the language and culture of the country. This was achieved through acquiring knowledge of science education concepts and constructs, using language specific to the sciences, and contextualizing lessons. The workshop also provided guidance on managing diverse science classrooms, introduced the SELC-PhPiEd framework and other ESTA products, and facilitated the creation and validation of Lesson Exemplars (LEs) covering various science topics.

# EXECUTIVE SUMMARY

The program's two-phase implementation (Phase 1: plenary sessions and academic staff tour workshops, and Phase 2: mentoring program) provided significant inputs to the participants. Phase 1 discussed the major concepts and principles of inclusivity in science education. This discussion progressed to familiarization with strategies on how to manage diverse and heterogeneous classes, and integration of culture and language in teaching science concepts. Phase 2 (mentoring program) capacitated the selected 100 participants assigned to ESTA-PNU mentors. In Phase 2, there were 21 groups or mentoring cells. Mentoring and consultation included LE development, peer review, and revision of the participants' outputs. After a month of mentoring, presentation of the group-designed Lesson Exemplar and Hook Videos was done by each group to a panel of three evaluators who provided their constructive feedback during the closing activity. Finalization of Lesson Exemplars and Hook Videos of the participants, through the help of their respective mentors, populated the major product of the training program, ESTA Open Educational Resource (OER). ESTA-OER (http://pnu-onlinecommons.org/omp/index.php/ESTA/index) aims to provide good resources for inclusive science education, which is the major contribution of this program to the Philippine Science Education.

# ABOUT THE TRAINING

# RATIONALE

Science teachers in the country encounter issues and struggle against the plurality of language, diversity, and heterogeneity of learners.The Philippine plurality of language and culture are sourced from the cultural and linguistic profile of the Filipino people, with about 110 indigenous groups and more than 170 languages spoken as first languages from a multitude of regional dialects and languages (Philippines, 28 September, 2017). Hence, it may be assumed that science education in the country takes place amidst ethnic divides that translate into linguistic and cultural diversity. Such social conditions in the school or classroom may hamper meaningful learning of science concepts.

Several studies claim the vital contribution of teacher quality to student learning and achievement in general (Nilsen & Gustafsson, 2016; Seebruck, 2015). In fact, SDG 4 that promotes quality education and identifies recruiting and training quality teachers as important aspects of ensuring inclusive, quality education. Similarly, the Philippine Professional Standards for Teachers aim for teacher quality in the country. In congruence with and in response to the Department of Education's aim to produce quality teachers, there may be a need to promote programs on capacity building and the retooling of in-service science teachers to better enact their science lessons.

Educating Science Teachers for All (ESTA) is a specially designed international project and program that seek to contribute to the retooling program of the Department of Education, specifically science teachers, through disseminating science teaching approaches in linguistically and culturally diverse contexts.Conscient of these conditions, the ESTA-PHIL-PNU team proposes to conduct an intensive training workshop for the Department of Education science teachers from all the regions of the country for an inclusive and quality science education. Primarily, the training will acquaint our science teachers with the management of diverse classes within the context of the Philippine language and culture. This aim may be achieved by familiarizing the science teachers with the ESTA-Philippines-PNU framework, Science Education for Linguistic and Cultural Diversity in Philippine Public Higher Education (SELC-PhPHiEd) framework and to the other ESTA products. Design of the lesson exemplars will also be the focus of the training program.

# MAJOR GOAL AND OBJECTIVE OF THE

The training workshop aims to train science teachers in the aspect of providing an avenue to successfully manage diversity in science classes within the context of the country's language and culture. Specifically, the workshop aims to:

1. Provide input to science teachers on the concepts and constructs of science education, language for the sciences, and the contextualization of lessons;
2. Acquaint the science teachers with strategies for managing diverse science classrooms.
3. Orient the science teachers on the Science Education for Linguistic and Cultural Diversity in Philippine Public Higher Education (SELC-PhPHiEd) framework and other ESTA products.
4. Facilitate the development and validation of Lesson Exemplars

# PARTICULAR CONTINUING PROFESSIONAL COMPETENCY/IES:

1. Acquire understanding and appreciation of the concepts and constructs of science education, language for the sciences, and the contextualization of lessons;
2. Obtain an overarching understanding of the Science Education for Linguistic and Cultural Diversity in Philippine Public Higher Education (SELC-PhPHiEd) framework and other ESTA products.
3. Gain knowledge on the different theories, concepts, and principles in relation to the three major constructs of the SELC-PhPHiEd framework, which are: Filipino Learners, Teachers' knowledge and suited Pedagogies anchored on all PPST domains.
4. Enhance teaching proficiency of Filipino Science Teachers through an intensive training on language and cultural diversity for an inclusive science education.
5. Acquire skills in developing Lesson Exemplars as directed/guided by the framework and models.
6. Establish linkages with professionals in the field of science education.

# TRAINING PARTICIPANTS

**Expected Number of Participants:**

Participants to this activity are about 1000 basic education science teachers for synchronous, 100 basic education science teachers for mentoring.

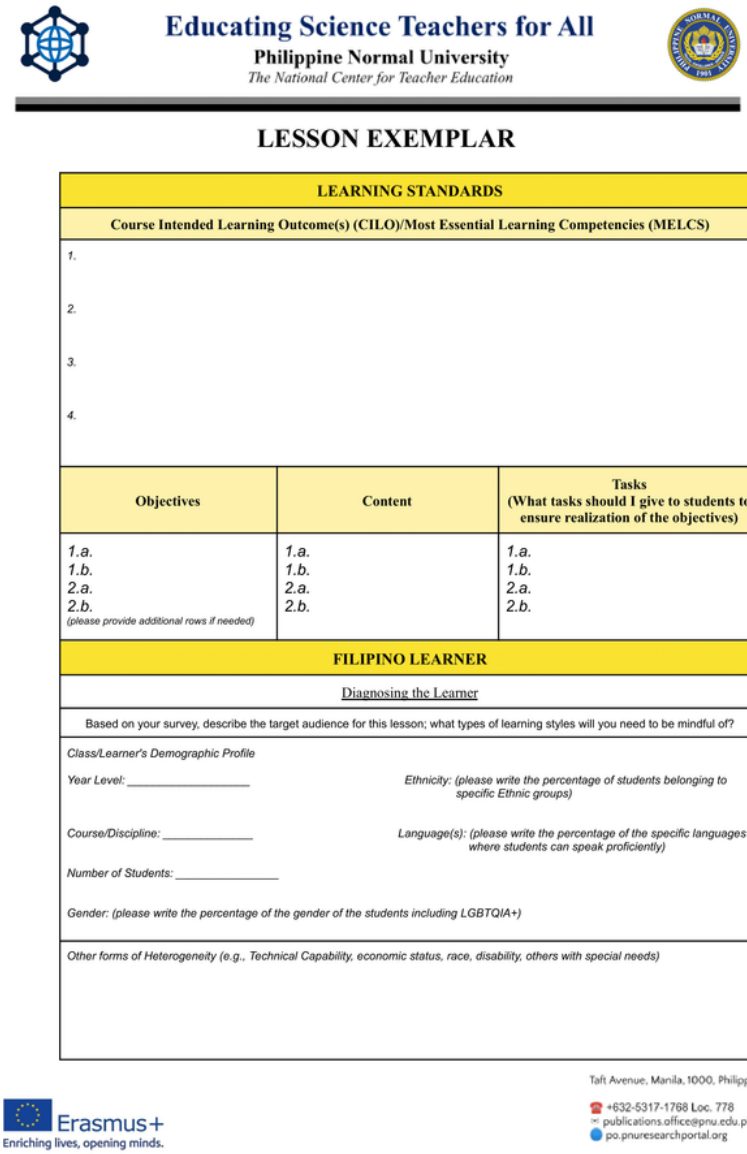
**Proposed Charge per Participant:**

Participation in this Intensive Training Program is free of charge. All expenses pertaining to participants' registration is covered by the project (Educating Science Teachers for All). Internet and communication expenses were shouldered by the participants via their university/school funds.

# MATERIALS AND INSTRUCTION

## Lesson Exemplar (LE) Template

This template, designed based on the SELC-PhPHiEd framework, served as guide to participants in the design and development of their respective Lesson Exemplars and all attached documents [e.g., worksheets, assessment].



Educating Science Teachers for All
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*The National Center for Teacher Education*

**LESSON EXEMPLAR**

| **LEARNING STANDARDS** | | |
|---|---|---|
| **Course Intended Learning Outcome(s) (CILO)/Most Essential Learning Competencies (MELCS)** | | |
| *1.*<br>*2.*<br>*3.*<br>*4.* | | |
| **Objectives** | **Content** | **Tasks (What tasks should I give to students to ensure realization of the objectives)** |
| *1.a.*<br>*1.b.*<br>*2.a.*<br>*2.b.*<br>*(please provide additional rows if needed)* | *1.a.*<br>*1.b.*<br>*2.a.*<br>*2.b.* | *1.a.*<br>*1.b.*<br>*2.a.*<br>*2.b.* |
| **FILIPINO LEARNER** | | |
| Diagnosing the Learner | | |
| Based on your survey, describe the target audience for this lesson; what types of learning styles will you need to be mindful of? | | |
| *Class/Learner's Demographic Profile*<br>*Year Level: _____*<br>*Course/Discipline: _____*<br>*Number of Students: _____*<br>*Gender: (please write the percentage of the gender of the students including LGBTQIA+)*<br>*Ethnicity: (please write the percentage of students belonging to specific Ethnic groups)*<br>*Language(s): (please write the percentage of the specific languages where students can speak proficiently)* | | |
| *Other forms of Heterogeneity (e.g., Technical Capability, economic status, race, disability, others with special needs)* | | |

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# MATERIALS AND INSTRUCTION

## Peer Review Form

This form is an evaluation tool, which was utilized in the first level quality assurance of the developed Lesson Exemplars.

**Educating Science Teachers for All**
**Philippine Normal University**
*The National Center for Teacher Education*

**PEER-REVIEW FORM**

**Your Name:** _____ **Program:** _____
**Subject/Course:** _____
**Topic:** _____
**Lesson Title:** _____
**Level:** _____ **Lesson Duration:** _____

| ESTA Dimension | Attributes | 5 Exceeds standard | 4 Meets standard | 3 Nearly meets standard | 2 Does not meet standard | 1 No Evidence | Remarks/Suggestions |
|---|---|---|---|---|---|---|---|
| Course Learning Outcomes/Learning Competencies | Provides clear lesson objectives | ☐ | ☐ | ☐ | ☐ | ☐ | |
| | Topics/Content match the learning objectives | ☐ | ☐ | ☐ | ☐ | ☐ | |
| | Identified tasks match each of the specified learning objectives and content | ☐ | ☐ | ☐ | ☐ | ☐ | |

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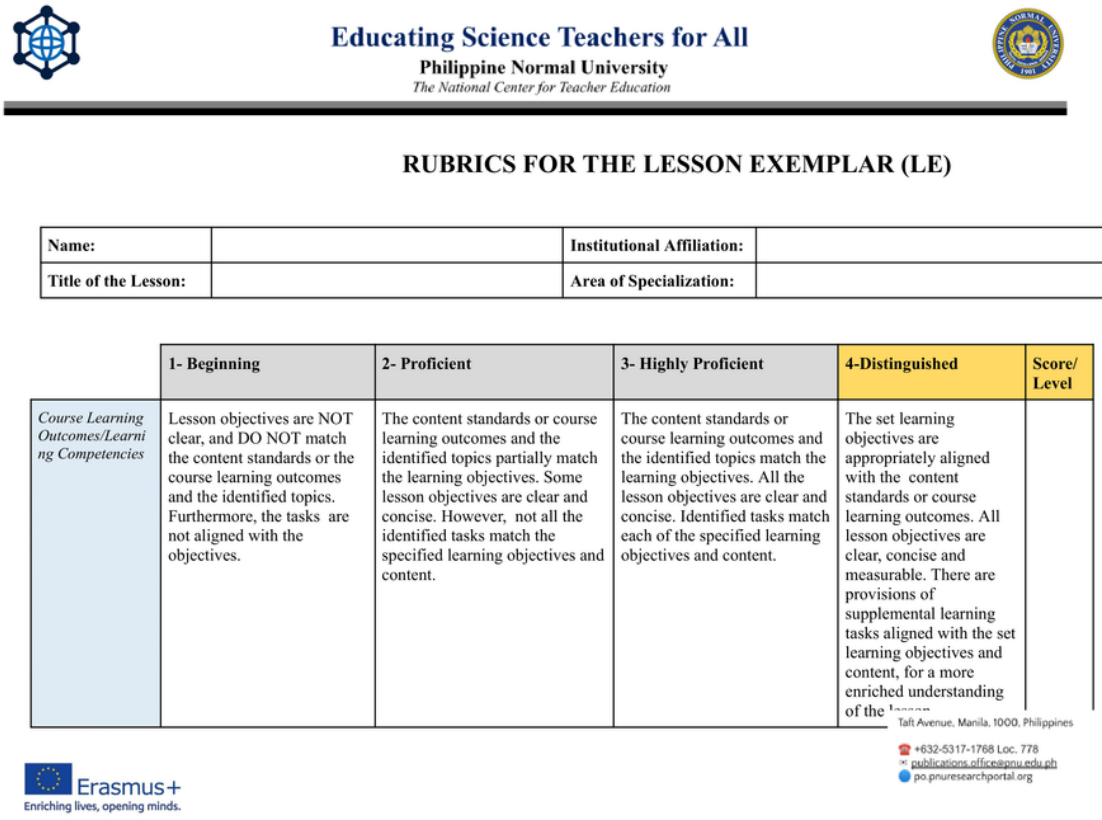
# MATERIALS AND INSTRUCTION

## Evaluation Rubric

The LE template comes with an evaluation Rubric designed to frame the criteria for exemplars. The same tool was utilized in the panel critiquing.



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*The National Center for Teacher Education*

**RUBRICS FOR THE LESSON EXEMPLAR (LE)**

| | | | |
|---|---|---|---|
| **Name:** | | **Institutional Affiliation:** | |
| **Title of the Lesson:** | | **Area of Specialization:** | |

| | 1- Beginning | 2- Proficient | 3- Highly Proficient | 4-Distinguished | Score/ Level |
|---|---|---|---|---|---|
| *Course Learning Outcomes/Learning Competencies* | Lesson objectives are NOT clear, and DO NOT match the content standards or the course learning outcomes and the identified topics. Furthermore, the tasks are not aligned with the objectives. | The content standards or course learning outcomes and the identified topics partially match the learning objectives. Some lesson objectives are clear and concise. However, not all the identified tasks match the specified learning objectives and content. | The content standards or course learning outcomes and the identified topics match the learning objectives. All the lesson objectives are clear and concise. Identified tasks match each of the specified learning objectives and content. | The set learning objectives are appropriately aligned with the content standards or course learning outcomes. All lesson objectives are clear, concise and measurable. There are provisions of supplemental learning tasks aligned with the set learning objectives and content, for a more enriched understanding of the | |

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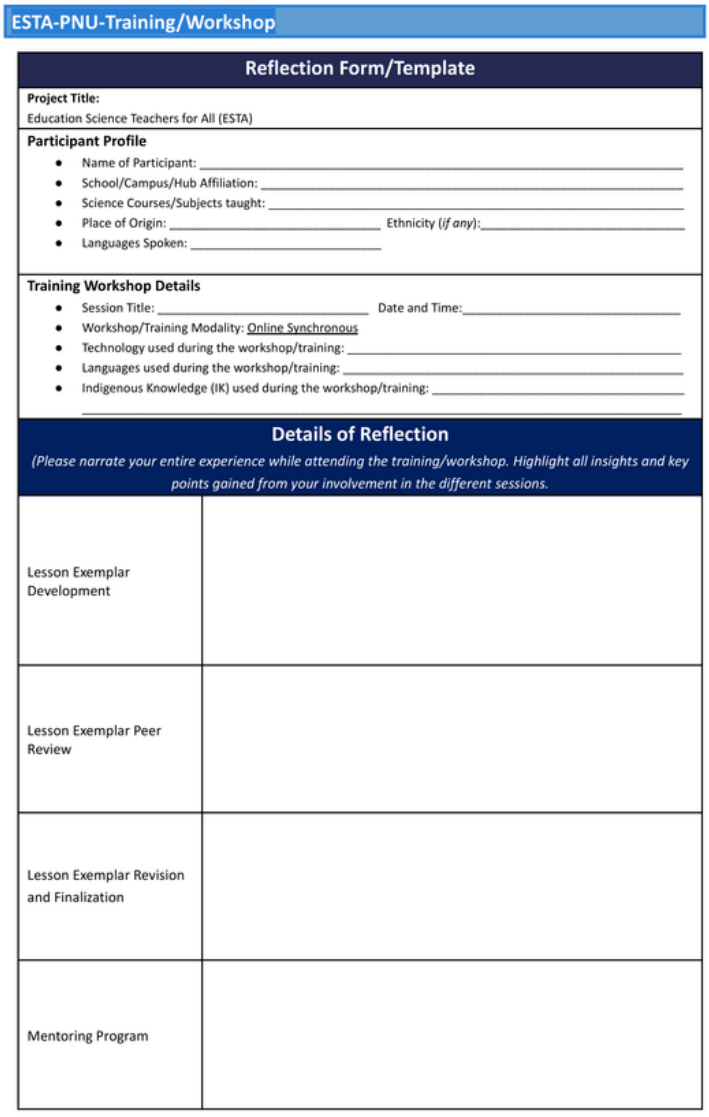
# MATERIALS AND INSTRUCTION

## Reflection Template

This template was used to help our participants document their journey in the training program in case they want to craft their manuscript.



**ESTA-PNU-Training/Workshop**

**Reflection Form/Template**

**Project Title:**
Education Science Teachers for All (ESTA)

**Participant Profile**

- Name of Participant: _____
- School/Campus/Hub Affiliation: _____
- Science Courses/Subjects taught: _____
- Place of Origin: _____ Ethnicity (*if any*):_____
- Languages Spoken: _____

**Training Workshop Details**

- Session Title: _____ Date and Time:_____
- Workshop/Training Modality: Online Synchronous
- Technology used during the workshop/training: _____
- Languages used during the workshop/training: _____
- Indigenous Knowledge (IK) used during the workshop/training: _____

**Details of Reflection**

*(Please narrate your entire experience while attending the training/workshop. Highlight all insights and key points gained from your involvement in the different sessions.*

| | |
|---|---|
| Lesson Exemplar Development | |
| Lesson Exemplar Peer Review | |
| Lesson Exemplar Revision and Finalization | |
| Mentoring Program | |

1

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# MATERIALS AND INSTRUCTION

## Peer Review Form

This form is an evaluation tool, which was utilized in the first level quality assurance of the developed Lesson Exemplars.

**Educating Science Teachers for All**
**Philippine Normal University**
*The National Center for Teacher Education*

**PEER-REVIEW FORM**

**Your Name:** _____ **Program:** _____
**Subject/Course:** _____
**Topic:** _____
**Lesson Title:** _____
**Level:** _____ **Lesson Duration:** _____

| ESTA Dimension | Attributes | 5 Exceeds standard | 4 Meets standard | 3 Nearly meets standard | 2 Does not meet standard | 1 No Evidence | Remarks/Suggestions |
|---|---|---|---|---|---|---|---|
| Course Learning Outcomes/Learning Competencies | Provides clear lesson objectives | ☐ | ☐ | ☐ | ☐ | ☐ | |
| | Topics/Content match the learning objectives | ☐ | ☐ | ☐ | ☐ | ☐ | |
| | Identified tasks match each of the specified learning objectives and content | ☐ | ☐ | ☐ | ☐ | ☐ | |

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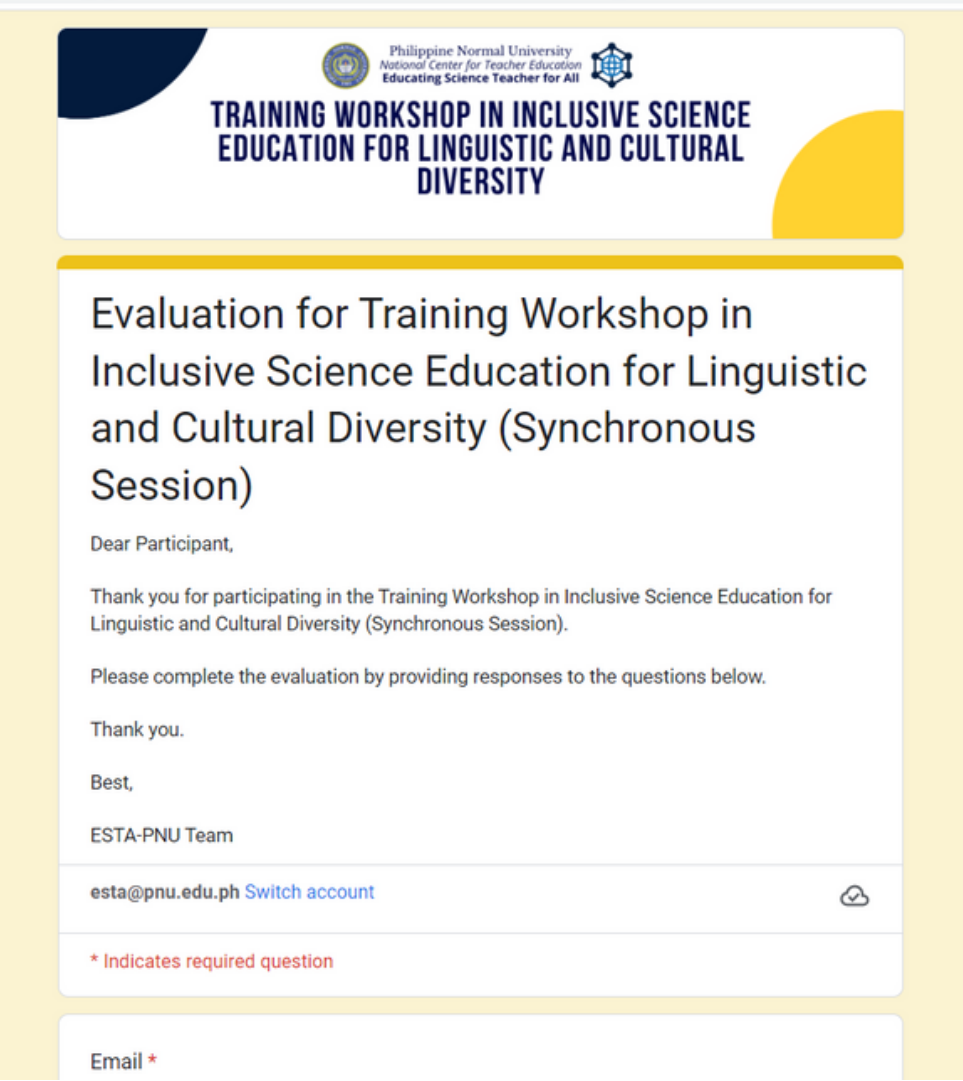
# MATERIALS AND INSTRUCTION

## Evaluation Form

The form was administered to the participants to assess the overall management of the training program and the attainment of the aforementioned objectives of the training.



Philippine Normal University
National Center for Teacher Education
Educating Science Teacher for All

TRAINING WORKSHOP IN INCLUSIVE SCIENCE EDUCATION FOR LINGUISTIC AND CULTURAL DIVERSITY

Evaluation for Training Workshop in Inclusive Science Education for Linguistic and Cultural Diversity (Synchronous Session)

Dear Participant,

Thank you for participating in the Training Workshop in Inclusive Science Education for Linguistic and Cultural Diversity (Synchronous Session).

Please complete the evaluation by providing responses to the questions below.

Thank you.

Best,

ESTA-PNU Team

esta@pnu.edu.ph Switch account

* Indicates required question

Email *

# TRAINING DESIGN

## MATRIX OF TOPICS, OUTCOMES, ASSESSMENT, ACTIVITIES AND OUTPUTS

The training includes two phases: plenary sessions and mentoring sessions. The plenary sessions are designed as synchronous sessions for the team to discuss the major concepts and principles with the participants. The team shared their knowledge on strategies on how to: (1) manage diverse and heterogeneous classes, and (2) integrate culture and language in teaching science concepts. The plenary sessions accepted as many participants as possible on the Zoom platform and disseminated the synchronous session through Facebook Live for more reach. The mentoring sessions, however, only accommodated a specific number of participants (100). Selection criteria for the participants in the mentoring session include: 1) having a strong commitment to complete the training program; 2) handling a diverse science class; 3) having technological capability; and 4) being well-versed in one of the major mother tongue languages in the country.

