

# Perceptions of Environmental Science and Management Students on Synchronous Online Teaching of Environmental Policies: Learning Experience from Southeast Asian Cohort

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## ABSTRACT

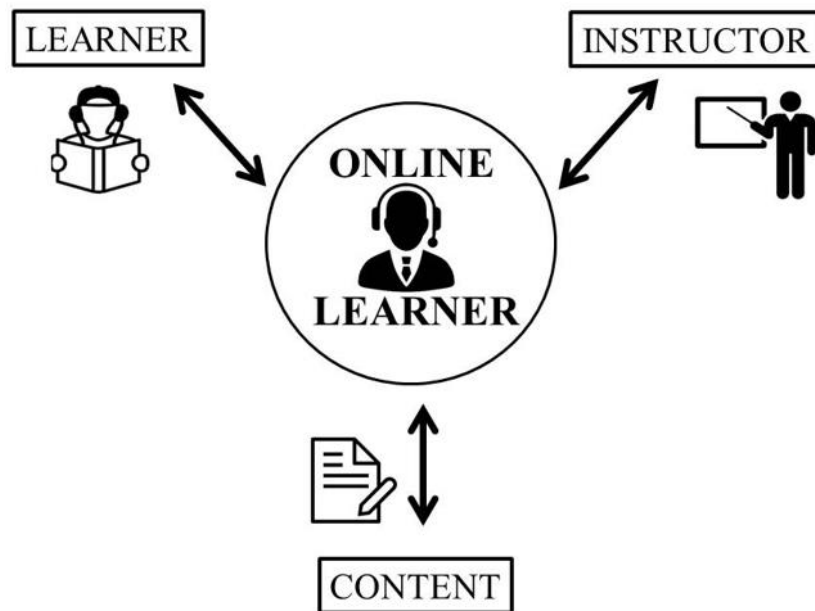
Understanding global environmental policies addresses the aim of educating individuals to become environmentally literate on pertinent issues related to sustainable development. Online classes were established recently in most public universities in Vietnam to address the educational backlash brought by the COVID-19 pandemic crisis. This case study was conducted to serve as baseline information on the effectiveness of using online platforms to teach environmental policies among undergraduate Environmental Science and Management students. The qualitative-quantitative responses elicited from semi-structured interviews, online classroom observation, and survey of 11 Filipino and 8 Vietnamese students have confirmed the role of learner-instructor, learner-learner, and learner-content interactions in creating an impactful online experience from students usually stereotyped as passive learners. In spite of some technical and physical challenges identified in this study, utilizing online platforms have positively helped undergraduate students to raise their personal environmental knowledge related to many global environmental policies and environmental consciousness towards building a more sustainable future. Hence, synchronous online learning is a pedagogy that can be adapted by most Vietnamese educators.

**Keywords:** Advanced Education Program, ASEAN, distance learning, environmental analysis, SDG 4 (quality education)

## INTRODUCTION

As a by-product of rapid globalization, environmental issues i.e. climate protection, sustainable solid waste management, and conservation of biodiversity, which goes beyond national borders have risen (Lenschow et al., 2016). This is now addressed by international cooperation that covers the development of guiding decision frameworks in a form of international environmental policies (Galaz & Hahn, 2008; Merrill et al., 2017). For many developing countries especially in Southeast Asia, these environmental policies are usually discussed on many educational platforms (Chou & Ravinet, 2017; Ho & Ang, 2018; Sanusi & Khelghat-Doost, 2008). This now leads to the development of independent subjects, which is coined with different names such as *Environmental Policies and Law*, *Environmental Policy Analysis*, or *Global Environmental Policy*, that is usually taught on undergraduate teaching programs of public universities specializing in environmental sciences. The theoretical concepts related to environmental policies are considered to be important on both raising students with holistic insights about global environmental problems and on creating an environmentally literate society adhered to the concepts of sustainable development. Hence, learning environmental policies is considered to be a core subject in most environmental science curriculum including in the universities of rapidly developing country like Vietnam.

