

Republic of the Philippines **Department of Education** REGION IV-A CALABARZON GATE 2, KARANGALAN VILLAGE 1900 CAINTA, RIZAL



March 2, 2022

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Home-based Biology Experiments Microtraining Course for Teachers

Relative to the letter of DE LA SALLE University Manila, there will be a virtual course entitled "Home-based Biology Experiments For Teachers (HBE4T) Microtraining Course" from the 3rd week of January until the 1st Week of April 2022 using Learn Worlds and Zoom conference.

This virtual course aims to teach and guide the teachers in the development, validation, implementation, and evaluation of their home-based biology experiments (HBEs) to improve the quality of biology teaching in the region.

The activity is open to 50 public and private science teachers. The virtual course is free. Please see the attached documents for further information and details.

clmd/ptm





January 4, 2022

RE: Home-based Biology Experiments Microtraining Course for Teachers

MR. JOB. ZAPE JR.

Chief, Curriculum Learning Management Development Department of Education, Region IV-A CALABARZON

Dear Mr. Zape Jr.,

Greetings of peace, good health, and a prosperous New year ahead!

Teachers are the most significant contributors to raising educational standards. They are the key implementers of new programs and practices that impact students' learning. In the past two years, science teachers were significantly challenged by the educational shift from in-person classes to remote teaching and learning brought by the COVID-19 pandemic. Laboratory experimentation, in particular, has been halted to reduce face-to-face interaction and control the spread of the virus. This major challenge inspired us to develop a "Home-based Biology Experiments (HBEs)" compilation. HBEs are practical activities that utilize readily available household materials and tools which are affordable and safe to implement. HBEs can be used in teaching biology synchronously and asynchronously. HBEs, as teaching and learning resources, have been validated and found to be effective in improving students learning and engagements.

Understanding the need to share these practices with our fellow science teachers, we have developed a virtual course entitled **"Home-based Biology Experiments For Teachers (HBE4T) Microtraining Course".** The main objective of this training course is to teach and guide the teachers in the development, validation, implementation, and evaluation of their home-based biology experiments (HBEs) to improve the quality of biology teaching in the region. Overall, 50 science teachers will be selected to participate in this training course from the 3rd week of January until the 1st Week of April 2022 using Learn Worlds and Zoom conference. Attached in this letter are the; a). Poster b). Abstract c). Training Matrix, d.) survey questionnaires, and d). the Bio note of the lead facilitator for your perusal.

To encourage our teachers to participate in this virtual training course, we are writing this letter to humbly ask for your approval and formal endorsement to disseminate our invitation to teachers and for us to conduct this microtraining course. This HBE4T Microtraining course will benefit the teachers and the students. This will allow them to develop and implement relevant and validated teaching resources that promote authentic learning. Should you have any questions or concerns, please let us know.

We are looking forward to your positive response on this matter. Thank you very much!

Sincerely,

Mr. Dave Arthur R. Robledo Lead Researcher & Facilitator

Dr. Maricar S/ Prudente

Adviser



ABSTRACT

Home-based Biology Experiments For Teachers (HBE4T) Microtraining Course is a 12-week virtual training course that provides free training for teachers in developing, implementing, and evaluating their HBEs using action research. Overall, 50 teacherparticipants will be selected according to the following criteria; location, teaching biology or elementary science, with a strong internet connection, with a laptop or any electronic device for synchronous and asynchronous sessions, with a good level of digital skills, willingness to develop, implement, and evaluate their self-made or modified home-based biology experiments, willing participate in interviews and focus group discussion, ready to participate in a 12-week online microtraining with synchronous (1 hour per week) and asynchronous sessions. At the end of the microtraining, the teacher-participants will present their best practices in using HBEs in virtual culminating activity. Moreover, the teacher-participants will also accomplish a survey form to determine the effects of the HBE4T Microtraining on their self-efficacy, resiliency, and professional development. I the researcher will offer this microtraining for "free", including the other benefits such as free action research workshops; they will also have the chance to contribute and publish their work in the HBE manual, they will receive a certificate of participation and recognition issued by recognized professional organizations, they will receive a free one-year membership to BIOTA Philippines, and they will have the chance to acquire monetary grants and recognition for the Best HBE practice awards during the culminating program on the 12th week and in ARAL 2023.





BIONOTE OF THE FACILITATORS

FACILITATOR	BIONOTE
Mr. Dave Arthur R. Robledo	Dave Arthur R. Robledo is a PhD candidate at De La Salle University-Manila, where he studies home-based biology experiments as alternative learning material for distance learning. He holds a MS in biology teaching, where he studied the educational design and utilization of improvised microbial fuel cells.
Dr. Maricar S. Prudente	Dr. Maricar S. Prudente is a Full professor 10 of the Science Education Department of De La Salle University-Manila. She has PhD in Environmental Chemistry and Ecotoxicology, and her research work is focused on environmental issues, action research and integration of technology and development of 21st Century skills in the teaching of science.
Dr. Socorro E. Aguja	Dr. Socorro E. Aguja is currently the Vice Dean of the Graduate School of De La Salle-Araneta University, Malabon City. Her research activities are multidisciplinary as it covers the area of science education, action research, environmental studies, and human capital development.