Part 2 of the training is designed as a mentoring program. In this part or phase of the training, the participants were assigned to one or two of the ESTA-PNU team members of the same specialization. The mentoring and consultation included lesson exemplar development, peer review, and revision of the participants' outputs. For this part of the training, each major activity, as aforementioned, for mentoring and consultation is allotted a week of engagement with the participants in small research cells [grouping according to or based on specialization: biology, chemistry, and physics]. In summary, the training included 32 hours of synchronous sessions [plenary and panel critiquing] and three weeks of asynchronous sessions [mentoring and consultation].

# TRAINING DESIGN

## SCHEDULE OF ACTIVITIES

### Matrix of Topics, Outcomes, Assessment, Activities and Outputs

| Sub-Topics and Time Allotment for every topic (in hours) | Expected Learning Outcomes | Activities to Achieve Learning Outcomes | Assessment Strategies including, Assessment Tools | Requirements/Outputs |
|---|---|---|---|---|
| **Day 1: [1:00-5:00 PM]**<br><br>Opening Program:<br><br>**Keynote 1**: Teacher Quality<br>**Plenary 1**: Science Education<br>**Keynote 2**: ESTA Program and the International Consortium | Acquires understanding and appreciation of the Teacher Quality including applicable sustainable development goals, and national goals<br><br>Obtains an overarching understanding of Philippine Science Education.<br><br>Be familiar and appreciates the International capability building and international consortia | Synchronous Online Lecture/Talk/Sharing | Presentation key concepts, critical issues and innovations from ESTA Project Leaders and invited speaker<br><br>Q&A strategies during the sharing process | Questions prepared by the participants to demonstrate deeper understanding of the topic.<br><br>Sharing of best practices. |
| **Day 2: [1:00-5:00 PM]**<br><br>**Plenary 2**: Language for Sciences<br>**AST 1**: Diversity in Class<br>**AST 2**: Conceptual Change | Gains knowledge on Language Diversity, Language for Sciences and possible strategies for science teachers to develop language command.<br><br>Enhances teaching proficiency of Science teachers by acquiring strategies on management of diversity in class and approaches on the implementation of Conceptual change in science classes. | Synchronous Online Lecture/Talk/Sharing<br><br>Workshop | Presentation key concepts, critical issues and innovations from ESTA-Philippines-PNU team members<br><br>Q&A strategies during the sharing process | Questions prepared by the participants to demonstrate deeper understanding of the topic.<br><br>Sharing of best practices. |

# TRAINING DESIGN

## SCHEDULE OF ACTIVITIES

| | | | | |
|---|---|---|---|---|
| **Day 3: [1:00-5:00 PM]**<br><br>**Plenary 3**:<br>Contextualization<br>• Culture for Sciences<br>• Culture Integration<br><br>**AST 3**: Chemistry self-concepts: gender and culture, and the impact of chemistry self-concept on learning behavior<br>**AST 4**: Acquisition of Science Capital in Chemistry | Gains knowledge on Contextualization, culture for Science and Culture Integration and possible strategies for science teachers to contextualization of science lessons<br><br>Enhances teaching proficiency of Science teachers by acquiring strategies on how to integrate gender and culture in science classes and on the acquisition of science capital.<br><br>Acquires knowledge on how to develop Lesson Exemplars as directed/guided by the frameworks and models. | Synchronous Online Lecture/Talk/Sharing<br><br>Workshop | Presentation key concepts, critical issues and innovations from ESTA-Philippines -PNU team members<br><br>Q&A strategies during the sharing process | Questions prepared by the participants to demonstrate deeper understanding of the topic.<br><br>Sharing of best practices. |
| **Day 4: [1:00-5:00 PM]**<br><br>**Plenary 4**: Indigenous Languages and proficiency in Language<br><br>**AST 5**: Technology Integration | Gains knowledge on Indigenous Languages and possible strategies for science teachers to integrate language development in science classes<br><br>Enhances teaching proficiency of Science teachers by acquiring strategies on how to integrate technology in science classes.<br><br>Acquires knowledge on how to develop Lesson Exemplars as directed/guided by the frameworks and models. | Synchronous Online Lecture/Talk/Sharing<br><br>Workshop | Presentation key concepts, critical issues and innovations from ESTA-Philippines -PNU team members and invited speakers<br><br>Q&A strategies during the sharing process | Questions prepared by the participants to demonstrate deeper understanding of the topic.<br><br>Sharing of best practices. |
| **Day 5: [1:00-5:00 PM]**<br><br>**Plenary 4**: Other ESTA-Country Participants Experiences<br><br>**AST 6**: Flipped Classroom | Gains knowledge on the best practices and sharings of other ESTA-countries<br><br>Enhances teaching proficiency of Science teachers by acquiring strategies on how to | Synchronous Online Lecture/Talk/Sharing<br><br>Workshop | Presentation key concepts, critical issues and innovations from ESTA-Philippines -PNU team members | Questions prepared by the participants to demonstrate deeper understanding of the topic.<br><br>Sharing of best practices. |

# TRAINING DESIGN

## SCHEDULE OF ACTIVITIES

| | | | | |
|---|---|---|---|---|
| | implement Flipped Classroom<br><br>Acquires knowledge on how to develop Lesson Exemplars as directed/guided by the frameworks and models | | Q&A strategies during the sharing process | |
| **Day 6: [1:00-5:00 PM]**<br><br>**Science Educator Sharing 1**: Chemistry<br>**Science Educator Sharing 2**: Physics<br>**Science Educator Sharing 3**: Biology<br>**Science Educator Sharing 4**: Environmental Science | Acquires knowledge on how to develop Lesson Exemplars as directed/guided by the frameworks and models | Synchronous Online Lecture/Talk/Sharing<br><br>Workshop | Presentation key concepts, critical issues and innovations from ESTA-Philippines-PNU team members<br><br>Q&A strategies during the sharing process | Questions prepared by the participants to demonstrate deeper understanding of the topic.<br><br>Sharing of best practices. |
| **Week 2**<br>[Asynchronous]<br>**Lesson Exemplar Development** | Acquires skills in developing Lesson Exemplars as directed/guided by the frameworks and models. | Workshop Facilitation | Facilitation of Workshop on Designing Lesson Exemplars | Lesson Exemplar submission Reflection Form |
| **Week 3**<br>[Asynchronous]<br>**Lesson Exemplar Peer Review** | Acquires skills in assessing developed Lesson Exemplars as peer guided by the SELC-PhPHiEd framework | Peer Review Workshop | Facilitation of Peer Review of Developed Lesson Exemplars | Peer Review Form Reflection Form |
| **Week 4**<br>[Asynchronous]<br>**Lesson Exemplar Revision** | Acquires skills in enhancing Lesson Exemplars as per peer assessment/evaluation | Workshop on Revision of Lesson Exemplars | Facilitation of Workshop on Enhancing Lesson Exemplars | Rubric on ESTA Lesson Plans |
| **Week 5**<br>**Lesson Exemplar Presentation and Panel Critiquing** | | Presentation and Critiquing | Critiquing and revision of Lesson Exemplars | Presentation and Critiquing of Lesson Exemplars |

### SCHEDULE OF ACTIVITIES

| Sub-Topics and Time Allotment for every topic (in hours) | Program Flow | Oral Presentation Themes | Speakers and Moderators |
|---|---|---|---|
| **Day 1: [1:00-5:00 PM]**<br><br>Opening Program: | 1:00-1:45 PM Opening Program | **Keynote 1: Teacher Quality**<br>This session will provide key discussion points on teacher quality. The aim is to provide teachers with | **VPA Jennie V. Jocson**<br>Vice President for Academics, PNU-Manila |

# TRAINING DESIGN

## SCHEDULE OF ACTIVITIES

| | | | |
|---|---|---|---|
| | | The session is directed towards understanding how students coming from various socio-economic, cultural and language backgrounds bring with them a sense of conceptual understanding. Teacher knowledge on conceptual change allows science educators to provide engaging learning experiences to our science learners. | |
| **Day 3: [1:00-5:00 PM]**<br><br>**Plenary 3:** Contextualization<br>• Culture for Sciences<br>• Culture Integration<br><br>**AST 3:** Acquisition of Science Capital in Chemistry | 1:00-1:30 PM Preliminaries<br><br>1:30-3:30 Plenary 3<br>3:30-4:30 AST 3<br>4:30-5:00 Q&A | **Plenary 3: Contextualization**<br>This session leads the participants to acquire a deep understanding of the concept, background, and teaching-learning processes of contextualization. Included in the session is the development of one's epistemology of contextualization as the basis of one's praxis.<br><br>**AST 3: Acquisition of Science Capital in Chemistry**<br>This session focuses on identification of factors and drivers that encourage students to learn Chemistry, and at large, Science. The outcomes of the research article authored by Rüschenpöhler and Markic in 2019 to emphasize the role of families, peers and significant others in the development of positive attitudes and increased engagement of students to science. | **Dr. Zenaida Q. Reyes**<br>ESTA-Phil-PNU Team<br><br>**Dr. Crist John M. Pastor**<br>ESTA-Phil-PNU Team<br><br>Moderator/Facilitator: **Dr. Leah Amor S. Cortez**<br>ESTA-Phil-PNU Team |
| **Day 4: [1:00-5:00 PM]**<br><br>**Plenary 4:** Indigenous Languages and proficiency in Language<br><br>**AST 4:** Chemistry self-concepts: gender and culture, and the impact of chemistry self-concept on learning behavior<br>**AST 5:** Technology Integration | 1:00-1:30 PM Preliminaries<br><br>1:30-2:30 Plenary 4<br>2:30-3:30 AST 4<br>3:30-4:30 AST 5<br>4:30-5:00 Q&A | **Plenary 4: Indigenous Languages and proficiency in Language**<br>This session will disseminate how technology can be used to preserve the language of the indigenous people.<br><br>**AST 4: Chemistry self-concepts: gender and culture, and the impact of chemistry self-concept on learning behavior**<br>This session focuses on students' chemistry self-concept with respect to their cultural background and gender. The session also highlights | **Dr. Rochelle Irene G. Lucas**<br>ESTA-Phil-DLSU Team<br><br>**Dr. Arlyne C. Marasigan**<br>ESTA-Phil-PNU Team<br><br>**Mr. Ruel A. Avilla**<br>ESTA-Project Team<br><br>Moderator/Facilitator: **Dr. Ruth A. Alido**<br>ESTA-Phil-PNU Team |

# TRAINING DESIGN

## SCHEDULE OF ACTIVITIES

| | | | |
|---|---|---|---|
| **Keynote 1**: Teacher Quality<br><br>**Plenary 1**: Science Education<br><br>**Keynote 2**: ESTA Program and the International Consortium | 2:00-2:45 Keynote 1<br>2:45-3:30 Plenary 1<br>3:30-4:30 Keynote 2<br>4:30-5:00 Q&A | an understanding of the extent of teacher quality to achieving quality education referenced to global themes such as the SDGs and national focus.<br><br>**Plenary 1: Science Education**<br>This session will familiarize teachers with the general purposes of Science Education and the aims and goals of science education in the Philippines.<br><br>**Keynote 2: ESTA Program and the International Consortium**<br>This session will focus on the description and nature of the international capacity building program for science teachers. | **Prof. Marie Paz E. Morales**<br>ESTA-Phil-PNU Project Lead]<br><br>**Prof. Sylvia Markic**<br>ESTA-Project Lead<br><br>Moderator/Facilitator:<br>**Mr. Alfons Jayson O. Pelgone**<br>ESTA-Phil-PNU Team |
| **Day 2: [1:00-5:00 PM]**<br><br>**Plenary 2**: Language for Sciences<br>**AST 1**: Diversity in Class<br>**AST 2**: Conceptual Change | 1:00-1:30 PM Preliminaries<br><br>1:30-2:30 Plenary 2<br>2:30-3:30 AST 1<br>3:30-4:30 AST 2<br>4:30-5:00 Q&A | **Plenary 2: Language for Sciences**<br>This session focuses on the rhetorical functions, syntactic constructions, and vocabulary frequently used in scientific discourse. In reviewing the language for Science, the participants will be directed to the aspects of language that can be highlighted in the module exemplars.<br><br>**AST 1: Diversity in Class**<br>This Academic Staff Tour engages participants through a thorough discussion of how to diagnose diversity in class. The session will familiarize participants on probable ways and activities to detect diversity and heterogeneity in class.<br><br>**AST 2: Conceptual Change**<br>This Academic Staff Tour engages participants through a thorough discussion of interest in science education as well as the conceptual change model. Part of the highlight of the session is the presentation of 'hooks' in teaching science which may be in the form of videos, puzzles and intriguing questions. | **Dr. Ruth A. Alido**<br>ESTA-Phil-PNU Team<br><br>**Mr. Alfons Jayson O. Pelgone**<br>ESTA-Phil-PNU Team<br><br>**Dr. Leah Amor S. Cortez**<br>ESTA-Project Team<br><br>Moderator/Facilitator: **Dr. Crist John M. Pastor**<br>ESTA-Phil-PNU Team |

# TRAINING DESIGN

## SCHEDULE OF ACTIVITIES

| | | | |
|---|---|---|---|
| | | the students thinking about science and scientists and the colonial portrayal of Filipinos.]<br><br>AST 5: **Technology Integration**<br>This session focuses on the nature, significance and methods of technology integration. The session also highlights some frameworks used in technology interaction inside a science classroom. | |
| **Day 5: [1:00-5:00 PM]**<br><br>Plenary 5: Other ESTA-Country Participants Experiences<br><br>AST 6: Flipped Classroom<br>Topic 1: Orientation to Lesson Exemplar (LE) Development Workshop<br>• Agreements for Part 2: LE Development Workshop<br>• Groupings for Consultation and Mentoring | 1:00-1:30 PM Preliminaries<br><br>1:30-2:30 Plenary 5<br>2:30-3:30 AST 6<br>3:30-4:30 Topic 1<br>4:30-5:00 Q&A | Plenary 5: **Other ESTA-Country Participants Experiences**<br>This session will primarily focus on the sharing of other partner countries/universities on managing diversity and heterogeneity in science classes.<br><br>AST 6: **Flipped Classroom**<br>This session presents the theoretical underpinnings and instructional processes implemented in science teaching through flipped classroom approach (FCA). It also highlights the instructional technologies and significant implications of FCA as utilized in science teaching based on current empirical studies. Similarly, this session provides insights on how FCA is appropriately applicable in teaching science in the context of the pandemic and post-pandemic experiences.<br><br>**Topic 1: Orientation to Lesson Exemplar (LE) Development Workshop**<br>This session aims to present the features of the instructional design of the Lesson Exemplar anchored on the developed frameworks and models. The session also intends to familiarize the participants on the implementing guidelines on how to develop Lesson Exemplars influenced by the aforementioned models, agreements, groupings and | **Dr. Marika Kapanadze**<br>ESTA-Georgia Team<br><br>**Dr. Lydia S. Roleda**<br>ESTA-Phil-DLSU Team<br><br>**Dr. Brando C. Palomar**<br>ESTA-Project Team<br><br>Moderator/Facilitator: **Mr. Ruel A. Avilla**<br>ESTA-Phil-PNU Team |

# TRAINING DESIGN

## SCHEDULE OF ACTIVITIES

| | | | |
|---|---|---|---|
| | | processes of consultation and mentoring. | |
| **Day 6: [1:00-5:00 PM]**<br><br>**Science Educator Sharing 1**: Chemistry<br>**Science Educator Sharing 2**: Physics<br>**Science Educator Sharing 3**: Biology<br>**Science Educator Sharing 4**: Environmental Science | 1:00-1:30 PM Preliminaries<br><br>1:30-4:00 Insights and Experiences<br>4:00-5:00 Q&A | This session will primarily focus on the sharing of Science Teacher Educators on developing their courses using the framework. | Chemistry: Prof. Nelson Garcia<br><br>Physics 1: Prof. Amber Dea Marie V. Peguit-Opeda<br><br>Physics 2: Jayson L. De Vera<br><br>Biology 1: Dr. Marie Grace S. Cabansag<br><br>Biology 2: Dr. Brian M. Limson<br><br>Moderator/Facilitator: **Dr. Brando C. Palomar**<br><br>ESTA-Phil-PNU Team |
| **Week 2**<br>[Asynchronous]<br>**Lesson Exemplar Development** | | **Lesson Exemplar Development**<br>The session will focus on facilitating participants for them to be able to draft and craft their Lesson Exemplars. Informal sharing may be within and across groups and disciplines to exact the finest Lesson Exemplar for a particular science lesson or topic. | ESTA-Phil-PNU Team<br><br>PNU Science Educators |
| **Week 3**<br>[Asynchronous]<br>**Lesson Exemplar Peer Review** | | **Lesson Exemplar Peer Review**<br>In this session, crafted and designed Lesson Exemplars for science lessons or topics will be subjected to peer review (by fellow participants) to help the developers provide varied perspectives while peers assess their Lesson Exemplars. This session aims to provide constructive remarks for the improvement or enhancement of developed Lesson Exemplars and to determine alignment of designed Lesson Exemplars to the aforementioned models and frameworks. | ESTA-Phil-PNU Team<br><br>PNU Science Educators |
| **Week 4**<br>[Asynchronous] | | **Lesson Exemplar Revision** | ESTA-Phil-PNU Team<br>PNU Science Educators |

# TRAINING DESIGN

## SCHEDULE OF ACTIVITIES

| | | | |
|---|---|---|---|
| **Lesson Exemplar Revision** | | In this session, developers of Lesson Exemplars will engage in revising their products based on the comments and suggestions of their peers. This is a prerequisite to the next activity that will focus on presentation of the revised Lesson Exemplars to the ESTA-Philippines-PNU Team and critiquing of the panel of evaluators. | |
| **Week 5**<br>**Lesson Exemplar Presentation and Panel Critiquing** | | **Lesson Exemplar Presentation and Panel Critiquing**<br>In this session, crafted and designed Lesson Exemplars for science lessons or topics will be presented to the participants and experts. Critiquing will also be done to provide constructive remarks for the improvement or enhancement of presented Lesson Exemplars and to determine alignment of designed Lesson Exemplars to the aforementioned models and frameworks. | ESTA-Phil-PNU Team<br>PNU Science Educators |

# TRAINING PROPER

# PHASE 1: SYNCHRONOUS PHASE

## July 19, 2022 (Day 1)

**Opening Program:**

The first day of the national training commenced with a warm welcome from Prof. Alfons Jayson O. Pelgone, master of ceremonies. Preliminaries were followed by the opening remarks delivered by Dr. Adonis P. David, Vice President for Research, Planning, and Quality Assurance, and a message by Dr. Bert J. Tuga, University President.

**Keynote 1: Teacher Quality**

This session provided key discussion points on teacher quality. The aim was to provide teachers with an understanding of the extent of quality to achieving quality education with reference to global themes such as the SDGs and national focus with Dr. Jennie V. Jocson, Vice President for Academics, as Keynote Speaker.

**Plenary 1: Science Education**

This session familiarized teachers with the general purposes of science education and the aims and goals of science education in the Philippines, with Dr. Marie Paz E. Morales, ESTA-PNU Project Lead, as the plenary speaker.

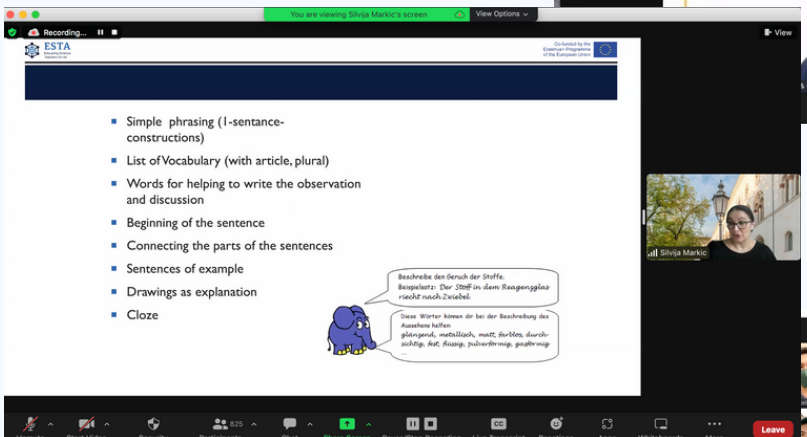
**Keynote 2: ESTA Program and the International Consortium**

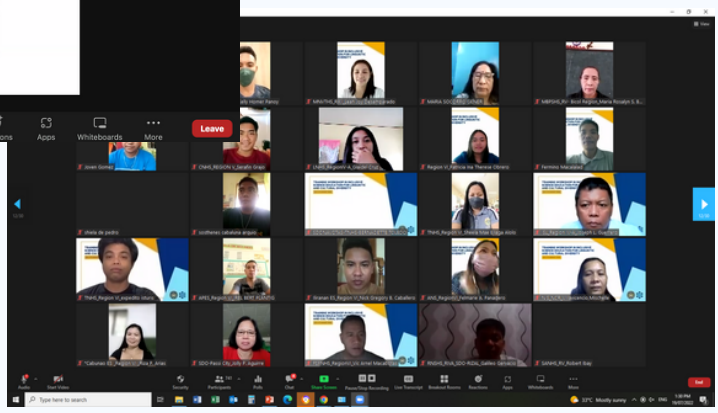
This session focused on the description and nature of the international capacity building program for science teachers, with Prof. Silvija Markic, ESTA Project Lead, as another keynote speaker.

# PHASE 1: SYNCHRONOUS PHASE

## July 19, 2022 (Day 1)






# PHASE 1: SYNCHRONOUS PHASE

## July 20, 2022 (Day 2)

**Plenary 2: Language for Sciences**

This session focused on the rhetorical functions, syntactic constructions, and vocabulary frequently used in scientific discourse. In reviewing the language for science, the participants were directed to the aspects of language that can be highlighted in the module exemplars with Dr. Ruth A. Alido, an ESTA-PNU team member, as a plenary speaker.

**AST 1: Diversity in Class**

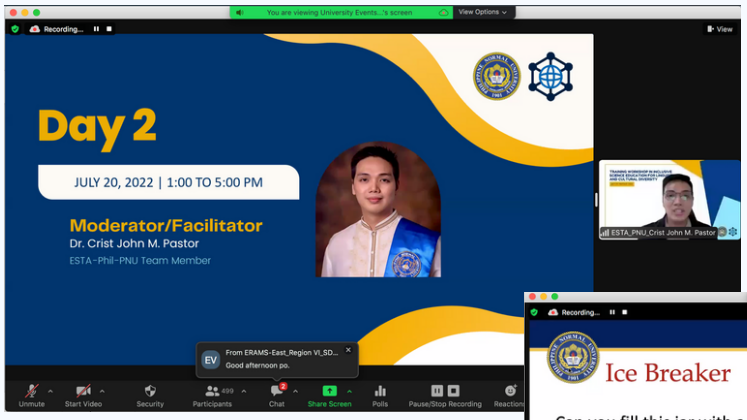
This academic staff tour (AST) engaged participants through a thorough discussion of how to diagnose diversity in class. The session familiarized participants with probable ways and activities to detect diversity and heterogeneity in class with Prof. Alfons Jayson O. Pelgone, ESTA-PNU Team Member, as Resource Speaker.