The traditional classroom lectures that involve face to face contact of the lecturers with the students are what commonly practiced in most conservative public universities in Vietnam. Therefore, when many public universities in the country are forced to temporarily suspend their academic semester due to the immediate government lockdown orders brought by the COVID-19 pandemic, most of these public universities resorted to online distance learning as an alternative to continue on selected undergraduate courses in the university. Online learning has been a well-established educational paradigm (Shalev-Shwartz, 2012) that has been popularly used in many reported case studies in Western universities (Robinson & Hullinger, 2008; Smart & Cappel, 2006) and are applied on different undergraduate courses such as business (Blau & Kapanjie, 2016), education (Cho et al., 2017), health care (Palominos et al., 2019), and pharmacy (Almaghaslah et al., 2016). In a comparative study between face to face

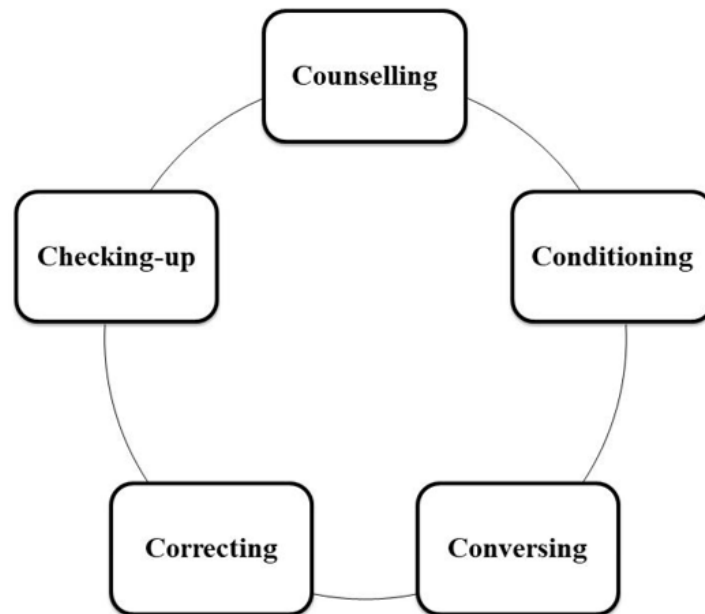


**Figure 1.** Theoretical framework of the three types of interactions to engage online learners

approach and online learning reported by Paechter and Maier (2010), students seem to prefer face-to-face learning when conceptual knowledge and skills in the applications of one's knowledge are to be learned, however students favored online learning if skills that involve self-paced knowledge were expected for them to be acquired.

The effectiveness of online classes relies heavily on three types of interactions (Figure 1, Moore, 1993) that help to facilitate the active and engaged behaviors of the online learners (Lear et al., 2010). The online learner's connections to his instructor, co-learners, and course content during the online classes build interactive rapport and sense of community that can result in effective instruction and achievable learning outcomes (Martin & Bolliger, 2018). Firstly, the *interaction between the online learner and the instructor* involves multiple learner-instructor communication that is important in creating an engaging online classroom environment (Dennen et al., 2007; Larson et al., 2019). The different learning styles of students, particularly considering their ability to focus on the online tasks, attention spans, and comprehension to digest instructions are important considerations that an instructor needs to put in mind to minimize student anxieties and uninterested student participation (Nilsson, 2016; Trembach & Deng, 2018). Prompt feedback mechanisms on every assignment, constructive criticisms for individual tasks, clearly defined objectives of the lessons, and open discussions about any clarifications or inquiries should be practiced by the instructor to guide every learner on independent learning habits (Hew, 2014). Secondly, *learner to learner interaction* is also deemed important to provide the essence of cooperation among the students in the online class (Bollinger & Martin, 2018). In such a way, the potential feeling of isolation, boredom, and being unwanted will be apprehended. Studies have shown that making a learning environment collaborative among peers would give a more satisfying experience for students than focusing on lectures (Arioder et al., 2020), especially in the online environment (Osborne et al., 2018; Molesworth, 2004). Web-based applications such as Twitter feeds, Google applications, or even Zoom chat-box are just some tools that are recommended to be applied in engaging students with their classmates in diverse online learning discussions. Lastly, the *interaction of the learner to the content* would help stimulate general knowledge and individual interest of the student to the subject matter of the online course (Shapiro et al., 2017). Strategies such as watching documentary videos or multimedia interactions can be used to promote the engagements of the learner with the content (Abrami et al., 2011; Zhang et al., 2016). Making also a "gamified" post-evaluation of some concepts, by using the Quizziz web application, have shown better engagements (Suharsono & Uluwiyah, 2020) and improve motivations among students (Singh & Harun, 2016).