TRAINING MATRIX

Title: Home-based Biology Experiments for Teachers: A Virtual Microtraining Course **Target Participants:** 50 public or private school science teachers **Learning Platform:** Asynchronous (Learn worlds and Google Classroom), Synchronous (Zoom) **Dates:** 4th Week of January 2022 until the 2nd Week of April 2022.

Week	Торіс	Participants' Tasks	Organizers' Tasks	Expected Outputs	Facilitator
1	Introduction to HBEs	Participate in a 1-hour interactive session about home-based biology experiments.	Discuss the roles of HBEs in teaching and learning biology concepts.	Identified Specific topic and Learning Competencies for HBEs	Mr. Dave Arthur R. Robledo
2	Planning and Conceptualizing HBEs	Create a draft or proposal for HBEs that is suitable and appropriate for their respective classes.	Discuss the procedures in designing experiments and guide the teachers in draft making process.	Initial Draft of HBEs	Mr. Dave Arthur R. Robledo
3	Safety and Ethical Issues on HBEs	Identify the safety, ethical, and environmental issues on their proposed HBEs.	Discuss the ethical, safety, and environmental considerations on the development of HBEs.	Identified ethical and safety issues. Modified HBE draft.	Mr. Dave Arthur R. Robledo
4	Development and Pilot-testing of HBEs	Develop and pilot-test their proposed HBEs.	Guide the participants in the development and pilot-testing.	Final draft of Home-based Biology Experiment.	Mr. Dave Arthur R. Robledo



5	Validation of HBEs and School Approval for Implementation	Participate in the validation process and seek the Principals' approval for the implementation of HBEs. Week 6 to V	Lead and assist the validation process and provide template for the letter of approval. Week 9 – Implementation o	Validated HBEs School's Approval f Validated HBEs	Mr. Dave Arthur R. Robledo
6	Action Research Orientation	Participate in the virtual action research webinar and draft their action research proposal.	Discuss the foundations of Action Research, and guide the participants in developing their action research.	Action Research Plan	Dr. Maricar S. Prudente Dr. Socorro Aguja
7	Presentation of Action Research Plan	Participants will submit or share their action research during a synchronous session.	Provide comments or feedback on their action research plan.	Revised Action Research Plan	Dr. Maricar S. Prudente Dr. Socorro Aguja
8	Distribution of Questionnaires (TKSUHQ, STSB, TRQ, PLPDQ, PDPDEF)	Fill out the survey questionnaires.	Assist the participants in filling out the survey questionnaires.	Accomplished survey forms.	Mr. Dave Arthur R. Robledo
9	Focus Group Discussion (Drawing Best Practices for Parental Involvement)	Participate in the virtual FGD and share their practices in integrating parental involvement to their classes.	Facilitate the FGD and summarize the inputs of the participants.	Feedback, comments, and responses on the best practices of parental involvement.	Mr. Dave Arthur R. Robledo



10	Evaluation of HBEs using Action Research	Participate in the virtual webinar on the use of action research as evaluation tool for HBEs	Discuss the use of AR as evaluation tool for HBEs	Finalized Action Research Plan	Mr. Dave Arthur R. Robledo
11	Revisions and Modifications on HBEs	Improve and modify their HBEs based on the feedbacks and comments.	Provide the template for final HBE draft. (template for publication)	Individual HBE draft as contribution to the teachers' manual.	Mr. Dave Arthur R. Robledo
12	Culminating Activity Teachers' Presentation of HBE Experiences	Some of the participants will share their experiences in using HBEs.	Organize the culminating activity, and recognize the "Best Presenters" and "Best HBE Drafts".	HBE Experiences Presentation	Mr. Dave Arthur R. Robledo

NOTE:

All outputs will evaluated using the attached rubrics (Rubric for Oral Presentation, and Rubric for HBEs)

Aside from the free training and action research webinar, all participants will receive the following if they completed the 12 sessions, and summitted all the assigned tasks;

- O Certificate of Participation
- O One year free membership to BIOTA Philippines.