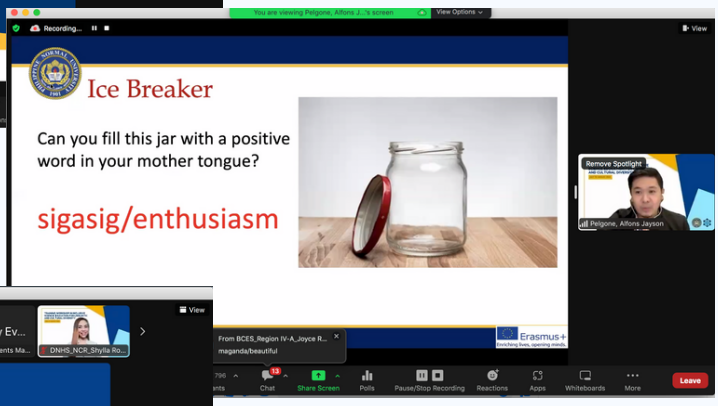
**AST 2: Conceptual Change**

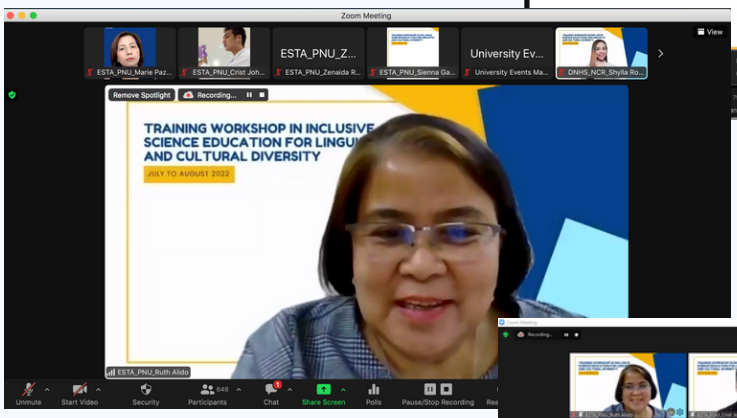
This AST engaged participants through a thorough discussion of interest in science education as well as the conceptual change model. Part of the highlight of the session was the presentation of 'hooks' in teaching science, which may be in the form of videos, puzzles, or intriguing questions. The session was directed towards understanding how students coming from various socio-economic, cultural, and language backgrounds bring with them a sense of conceptual understanding. Teacher knowledge on conceptual change allowed science educators to provide engaging learning experiences to our science learners with Dr. Leah Amor S. Cortez, ESTA-PNU Team Member, as Resource Speaker, together with Prof. Alfons Jayson O. Pelgone, who introduced hook videos to the participants.

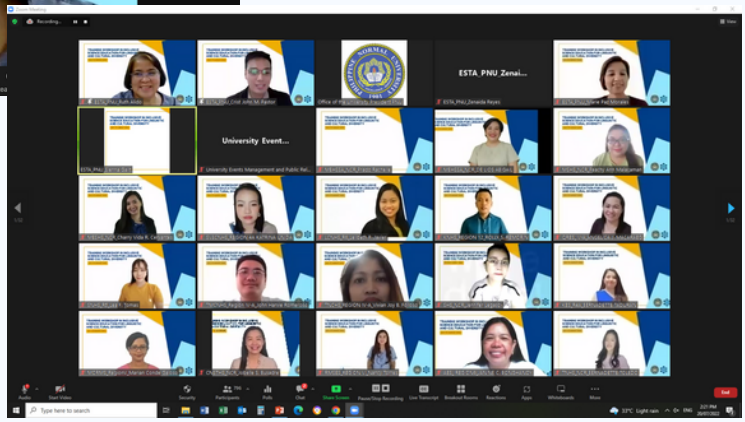
# PHASE 1: SYNCHRONOUS PHASE

## July 20, 2022 (Day 2)



# PHASE 1: SYNCHRONOUS PHASE

## July 21, 2022 (Day 3)

**Plenary 3: Contextualization**

a. Culture for Sciences
b. Culture Integration

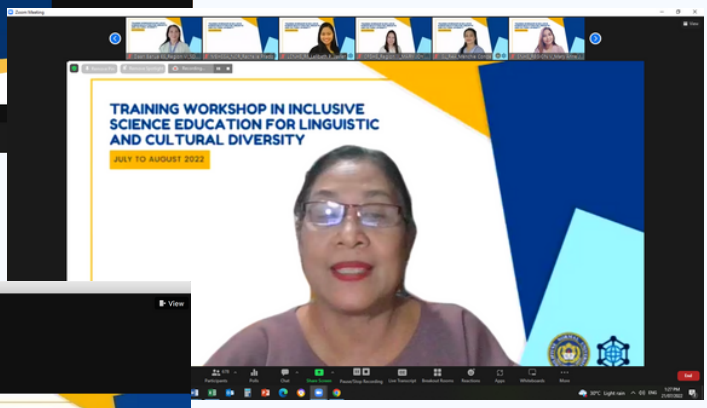
This session led the participants to acquire a deep understanding of the concept, background, and teaching-learning processes of contextualization. Included in the session was the development of one's epistemology of contextualization as the basis of one's praxis, with Dr. Zenaida Q. Reyes, ESTA-PNU Team Member, as Plenary Speaker.

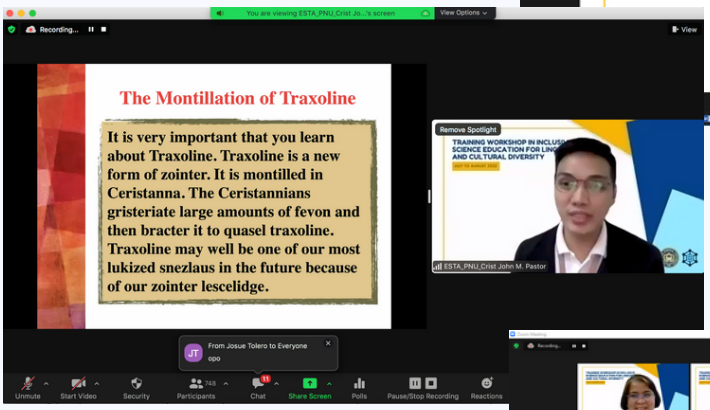
**AST 3: Acquisition of Science Capital in Chemistry**

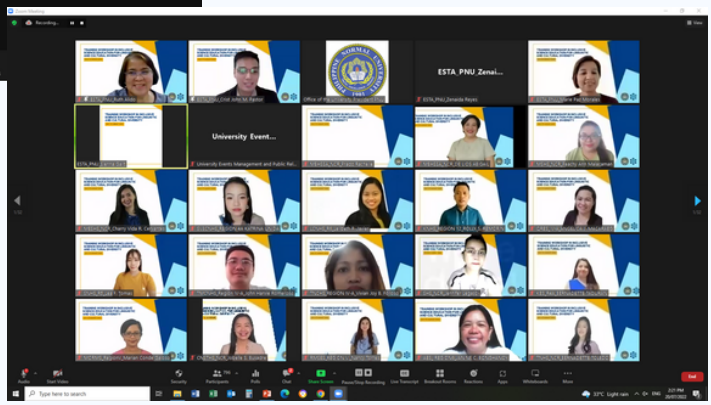
This session focused on the identification of factors and drivers that encourage students to learn chemistry and, at large, science. The outcomes of the research article authored by Rüschenpöhler and Markic in 2019 emphasized the role of families, peers, and significant others in the development of positive attitudes and increased engagement of students in science, with Dr. Crist John M. Pastor, ESTA-PNU Team Member, as Resource Speaker.

# PHASE 1: SYNCHRONOUS PHASE

## July 21, 2022 (Day 3)

# PHASE 1: SYNCHRONOUS PHASE

## July 22, 2022 (Day 4)

**Plenary 4: Indigenous Languages and proficiency in Language**

This session disseminated how technology can be used to preserve the language of the indigenous people with Dr. Rochelle Irene G. Lucas, ESTA-Phil-DLSU Team Member, as Plenary Speaker.

**AST 4: Chemistry self-concepts: gender and culture, and the impact of chemistry self-concept on learning behavior**

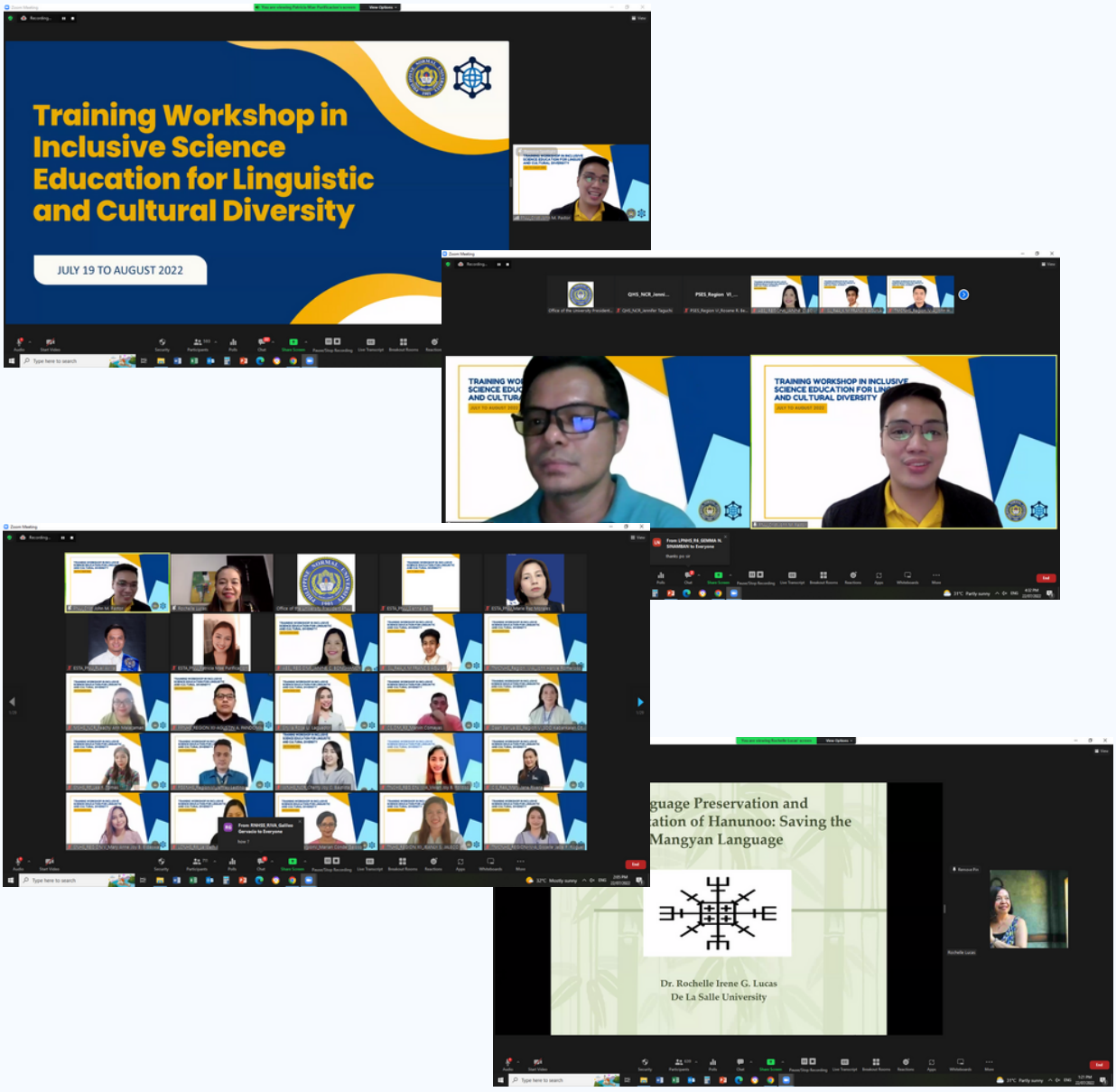
This session focused on students' chemistry self-concept with respect to their cultural background and gender. The session also highlighted the students thinking about science and scientists and the colonial portrayal of Filipinos with Dr. Arlyne C. Marasigan, ESTA-PNU Team Member, as Resource Speaker.
PM

**AST 5: Technology Integration**

This session focused on the nature, significance, and methods of technology integration. The session also highlights some frameworks used in technology. interaction inside a science classroom with Prof. Ruel A. Avilla, ESTA-PNU Team Member, as Resource Speaker.

# PHASE 1: SYNCHRONOUS PHASE

## July 22, 2022 (Day 4)



# PHASE 1: SYNCHRONOUS PHASE

## July 25, 2022 (Day 5)

**Plenary 5: Other ESTA-Country Participants Experiences**

This session primarily focused on the sharing of experiences from other partner countries and universities on managing diversity and heterogeneity in science classes with Prof. Marika Kapanadze, ESTA-Georgia Team Member, and Dr. Lydia S. Roleda, ESTA-Phil-DLSU Team Member, as plenary speakers.

**AST 6: Flipped Classroom**

This session presented the theoretical underpinnings and instructional processes implemented in science teaching through the flipped classroom approach (FCA). It also highlighted the instructional technologies and significant implications of FCA as utilized in science teaching based on current empirical studies. Similarly, this session provided insights on how FCA is appropriately applicable in teaching science in the context of the pandemic and post-pandemic experiences with Dr. Brando C. Palomar, ESTA-PNU Team Member and Resource Speaker.

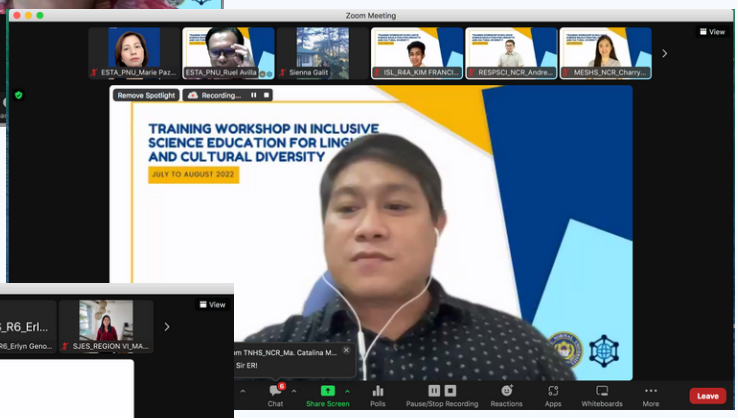
**Topic 1: Orientation to Lesson Exemplar (LE) Development Workshop**

a. Agreements for Part 2: LE Development Workshop
b. Groupings for Consultation and Mentoring

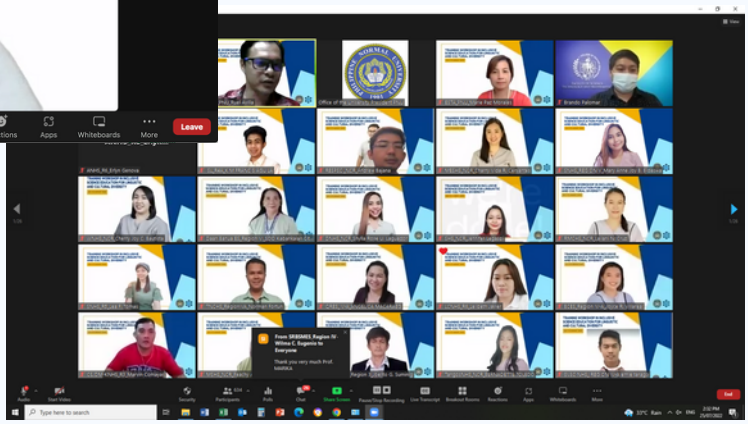
This session presented the features of the instructional design of the lesson exemplar, anchored on the developed frameworks and models. The session familiarized the participants with the implementing guidelines on how to develop lesson exemplars influenced by the aforementioned models, agreements, groupings, and processes of consultation and mentoring.

# PHASE 1: SYNCHRONOUS PHASE

## July 25, 2022 (Day 5)





# PHASE 1: SYNCHRONOUS PHASE

## July 27, 2022 (Day 6)

This session primarily focused on the sharing of science teacher educators' experiences in developing their courses using the framework, with the faculty from PNU-Manila, PNU-Visayas, and PNU-Mindanao as representatives. Ms. Amber Dea Marie P. Opeda and Mr. Jayson L. De Vera represented the Physics Group, while the Biology Group had Dr. Marie Grace S. Cabansag, Dr. Brian M. Limson, and Prof. Nelson Garcia for Chemistry.

After the successful science educator sharing session, Dr. Brando C. Palomar presented the ways forward for the project. He further encouraged the participants to share their learning and insights from the training in the attendance sheets and evaluations as well as on social media platforms using #esta_ph-pnu. A few reminders, such as applying the instructional practices and educational principles to the participants' classes and being actively involved in the future activities and training of ESTA, were also discussed by Dr. Palomar.

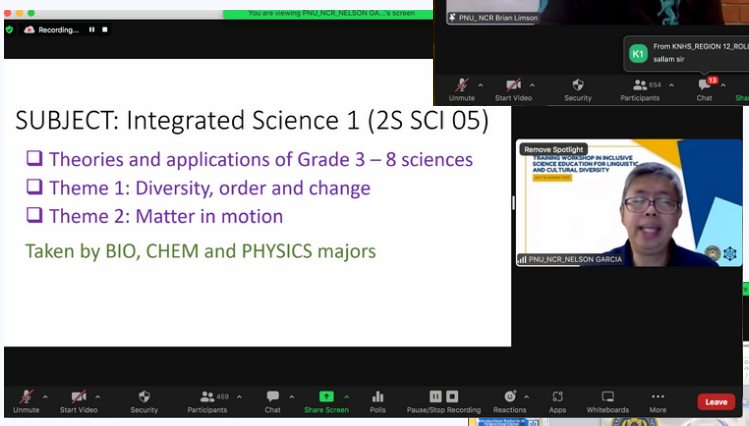
To formally conclude the six-day inclusive training and workshop, Dr. Palomar thanked the staff from the University Events Management and Public Relations Office (UEMPRO) and Publication Office (PO), Regional Directors, Division Superintendents, Science Education Program Supervisors, School Principals, Science Department Heads and Coordinators, Higher Education Institutions officials, Science teacher participants, and the ESTA-PNU core team.

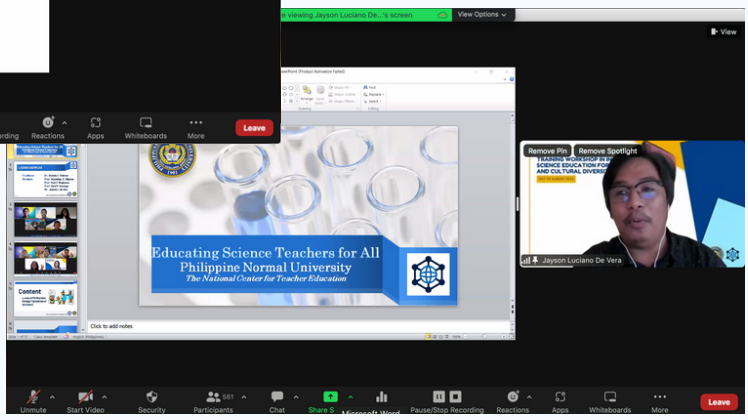
The participants also expressed their gratitude to the entire ESTA-PNU team for the knowledge and skills they have gained from the training.

# PHASE 1: SYNCHRONOUS PHASE

## July 27, 2022 (Day 6)





# PHASE 2: ASYNCHRONOUS PHASE

**Week 2**

**Lesson Exemplar Development**

The session focused on facilitating participants ability to draft and craft their lesson exemplars. Informal sharing was done within and across groups and disciplines to exact the finest lesson exemplar for a particular science lesson or topic.

**Week 3**

**Lesson Exemplar Peer Review**

In this session, crafted and designed lesson exemplars for science lessons or topics were subjected to peer review (by fellow participants) to help the developers provide varied perspectives while peers assessed their lesson exemplars. This session aimed to provide constructive remarks for the improvement or enhancement of developed lesson exemplars and to determine the alignment of designed lesson exemplars to the aforementioned models and frameworks.

**Week 4**

**Lesson Exemplar Revision**

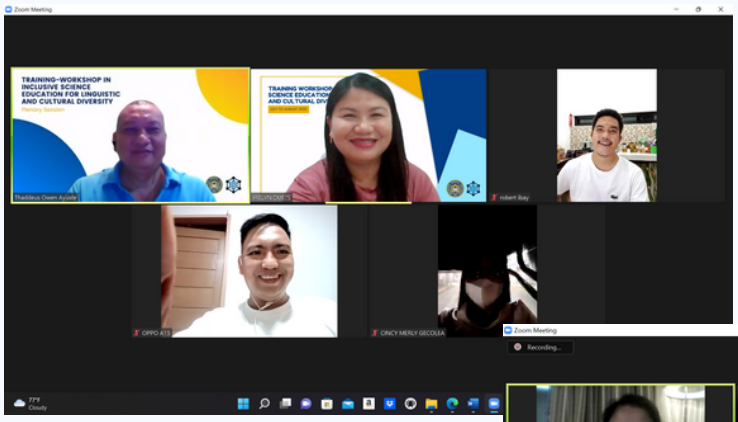
In this session, developers of lesson exemplars engaged in revising their products based on the comments and suggestions of their peers, a prerequisite to the next activity that focused on the presentation of the revised lesson exemplars to the ESTA-Philippines-PNU Team and the critiquing of the panel of evaluators.

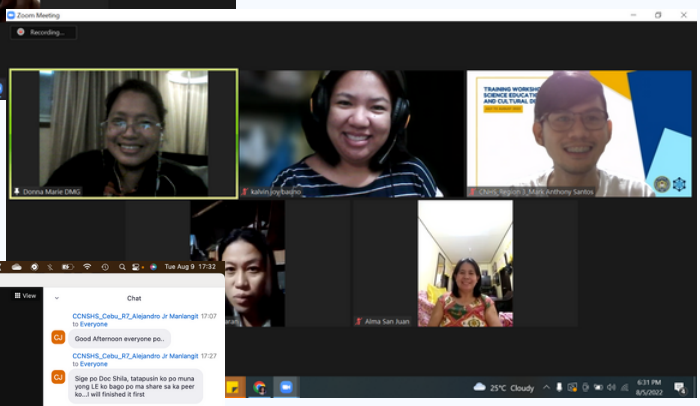
**Week 5**

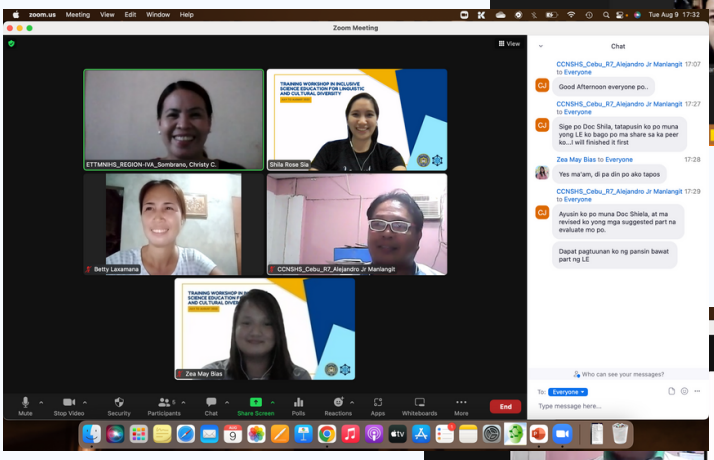
**Lesson Exemplar Presentation and Panel Critiquing**

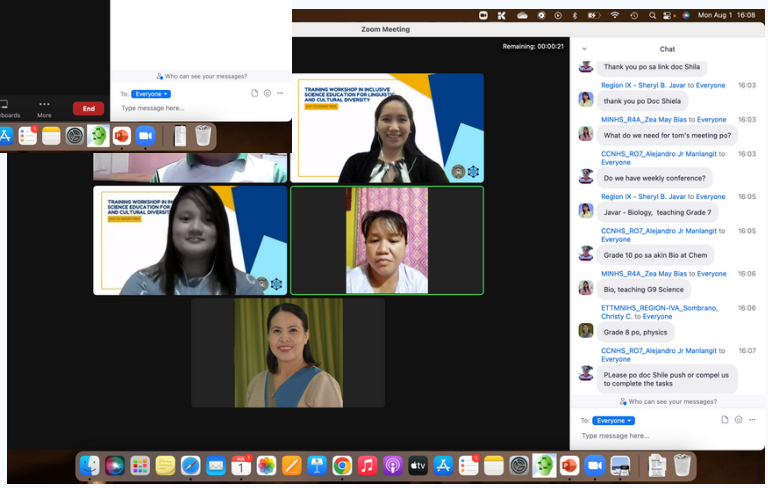
In this session, carefully crafted and designed lesson exemplars for science lessons or topics were presented to the participants and experts. Critiquing was also done to provide constructive remarks for the improvement or enhancement of the presented lesson exemplars and to determine the alignment of the designed lesson exemplars to the aforementioned models and frameworks.