Although there are seemingly a number of educational pedagogies that have been used to serve as a model for many online classes, case studies or reports about (1) the adoption of online approach in Southeast Asian settings, (2) perceptions of undergraduate students taking majors related to environmental science and management about online classes and, (3) teaching experiences and practices regarding the theme of environmental policies on many Vietnamese public universities are still undocumented. Hence to address these gaps, this case study was employed on the students of the Advanced Educational Program (AEP) of Thai Nguyen University of Agriculture and Forestry (TUAF). AEP is a special project of the Ministry of Education and Training (MOET) in Vietnam that develops high quality training programs whose curriculum content are adapted from programs in some prestigious universities in the world. All subjects are instructed in English with the participation of both Vietnamese and international students, mostly from Southeast Asia. The major contribution of this paper is to serve as a basis for the effectiveness of synchronous online instruction in the Southeast Asian region.



**Figure 2.** The 5C procedure designed for the synchronous online meetings for this study

## MATERIALS AND METHODS

### Participants

For this study, the participants were 19 undergraduate students composed of 11 Filipinos (7 females, 4 males) and 8 Vietnamese (4 females, 4 males) taking up Environmental Science and Management in the AEP program of Thai Nguyen University of Agriculture and Forestry (TUAF). All of these students have also not participated in any form of online classes before. However, since all of these students have been able to already participated on classes related to the Internet and Computing Core Certification (IC3), student participants in this study have more sufficient technological knowledge and more adept computer skills prior to engaging in such online classes, in comparison to other students that have taken the normal courses offered by TUAF. These student participants (coded as S01-S19) voluntarily registered in intensive synchronous online meetings via Zoom videoconferencing for the 3-credit course on Environmental Analysis (EA).

### Course Content

The EA subject is designed as a core subject for students to provide them (1) the knowledge of environmental and natural resource policies and management, (2) the scientific basis for policies and the role of science in the policy-making process, and (3) a balanced perspective and appreciation of the scientific, political, economic, and legal issues associated with the making of environmental policy at global, regional (ASEAN), and local levels. Topics discussed in this subject are policies related to (i) wildlife trade, (ii) conservation of endangered species, (iii) access to genetic resources and equitable benefit sharing arising from utilization of biodiversity (Nagoya protocol), (iv) sustainable renewable energy, (v) carbon pricing (cap and trade, carbon tax), (vi) marine protection initiatives, (vii) clean air act, and (viii) reduction of carbon emission from deforestation and forest degradation in developing countries (REDD+).

### Process

The online classes are divided into 15 intensive synchronous videoconferencing meetings, with 3 hours allotted per meeting, from April 15 - May 16, 2020. The lecturer designed the online meetings into 5C steps (**Figure 2**): the *counselling* - an informal part of the class where participants are given an ample time to clarify information; *conditioning* - are interactive online activities, like online games or video documentaries, that would help reinforce some concepts discussed in the online class; *conversing* - are either in a form of short lectures that the facilitator was giving in a form of powerpoint presentations to formally discuss the objectives and theoretical background of the lesson or class activity where students are synthesizing a certain global policy by opinion formulations and constructive criticisms; *correcting* - is the allocated time to give feedbacks on their assignments or activities that was scheduled for that meeting either in a form of personal feedbacks from the teacher or active peer evaluation. During this step, all of the evaluation criteria for every activity each student conducted were clearly explained to them using a rubric scale; *checking up* - which usually takes place after the end of every meeting wherein the lecturer is writing a summarized lessons tackled during the online class and motivational letters related to environmental values for students to read.