RUBRIC FOR HBE ORAL PRESENTATION

CRITERIA	4	3	2	1
CLARITY/ORGANIZATION/ DEPTH OF PRESENTATION	Presentation is very clear and comprehensive with the use of well-crafted audio/visual aids.	Presentation is satisfactory with good audio/visual aids.	Presentation lacks clarity and organization with inappropriate visual aids.	Vague and shallow presentation with no visual aids.
CONTENT/STUCTURE	Shows full understanding of the topic. The actual presentation was exceptionally well-organizes and easy to understand.	Shows a good understanding of the topic. The flow of the presentation was clear and concise and easy to follow.	Shows a good understanding of parts of the topic. The presentation was somewhat unclear and somewhat confusing to follow.	Does not seem to understand the topic. The flow of the presentation was unclear and confusing to follow.
MASTERY OF SUBJECT	The speaker makes evident the knowledge of the subject, demonstrating the ability of answering questions related to the topic.	The speaker shows enough knowledge and management of the topic, being able of answering questions.	The speaker proves some knowledge of the topic and can answer a few questions.	The speaker does not master the subject completely and is unable to answers questions.
LANGUAGE USAGE	Presenter used the best sentence structure/syntax that supported the topic.	Presenter used correct sentence structure/syntax that was appropriate in supporting the topic.	Presenter used correct sentence structure/syntax that was mostly appropriate in supporting the topic.	Presenter used incorrect sentence structure/syntax that was not appropriate for the topic.
COMMUNICATIVE ABILITY/ CONFIDENCE	Exhibits poise and confidence and can communicate in a convincing/pers uasive manner	Highly satisfactory communication skills with poise and confidence.	Good communication skills with low level of poise and confidence.	Poor communication skills with low level of poise and confidence.



RUBRIC FOR HBE EVALUATION

Components	3 Points	2 Points	1 Point
OBJECTIVES	Brief, clearly stated problem or question, relevant to the task.	Brief, somewhat clearly stated problem or question, relevant to the task.	Poorly stated question or problem. May lack relevance.
HYPOTHESIS	Hypothesis is clearly stated in one sentence and supported by previous knowledge or research.	Hypothesis is somewhat vague, unclear, or wordy, and is somewhat based on previous knowledge or research.	Hypothesis is unclear and not based on previous knowledge or research.
EXPERIMENTAL DESIGN	Procedure is specific, addresses the question or problem, defines data collection and specifies an appropriate control.	Procedure is somewhat specific, does not completely address the question or problem, defines data collection, and specifies the control.	Procedure is not specific, does not address the question or problem, or data collection and does not specify an appropriate control.



Teachers' Knowledge and Skills on the Use of HBEs Questionnaire

Please read the following statements carefully and encircle the number which corresponds to the item that applies to your perspective. In these items:

- 4= strongly agree,
- 3= agree,
- 2= disagree,
- 1= strongly disagree

I. Kno	wledge on HBEs					
1.	Objectives were clearly stated and attainable.	1	2	3	3 4	
2.	Materials and tools were easy to use, readily	1	2	3	3 4	
	available and affordable.					
3.	Home-based biology experiment was safe to	1	2	3	3 4	
	perform and risk-free.					
4.	Instructions and procedures were clearly stated, organized, and easy to follow.	1	2	3	84	
5.	Materials were changeable and modifiable.	1	2	3	8 4	
II. Ski	lls on HBEs					
Ноте	-based biology experiment					
1	diractly applies what was taught in the losson	1	c	2	Л	
1.	shows coherence and congruence with the topic	1 1	2	ר כ	т 4	
۷.	discussed	T	2	J	т	
З	provides real-life application of the lesson	1	2	З	4	
4.	provides a good hands-on activity for the topic.	1	2	3	4	
5.	relates with the processes and concepts taught	1	2	3	4	
•	in the lesson.	-	_	•	•	
III. E>	xperience on HBEs					
1.	Home-based biology experiment was fun.	1	2	3	4	
2.	Home-based biology experiment gives me the					
	opportunity to modify and use alternative					
	materials.					
3.	Home-based biology experiment was	1	2	3	4	
	challenging.					
4.	Home-based biology experiment was an	1	2	3	4	
	effective way to learn about the assigned topics.					
5.	Home-based biology experiment makes me feel	1	2	3	4	
	enthusiastic to learn more about the topic.					



Science Teaching Efficacy Belief Instrument

Please indicate the degree to which you agree or disagree with each statement below by circling the appropriate letters to the right of each statement.

- SA = Strongly AgreeA = Agree
- UN = Uncertain
- D = Disagree SD = Strongly Disagree
- When a student does better than usual in science, it is often because the 1. teacher exerted
 - a little extra effort.
- 2. I am continually finding better ways to teach science.
- Even when I try very hard, I don't teach science as well as I do most 3. subjects.
- When the science grades of students improve, it is most often due to their 4. teacher having
- found a more effective teaching approach.
- 5. I know the steps necessary to teach science concepts effectively.
- 6. I am not very effective in monitoring science experiments.
- If students are underachieving in science, it is most likely due to ineffective 7. science
 - teaching.
- 8. I generally teach science ineffectively.
- The inadequacy of a student's science background can be overcome by 9. good teaching.

The low science achievement of some students cannot generally be blamed 10. on their

teachers.

When a low achieving child progresses in science, it is usually due to extra 11. attention

given by the teacher.

I understand science concepts well enough to be effective in teaching

12. elementary science.

Increased effort in science teaching produces little change in some

13. students' science achievement.

The teacher is generally responsible for the achievement of students in 14. science.

15. Students' achievement in science is directly related to their teacher's effectiveness in science teaching.