# PHASE 2: ASYNCHRONOUS PHASE









# CLOSING ACTIVITY

The closing activity primarily focused on the presentation and critique of lesson exemplars. Dr. Adonis P. David, Vice President for Research, Planning, and Quality Assurance, graced the event with his opening message, followed by the recap of the mentoring program and the orientation on panel critiquing and the presentation of groups, mentors, and the panel by Mr. Jayson L. De Vera.

For the breakout session, each group proceeded to the breakout rooms for panel critiquing with three evaluators from the ESTA members and invited faculty from the PNU-Manila campus. The panel was assigned to provide constructive feedback on the group-designed lesson exemplars and hook videos done by each group.

Following the presentation of lesson exemplars, three of the participants (Ms. Rosemarie D. Peñaflor, Mr. Eldy U. Oñas, and Mr. John B. Ituralde, Jr.) gave an impression of the 6-day inclusive training.

Concluding the activity, Dr. Vic Marie I. Camacho gave a closing message expressing her gratitude to the participants, the ESTA team, and the staff. She also thanked the mentors and the panel members for their substantial contributions.

The improved outputs will be stored at ESTA Open Educational Resource (ESTA-OER), which serves as the major product of the training program and aims to provide good resources for inclusive science education.

# CLOSING ACTIVITY

The closing activity primarily focused on the presentation and critique of lesson exemplars. Dr. Adonis P. David, Vice President for Research, Planning, and Quality Assurance, graced the event with his opening message, followed by the recap of the mentoring program and the orientation on panel critiquing and the presentation of groups, mentors, and the panel by Mr. Jayson L. De Vera.

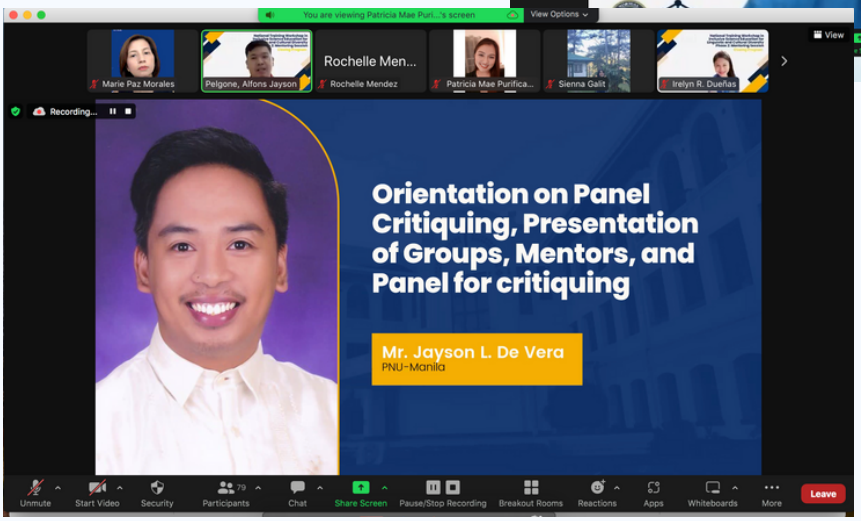
For the breakout session, each group proceeded to the breakout rooms for panel critiquing with three evaluators from the ESTA members and invited faculty from the PNU-Manila campus. The panel was assigned to provide constructive feedback on the group-designed lesson exemplars and hook videos done by each group.

Following the presentation of lesson exemplars, three of the participants (Ms. Rosemarie D. Peñaflor, Mr. Eldy U. Oñas, and Mr. John B. Ituralde, Jr.) gave an impression of the 6-day inclusive training.

Concluding the activity, Dr. Vic Marie I. Camacho gave a closing message expressing her gratitude to the participants, the ESTA team, and the staff. She also thanked the mentors and the panel members for their substantial contributions.

The improved outputs will be stored at ESTA Open Educational Resource (ESTA-OER), which serves as the major product of the training program and aims to provide good resources for inclusive science education.

# CLOSING ACTIVITY

# TRAINING OUTCOMES

# TRAINING BY THE NUMBERS

## 1. CPD Points

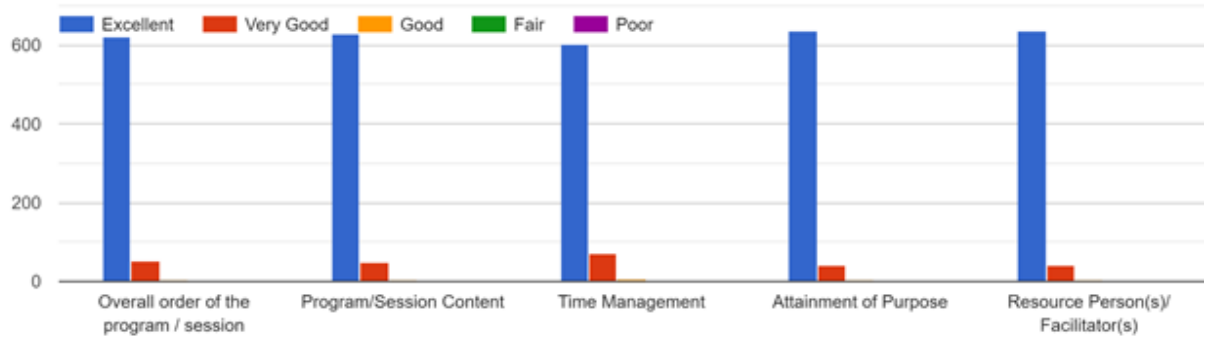
24 CPD Points Accreditation Code: PTR-2017-044-1640

## 2. Number of Mentors

| No. | Mentors | Specialization |
|---|---|---|
| 1 | Ayuste, Thaddeus Owen D. | Biology |
| 2 | Belmi, Rosario M. | Biology |
| 3 | Butron, Benilda R. | Biology |
| 4 | Camacho, Vic Marie I. | Chemistry |
| 5 | Danzalan, Jandy S. | General Science |
| 6 | Datukan, Janir T. | Chemistry |
| 7 | De Vera, Jayson L. | General Science |
| 8 | Dela Cruz, Jovenal V., Jr. | General Science |
| 9 | Espinosa, Allen A. | Chemistry |
| 10 | Gonong, Donna Marie D.M. | Physics |
| 11 | Magbanua, Paul S. | General Science |
| 12 | Opeda, Amber Dea Marie P. | Physics |
| 13 | Oyanib, Reynald A. | General Science |
| 14 | Palomar, Brando C. | Physics |
| 15 | Pelgone, Alfons Jayson O. | Physics |
| 16 | Ocampo, Crisanta A. | Chemistry |
| 17 | Santiago, Gizel R. | General Science |
| 18 | Sia, Shila Rose D. | Physics |
| 19 | Tampon, Gregie P. | Biology |
| 20 | Villamor, Brenda B. | Physics |

# TRAINING EVALUATION

## Results of Evaluation




## Feedback from Some Participants (Extracted from Evaluation Form)

- It is a great opportunity to be a recipient of this training and be part of the ESTA community. Thank you so much for everything. I have learned a lot.
- I definitely like to commend all the speakers for a job well done, congratulations to all of you, hoping for more training in the future.
- I am grateful to all the speakers, moderators, facilitators, and to the whole ESTA team for providing this timely seminar that would enhance our knowledge on dealing with students.
- All the topics discussed were relevant and very helpful to all teachers, it provided us a deeper and broader knowledge on how to teach science more effectively.
- Thank you ESTA PNU for giving me an opportunity to join the workshop and to learn varieties of techniques in teaching science. God bless you all!
- Thank you forgiving us additional input on how to be an effective teacher in the field.
- The training provides new ideas and techniques on how to handle diverse learners.

# TRAINING EVALUATION

In summary, the basic education and tertiary science education teachers rated the training as very good to excellent. Specifically, the following constructs were rated by the participants as very good to excellent: overall program, program/session content, time management, attainment of purpose and resource persons/facilitators. These exemplar ratings in each construct were verified and validated through the verbatim responses of the participants in each of the open-ended questions. The succeeding paragraphs present the summarized comments by the participants in each question.

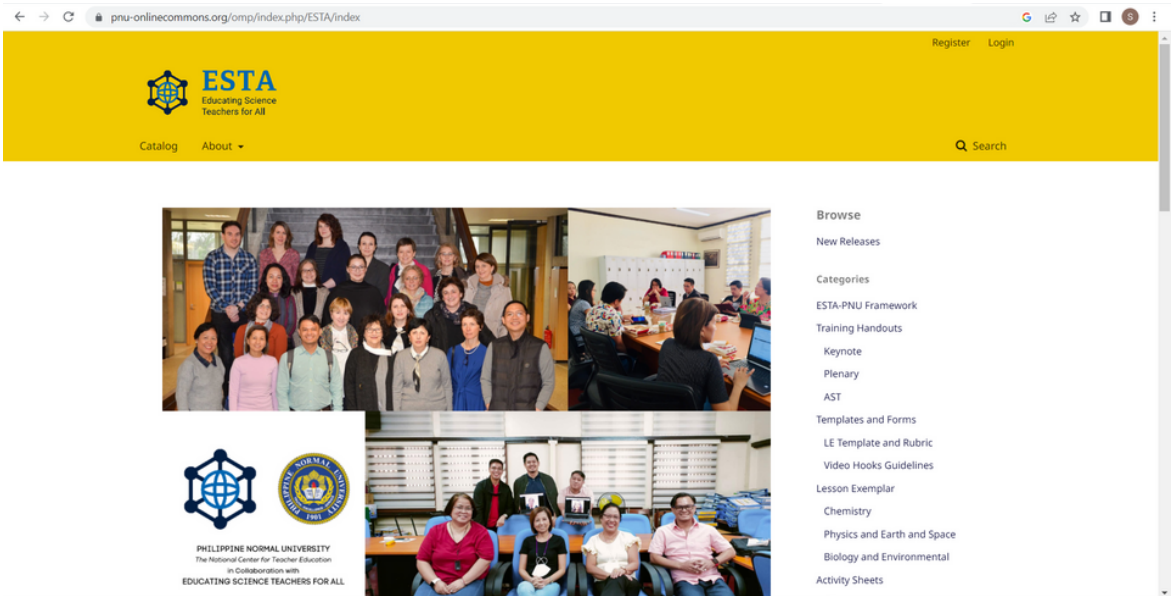
In the aspect of what the basic education and tertiary science education teachers have learned the most from the training workshop, their responses may be summarized in two major categories: contextualization and technology integration that paved the way in addressing diversity of learners which also serves as an arsenal to inclusive science education.

When asked what aspects of the training can be used/adapted in class to address heterogeneity and diversity, the basic education and tertiary science education teachers emphasized the importance of profiling of learners, contextualization, and lesson exemplars.

In the aspect of how they can implement what they have learned, the basic education and tertiary science education teachers' responses can be clustered into four constructs: contextualization, integration of culture and language, application of ESTA principles, and development of Lesson Exemplars.

Finally, their overall very good to excellent rating are verbalized in the other comments commending the team for a successful training that they can really utilize in achieving inclusive science education.

# ESTA-PHIL-PNU OER




This open educational resource is intended for all the products of the European Union-funded research project, Educating Science Teachers for All (ESTA). These resources are crafted by the core team, which includes trained university science teacher educators and basic education science teachers. The aim of this press is to share knowledge for quality science education in the Philippines.

# LESSON EXEMPLARS

**Educating Science Teachers for All**
**Philippine Normal University**
*The National Center for Teacher Education*

## LESSON EXEMPLAR in SCIENCE 7
### SOLAR AND LUNAR ECLIPSE

By: **MARICEL D. DOMALAON**
Prieto Diaz National High School, Region V, Province of Sorsogon

| **LEARNING STANDARDS** | | |
|---|---|---|
| **Course Intended Learning Outcome(s) (CILO)/Most Essential Learning Competencies (MELCS)** | | |
| 1. Explain how solar and lunar eclipses occur using models. **(S7ES-IVh-9)** | | |
| **Objectives** | **Content** | **Tasks (What tasks should I give to students to ensure realization of the objectives)** |
| *1. Describe how shadows are formed.* | *The occurrence of solar and lunar eclipse* | 1. Invite student to block light with their hands and arms to cast animals and other fun shapes onto a wall. Simple shadow puppets include a dog, a bunny, and a bird. |
| *2. Explain how solar and lunar eclipse occur.* | | 2. Watch a video clip about the wobble movement of earth and moon to the sun.<br>3. Watch video hooks for the occurrence of solar and lunar eclipse. |
| *3. Create an eclipse model.* | | 5. Learners will create an eclipse model. |
| 5. Relate scientifically the different beliefs and practices in the community in relation to lunar eclipse. | | 6. Watch a movie clip about Apocalypto, Here Comes the Bride and the Tale of a Dragon and Seven Moons (Bakunawa Story).<br>7. Conduct an interview to the elders of the community for their superstitious beliefs and practices for the occurrence of lunar eclipse. |

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# LESSON EXEMPLARS

## FILIPINO LEARNER

Diagnosing the Learner

Based on your survey, describe the target audience for this lesson; what types of learning styles will you need to be mindful of?

*Class/Learner's Demographic Profile*
*Year Level:* ***7***
*Course/Discipline:* ***Earth Science***
*Number of Students:****40***
*Gender:* ***15 Male, 25 Female***
*Disability: dysgraphia*

*Ethnicity:* ***none***
*Language(s):* ***English, Filipino/Tagalog, Bicol – Prieto Diaz, Bisakol***

*Other forms of Heterogeneity (e.g., Technical Capability, economic status, race, disability, others with special needs)*

- *15 of the students owned a smart phone and laptop/desktop computer. However, they are not yet capable of manipulating office application.*
- *Most of my students belong to poor family.*
- *They are all Filipino, Bicolanos and Bicolanas.*

*Misconception/Course Topic Impression*
*To refute the following;*

1. **Bakunawa Myth**
   - In the Philippines, some people believe that a giant dragon or snake called the "*Bakunawa*" in the Visayan region swallows the Moon, causing a lunar eclipse. People go out from their houses and make different kinds of noise in the belief that the disturbance will frighten the dragon to release the Moon. This tradition started from ancient Chinese.

**2. The Sun is attempting to eat the Moon.**

**3. Superstitious beliefs**
- Total solar eclipses produce harmful rays that can cause blindness.
- Eclipses will poison any food that is prepared during the event.
- If you are pregnant you should not watch an eclipse because it can harm your baby.
- There are no total solar eclipses at Earth's North or South Poles.
- The moon turns completely black during a total solar eclipse.
- Solar Eclipses foretell major life changes and events about to happen
- The world would come to an end or a great evil would follow.
- Some Filipinos believe that eclipses signal bad events, like earthquakes or wars. Eclipses are associated with such events because some old folks believe that the magnetic fields of the earth are being disturbed when an eclipse occurs.

**4. Movie**
- Apocalypto Eclipse (https://youtu.be/Qrvj_pvmLUU)
  - The ancient Mayans said that when an eclipse happens, Kukulkan is satisfied with its fill of human blood.
- Here Comes the Bride (https://youtu.be/HA-B49YrH-c)
  *- swapping of souls as an effect of solar eclipse*

## PEDAGOGIES

| *What skills will be addressed by this lesson?* | *What activities may be integrated in each to help enhance the learning of the content? [CLIL]* |
|---|---|
| **Cognitive Skills (Link)** | **Language Function (Link)** |
| • Describing how shadow is formed.<br>• Explaining how solar and lunar eclipse occur.<br>• Creating eclipse model.<br>• Relating scientifically the different beliefs and practices in the community in relation to eclipses. | 1. *Reading*<br>• The Bakunawa Story is in Filipino and it has a subtitle in English.<br>• Video Hooks in Bicol dialect and it has a subtitle in English |

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# LESSON EXEMPLARS

| | |
|---|---|
| **Science Process Skills**<br>• Observing what will happen to the moon when it enters into the shadow of the earth or what will happen to the sun when the earth enters into the shadow of the moon using an eclipse model.<br>• Predicting how solar and lunar eclipse occur.<br>• Inferring the reason for the occurrence of solar and lunar eclipse.<br>• Communicating the result of an interview conducted from the elders of the community regarding the beliefs and practices in relation to eclipses. | 2. *Listening*<br>• Movie clip about Bakunawa and video hooks.<br>3. *Writing*<br>• Making reports from the result of the interview conducted.<br>4. *Speaking*<br>• Presentation on how solar and lunar eclipse occur using an eclipse model.<br>• The students will conduct an interview on the beliefs and practices of the community for the occurrence of lunar eclipse. |
| **Future Skills (Link)**<br>**Self-efficacy, Creativity, Cooperation Skills, Communication Competence** | |
| **Scientific Attitudes and Filipino Values**<br>**Scientific Attitudes:**<br>1. reliance on fact<br>2. analytical and critical thinking<br>3. evaluating/valuing information/data<br>**Filipino Values:**<br>1. Respect for elders' beliefs. 3. Cooperation<br>2. curiosity and innocence | |

***What are the action words and vocabulary for this lesson? Please provide Mother Tongue translation for each identified vocabulary [MTB-MLE]***

- Shadow = anino
- Eclipse = eklipse o pagkawara kan liwanag
- Solar eclipse = pagkawara kan sin ag kan aldaw
- Lunar eclipse = pagdolom kan bulan
- Full moon = kabilugan kan bulan
- Beliefs = pagtubod
- Umbra = sentro kan batik kan aldaw
- Penumbra = multo kan batik kan aldaw
- Total lunar eclipse = kabilugan kan pagdolom kan bulan
- Partial lunar eclipse = kabanga na pagkawara kan liwanag
- Penumbral lunar Eclipse = ang paglaog kan bulan sa multo kan mundo

**Key Language** *(Link to all constructs of Key Languages)*
**(What children need to recognize/produce)**

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# LESSON EXEMPLARS

*Action Words (scientific processes)*

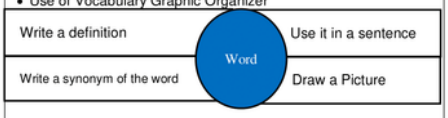
- *The students will be able to show how shadows are formed from the given activity.*
- *The students will be able to manipulate the eclipse model to show and explain the occurrence of solar and lunar eclipse.*
- *The students will be able to talk with elders about their beliefs and practices for the occurrence of eclipses.*

*Vocabulary (other terms)*

Shadow
Eclipse
Lunar eclipse
Full moon
Solar eclipse
Penumbra
Total lunar eclipse
Partial lunar eclipse
Penumbral lunar Eclipse
Umbra
Beliefs

*Language Structure*

- Use of Vocabulary Graphic Organizer




**TEACHER KNOWLEDGE**

| **Technology Being Used by Students** | **Technology Being Used by Teacher** |
|---|---|
| *What technology will my students use in this lesson?*<br>• Smartphone<br>• Computer<br>• laptop<br>• printer<br>• video editor<br>• google chrome<br>• Windows Media Player | *What technology will I use in this lesson?*<br>• Laptop<br>• Printer<br>• Smart TV<br>• Microsoft PowerPoint<br>• Microsoft Word<br>• Video Editor/Capcut<br>• Windows Media Player<br>• Google Chrome<br>• Quizziz |
| *What were your reasons for choosing the technology for the students to use?*<br>• Smartphone for vlogging during the conduct of an interview.<br>• Computer/laptop – encoding of the report from the result of an interview.<br>• Printer – for producing hardcopy of the report.<br>• Video editor – can be used to edit learners' vlog<br>• Google chrome – to access the quizziz<br>• Windows Media Player – used to play learners' vlog. | *What were your reasons for choosing the technology in the lesson?*<br>• Laptop – for encoding the lesson<br>• Printer – for producing hardcopy of the activity<br>• Smart TV – to display the presentation<br>• Microsoft PowerPoint– for presentation of salient points and content of my lectures.<br>• Microsoft Word – for making instructional materials.<br>• Video Editor/capcut – for creating and editing the video hooks<br>• Windows Media Player – used to play video.<br>• Google Chrome – for web browsing and accessing quizziz<br>• Quizziz – for creating formative assessment |
| *What are the limitations and potential problems in utilizing the technology?*<br>• Smartphone. Maybe has limited features.<br>• Computer/laptop – not well versed in using the Microsoft word<br>• Printer - availability of an ink<br>• Video editor – learners may take time for editing.<br>• Google Chrome – slow internet connectivity<br>• Power Interruptions<br>• Additional expenses for internet data | *What are the limitations and potential problems in utilizing the technology?*<br>• Power interruptions<br>• Internet connectivity<br>• Additional expenses for internet data<br>• Limited skills for manipulating the video editor and quizziz |

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# LESSON EXEMPLARS

| Assessment for Learning (Formative Assessment) | Teacher Competence |
|---|---|
| Assessment Strategy<br>• Vocabulary Graphic Organizer – Printed/Hard copy materials<br>• Test Questions– Non-Print/Soft Copy Materials<br>• | What other skills (language competence, multicultural knowledge system, TPCK) and attitudes do you need in order to implement the lesson?<br>1. Mastery of the Content of the lesson<br>2. Apply different pedagogical approaches and strategies.<br>3. Ensure that learners are task – oriented.<br>4. Liberation to the choice of the learners in constructing eclipse model.<br>5. Competence in using technology in teaching.<br><br>Attitude: Being respectful to the beliefs of the community.<br>Patience<br>Creative<br>Empathy |
| Feedback Strategy<br>• I Used to Think……Now I know……<br>• Traffic Light Dots | |
| *Technology which will be integrated in the Assessment*<br>• Quizziz | |
| *Technology which will be integrated in the Feedback System*<br>• Google Forms | |
| **Assessment of Learning (Summative Assessment)** | **Readings/Materials/Tools** |
| *1. How do you know students met the learning objectives and targets?*<br>• Use of Rubrics for constructing an eclipse model/ vlogging/data report presentation<br>• Get the performance/mastery level of the learners from the result of their written tests. | *What materials, readings, tools do you need to improve your competence and confidence in teaching the topic?*<br><br>• Phases of the Moon Model<br>• Earth and Moon Movement around the sun. |
| *2. What technology will you use to facilitate the assessment of learning?*<br>• Smart TV<br>• Laptop<br>• Windows Media Player<br>• Microsoft Excel | |
| **PROCESS** | |
| *Walkthrough of the lesson (how will you deliver the lesson/topic (from engaging the student to ensuring achievement of learning objectives?)*<br><br>*1. How will I ensure interdisciplinarity (Use of STEAM Approach)?*<br>*Inductive Reasoning. Start with a more specific hypothesis to a general notion.*<br>*(What specific activities will integrate STEAM?)*<br>***S:*** Activity Proper – Manipulation of Eclipse Model<br>***T:*** Video Presentation/Vlogging<br>***E:*** Constructing an eclipse model<br>***Arts:*** Use of hand to create fun shapes shadow<br>Use of indigenous/recycled materials for designing an eclipse model<br>***M:*** Measurement<br><br>*2. How will I integrate culture, Language, gender and context in my lesson?*<br>*Culture:*<br>• Know the beliefs of the elders in the community about the occurrence of eclipses, then discuss the scientific explanation of the occurrence of eclipses.<br>*Language:*<br>• The Video Hooks should be in bicol dialect but with subtitle in English<br>• In Vlogging, learners may use bicol dialect. | |

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# LESSON EXEMPLARS

*Gender:*

- Here Comes the Bride Movie Clip – The movie is about the swapping of souls due to the effect of solar eclipse. In this movie, there is gender equality, the casts are composed of male, female, LGBTQ.

*Context:*

- The learners will be grouped to same barangays and they will conduct an interview in their respective purok.

*3. How will I encourage my students to communicate what they know and want to know?*

- Let the learners share the experience they have or from their friends or family members during the occurrence of eclipses.
- They may also tell what their parents told them when there is solar or lunar eclipse.