## Data Collection and Analysis

### Survey

An evaluation survey have been accomplished after the whole online class sessions were conducted using the questionnaire on constructivist-compatible learning principles patterned with the Seven Principles of Effective Teaching (Chickering & Gamson, 1987). The question instrument used in the survey was adapted from the study of Bangert (2004) that specifically addressed within the context of online learning environments. Students responses were elicited using a four point Likert type scale ranging from strongly agree (4) to strongly disagree (1). Moreover, seven open-ended questions were added on the survey to capture more the personalized and detailed perspectives of the participants.

### Interviews

A semi structured questionnaire was formulated by the authors of this study. All the participants were initially informed about the purpose of the interview and were asked for their permission for the transcribing or recording of what would be confidentially discussed during the online interview. After the student participants willingly gave all their consent for an online interview, the last author started to schedule individual interviews that lasted between 30 - 60 minutes outside the online class meetings. The notes taken down were then divided into segments that were relevant to this study. These responses were specifically coded using the principle of open, axial, and selective coding. Moreover, the content were systematically categorized, compared, and summarize to explicitly elicit the context of students insights reported in this study.

### Observation

The first author of this study acted like a student participant to objectively observe the online learning setting during the course of the online classes. The observer immersed himself on all the activities and assignments that the participants needed to accomplish every meeting by joining in some of their online discussions or even playing with them on some online games that was used in the online class. The observer carefully takes down notes on the behaviours of every participants, the classroom management during the online classes, and the evaluation periods that the lecturer was facilitating during the whole course.