*4. What combination of pedagogies will I use to design the Lesson? How will I ensure the integration of the principles of inclusivity in my pedagogies?*

- Constructivism and 7Es

*5. What instructional flow would capture all these plans? 7Es*

| Lesson Phase | Essential Question/s | Activity (specify the modalities) | Expected Output/Learning |
|---|---|---|---|
| *Elicit* | *How shadows are formed?* | Invite a learner to block light with their hands and arms to cast animals and other fun shapes onto a wall, screen, or curtain. Simple shadow puppets include a dog, a bunny, and a bird. | *The learners will be able to describe the formation of the shadow. (The shadows are formed when the object blocks the light)* |
| *Engage* | *How shadow is formed in an outer space? What are the conditions for the formation of shadow?* | Watch a video clip about the wobble movement of earth and moon to the sun. https://youtu.be/Kt1dbwAJOZQ | *The learners will be able to infer the conditions for the formation of the shadow. (Alignment and position of the object to the source of light)* |
| *Explore* | *How shadow appeared to the earth? What will happen to the earth when it enters to the shadow of the moon?*<br><br>*How shadow appeared to the moon? What will happen to the moon when it enters to the shadow of the earth?* | The group of learners will construct an eclipse model. (Attached herewith is the Activity Sheet #1 "Create Me A Model")<br><br>* After creating an eclipse model, there will be a presentation of an eclipse model and the group will explain how solar and lunar eclipse occur using the model. (attached herewith is the rubric for creating an eclipse model and for presentation) | *The learners will be able to describe the appearance of the shadow to the earth and its effect on it. (The shadow appears to the earth due to the alignment of sun, moon and earth. The moon blocks the sun which causes moon's shadow. This shadow falls to the earth and makes the earth dark.)*<br><br>*The learners will be able to describe the appearance of the shadow to the moon and its effect on it. (The shadow appears to the moon due to the alignment of sun, earth and moon. The earth blocks the sun which causes earth's shadow. This shadow falls to the moon and makes the darkening of the moon.)* |
| *Explain* | *What is a solar eclipse?* | * The teacher will let the students watch her video hooks about solar and lunar eclipse.<br>* The teacher will also explain umbra, penumbra in relation to the types of lunar eclipse. | • The learners will be able to explain how solar and lunar eclipse occur.<br>• The learners may also describe an eclipse.<br><br>Solar Eclipse occurs when the Moon moves in a **straight line** between the |

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# LESSON EXEMPLARS

| | | | |
|---|---|---|---|
| | *What is a lunar eclipse?*<br><br>*What is an eclipse?*<br><br>*Can a solar eclipse be observed in all places on Earth?*<br><br>*Can a lunar eclipse be seen everywhere?* | 1. Use Vocabulary Graphic Organizer to describe how shadows are formed.<br><br>2. Based from eclipse model, explain how solar and lunar eclipse occur. (In a form of test questions)<br><br>3. Create an eclipse model using shapes in a Microsoft wor | Sun and the Earth, the shadow of the Moon now falls on the Earth. When you are within this shadow, you will experience a solar eclipse (darkening effect).<br><br>Lunar Eclipse occurs when the Moon is directly on the opposite side of the Earth as the Sun. The Moon is in the shadow of the Earth. In this case, you will observe a lunar eclipse.<br><br>**ECLIPSE** = is a phenomenon where a darkening effect is observed due to the formation of shadows on astronomical objects. It takes place on Earth once the Moon or the Earth changes its position and distance from the Sun.<br><br>*No. Since Moon is smaller as compared to the Sun and Earth, its shadow on Earth isn't very big. As a result, **only some places on the planet get to witness the phenomenon**. People who are on the sunny side of Earth and in the path of the moon's shadow can see the solar eclipse, while others miss it.*<br><br>A lunar eclipse may be viewed from anywhere on the night side of Earth. Some parts of the earth may experience total, partial or penumbral lunar eclipse. Total lunar eclipse can be seen when the parts of the moon enters into the umbra of the earth, while the other parts of the earth may only experience partial or penumbral lunar eclipse, when the moon enters to the penumbra of the earth. |

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# LESSON EXEMPLARS

| | | | |
|---|---|---|---|
| *Elaborate* | *What are the misconceptions of the Apocalypto? Here Comes the Bride and Bakunawa Story?*<br><br>*How do you explain scientifically the occurrence of solar and lunar eclipse?*<br><br>*Do you think the movie "Here Comes the Bride" has scientific explanation?* | • The learners will watch a movie clip about Apocalypto, https://www.youtube.com/watch?v=Qrvj_pvmLUU&t=2s<br>• Here Comes the Bride https://www.youtube.com/watch?v=HA-B49YrH-c<br>• Bakunawa Story. https://youtu.be/FoSbz1fmUvg | The learners will be able to identify that the misconception in Apocalypto Movie is that solar eclipse occurs because the god of Mayan People is thirsty with the human blood, so, they need to sacrifice the lives of the people so that the sunlight may come back.<br><br>For Here Comes the Bride, there is swapping of souls when the solar eclipse occurs.<br><br>For Bakunawa Story, the occurrence of lunar eclipse is due the swallowing of moon by the dragon.<br><br>The learners will be able to explain scientifically the occurrence of eclipses based from the teacher's discussion. The occurrence of the eclipses due to the alignment and position of astronomical bodies which causes shadow to earth or moon.<br><br>No. This is just an imagination. Eclipses are natural phenomena due to the movement of astronomical bodies. |
| *Evaluate* | How the shadows are formed?<br><br>Based from the model, how do you explain solar eclipse? Lunar eclipse?<br><br>How do you illustrate solar and lunar eclipse?<br><br>What are the beliefs of ancient people about the occurrence of eclipses? Is there any scientific basis on their beliefs? | 1. Use Vocabulary Graphic Organizer to describe how shadows are formed.<br><br>2. Learners will access quizziz from google chrome.<br><br>*(Attached herewith is the evaluation sheet)*<br><br>**Reflection Questions:**<br>Traffic light dots<br><br>Green – Successfully completed the task.<br><br>Yellow – they are not sure about their work and would like feedback.<br><br>Red – they feel they didn't understand or perform well the task and need help. | *The learners will be able to construct a sentence that would describe the formation of shadow.* |

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# LESSON EXEMPLARS

| | | | |
|---|---|---|---|
| *Extend* | *What are the beliefs and practices of the community for the occurrence of eclipses?* | The learners will make a vlog while conducting an interview to the elders from their community about their beliefs and practices during eclipse.<br>(Each Group is composed of 4 – 5 members)<br><br>(Attached herewith is the activity sheet #2 and the rubric) | the learners will be able to collect, record and report data on the beliefs and practices of the community during eclipse. |

*How will the lesson delivery manifest efficient classroom management?*

- Impose rules and regulations before the start of the classes.
- Group the learners beforehand and each member has their own task to do.

*How will I integrate technology in the lesson delivery?*

- Use of PowerPoint Presentation helps to facilitate the delivery of the lesson.
- Use of movie/video clip helps learners visualize the content of the lesson.
- For the extend part, learners may vlog the interview to the elders about the beliefs and practices for the occurrence of eclipses.

*Summary: How will technology, content, and pedagogical knowledge work together in this lesson?*

*By the use of PowerPoint presentation, movie/video clip, the teacher will be able to communicate well the content to the learners and by the use of 7Es and Constructivism, the learners will be able to liquify the solid/concrete knowledge so that learners may easily absorbed the content of the lesson. With the pedagogical approaches that will be applied, the teacher will be able to hone the knowledge, skills and attitudes of the learners.*

**REFLECTIONS**
***(Please accomplish this part after lesson delivery)***

*1. What worked or didn't work in the delivery of the lesson?*

*2. What difficulties have you encountered (during planning and delivering the lesson)?*

*3. What insight have you gained?*

*4. How do these insights connect or affect your teaching practice, and personal and professional life philosophy?*

**MODIFICATIONS**
***(Please accomplish this part after lesson delivery)***

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# LESSON EXEMPLARS

**ACTIVITY SHEET 1**
**CREATE ME A MODEL**

Materials:
Cardboard
Paste

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# LESSON EXEMPLARS

**Educating Science Teachers for All**
**Philippine Normal University**
*The National Center for Teacher Education*

## LESSON EXEMPLAR

*Focus:* ***Types and Ingredients of Personal Care Products***

| **LEARNING STANDARDS** | | |
|---|---|---|
| **Course Intended Learning Outcome(s) (CILO)/Most Essential Learning Competencies (MELCS)** | | |
| 1. Give common examples of personal care products used to enhance the appearance of the human body. (S11/12PS-IIIi-j33)<br>2. Identify the major ingredients of cosmetics such as body lotion, skin whitener, deodorants, shaving cream, and perfume. (S11/12PS-IIIi-j34) | | |
| **Objectives** | **Content** | **Tasks (What tasks should I give to students to ensure realization of the objectives)** |
| 1.a. Identify the personal care products that are commonly used to enhance the appearance of the human body.<br><br>1.b. Classify the personal care products based on their specific usage or purpose in the human body.<br><br>2.a. Give the major ingredients of cosmetics such as body lotion, skin whitener, deodorants, shaving cream, and perfume.<br><br>2.b. Explain the importance and application of cosmetics in daily life. | Types and Ingredients of Personal Care Products | a. Students will be given the pre-test through a Kahoot Game.<br>b. Through the Think-Pair-Share approach, the students will differentiate household products and personal care products based on the product labels.<br>c. Using the 4 pics 1-word PowerPoint Presentation, students will identify the ingredients of personal care products.<br>d. Using the GRASP approach, students will perform a role-play through a commercial talk show highlighting the usage, the labels indicated in every product, some precautions of using these products, and their importance in the physical human body.<br>e. In a commercial talk show, tips and simple preparation of non-toxic or organic personal care products from foods or fruits will be discussed as an alternative to synthetic products which is significant in lessening the expenses spent by people.<br>f. Rubrics and peer evaluation tools will be used in evaluating students' performance.<br>g. Students will share insights from their journal or in Slido. |
| **FILIPINO LEARNER** | | |
| Diagnosing the Learner | | |
| Based on your survey, describe the target audience for this lesson; what types of learning styles will you need to be mindful of? | | |
| *Class/Learner's Demographic Profile*<br>*Year Level:* ***Grade 12 Senior High School***<br>*Course/Discipline:* ***Physical Science-Quarter 1***<br>*Number of Students:* ***50***<br>*Gender: Male= 18/50 = 36%*<br>*Female= 30/50 = 60%*<br>*LGBTQIA= 2/50 = 4%*<br><br>*Ethnicity:* ***Akeanon***<br>*Language(s):* ***English, Filipino, Akeanon*** | | |
| *Other forms of Heterogeneity (e.g., Technical Capability, economic status, race, disability, others with special needs)*<br><br>*Through the use of DepEd e-LESF (Electronic Learners Enrolment and Survey Form) the teacher may already identify the ethnicity of the learners and if these learners have a disability or special needs. The teacher may also decide on the use of technology or other flexible learning approach based on the availability of their gadgets as reflected on the answered e-LESF by the students.* | | |

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*Misconception/Course Topic Impression*

*One misconception people keep on believing is that* ***if our skin type is oily, it's okay to skip using moisturizers in our day-to-day routine.*** *(The correct concept is that moisturizers protect our skin from pollutants and harmful UV rays which can break our skin barriers. If we do not use moisturizers to protect our skin from these environmental factors, it may lead to irritate our skin more and cause an increase in oil production resulting our the skin being shinier.)*

**PEDAGOGIES**

| ***What skills will be addressed by this lesson?*** | ***What activities may be integrated in each to help enhance the learning of the content? [CLIL]*** |
|---|---|
| **Cognitive Skills (Link)** | **Language Function (Link)** |
| *Knowledge and comprehension skills by understanding the subject matter.*<br>*Application skills through integrating the lesson into real life.* | Language functions such *as reading, listening, and speaking* are used during the commercial talk show. Through reading, the student can understand the printed words on the product label. Speaking is also vital in communicating, interpreting, and sharing ideas. Moreover, by listening, the listeners can easily understand and catch up with the insights shared with them.<br>On the other hand, through the journal or the Slido, the student can write their insights learned from the lesson. |
| **Science Process Skills** | |
| *Classifying*<br>*Communicating* | |
| **Future Skills (Link)** | |
| *Self-initiative, Creativity and Innovation, Cooperation Skills, Communication Competence, and Digital Literacy* | |
| **Scientific Attitudes and Filipino Values** | |
| *Scientific Attitudes: Open-mindedness*<br>*Filipino Values: Pakikisama (Fellowship)*<br>*Malikhain (Creativity)*<br>*Kusang-Palo (Making Initiative)* | |

***What are the action words and vocabulary for this lesson? Please provide Mother Tongue translation for each identified vocabulary [MTB-MLE]***

**Key Language** *(Link to all constructs of Key Languages)*
**(What children need to recognize/produce)**

| *Action Words (scientific processes)* | *Vocabulary (other terms)* |
|---|---|
| *In Filipino: Uriin ang mga produkto batay sa kanyang gamit sa ating katawan.*<br>*In Akeanon: Pagplastar it produkto base sa anang gamit sa atong eawas.* | *In Filipino: Lumambot ang ating mga balat*<br>*In Akeanon:Maghumok ang aton mga panit*<br><br>*In Filipino: Tigilan at mawala ang mabahong amoy sa ating katawan*<br>*In Akeanon:Punggan ag madula ang baho nga hugom sa aton eawas*<br><br>*In Filipino: Nagbibigay ng mabangong amoy sa ating katawan*<br>*In Akeanon:Nagatao it humot nga hugom sa aton eawas*<br><br>*In Filipino: Mabilis makuha ang mga buhok sa iba't-ibang parte ng ating katawan*<br>*In Akeanon:Madali mabuoe ang mga buhok sa iba-ibang parte it aton nga eawas*<br><br>*In Filipino: Nagpapalinis at nagpapakintab ng ating mga ngipin at mapanatiling presko ang ating hininga*<br>*In Akeanon:Nagapalimpyo at nagapakintab it mga ngipon ag nagapapresko it aton hininga* |
| *Language Structure*<br>• *Using simple present tense for general truths* | |

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| | |
|---|---|
| | *In Filipino: Nagpapalinis ng ating mga buhok*<br>*In Akeanon:Nagapalimpyo it aton nga mga buhok*<br><br>*In Filipino: Pinipigil ang pagkakaroon ng melanin sa ating mga balat*<br>*In Akeanon:Nagapapundo it pagbuo it melanin sa aton mga panit* |
| **TEACHER KNOWLEDGE** | |
| **Technology Being Used by Students** | **Technology Being Used by Teacher** |
| *What technology will my students use in this lesson?*<br><br>• Kahoot for the pre-test.<br>• 4 pics 1-word using PowerPoint Presentation for individual activity<br>• Slido or journal for reflection<br><br>• **Cellphones** | *What technology will I use in this lesson?*<br><br>• Kahoot for the pre-test.<br>• 4 pics 1-word using PowerPoint Presentation for individual activity<br>• Slido or journal for reflection<br><br>• **Laptops** |
| *What were your reasons for choosing the technology for the students to use?*<br><br>• Easy and convenient to use.<br>• Available and accessible. | *What were your reasons for choosing the technology in the lesson?*<br><br>• Easy and convenient to use.<br>• Available and accessible. |
| *What are the limitations and potential problems in utilizing the technology?*<br><br>• Limited knowledge of using digital applications and gadgets.<br>• Compatibility of the gadgets to the digital applications used.<br>• Low or no internet connection<br>• Electrical interruption | *What are the limitations and potential problems in utilizing the technology?*<br><br>• Limited knowledge of using digital applications and gadgets.<br>• Compatibility of the gadgets to the digital applications used.<br>• Low or no internet connection<br>• Electrical interruption |
| **Assessment for Learning (Formative Assessment)** | **Teacher Competence** |
| *Assessment Strategy*<br><br>7 E's, Social Constructivism, and Experiential Learning<br>Elicit: Kahoot Game (pre-test)<br>Engage: Think-Pair-Share approach in transitioning the previous lesson to the new lesson<br>Explore: 4 pics 1-word PowerPoint Presentation in identifying the ingredients in each personal care product<br>Explain: Role play through a Commercial Talk show to discuss the lesson<br>Elaborate: Continuation of the lesson from the explain<br>Evaluation: Rubrics and peer evaluation form<br>Extend: Sharing of insights through journal or Slido | *What other skills (language competence, multicultural knowledge system, TPCK) and attitudes do you need in order to implement the lesson?*<br><br>• The lesson plan followed the DepEd format and has a complete and organized structural design.<br><br>• The lesson plan integrates real-life situations and can be used for diverse learners regardless of the ethnicity they belong to and the language they used.<br><br>• Effective use of digital applications through available technologies in delivering lessons and activities used to students.<br><br>• Implemented effectively some plans or set-up in delivering instruction when malfunctions of |
| *Feedback Strategy*<br><br>*Evaluation using a journal reflection form or Slido.* | |

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| *Technology which will be integrated in the Assessment*<br><br>The technology which will be integrated in the assessment is the laptop for printing the rubrics and peer assessment tools. | technologies, low internet connectivity, or electrical disruptions occur unexpectedly. |
| *Technology which will be integrated in the Feedback System*<br><br>The technology which will be integrated in the feed backing process is the Slido. | |
| **Assessment of Learning (Summative Assessment)** | **Readings/Materials/Tools** |
| *1. How do you know students met the learning objectives and targets?*<br><br>a. Students must attain assessment grades of 75% and above for their performance tasks using rubrics and peer-assessment tools. | *What materials, readings, tools do you need to improve your competence and confidence in teaching the topic?*<br><br>• Physical Science books<br>• Lesson Exemplars<br>• Rubrics and peer-evaluation tools<br>• Good internet connection<br>• Functional laptop with higher specifications<br>• Knowledgeable of the use of digital applications and technologies. |
| *2. What technology will you use to facilitate the assessment of learning?*<br><br>• Kahoot for the pre-test.<br>• 4 pics 1-word using PowerPoint Presentation for individual activity<br>• Slido or journal for reflection. | |
| **PROCESS** | |
| *Walkthrough of the lesson (how will you deliver the lesson/topic (from engaging the student to ensuring achievement of learning objectives?)*<br><br>*1. How will I ensure interdisciplinarity (Use of STEAM Approach)?*<br><br>*(What specific activities will integrate STEAM?)*<br>***S:*** Identify the different elements or substances in our environment that we are using as personal care products.<br>***T:*** Kahoot for pre-test, 4 pics 1-word using PowerPoint Presentation, and Slido or journal for reflection<br>***E:*** Present some organic personal care products that we can use as an alternative to synthetic products.<br>***Arts:*** Arrangement of the product labels and packaging used for personal care products.<br>***M:*** Amount or percentage of ingredients present in each personal care product found on the nutrition facts label of the product. The cost you can save using organic personal care products than using synthetic one.<br><br>*2. How will I integrate culture, Language, gender and context in my lesson?*<br><br>Classifying organic ingredients (e.g. flower extract, oil from fruits, atsuwete, aloe vera, apple cider vinegar, charcoal, etc.) used by elders as an enhancement to their body and its global application to different tribes.<br><br>*3. How will I encourage my students to communicate what they know and want to know?*<br><br>I will encourage my students to communicate what they know through verbal and non-verbal communication. Through verbal communication, students can freely share their own insights and interact with others to gain knowledge too. Further, some students can express their ideas through non-verbal such as writing their own reflections in the journal or Slido.<br><br>*4. What combination of pedagogies will I use to design the Lesson? How will I ensure the integration of the principles of inclusivity in my pedagogies?*<br><br>7E's, Social Constructivism Theory, and Experiential Learning Theory are the pedagogies that I will be using in designing my lesson. To ensure the integration of the principles of inclusivity in my pedagogies, I will give my students equal access and opportunities | |

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to learn regardless of the ethnicities they belong. There will be no students be aloof and everyone is open in expressing and sharing their feelings and ideas. I will instill value and respect for everybody for who they are regardless of their differences.

*5. What instructional flow would capture all these plans? (Present the lesson flow below. Use any applicable model e.g. Experiential model, 7E's)*

| *Lesson Phase* | *Essential Question/s* | *Activity (specify the modalities)* | *Expected Output/Learning* |
|---|---|---|---|
| ***ELICIT*** | Before we start our new lesson, get your cell phones and answer the following questions using Kahoot. | Students will be given the pre-test through a Kahoot Game. | Identifying students' prior knowledge of the lesson. |
| ***ENGAGE*** | Consumer products contain substances that perform specific functions. We tackled from our last topic that some of these products are used for household cleaning.<br>• How will you differentiate if a certain product is for household or for personal use? | The teacher provides realia of consumer products. Through the Think-Pair-Share approach, the students may differentiate household products and personal care products based on product labels. | Group sharing of ideas about the difference between household products and personal care products. |
| ***EXPLORE*** | What are the major ingredients each personal care product has? | Identifying the major ingredients present in each personal care product through 4 pics 1-word PowerPoint Presentation.<br>• The activity is in trivia format.<br>• It presents samples and students will identify the ingredients.<br>• There is an integration of culture *e.g. atsuwete seeds from plants has ingredients that are useful in preventing scars and stopping bleeding.* | Identification of major ingredients for each personal care product that is also used by ancient people as old practices for beautification. |
| ***EXPLAIN*** | • What are the usage of different personal care products?<br>• What are the product labels indicated in each of these products?<br>• What are the precautions indicated in each product?<br>• Why do you think personal care products are important in the physical human body? | Using the GRASP approach, role play will be conducted through a Commercial Talk show.<br>The host of the show will be presenting different personal care products and the guest who is knowledgeable about these products will explain their usage, the labels indicated in every product, some precautions of using these products, and their importance in the physical human body. | Group presentation through a commercial talk show. |
| ***ELABORATE*** | • Since synthetic personal care products are quite expensive for some users, can you give some tips or share a simple preparation for non-toxic organic personal care products out of our favorite foods/fruits? | In continuation of the commercial talk show, the host will ask the guest to share her knowledge on how to prepare some non-toxic personal care products out of our favorite foods or fruits to lessen the cost of buying synthetic personal care products.<br>e.g. Exfoliating Scrub-*Mix uncooked oatmeal with warm water to make a paste. Apply the paste to cleansed skin, then rinsed with cold water.*<br>Moisturizing Mask-*Prepare a thin slice of fresh avocado meat. Rub it into your face and use it as a mask. After 10 minutes, rinse your face with cold water.*<br>Eyes Pack- *Place thin slices of fresh cucumber over closed eyes for about 30 minutes for your puppy* | Group presentation through a commercial talk show. |

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| | | *and tired eyes.* | |
| ***EVALUATE*** | • What assessment tool can be used in assessing the performance of the students? | • Rubrics are used by the teacher to evaluate students' performance.<br>• A peer-evaluation tool to be utilized by students in assessing the performance of their peers. | Students evaluated the performance |
| ***EXTEND*** | • What have you learned from this lesson?. | • Students will share insights from their journals or in Slido. | Students gained insights in the lesson. |

*How will the lesson delivery manifest efficient classroom management?*

The teacher should have a lesson exemplar as a guide in delivering a lesson. Also, she must have authority inside the classroom so that students will follow all her instructions and tasks effectively. She must always maintain an engaging, interactive, and equality among her learners in fostering a positive learning environment.

*How will I integrate technology in the lesson delivery?*

I will be using technology that is commonly available to all students. I will integrate it through interactive games such as Kahoot for the pre-test, 4 pics 1-word using PowerPoint Presentation for individual activity, and Slido for journal reflection.

*Summary: How will technology, content, and pedagogical knowledge work together in this lesson?*

The content of the lesson must anchor with the learning objectives. To make the content more engaging in the eyes of the learners, the teacher can use technology and different digital applications. Moreover, the teacher should have pedagogical knowledge about how to organize and present the content efficiently to a variety of learners using technology where all students are involved and feel a sense of belongingness.

**REFLECTIONS**
***(Please accomplish this part after lesson delivery)***

*1. What worked or didn't work in the delivery of the lesson?*

*2. What difficulties have you encountered (during planning and delivering the lesson)?*

*3. What insight have you gained?*

*4. How do these insights connect or affect your teaching practice, and personal and professional life philosophy?*

**MODIFICATIONS**
***(Please accomplish this part after lesson delivery)***

**References:**

[1] Santiago, Karen S. & Silverio, Angelina A. (2016). Exploring Life Through Science Series (Physical Science). Quezon City: Phoenix Publishing House, Inc.

[2] 10 Misconceptions About a Healthy Skin Care Routine. Accessed August 8, 2022. https://www.apothecopharmacy.com/10-misconceptions-about-a-healthy-skin-care-routine/

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# REFLECTIONS

**ESTA-PNU-Training/Workshop**

## Reflection Form/Template

**Project Title: Training Workshop in Inclusive Science Education for Linguistic and Cultural Diversity**
Education Science Teachers for All (ESTA)

**Participant Profile**

- Name of Participant: Rommel G. Jolo
- School/Campus/Hub Affiliation: Sinalhan Integrated High School
- Science Courses/Subjects taught: Earth and Life Science, Physical Science
- Place of Origin: Santa Rosa City, Laguna Ethnicity (*if any*):
- Languages Spoken: Tagalog, Bicolano, English

**Training Workshop Details**

- Session Title: Lesson Exemplar Mentoring Date and Time: Every Saturday at 1pm
- Workshop/Training Modality: Online Synchronous
- Technology used during the workshop/training: Zoom app
- Languages used during the workshop/training: Tagalog, English
- Indigenous Knowledge (IK) used during the workshop/training: none

## Details of Reflection

*(Please narrate your entire experience while attending the training/workshop. Highlight all insights and key points gained from your involvement in the different sessions.*

| | |
|---|---|
| Lesson Exemplar Development | One of the important insights I gained in developing a lesson exemplar is to keep in mind the "future skills" and Filipino values that the learners will learn in a specific lesson. We should keep in mind that in every lesson, we should develop the critical thinking of the learners because it is one aspect of measuring the learned skills in a lesson. If the learner knows how to think out of the box for every given topic, The learner will adapt the skill of exploring his/her surroundings applying the learned concepts and developing his/her innovative ideas. |
| Lesson Exemplar Peer Review | The peer review is one of the important aspects that needs to consider because it helps us gather additional insights and learnings. Accepting advices for additional refinement of the lesson exemplar will gives our lesson exemplar high quality lessons delivery for our learners. |
| Lesson Exemplar Revision and Finalization | Revision of lesson exemplar means "a lesson exemplar that is almost nearly perfect". In every crafting and development of a lesson, it is always an important method to do some revisions after it was undergone evaluation so that when it reach its finalization stage, we can make sure that the lesson that we will deliver to our learners are substantial and with quality content. |

# REFLECTIONS

| | |
|---|---|
| Mentoring Program | At this stage, I realize that our mentors are well equipped with professional skills and concepts that guides and helps us developed a well comprehensive lesson exemplar. The sharing of lesson exemplar templates, the processes and techniques that they shared with us mentees are very valuable inputs that we learned along the process of lesson exemplar development.<br><br>Another was the sharing of samples for hook videos so that we can adapt the process of crafting hook videos that are relevant in every lesson. |
| **Reflection** | |
| *Reflect on the whole process of your professional learning with ESTA by answering the questions below.* | |
| What have I learned from this mentoring program involvement? | This mentoring program helped me to enhance my learning in developing my knowledge in crafting lesson exemplar. And most importantly my dedication and eagerness to develop my professional conduct for the betterment of my teaching. In every project development, it is important to act patiently and devote time for every task with positive motivation and mind set. |
| How could my students and my school benefit from this involvement? | By joining this training, I can impart knowledge with my colleagues and my leaners in a better and quality approaches of crafting lesson exemplar and applying the systematic processes of developing lessons to produce quality outputs. |
| What were the challenges I experienced during the conduct of all activities relative to the mentoring program? | The challenges I experienced was the "time management" between our school's preparation for the opening of classes and the time needed to devote in crafting the lesson exemplar required for the training. |
| What aspects of my involvement in this project would I like to keep? | I like to keep the learned concepts of developing a scientific method of crafting lesson exemplar and also the importance of the "hook videos" that helps our learners enhanced their motivation in a lesson. |
| What aspect of my teacher knowledge do I need to improve on based on the inputs of the ESTA mentoring program? | I think, I still need to improve my lack of skills in technology integration because as a 21st teacher, it is now very important to grasp technology applications that enhances our learners to every lesson. By integrating technology in every lesson delivery, it excites our learners to learn the concepts of every lesson. |
| What aspect of my instructional practices do I need to improve on based on the inputs of the ESTA training? | I think, I still need to improve my strategy in delivering a lesson that is environment friendly to my learners. Activities that should have a clear and concise instructions so that the learners will easily understand. |

# REFLECTIONS

| | |
|---|---|
| How will my new understanding of Filipino learners help improve my classroom practice? | Buy understanding the Filipino values and varieties of every learner, I can improve the teaching practice from time to time. Also, keeping in mind the importance of "teacher reflection' after every lesson delivery will enhance more my teaching strategies for the upliftment of quality education. |
| Comments/Suggestions<br><br>I want to congratulate the ESTA team for their holistic support for this training for us science teachers. In crafting this huge project, it will benefit the entire Philippine Educators by adapting and uplifting the quality education in every region. | |

Rommel G. Jolo

**Participant**

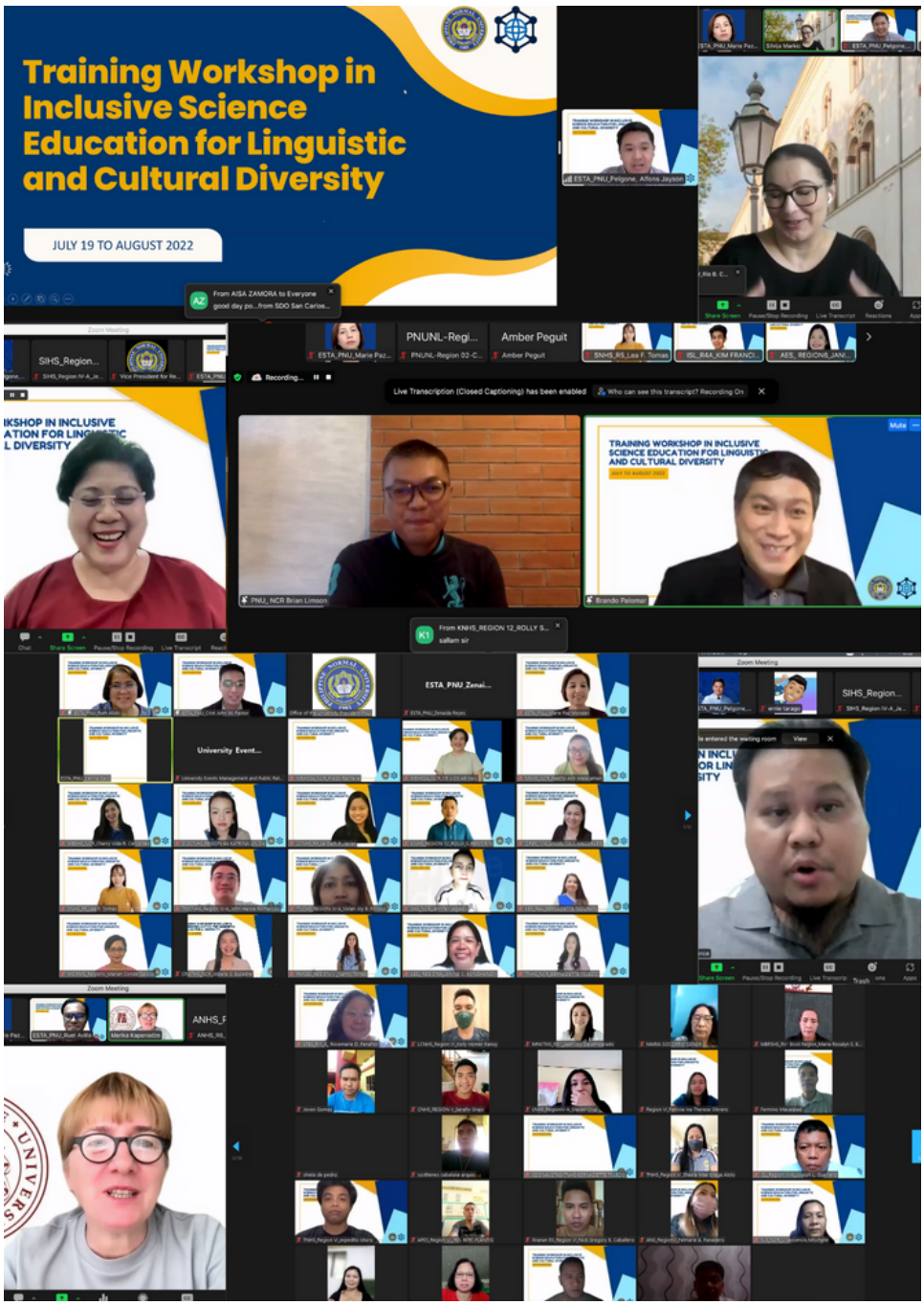
(Signature over printed name)

August 17, 2022

Date

# APPENDICES

# PHASE 1: SYNCHRONOUS PHASE



# APPROVED CONCEPT PAPER

Educating Science Teachers for All
Philippine Normal University
*The National Center for Teacher Education*

## Training Workshop in Inclusive Science Education for Linguistic and Cultural Diversity

### Inclusive Dates:

Synchronous: July 19, 20, 21, 22, 25, 27, Asynchronous [as per schedule with mentors: July 28-August 15], Closing Activity: August 16, 2022

### Purpose:

This intensive training is intended to retool or train the **basic education science teachers of the Department of Education** of the country for quality and inclusive science education.

### Proponent:

ESTA-PHIL-PNU Team

### Rationale:

Science teachers in the country encounter issues on and struggle against plurality of language, diversity and heterogeneity of learners. The Philippine plurality of language and culture is sourced from the cultural and linguistic profile of the Filipino people with about 110 indigenous groups and more than 170 languages spoken as first languages from a multitude of regional dialects and languages (Philippines, 28 September, 2017). Hence, it may be assumed that science education in the country takes place amidst ethnic divides that translate into linguistic and cultural diversity. Such social conditions in the school or classroom may hamper meaningful learning of science concepts.

Several research claim the vital contribution of teacher quality to student learning and achievement in general (Nilsen & Gustafsson, 2016; Seebruck, 2015). In fact, SDG 4 that promotes quality education, identifies recruitment and training of quality teachers as an important aspect to ensure inclusive quality education. Similarly, the Philippine Professional Standards for Teachers aims for teacher quality in the country. In congruence and in response to the Department of Education's aim to produce quality teachers, there may be a need to promote programs on capacity building and the retooling of in-service science teachers to better enact their science lessons.

Educating Science Teachers for All (ESTA) is a specially designed international project and program that seeks to contribute to the retooling program of the Department of Education,



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specifically science teachers through disseminating science teaching approaches in linguistically and culturally diverse contexts. Cognizant of these conditions, ESTA-PHIL-PNU team proposes to conduct an intensive training workshop to the Department of Education Science Teachers from all the regions of the country for an inclusive and quality science education. Primarily, the training will acquaint our science teachers to management of diverse classes within the context of the Philippine language and culture. This aim may be achieved by familiarizing the science teachers to the ESTA-Philippines-PNU framework, Science Education for Linguistic and Cultural Diversity in Philippine Public Higher Education (SELC-PhPHiEd) framework and to the other ESTA products. Design of lesson exemplars will also be the focus product of the training program.

## Objectives:

The training workshop aims to train science teachers in the aspect of providing an avenue to successfully manage diversity in science classes within the context of the country's language and culture. Specifically, the workshop aims to:

A. Provide inputs to science teachers on the concepts and constructs of science education, language for the sciences, and the contextualization of lessons;
B. Acquaint the science teachers with strategies in managing diverse science classrooms.
C. Orient the science teachers on the Science Education for Linguistic and Cultural Diversity in Philippine Public Higher Education (SELC-PhPHiEd) framework and other ESTA products.
D. Facilitate the development and validation of Lesson Exemplars

## Particular Continuing Professional Competency/ies:

A. Acquire understanding and appreciation of the concepts and constructs of science education, language for the sciences, and the contextualization of lessons;
B. Obtain an overarching understanding of the Science Education for Linguistic and Cultural Diversity in Philippine Public Higher Education (SELC-PhPHiEd) framework and other ESTA products (
C. Gain knowledge on the different theories, concepts, and principles in relation to the three major constructs of the SELC-PhPHiEd framework, which are: Filipino Learners, Teachers' knowledge and suited Pedagogies anchored on all PPST domains.
D. Enhance teaching proficiency of Filipino Science Teachers through an intensive training on language and cultural diversity for an inclusive science education
E. Acquire skills in developing Lesson Exemplars as directed/guided by the framework and models.
F. Establish linkages with professionals in the field of science education.



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### Training Design:

The training will include two phases: Plenary sessions and Mentoring Sessions. The plenary sessions are designed as synchronous sessions for the team to discuss to the participants the major concepts and principles. The team will share their knowledge on strategies on how to: (1) manage diverse and heterogeneous classes, and (2) integrate culture and language in teaching science concepts. The plenary sessions will accept as many participants as possible in the zoom platform and will also disseminate the synchronous session through FB live for more reach. The Mentoring sessions, however, will only accommodate a specific number of participants (100 participants). Selection criteria for the participants in the mentoring session includes: 1) having a strong commitment to complete the training program, 2) is handling a diverse science class, 3) has technological capability, 4) well-versed in one of the major mother tongue languages in the country.

Part 2 of the training is designed as a Mentoring Program. In this part or phase of the training, the participants will be assigned to one or two of the ESTA-PNU team members of the same specialization. Mentoring and consultation will include Lesson Exemplar Development, Peer Review and Revision of the participants' outputs. For this part of the training, each major activity as aforementioned for the mentoring and consultation is allotted a week of engagement with the participants in small research cells [grouping according to or based on specialization: Biology, Chemistry, Physics]. In summary, the training will include 32 hours of synchronous sessions [Plenary and Panel Critiquing] and three weeks of asynchronous sessions [Mentoring and Consultation].

### Expected Number of Participants:

Participants to this activity are about 1000 basic education science teachers for synchronous, 100 basic education science teachers for mentoring.

### Proposed Charge per Participant:

Participation in this Intensive Training Program will be free of charge. All expenses pertaining to participants' registration) will be covered by the project (Educating Science Teachers for All). Internet and communication expenses should be shouldered by the participants via their university/school funds.



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## Materials and Instruments:

This intensive Teacher Training utilize the following materials and instruments in the entire training program:

1. ***Lesson Exemplar (LE) Template***. This template designed based on the SELC-PhPHiEd framework will serve as guide to participants in the design and development of their respective Lesson Exemplars and all attached documents [e.g., worksheets, assessment].
2. ***Peer Review Form***. This form is an evaluation tool will be utilized in the first level quality assurance of the developed Lesson Exemplars
3. ***Evaluation Rubric.*** The LE template comes with an evaluation Rubric designed to frame the criteria for exemplars. The same tool will be utilized in the panel critiquing.
4. ***Reflection Template***. This will be utilized to help our participants document their journey in the training program in case they want to craft their manuscript.
5. ***Evaluation Form***. This form will be administered to the participants to assess the overall management of the training program and the attainment of the aforementioned objectives of the training.

## Matrix of Topics, Outcomes, Assessment, Activities and Outputs

| Sub-Topics and Time Allotment for every topic (in hours) | Expected Learning Outcomes | Activities to Achieve Learning Outcomes | Assessment Strategies including, Assessment Tools | Requirements/Outputs |
|---|---|---|---|---|
| **Day 1: [1:00-5:00 PM]**<br><br>Opening Program:<br><br>**Keynote 1**: Teacher Quality<br>**Plenary 1**: Science Education<br>**Keynote 2**: ESTA Program and the International Consortium | Acquires understanding and appreciation of the Teacher Quality including applicable sustainable development goals, and national goals<br><br>Obtains an overarching understanding of Philippine Science Education.<br><br>Be familiar and appreciates the International capability | Synchronous Online Lecture/Talk/Sharing | Presentation key concepts, critical issues and innovations from ESTA Project Leaders and invited speaker<br><br>Q&A strategies during the sharing process | Questions prepared by the participants to demonstrate deeper understanding of the topic.<br><br>Sharing of best practices. |



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| | building and international consortia | | | |
| **Day 2: [1:00-5:00 PM]**<br><br>**Plenary 2:** Language for Sciences<br>**AST 1:** Diversity in Class<br>**AST 2:** Conceptual Change | Gains knowledge on Language Diversity, Language for Sciences and possible strategies for science teachers to develop language command.<br><br>Enhances teaching proficiency of Science teachers by acquiring strategies on management of diversity in class and approaches on the implementation of Conceptual change in science classes. | Synchronous Online Lecture/Talk/Sharing<br><br>Workshop | Presentation key concepts, critical issues and innovations from ESTA-Philippines -PNU team members<br><br>Q&A strategies during the sharing process | Questions prepared by the participants to demonstrate deeper understanding of the topic.<br><br>Sharing of best practices. |
| **Day 3: [1:00-5:00 PM]**<br><br>**Plenary 3:** Contextualization<br>• Culture for Sciences<br>• Culture Integration<br><br>**AST 3:** Chemistry self-concepts: gender and culture, and the impact of chemistry self-concept on learning behavior<br>**AST 4:** Acquisition of Science Capital in Chemistry | Gains knowledge on Contextualization, culture for Science and Culture Integration and possible strategies for science teachers to contextualization of science lessons<br><br>Enhances teaching proficiency of Science teachers by acquiring strategies on how to integrate gender and culture in science classes and on the acquisition of science capital.<br><br>Acquires knowledge on how to develop Lesson Exemplars as directed/guided by the frameworks and models. | Synchronous Online Lecture/Talk/Sharing<br><br>Workshop | Presentation key concepts, critical issues and innovations from ESTA-Philippines -PNU team members<br><br>Q&A strategies during the sharing process | Questions prepared by the participants to demonstrate deeper understanding of the topic.<br><br>Sharing of best practices. |
| **Day 4: [1:00-5:00 PM]**<br><br>**Plenary 4:** Indigenous Languages and proficiency in Language | Gains knowledge on Indigenous Languages and possible strategies for science teachers to integrate language | Synchronous Online Lecture/Talk/Sharing<br><br>Workshop | Presentation key concepts, critical issues and innovations from ESTA-Philippines | Questions prepared by the participants to demonstrate deeper understanding of the topic. |



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| AST 5: Technology Integration | development in science classes<br><br>Enhances teaching proficiency of Science teachers by acquiring strategies on how to integrate technology in science classes.<br><br>Acquires knowledge on how to develop Lesson Exemplars as directed/guided by the frameworks and models. | | -PNU team members and invited speakers<br><br>Q&A strategies during the sharing process | Sharing of best practices. |
| Day 5: [1:00-5:00 PM]<br><br>Plenary 4: Other ESTA-Country Participants Experiences<br><br>AST 6: Flipped Classroom | Gains knowledge on the best practices and sharings of other ESTA-countries<br><br>Enhances teaching proficiency of Science teachers by acquiring strategies on how to implement Flipped Classroom<br><br>Acquires knowledge on how to develop Lesson Exemplars as directed/guided by the frameworks and models | Synchronous Online Lecture/Talk/Sharing<br><br>Workshop | Presentation key concepts, critical issues and innovations from ESTA-Philippines -PNU team members<br><br>Q&A strategies during the sharing process | Questions prepared by the participants to demonstrate deeper understanding of the topic.<br><br>Sharing of best practices. |
| Day 6: [1:00-5:00 PM]<br><br>Science Educator Sharing 1: Chemistry<br>Science Educator Sharing 2: Physics<br>Science Educator Sharing 3: Biology<br>Science Educator Sharing 4: Environmental Science | Acquires knowledge on how to develop Lesson Exemplars as directed/guided by the frameworks and models | Synchronous Online Lecture/Talk/Sharing<br><br>Workshop | Presentation key concepts, critical issues and innovations from ESTA-Philippines -PNU team members<br><br>Q&A strategies during the sharing process | Questions prepared by the participants to demonstrate deeper understanding of the topic.<br><br>Sharing of best practices. |
| Week 2 [Asynchronous] **Lesson Exemplar Development** | Acquires skills in developing Lesson Exemplars as | Workshop Facilitation | Facilitation of Workshop on Designing | Lesson Exemplar submission Reflection Form |



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| | directed/guided by the frameworks and models. | | Lesson Exemplars | |
| **Week 3** [Asynchronous] **Lesson Exemplar Peer Review** | Acquires skills in assessing developed Lesson Exemplars as peer guided by the SELC-PhPHiEd framework | Peer Review Workshop | Facilitation of Peer Review of Developed Lesson Exemplars | Peer Review Form Reflection Form |
| **Week 4** [Asynchronous] **Lesson Exemplar Revision** | Acquires skills in enhancing Lesson Exemplars as per peer assessment/evaluation | Workshop on Revision of Lesson Exemplars | Facilitation of Workshop on Enhancing Lesson Exemplars | Rubric on ESTA Lesson Plans |
| **Week 5** **Lesson Exemplar Presentation and Panel Critiquing** | | Presentation and Critiquing | Critiquing and revision of Lesson Exemplars | Presentation and Critiquing of Lesson Exemplars |

## Schedule of Activities

| Sub-Topics and Time Allotment for every topic (in hours) | Program Flow | Oral Presentation Themes | Speakers and Moderators |
|---|---|---|---|
| **Day 1: [1:00-5:00 PM]**<br><br>Opening Program:<br><br>**Keynote 1**: Teacher Quality<br><br>**Plenary 1**: Science Education<br><br>**Keynote 2**: ESTA Program and the International Consortium | 1:00-1:45 PM Opening Program<br><br>2:00-2:45 Keynote 1<br>2:45-3:30 Plenary 1<br>3:30-4:30 Keynote 2<br>4:30-5:00 Q&A | **Keynote 1: Teacher Quality**<br>This session will provide key discussion points on teacher quality. The aim is to provide teachers with an understanding of the extent of teacher quality to achieving quality education referenced to global themes such as the SDGs and national focus.<br><br>**Plenary 1: Science Education**<br>This session will familiarize teachers with the general purposes of Science Education and the aims and goals of science education in the Philippines.<br><br>**Keynote 2: ESTA Program and the International Consortium**<br>This session will focus on the description and nature of the international capacity building program for science teachers. | **VPA Jennie V. Jocson**<br>Vice President for Academics, PNU-Manila<br><br>**Prof. Marie Paz E. Morales**<br>ESTA-Phil-PNU Project Lead]<br><br>**Prof. Sylvia Markic**<br>ESTA-Project Lead<br><br>Moderator/Facilitator:<br>**Mr. Alfons Jayson O. Pelgone**<br>ESTA-Phil-PNU Team |



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| **Day 2: [1:00-5:00 PM]**<br><br>**Plenary 2**: Language for Sciences<br>**AST 1**: Diversity in Class<br>**AST 2**: Conceptual Change | 1:00-1:30 PM Preliminaries<br><br>1:30-2:30 Plenary 2<br>2:30-3:30 AST 1<br>3:30-4:30 AST 2<br>4:30-5:00 Q&A | **Plenary 2: Language for Sciences**<br>This session focuses on the rhetorical functions, syntactic constructions, and vocabulary frequently used in scientific discourse. In reviewing the language for Science, the participants will be directed to the aspects of language that can be highlighted in the module exemplars.<br><br>**AST 1: Diversity in Class**<br>This Academic Staff Tour engages participants through a thorough discussion of how to diagnose diversity in class. The session will familiarize participants on probable ways and activities to detect diversity and heterogeneity in class.<br><br>**AST 2: Conceptual Change**<br>This Academic Staff Tour engages participants through a thorough discussion of interest in science education as well as the conceptual change model. Part of the highlight of the session is the presentation of 'hooks' in teaching science which may be in the form of videos, puzzles and intriguing questions. The session is directed towards understanding how students coming from various socio-economic, cultural and language backgrounds bring with them a sense of conceptual understanding. Teacher knowledge on conceptual change allows science educators to provide engaging learning experiences to our science learners. | **Dr. Ruth A. Alido**<br>ESTA-Phil-PNU Team<br><br>**Mr. Alfons Jayson O. Pelgone**<br>ESTA-Phil-PNU Team<br><br>**Dr. Leah Amor S. Cortez**<br>ESTA-Project Team<br><br>Moderator/Facilitator: **Dr. Crist John M. Pastor**<br>ESTA-Phil-PNU Team |