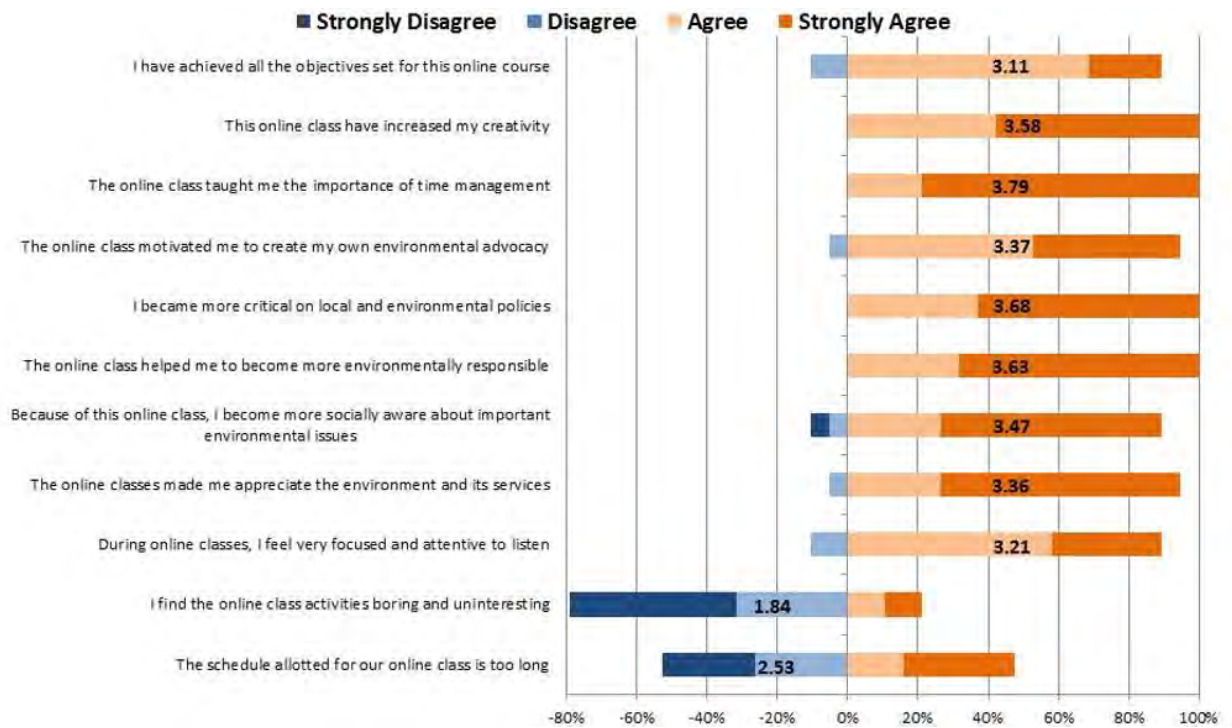
## RESULTS

### Student Responses on Effective Online Teaching

Based from the seven principles of effective online learning instrument, all the students responded positively in all aspects of what a quality online teaching should be. In terms of *student-faculty contact*, the students perceived that they were able to acquire knowledge successfully because of the interaction they build with their instructor. All students gave a positive agreement (agree - strongly agree) that their instructor had been effective in communicating the lessons during the online class, had been able to build a comfortable online learning space and had been able to display positive character of enthusiasm, genuine concern, respect, and responsiveness (**Supplementary Table 1**). This is also supported by some enthusiastic responses during the interview coming from the student participants. Eight students have implied that the instructor created a safe zone where they are motivated to exchange their ideas. Quoting S05, a Filipino female student has said *"I find very connected and comfortable talking with our teacher while discussing the topics about environmental policies online"* and S06, a Vietnamese female respondent have said: *"An instructor that has motivating instructional skills and very accommodating to student questions can make a good online experience"*. Five students qualify the instructor to be caring either by personally monitoring the progress of every student using online messaging i.e. Google classroom, Facebook Messenger or giving scheduled tutorials for students who missed an online meeting or needs further clarifications about the environmental policies being discussed during the online class. Specifically S18, a Vietnamese male student who have difficulty in participating during online classes due to some technical challenges, has expressed: *"The instructor is very thoughtful especially in checking-up if I have understood the lesson after our class and giving extra time for tutorials just to make up with some lessons I have missed"*.

The *cooperation among students* was also objectively noted by the students who all agreed that during their online class, the promotion of cooperative learning activities, encouragement to interact among peers and activities wherein students are able to discuss among each other was supported. Students rated high all the question items in the aspects of *active learning*, *prompt feedback* and *time on task* (**Supplementary Table 1**). Such responses from the students have been concurred during the online interviews. For instance, S17, a Vietnamese male student indicated that *"I enjoyed the activities where we give comments to each other's assignments and discuss in groups our criticisms in some scientific papers"*. He further cited a famous Vietnamese proverb that seems to fit on such online activities: *Hoc thay khong tay hoc ban* (Better learn from your friends than your teacher). Moreover, another Filipino male student has said *"Giving scores to my classmates using the online poll after they presented their policy synthesis was fun because the scores on that activity were not only coming from our teacher. The students were also encouraged to make their presentation as understandable as possible since we know we will be evaluated by our peers"* (S08).

It is also imperative to note that one item each on the criteria of *high expectations* (understandable instructional material supplied) and *diverse talents and ways of learning* (course designed so that technology would minimally interfere with learning) were negatively rated by 11%, and 5% of the students respectively (**Supplementary Table 1**).



**Figure 3.** The students personalized attitude responses on the online class about environmental policies. Values in the middle of every item is the mean Likert score

### Student Motivations and Attitudes in Participating in Online Classes

In the survey, 94% of the students responded that the instructor who teaches on their online class is what they initially considered in choosing to enroll in the subject Environmental Analysis (EA) offered by the AEP. This is followed by their interest to learn about environmental policies (79%) and seeing the subject as a degree requirement (58%). In response to the open-ended question, “*what in their opinion can make an ideally effective synchronous online learning experience for them?*”, there are four factors that were consistent on the students’ responses: (1) a compassionate instructor that can make the online learning experience exciting and is open to discuss opinions and clarifications, (2) an interactive online environment where their creative skills and critical thinking skills are instigated, (3) organized and achievable learning outcomes with clear schedule of all online meetings and online submission of course requirements, and (4) a relaxed learning space that can make them focused on the activities without having troubles of distractions from peers or technical difficulties brought by incremental weather conditions. When asked about the possibilities of using synchronous online classes as a medium of instruction, student responses have varied.

*Five students enthusiastically agreed because they preferred online classes over the traditional offline classes. One female Vietnamese student even quoted “I feel more productive in studying online because I am comfortable studying in my own room and less distractions from classmates who are chatting” (S06). Another female Filipino student also added “I prefer online classes since it is very convenient to use our devices while having such a friendly atmosphere to study” (S01).*

Nine students also agreed, but with some considerations i.e. the instructor who will teach the online course or interest on the subject being offered. S02, a Filipino male student have expressed “*Definitely I will take another online class if AEP will offer another one provided that it will be delivered with at least the same amount of teaching effort and dedication of a teacher we had in this EA class*”. A similar response was also prompted from another Filipino female student that mentioned “*If the teacher we will have in another online class will have the same passion like our teacher in this EA class, then I will love to take another online class*” (S07).

Two students have expressed their uncertainty of participating in joining another synchronous online class. An interesting response coming from one of these two student respondents have said “*I will take another online class if the situation is deemed necessary, however, I think online classes is unhealthy because we are exposed with our gadgets for a very long period of time*” (S15).

Three students have deliberately favored the traditional face to face lectures over doing online classes. One Filipino female student has strongly expressed “*I like it more to study in a classroom where I can physically interact with my teachers and classmates*”.

In terms of student personal attitudes (**Figure 3**), all of the students agreed that the following attitudes were gained because of the participation in the online activities: becoming environmentally responsible, becoming critical in assessing local environmental policies, valuing the importance of time management, and developing creativity. With the exception of one respondent, majority of the students have been motivated to establish their personal environmental advocacy and increased their environmental appreciation and its economic services because of the online course. 84% of the participants have positively agreed that they were able to achieve all the objectives set for the online class and to become more socially aware about pertinent environmental issues. During the operation of the online class, 84% have positively agreed that they were focused and attentive



to listen. In spite of the variation on students' perception about the length of time allotted for the online class, 79% of the participants disagreed when asked if they find their online class boring and uninteresting (**Figure 3**).

### Student Expectations and Involvement in Learning Environmental Policies

The interview with the students have identified that all of them have very classical expectations about the EA course. It is either just learning something new or increasing their previous knowledge. All of the students have identified that they have a fair or poor understanding about global environmental policies at the start of the course. However, four things were highlighted by most of the students that made their online experience of learning environmental policies worthwhile during the whole online class meetings:

- (1) the five take home tasks that includes synthesizing a local or regional policy in developing ASEAN countries, creating an evidence-base policy recommendations from environmental data sources, comparing and contrasting risk disaster management policies between Philippines and Vietnam, critiquing scientific papers that are about valuation of ecosystem services, and developing of monitoring plans for implemented policies related to nature protection and conservation. Students have described the assignment as *"challenging and requires keen analysis and brainstorming with other classmates"* (S10), *"thought-provoking that I enjoyed independently discovering the story behind every policy"* (S03)
- (2) relatable values and tangible examples that they can reflect on to apply in their future careers such as decision making, stakeholder identifying, and strategic prioritizing of resources. For instance, S13, a Filipino female student have realized a lot about how important are goal setting, and impact assessments as steps in the policy cycle by saying *"Besides the concept, I like how the policy process can be reflected also on personal attitudes I need to learn to succeed in life"*
- (3) activities that have used technology as an advantage such as simulated online games, online polling, online interactive quizzes, group chats, and podcasts; and (4) online exercises that requires group and collaborations like peer critiquing of the submitted assignments, peer evaluation of the policies synthesized and presented, brainstorming of ideas during small group consultations, and open inquiries from each other during the counseling or correcting step (**Figure 2**) of the online class.

Students have also raised three challenges that they have encountered while taking up the EA course: (1) technical glitches such as slow internet connections, intermittent electric power interruptions, and malfunctioning video cameras or head phones; (2) physical challenges like headache, distractions due to noise and tendency to open other websites while doing the online class and very hot and humid temperature, (3) personal challenges i.e. short attention spans, inability to confidently communicate in English with other learners, and time management.