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| **Day 3: [1:00-5:00 PM]**<br><br>**Plenary 3**: Contextualization<br>• Culture for Sciences<br>• Culture Integration<br><br>**AST 3**: Acquisition of Science Capital in Chemistry | 1:00-1:30 PM Preliminaries<br><br>1:30-3:30 Plenary 3<br>3:30-4:30 AST 3<br>4:30-5:00 Q&A | **Plenary 3: Contextualization**<br>This session leads the participants to acquire a deep understanding of the concept, background, and teaching-learning processes of contextualization. Included in the session is the development of one's epistemology of contextualization as the basis of one's praxis.<br><br>**AST 3: Acquisition of Science Capital in Chemistry**<br>This session focuses on identification of factors and drivers that encourage students to learn Chemistry, and at large, Science. The outcomes of the research article authored by Rüschenpöhler and Markic in 2019 to emphasize the role of families, peers and significant others in the development of positive attitudes and increased engagement of students to science. | **Dr. Zenaida Q. Reyes**<br>ESTA-Phil-PNU Team<br><br>**Dr. Crist John M. Pastor**<br>ESTA-Phil-PNU Team<br><br>Moderator/Facilitator: **Dr. Leah Amor S. Cortez**<br>ESTA-Phil-PNU Team |
| **Day 4: [1:00-5:00 PM]**<br><br>**Plenary 4**: Indigenous Languages and proficiency in Language<br><br>**AST 4**: Chemistry self-concepts: gender and culture, and the impact of chemistry self-concept on learning behavior<br>**AST 5**: Technology Integration | 1:00-1:30 PM Preliminaries<br><br>1:30-2:30 Plenary 4<br>2:30-3:30 AST 4<br>3:30-4:30 AST 5<br>4:30-5:00 Q&A | **Plenary 4: Indigenous Languages and proficiency in Language**<br>This session will disseminate how technology can be used to preserve the language of the indigenous people.<br><br>**AST 4: Chemistry self-concepts: gender and culture, and the impact of chemistry self-concept on learning behavior**<br>This session focuses on students' chemistry self-concept with respect to their cultural background and gender. The session also highlights the students thinking about science and scientists and the colonial portrayal of Filipinos.]<br><br>**AST 5: Technology Integration**<br>This session focuses on the nature, significance and methods of technology integration. The session | **Dr. Rochelle Irene G. Lucas**<br>ESTA-Phil-DLSU Team<br><br>**Dr. Arlyne C. Marasigan**<br>ESTA-Phil-PNU Team<br><br>**Mr. Ruel A. Avilla**<br>ESTA-Project Team<br><br>Moderator/Facilitator: **Dr. Ruth A. Alido**<br>ESTA-Phil-PNU Team |



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| | | also highlights some frameworks used in technology interaction inside a science classroom. | |
| **Day 5: [1:00-5:00 PM]**<br><br>**Plenary 5:** Other ESTA-Country Participants Experiences<br><br>**AST 6:** Flipped Classroom<br>Topic 1: Orientation to Lesson Exemplar (LE) Development Workshop<br>• Agreements for Part 2: LE Development Workshop<br>• Groupings for Consultation and Mentoring | 1:00-1:30 PM<br>Preliminaries<br><br>1:30-2:30 Plenary 5<br>2:30-3:30 AST 6<br>3:30-4:30 Topic 1<br>4:30-5:00 Q&A | **Plenary 5: Other ESTA-Country Participants Experiences**<br>This session will primarily focus on the sharing of other partner countries/universities on managing diversity and heterogeneity in science classes.<br><br>**AST 6: Flipped Classroom**<br>This session presents the theoretical underpinnings and instructional processes implemented in science teaching through flipped classroom approach (FCA). It also highlights the instructional technologies and significant implications of FCA as utilized in science teaching based on current empirical studies. Similarly, this session provides insights on how FCA is appropriately applicable in teaching science in the context of the pandemic and post-pandemic experiences.<br><br>**Topic 1: Orientation to Lesson Exemplar (LE) Development Workshop**<br>This session aims to present the features of the instructional design of the Lesson Exemplar anchored on the developed frameworks and models. The session also intends to familiarize the participants on the implementing guidelines on how to develop Lesson Exemplars influenced by the aforementioned models, agreements, groupings and processes of consultation and mentoring. | **Dr. Marika Kapanadze**<br>ESTA-Georgia Team<br><br>**Dr. Lydia S. Roleda**<br>ESTA-Phil-DLSU Team<br><br>**Dr. Brando C. Palomar**<br>ESTA-Project Team<br><br>Moderator/Facilitator: **Mr. Ruel A. Avilla**<br>ESTA-Phil-PNU Team |



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| **Day 6: [1:00-5:00 PM]**<br><br>Science Educator Sharing 1: Chemistry<br>Science Educator Sharing 2: Physics<br>Science Educator Sharing 3: Biology<br>Science Educator Sharing 4: Environmental Science | 1:00-1:30 PM Preliminaries<br><br>1:30-4:00 Insights and Experiences<br>4:00-5:00 Q&A | This session will primarily focus on the sharing of Science Teacher Educators on developing their courses using the framework. | Chemistry: Prof. Nelson Garcia<br><br>Physics 1: Prof. Amber Dea Marie V. Peguit-Opeda<br><br>Physics 2: Jayson L. De Vera<br><br>Biology 1: Dr. Marie Grace S. Cabansag<br><br>Biology 2: Dr. Brian M. Limson<br><br>Moderator/Facilitator: **Dr. Brando C. Palomar**<br><br>ESTA-Phil-PNU Team |
| **Week 2**<br>[Asynchronous]<br>**Lesson Exemplar Development** | | **Lesson Exemplar Development**<br>The session will focus on facilitating participants for them to be able to draft and craft their Lesson Exemplars. Informal sharing may be within and across groups and disciplines to exact the finest Lesson Exemplar for a particular science lesson or topic. | ESTA-Phil-PNU Team<br><br>PNU Science Educators |
| **Week 3**<br>[Asynchronous]<br>**Lesson Exemplar Peer Review** | | **Lesson Exemplar Peer Review**<br>In this session, crafted and designed Lesson Exemplars for science lessons or topics will be subjected to peer review (by fellow participants) to help the developers provide varied perspectives while peers assess their Lesson Exemplars. This session aims to provide constructive remarks for the improvement or enhancement of developed Lesson Exemplars and to determine alignment of designed Lesson Exemplars to the aforementioned models and frameworks. | ESTA-Phil-PNU Team<br><br>PNU Science Educators |



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| **Week 4**<br>[Asynchronous]<br>**Lesson Exemplar Revision** | | **Lesson Exemplar Revision**<br>In this session, developers of Lesson Exemplars will engage in revising their products based on the comments and suggestions of their peers. This is a prerequisite to the next activity that will focus on presentation of the revised Lesson Exemplars to the ESTA-Philippines-PNU Team and critiquing of the panel of evaluators. | ESTA-Phil-PNU Team<br>PNU Science Educators |
| **Week 5**<br>**Lesson Exemplar Presentation and Panel Critiquing** | | **Lesson Exemplar Presentation and Panel Critiquing**<br>In this session, crafted and designed Lesson Exemplars for science lessons or topics will be presented to the participants and experts. Critiquing will also be done to provide constructive remarks for the improvement or enhancement of presented Lesson Exemplars and to determine alignment of designed Lesson Exemplars to the aforementioned models and frameworks. | ESTA-Phil-PNU Team<br>PNU Science Educators |

**PROGRAM OUTCOMES:**

1. **People Service**: Training of Basic Education Science Teachers of the Department of Education
2. **Products**:
    a. ESTA-Phil-PNU Team
        i. Training Design
        ii. Documentation of the Training Program
        iii. Presentations and Activities
        iv. Video Recordings
        v. Mentoring Program
    b. Participants
        i. Lesson Exemplars in Science
        ii. Attachments to Lesson Exemplars
            1. Assessment Tools
            2. Worksheets or Activity Sheets
            3. Reading Materials (if applicable)
            4. List of References
        iii. Reflection Notes/Journal
3. **Publication:** One publication on training



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**Research Team**
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Team Leader

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2. Ruth A. Alido, Ph.D.
3. Marie Paz E. Morales, Ph.D.

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2. Leah Amor S. Cortez, Ph.D.
3. Alfons Jayson O. Pelgone, M.S.

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2. Mr. Mars M. Majul
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Submitted by:

**Marie Paz E. Morales, PhD**
Project Lead

Recommending Approval:

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Vice President for Academics

Approved:

**Bert J. Tuga, PhD**
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# CPD



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**ESTA, Educating Science Teachers for All <esta@pnu.edu.ph>**

## Re: Spreadsheet shared with you: "PNU-ESTA-Inital evaluation of CPD Documents.xlsx"

**Albania, Lovely Airein** <deguzman.lam@pnu.edu.ph> Fri, Jun 10, 2022 at 11:33 AM
To: "ESTA, Educating Science Teachers for All" <esta@pnu.edu.ph>
Cc: "Lariosa, Darrel" <lariosa.db@pnu.edu.ph>

Hello PNU-ESTA Team!

I am happy to report that the training is already credited with 15 CPD points. Please reflect the program accreditation number and CPD points in the participants' certificate (PTR-2017-044-1640).

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| PROG-2022-39980 | Training Workshop in Inclusive Science Education for Linguistic and Cultural Diversity | PTR-2017-044-1640 | Professional Teachers | 1100 | 124 | 15.00 | Accredited | | Submit Completion Report before Sep 15, 2022 |

Below is the list of attachments for the completion report. We will inform you once the council has assigned a CPD monitor for this training.

**Completion Report** per accredited CPD program shall be submitted within the specific period according to its type:
1. **Face-to-Face: 30 Calendar Days after the conduct**
2. **Webinar/Online: 10 Calendar Days after the conduct**
3. **Video-on-Demand: Every Month End**

Attach the following required supporting documents in order:
1. **Completion Report Form ("CPDD-05")**
2. **Electronic copies of registration and/or attendance sheets (in excel format)**
3. **Actual program of activities with the list and profile of lecturers/resource persons and information about any deviation from the approved pro**
4. **Lecture materials (Consolidated in One (1) PPT / PDF File only)**
5. **Summary of evaluation of resource persons in tabular form**
6. **Summary of evaluation of learning of the participants**
7. **Financial Report / Breakdown of Actual Expenses**
8. **Relevant photographs / screenshots of training / event proper**
9. **Souvenir magazine, if available**
10. **Others that may support the evaluation of your performance**

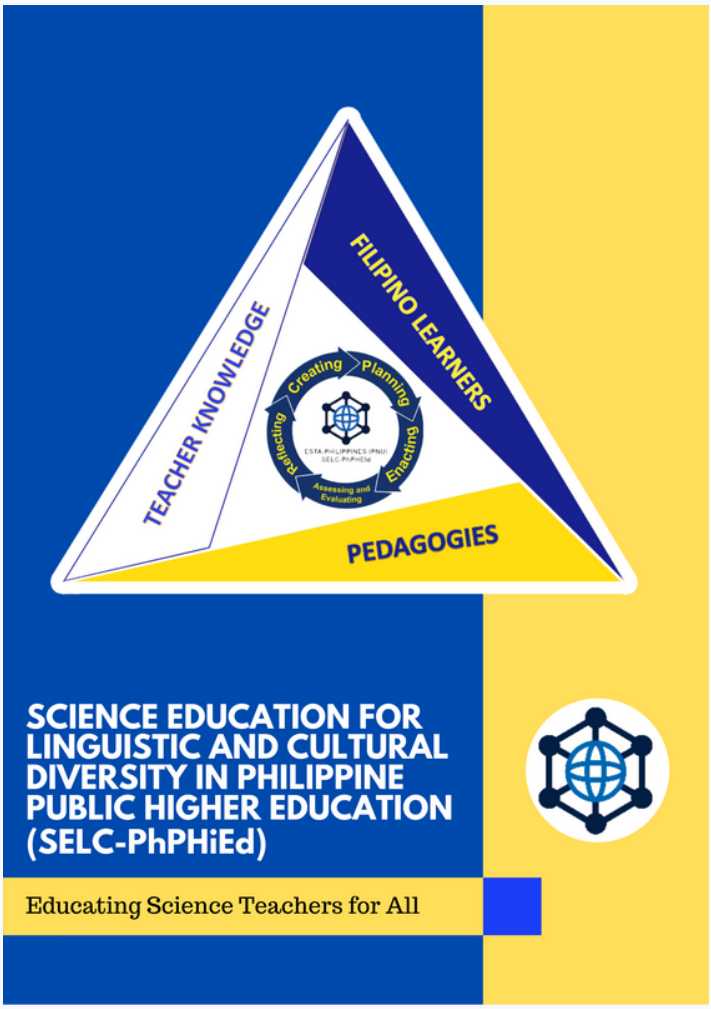
[Quoted text hidden]

**2 attachments**

**CPDD-COMPLETION REPORT FORM.docx**
63K

**CPD-Attendance Sheet (For Completion Report).xlsx**
20K

# ESTA-PNU FRAMEWORK




The framework for Science Education for Linguistic and Cultural Diversity in Philippine Public Higher Education (SELC-PhPHiEd) is visualized to encompass three major components: the Filipino learners, the pedagogies and pedagogical frameworks, and the teachers' knowledge system in terms of enacting the science curriculum. SELC-PhPHiEd presents the general constructs of focus in undertaking curricular modifications, enhancements, and enactment. These general constructs outline how the blueprint may also inform the different teacher education processes that inform teacher's knowledge, trainings and research in pedagogies, and the development of products for teaching and learning such as lesson exemplars, modules, and assessment within the bounds of linguistic and cultural inclusivity. SELC-PhPHiEd is PNU's vehicle to concretely advocate transfer of technology and disseminate knowledge on linguistic and cultural inclusivity to other Teacher Education Institutions for higher quality science education in the country.

# PRIMER


NATIONAL TRAINING - WORKSHOP IN INCUSIVE INCLUSIVE SCIENCE EDUCATION FOR LINGUISTIC AND CULTURAL DIVERSITY
July to August 2022
Please secure the zoom meeting link from the assigned mentor
Registration Link
https://bit.ly/PNUTeacherTrainingRegistration
Link to G-drive Folder
https://bit.ly/PNU-Teacher-Training
Informed Consent Form
https://bit.ly/ESTA-Informed-ConsentForm
NATIONAL TRAINING - WORKSHOP IN INCLUSIVE SCIENCE EDUCATION FOR LINGUISTIC AND CULTURAL DIVERSITY
PROGRAM
WEEK 2 Asynchronous
LESSON EXEMPLAR DEVELOPMENT
ESTA-Phil-PNU-Team
PNU Science Educators
WEEK 3 Asynchronous
LESSON EXEMPLAR PEER REVIEW
ESTA-Phil-PNU-Team
PNU Science Educators
WEEK 4 Asynchronous
LESSON EXEMPLAR REVISION
ESTA-Phil-PNU-Team
PNU Science Educators
WEEK 5 Asynchronous
LESSON EXEMPLAR PRESENTATION AND PANEL CRITIQUING
ESTA-Phil-PNU-Team
PNU Science Educators
CLOSING ACTIVITY
August 26, 2022
PHILIPPINE NORMAL UNIVERSITY
The National Center for Teacher Education
in collaboration with
EDUCATING SCIENCE TEACHERS FOR ALL
Links to Forms:
Form A: Lesson Exemplar Template:
https://bit.ly/FormA-LessonExemplarTemplate0
Form B: Evaluation Rubric:
https://bit.ly/FormB-EvaluationRubric0
Form C: Peer Review Form:
https://bit.ly/FormC-PeerReviewerForm0
Form D: Reflection Template:
https://bit.ly/FormD-ReflectionTemplate-0
Form E. Evaluation Form
https://bit.ly/FormE-EvaluationForm0
Form F: Implementation of ESTA Lesson Exemplar Template:
https://bit.ly/FormF-ImplementationofESTALessonExemplarTemplate0
Form G: Guidelines and Rubric for Hook Videos
https://bit.ly/GuidelinesandRubricforHookVideos0
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Educating Science Teacher for All

# FORMS

## Lesson Exemplar

**Educating Science Teachers for All**
**Philippine Normal University**
*The National Center for Teacher Education*

### LESSON EXEMPLAR

| **LEARNING STANDARDS** | | |
|---|---|---|
| **Course Intended Learning Outcome(s) (CILO)/Most Essential Learning Competencies (MELCS)** | | |
| *1.*<br>*2.*<br>*3.*<br>*4.* | | |
| **Objectives** | **Content** | **Tasks (What tasks should I give to students to ensure realization of the objectives)** |
| *1.a.*<br>*1.b.*<br>*2.a.*<br>*2.b.*<br>*(please provide additional rows if needed)* | *1.a.*<br>*1.b.*<br>*2.a.*<br>*2.b.* | *1.a.*<br>*1.b.*<br>*2.a.*<br>*2.b.* |
| **FILIPINO LEARNER** | | |
| Diagnosing the Learner | | |
| Based on your survey, describe the target audience for this lesson; what types of learning styles will you need to be mindful of? | | |
| *Class/Learner's Demographic Profile*<br>*Year Level: _____*<br>*Course/Discipline: _____*<br>*Number of Students: _____*<br>*Gender: (please write the percentage of the gender of the students including LGBTQIA+)* | | *Ethnicity: (please write the percentage of students belonging to specific Ethnic groups)*<br>*Language(s): (please write the percentage of the specific languages where students can speak proficiently)* |
| *Other forms of Heterogeneity (e.g., Technical Capability, economic status, race, disability, others with special needs)* | | |

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## Lesson Exemplar

| | |
|---|---|
| *Misconception/Course Topic Impression* | |
| **PEDAGOGIES** | |
| ***What skills will be addressed by this lesson?*** | ***What activities may be integrated in each to help enhance the learning of the content? [CLIL]*** |
| **Cognitive Skills (Link)** | **Language Function (Link)** |
| | *1. Reading* |
| **Science Process Skills** | *2. Listening* |
| | |
| **Future Skills (Link)** | *3. Writing* |
| | *4. Speaking* |
| **Scientific Attitudes and Filipino Values** | |
| | |
| ***What are the action words and vocabulary for this lesson? Please provide Mother Tongue translation for each identified vocabulary [MTB-MLE]*** | |
| **Key Language** (*Link to all constructs of Key Languages*) **(What children need to recognize/produce)** | |
| *Action Words (scientific processes)* | *Vocabulary (other terms)* |
| *Language Structure* | |
| **TEACHER KNOWLEDGE** | |

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| Technology Being Used by Students | Technology Being Used by Teacher |
|---|---|
| *What technology will my students use in this lesson?* | *What technology will I use in this lesson?* |
| *What were your reasons for choosing the technology for the students to use?* | *What were your reasons for choosing the technology in the lesson?* |
| *What are the limitations and potential problems in utilizing the technology?* | *What are the limitations and potential problems in utilizing the technology?* |
| **Assessment for Learning (Formative Assessment)** | **Teacher Competence** |
| *Assessment Strategy* | *What other skills (language competence, multicultural knowledge system, TPCK) and attitudes do you need in order to implement the lesson?* |
| *Feedback Strategy* | |
| *Technology which will be integrated in the Assessment* | |
| *Technology which will be integrated in the Feedback System* | |
| **Assessment of Learning (Summative Assessment)** | **Readings/Materials/Tools** |
| *1. How do you know students met the learning objectives and targets?* | *What materials, readings, tools do you need to improve your competence and confidence in teaching the topic?* |
| *2. What technology will you use to facilitate the assessment of learning?* | |
| **PROCESS** | |

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## Lesson Exemplar

*Walkthrough of the lesson (how will you deliver the lesson/topic (from engaging the student to ensuring achievement of learning objectives?)*

*1. How will I ensure interdisciplinarity (Use of STEAM Approach)?*

*(What specific activities will integrate STEAM?)*

***S:***
***T:***
***E:***
***Arts:***
***M:***

*2. How will I integrate culture, Language, gender and context in my lesson?*

*3. How will I encourage my students to communicate what they know and want to know?*

*4. What combination of pedagogies will I use to design the Lesson? How will I ensure the integration of the principles of inclusivity in my pedagogies?*

- ***STEAM Approach***
- ***CLIL***
- ***7E's***
- ***Constructivism***
- ***Social constructivism Theory***
- ***Second Language Acquisition Theory***
- ***Experiential Learning Theory***

***Other: (please specify)***

*5. What instructional flow would capture all these plans? (Present the lesson flow below. Use any applicable model e.g. Experiential model, 7E's)*

| Lesson Phase | Essential Question/s | Activity (specify the modalities) | Expected Output/Learning |
|---|---|---|---|
| | | | |
| | | | |

*How will the lesson delivery manifest efficient classroom management?*

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## Lesson Exemplar

| |
|---|
| *How will I integrate technology in the lesson delivery?* |
| *Summary: How will technology, content, and pedagogical knowledge work together in this lesson?* |
| **REFLECTIONS**<br>***(Please accomplish this part after lesson delivery)*** |
| *1. What worked or didn't work in the delivery of the lesson?*<br><br>*2. What difficulties have you encountered (during planning and delivering the lesson)?*<br><br>*3. What insight have you gained?*<br><br>*4. How do these insights connect or affect your teaching practice, and personal and professional life philosophy?* |
| **MODIFICATIONS**<br>***(Please accomplish this part after lesson delivery)*** |
| |

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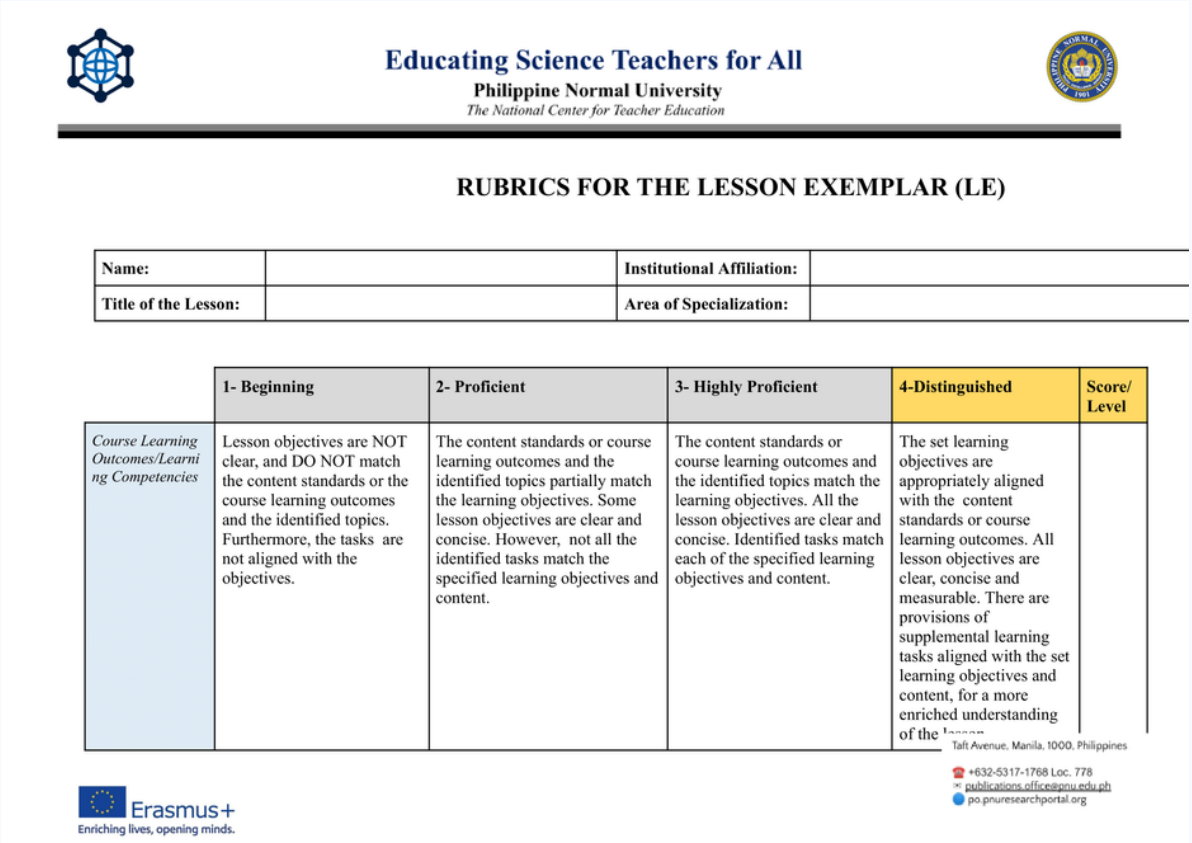
# FORMS