## DISCUSSION

Traditionally, students in public universities from developing countries of Southeast Asia are generally stereotyped to be passive learners even in face to face classroom settings. Literatures have associated such student passiveness, in particular the Vietnamese students, to the Confucian heritage culture that is characterized to be conforming, unquestioning, and submissive (Tran, 2013). This supposition seems to be contradicted by the findings of our study. Seemingly, the Southeast Asian Environmental Science and Management cohort, that was used to evaluate the effectiveness of online platform based on student engagement and motivation to educate them on specialized or professional courses like environmental policies, confirms the three types of interactions proposed by Moore (1993) is needed in creating a meaningful online learning experience.

### The Role of the Instructor in Creating a Worthwhile Online Experience

Obviously, the Southeast Asian cohort of this study identify specifically how significant is the role of their instructor in making their online experience interesting. In our study, this is evident in three ways: (i) as majority of the students (94%) considered *"instructor"* as their primary motivation to enroll in the online class (ii) identifying instructors' part in creating an ideal synchronous online class and (iii) majority of the Southeast Asian students would engage in another online class under the condition that they will have an effective instructor. On a cultural standpoint, Southeast Asian students mostly view their teachers as experts or masters. This in return creates a divide between students and teacher's professional relationship. Even more, in an environment that language or medium of instruction also plays a factor for students to participate in engaged learning experience. However, because of the fast evolving technology, this division starts to change nowadays. For instance, in the case of online learning, the researchers have observed that on one hand the students have been able to reach out easily to their instructor. On the other hand the instructor should also start to act more like a moderator, and not as superior, to the students. This means, besides possessing a friendly nature, an instructor should interact to student in three possible ways: (i) guiding the students on their inquiries or curiosities about the topic (Carwile, 2007), (ii) nurturing not just their cognitive skills but as well as their creative talents and ability to express their thoughts (Collard & Looney 2014), and (iii) caring for them especially on time of their emotional anxieties, behavioral immaturities, and personal insecurities (de Guzman et al., 2008). In the results of our study, this was validated by the students favorable ratings on the *prompt feedbacks* (where the instructor was constructively phrasing comments that is non-derogatory but more of highlighting what could be improved or work on by the students and teaching them how they can improve it during the online tasks), *diverse talents and ways of learning* (where the instructor cater to the different learning styles of the students by being tolerant to varying student views and by being flexible on the valid requests of the students in terms of the deadlines of their assignments) and *student-faculty contact* (where the instructor is easily accessible and have used the online platforms to personalized the interactions with the students even after the online meetings) criteria. Such activities were the framework of the 3 out of the 5C procedure (**Figure 2**) designed by the instructor for the online class. The counseling step that

accustomed every student at the start of every online classes, the pleasant responses that the instructor return to every students during the conversing step and the empathetic gestures that are grounded on the checking-up step have been able to collectively personalized the experience of each student so that they can have a learning space where they feel comfortable in spite of it being online.

### Interaction among Online Co-learners Develop an Interactive Online Experience

Interaction among online learners helps them to become more proactive in searching information, supporting their own ideas, and discussing with their peers. These make the class become like a small community, where all skills required for Industry 4.0 is openly practiced. Taking into consideration the Southeast Asian context, the hierarchical systems rooted in most cultures have a huge impact between various generations. For example, the younger people always pay too much respect with elders and are always polite with friends. Therefore, in most traditional universities, students feel uncomfortable in constructively criticizing their peers making most engagement between learners to learners also restrictive. To address such concern, especially in handling online classes, active learning strategy was practiced in the study. Hence, the correcting step (**Figure 2**) was added during the synchronous online learning. This is conducted in a way where the students that participated in the online class become the center of the classroom, instead of the instructor. Such environment, where everybody was encouraged to voice out their views free from fear or shyness, had helped the students to “break the ice” and start engaging in the online class. Students were able to practice to deliver constructive feedbacks that they can share among their peers to help each other in improving the skills they have acquired. At the same time, students were also able to listen and appreciate the comments given by their own online classmates. Additionally, the activities that promote online peer evaluation in the form of live polling or privately messaging those in chat-boxes have been identified by students to be useful in sharing their ideas but still maintaining the inherent value of politeness. The online class has also promoted collaborative learning where small groups were assigned. This in return has helped students understand the value of teamwork and to contribute efficiently on the group tasks given to them. Interestingly, the learner to learner interaction in our online class was supported by the positive agreement of most items in *cooperation among students* and *active learning* criteria in the survey given to the students.