## Evaluation Rubrics for the Lesson Exemplar (LE)



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**RUBRICS FOR THE LESSON EXEMPLAR (LE)**

| | | | |
|---|---|---|---|
| **Name:** | | **Institutional Affiliation:** | |
| **Title of the Lesson:** | | **Area of Specialization:** | |

| | 1- Beginning | 2- Proficient | 3- Highly Proficient | 4-Distinguished | Score/ Level |
|---|---|---|---|---|---|
| *Course Learning Outcomes/Learning Competencies* | Lesson objectives are NOT clear, and DO NOT match the content standards or the course learning outcomes and the identified topics. Furthermore, the tasks are not aligned with the objectives. | The content standards or course learning outcomes and the identified topics partially match the learning objectives. Some lesson objectives are clear and concise. However, not all the identified tasks match the specified learning objectives and content. | The content standards or course learning outcomes and the identified topics match the learning objectives. All the lesson objectives are clear and concise. Identified tasks match each of the specified learning objectives and content. | The set learning objectives are appropriately aligned with the content standards or course learning outcomes. All lesson objectives are clear, concise and measurable. There are provisions of supplemental learning tasks aligned with the set learning objectives and content, for a more enriched understanding of the | |

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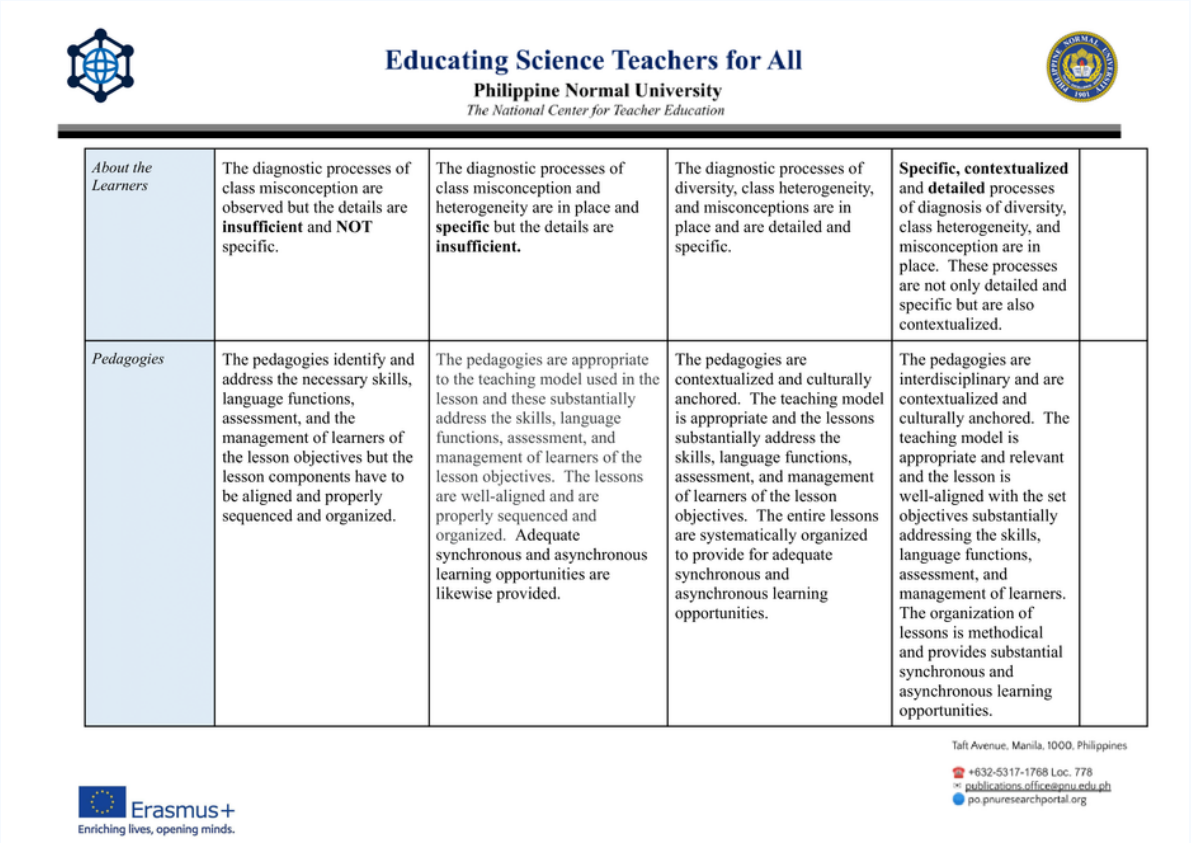
## Rubrics for the Lesson Exemplar (LE)



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| | | | | | |
|---|---|---|---|---|---|
| *About the Learners* | The diagnostic processes of class misconception are observed but the details are **insufficient** and **NOT** specific. | The diagnostic processes of class misconception and heterogeneity are in place and **specific** but the details are **insufficient.** | The diagnostic processes of diversity, class heterogeneity, and misconceptions are in place and are detailed and specific. | **Specific, contextualized** and **detailed** processes of diagnosis of diversity, class heterogeneity, and misconception are in place. These processes are not only detailed and specific but are also contextualized. | |
| *Pedagogies* | The pedagogies identify and address the necessary skills, language functions, assessment, and the management of learners of the lesson objectives but the lesson components have to be aligned and properly sequenced and organized. | The pedagogies are appropriate to the teaching model used in the lesson and these substantially address the skills, language functions, assessment, and management of learners of the lesson objectives. The lessons are well-aligned and are properly sequenced and organized. Adequate synchronous and asynchronous learning opportunities are likewise provided. | The pedagogies are contextualized and culturally anchored. The teaching model is appropriate and the lessons substantially address the skills, language functions, assessment, and management of learners of the lesson objectives. The entire lessons are systematically organized to provide for adequate synchronous and asynchronous learning opportunities. | The pedagogies are interdisciplinary and are contextualized and culturally anchored. The teaching model is appropriate and relevant and the lesson is well-aligned with the set objectives substantially addressing the skills, language functions, assessment, and management of learners. The organization of lessons is methodical and provides substantial synchronous and asynchronous learning opportunities. | |

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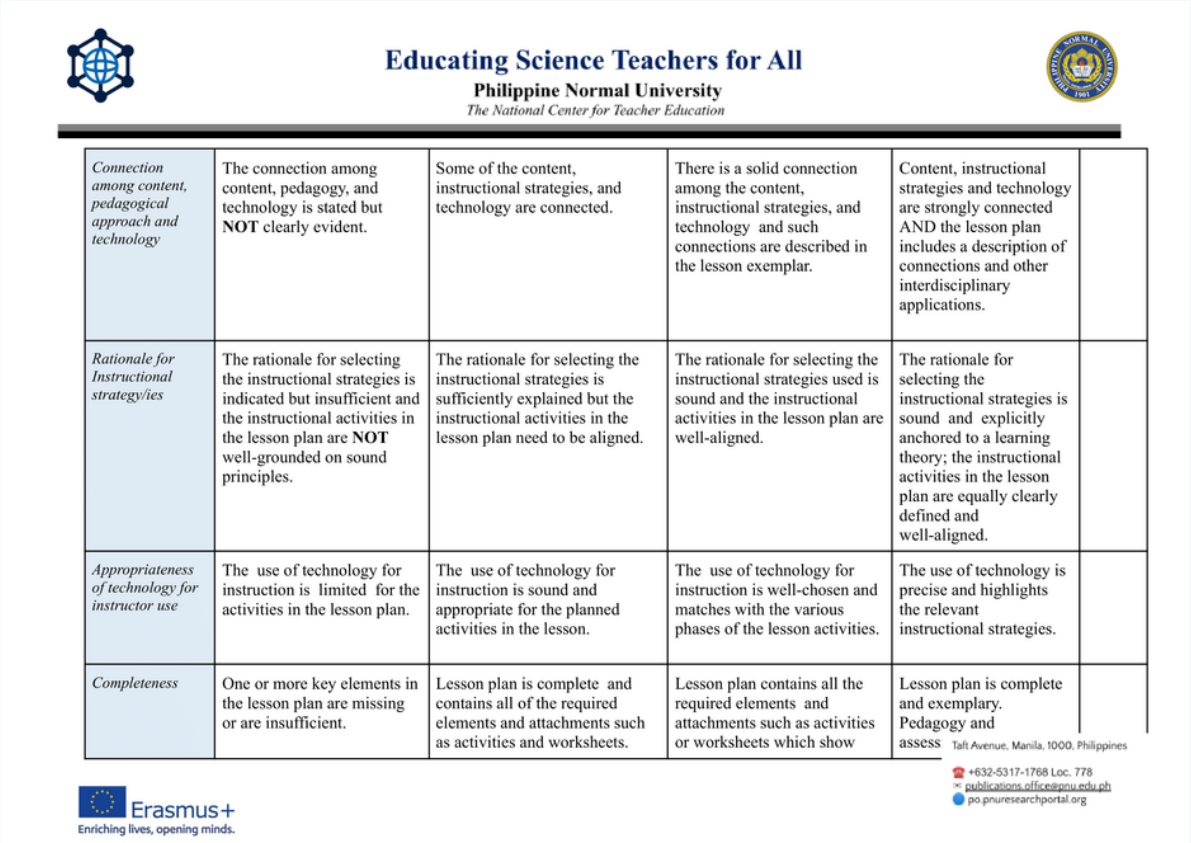

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| | | | | | |
|---|---|---|---|---|---|
| *Connection among content, pedagogical approach and technology* | The connection among content, pedagogy, and technology is stated but **NOT** clearly evident. | Some of the content, instructional strategies, and technology are connected. | There is a solid connection among the content, instructional strategies, and technology and such connections are described in the lesson exemplar. | Content, instructional strategies and technology are strongly connected AND the lesson plan includes a description of connections and other interdisciplinary applications. | |
| *Rationale for Instructional strategy/ies* | The rationale for selecting the instructional strategies is indicated but insufficient and the instructional activities in the lesson plan are **NOT** well-grounded on sound principles. | The rationale for selecting the instructional strategies is sufficiently explained but the instructional activities in the lesson plan need to be aligned. | The rationale for selecting the instructional strategies used is sound and the instructional activities in the lesson plan are well-aligned. | The rationale for selecting the instructional strategies is sound and explicitly anchored to a learning theory; the instructional activities in the lesson plan are equally clearly defined and well-aligned. | |
| *Appropriateness of technology for instructor use* | The use of technology for instruction is limited for the activities in the lesson plan. | The use of technology for instruction is sound and appropriate for the planned activities in the lesson. | The use of technology for instruction is well-chosen and matches with the various phases of the lesson activities. | The use of technology is precise and highlights the relevant instructional strategies. | |
| *Completeness* | One or more key elements in the lesson plan are missing or are insufficient. | Lesson plan is complete and contains all of the required elements and attachments such as activities and worksheets. | Lesson plan contains all the required elements and attachments such as activities or worksheets which show | Lesson plan is complete and exemplary. Pedagogy and assess | |

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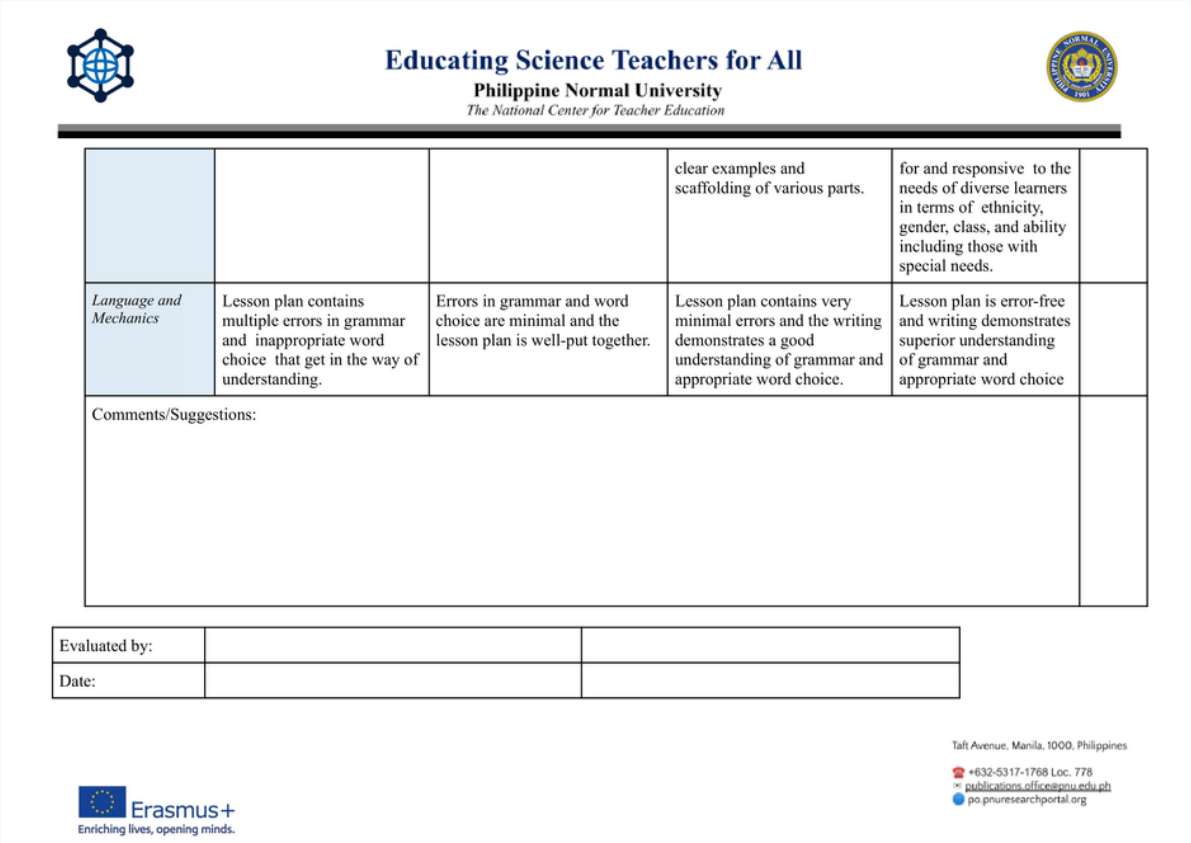
## Rubrics for the Lesson Exemplar (LE)



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| | | | | | |
|---|---|---|---|---|---|
| | | | clear examples and scaffolding of various parts. | for and responsive to the needs of diverse learners in terms of ethnicity, gender, class, and ability including those with special needs. | |
| *Language and Mechanics* | Lesson plan contains multiple errors in grammar and inappropriate word choice that get in the way of understanding. | Errors in grammar and word choice are minimal and the lesson plan is well-put together. | Lesson plan contains very minimal errors and the writing demonstrates a good understanding of grammar and appropriate word choice. | Lesson plan is error-free and writing demonstrates superior understanding of grammar and appropriate word choice | |
| Comments/Suggestions: | | | | | |

| | | |
|---|---|---|
| Evaluated by: | | |
| Date: | | |

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## Peer Review Form

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### PEER-REVIEW FORM

**Your Name:** _____ **Program:** _____
**Subject/Course:** _____
**Topic:** _____
**Lesson Title:** _____
**Level:** _____ **Lesson Duration:** _____

| ESTA Dimension | Attributes | 5 Exceeds standard | 4 Meets standard | 3 Nearly meets standard | 2 Does not meet standard | 1 No Evidence | Remarks/Suggestions |
|---|---|---|---|---|---|---|---|
| Course Learning Outcomes/Learning Competencies | Provides clear lesson objectives | ☐ | ☐ | ☐ | ☐ | ☐ | |
| | Topics/Content match the learning objectives | ☐ | ☐ | ☐ | ☐ | ☐ | |
| | Identified tasks match each of the specified learning objectives and content | ☐ | ☐ | ☐ | ☐ | ☐ | |

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| | | | |
|---|---|---|---|
| **Filipino Learners** | Specific and detailed processes of diagnosis of diversity, class heterogeneity, and misconception are in place. | □ □ □ □ □ | |
| **Pedagogies** | Skills [cognitive, science process, future] are accurately identified. | □ □ □ □ □ | |
| | Language functions match the provided activities. | □ □ □ □ □ | |
| | Exhibits contextualization/cultural integration | | |
| | Interdisciplinarity is evident and feasible. | □ □ □ □ □ | |
| | Assessments match instructional methods. | □ □ □ □ □ | |
| | Strategies or Theories of Learning and Principles of Teaching are reflected in the LE | | |
| | Lesson appears to help organize and manage student behavior—*Explains sequence of events and procedures for students.* | □ □ □ □ □ | |
| **Teacher's Knowledge** | | | |
| **Technology** | Lesson plan/exemplar incorporates at least 1 technology. | □ □ □ □ □ | |
| | Discusses possible limitations to technology or potential problems, as well as solutions. | □ □ □ □ □ | |

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## Peer Review Form

| | | | |
|---|---|---|---|
| | Provides clear rationale for technology choice to deliver instruction. | □ □ □ □ □ | |
| **Technological Content Knowledge** | Chooses appropriate technologies for subject domain (mathematics, science). | □ □ □ □ □ | |
| | Link between technology and content is obvious or explicit | □ □ □ □ □ | |
| **Technological Pedagogical Content Knowledge** | Appropriately uses content, pedagogy, and technology strategies. | □ □ □ □ □ | |
| | Technology enhances content objectives and instructional strategies. | □ □ □ □ □ | |
| **Completeness** | Lesson plan is complete with all its intended attachments [e.g. activities or worksheets etc.] AND includes the following:<br>• addresses higher-order thinking as per Bloom's Taxonomy<br>• integrates with other content areas<br>• provisions for students with special needs. | □ □ □ □ □ | |
| General Comments/Suggestions: | | | |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | Provides clear rationale for technology choice. | ☐ | ☐ | ☐ | ☐ | ☐ | |
| | Demonstrates understanding of technology as a teacher tool or student tool. | ☐ | ☐ | ☐ | ☐ | ☐ | |
| **Pedagogical Content Knowledge** | Selects effective teaching strategies appropriate to the subject domain to guide student thinking and learning. | ☐ | ☐ | ☐ | ☐ | ☐ | |
| | Demonstrates awareness of possible student misconceptions. | ☐ | ☐ | ☐ | ☐ | ☐ | |
| | Presents appropriate strategies for developing understanding of the subject content. | ☐ | ☐ | ☐ | ☐ | ☐ | |
| **Technological Pedagogical Knowledge** | Chooses technologies enhancing approaches (teacher-centered approaches) –*Uses technology to present material.* | ☐ | ☐ | ☐ | ☐ | ☐ | |
| | Chooses technologies enhancing student learning (student-centered approaches) –*Students use technology to explore content and achieve learning goals.* | ☐ | ☐ | ☐ | ☐ | ☐ | |

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## Reflection Template

**ESTA-PNU-Training/Workshop**

### Reflection Form/Template

**Project Title:**
Education Science Teachers for All (ESTA)

**Participant Profile**

- Name of Participant: _____
- School/Campus/Hub Affiliation: _____
- Science Courses/Subjects taught: _____
- Place of Origin: _____ Ethnicity (*if any*):_____
- Languages Spoken: _____

**Training Workshop Details**

- Session Title: _____ Date and Time:_____
- Workshop/Training Modality: Online Synchronous
- Technology used during the workshop/training: _____
- Languages used during the workshop/training: _____
- Indigenous Knowledge (IK) used during the workshop/training: _____
  _____

**Details of Reflection**

*(Please narrate your entire experience while attending the training/workshop. Highlight all insights and key points gained from your involvement in the different sessions.*

| | |
|---|---|
| Lesson Exemplar Development | |
| Lesson Exemplar Peer Review | |
| Lesson Exemplar Revision and Finalization | |
| Mentoring Program | |

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## Reflection Template

| | |
|---|---|
| **Reflection** | |
| *Reflect on the whole process of your professional learning with ESTA by answering the questions below.* | |
| What have I learned from this mentoring program involvement? | |
| How could my students and my school benefit from this involvement? | |
| What were the challenges I experienced during the conduct of all activities relative to the mentoring program? | |
| What aspects of my involvement in this project would I like to keep? | |
| What aspect of my teacher knowledge do I need to improve on based on the inputs of the ESTA mentoring program? | |
| What aspect of my instructional practices do I need to improve on based on the inputs of the ESTA training? | |
| How will my new understanding of Filipino learners help improve my classroom practice? | |

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## Reflection Template

| Comments/Suggestions |
| --- |
| |

**Participant**
(Signature over printed name)

Date

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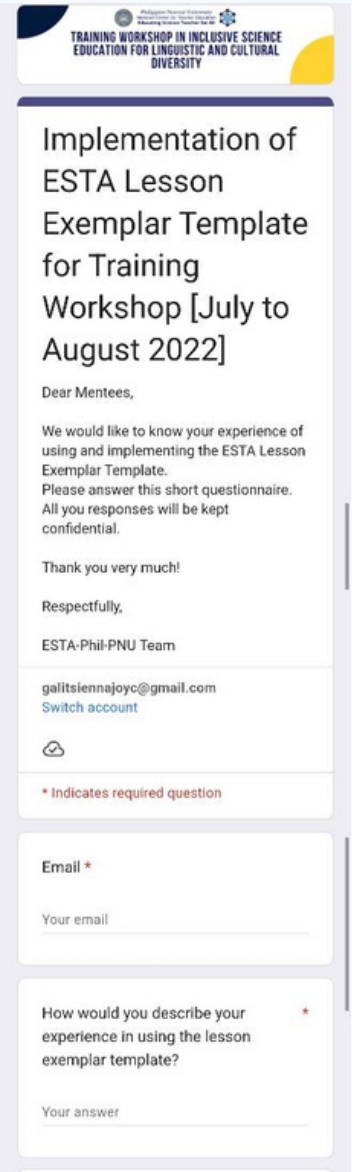
## Implementation of ESTA Lesson Exemplar Template for Training Workshop


TRAINING WORKSHOP IN INCLUSIVE SCIENCE EDUCATION FOR LINGUISTIC AND CULTURAL DIVERSITY

Implementation of ESTA Lesson Exemplar Template for Training Workshop [July to August 2022]

Dear Mentees,

We would like to know your experience of using and implementing the ESTA Lesson Exemplar Template.
Please answer this short questionnaire.
All you responses will be kept confidential.

Thank you very much!

Respectfully,

ESTA-Phil-PNU Team

galitsiennajoyc@gmail.com
Switch account

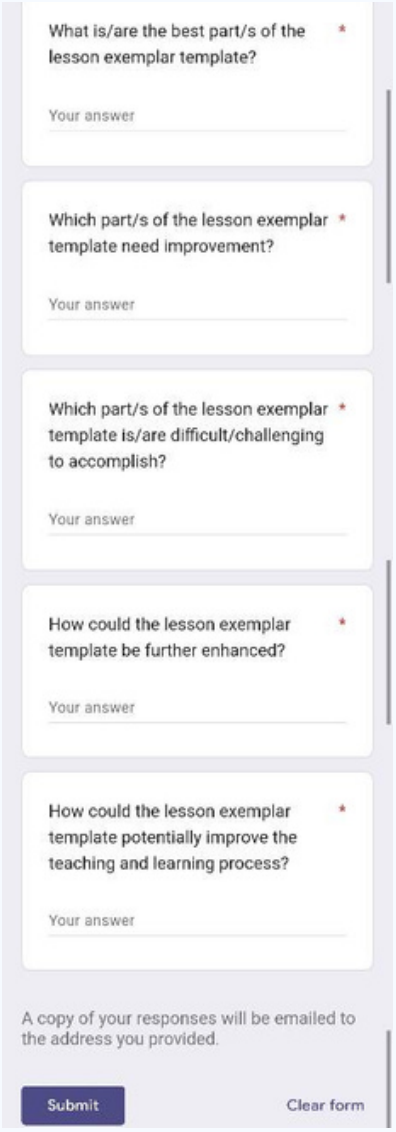
* Indicates required question

Email *

Your email

How would you describe your experience in using the lesson exemplar template? *

Your answer


What is/are the best part/s of the lesson exemplar template? *

Your answer

Which part/s of the lesson exemplar template need improvement? *

Your answer

Which part/s of the lesson exemplar template is/are difficult/challenging to accomplish? *

Your answer

How could the lesson exemplar template be further enhanced? *

Your answer

How could the lesson exemplar template potentially improve the teaching and learning process? *

Your answer

A copy of your responses will be emailed to the address you provided.

Submit

Clear form