### The Content Plays a Part in Engaging Students to Learn Environmental Policies

Our result showed that activities conducted during the synchronous online meetings have fostered meaningful online experience for the students to learn more about environmental policies. As enumerated already in the result section, students have identified that challenging assignments, relatable examples, and technology-based activities as helpful teaching strategies in reinforcing them not just to understand the concepts involved in environmental policies, but as well as motivated them to further research and comprehend the selected environmental policies discussed in the online class. This is further affirmed when students have actively realized during the interviews that topics such as policies related to REDD+ activities in Vietnam, public perceptions about air quality management policies, costs of creating renewable source of energy, or even measuring the willingness of people to pay as a means to value conservation efforts in Southeast Asian region can be putative topics for their undergraduate research thesis in their succeeding semester.

Although, students find most of the activities in the syllabus excruciatingly challenging, all of them have responded positively when asked about the helpfulness of the assignments both in acquiring new knowledge and skills needed for their future careers. Furthermore, numerous strategies to engage students on the lessons have been employed especially in a synchronous online platform (Barron et al., 2005). This is the reason why the conditioning step in the 5C procedure (**Figure 2**) was also placed in the procedures during online classes. Employing for instance online games that simulate reality have been used to effectively engage students about environmental management (Madani et al., 2017). More so, since the course entails interdisciplinary approach to teach, current relatable real scenarios were given as examples, either in a form of short video clip or live discussion, to compliment the assignments given to the students. Nonetheless, the interactive nature of synchronous online teaching has been supported to be much more preferred by students on other related literatures (see Dahlstrom-Hakki et al., 2020; Skylar, 2009; Ward et al., 2010). However, understanding the possibilities of using self-paced asynchronous online learning about environmental policies among Southeast Asian students do warrants for further investigations.

### Challenges and Opportunities of Using Synchronous Online Learning

Although online classes seem to be a promising alternative as a pedagogical tool in Southeast Asian context especially during the disruption of classes brought by the global pandemic crisis, synchronously conducting it would still pose a number of identified difficulties. As what the students have expressed in the interviews and was personally observed during the conduction of the online class by the researchers, uncontrollable technical glitches that can transpire or even the physical challenges experienced by students during the online class have impeded the learning experience of the students. This premise has been demonstrated on studies that have showcase how frequent technical problems may result in the disconnection of a learner in the learning community (Liu et al., 2007; McPhee & Przedpelska, 2018). To address such challenges, deliberate planning and designing of a clear back-up plans of technical support for the online courses is a pre-requisite (Gallagher-Lepak et al., 2009) as what have been similarly verbalized by the student cohort that having clear schedule of all online meetings and online submission of course requirements would be a criteria for a quality effective synchronous online learning.

Moreover, when practiced efficiently and effectively, online classes in Vietnam will be a very good instrument to address issues regarding distance learning. Like in the case of this study, the educational backlash brought by the current plight of a global pandemic crisis was consequently resolved using such online alternatives. In the not so distant future, online learning approaches can also be utilized by the AEP in TUAF, to actively invite experts especially in the field of global environmental policies that are constrained by financial, geographical, or physical means. With such evolving educational landscape, using online learning

platforms to convey concepts related to environmental policies can be part of what can be a “new normal” in many public universities in Vietnam.

### Limitations and Outlook of Using Online Class in Vietnam

The limited investigations about the effectiveness of distance learning especially in the undergraduate International Environmental Science and Management programs in Vietnam impelled this current study to be conducted. Nevertheless, some methodical limitations need to be addressed. The purposive sampling of this study has only utilized a relatively small sampling size. However, this made the researchers to easily control the design and the delivery of the course for the students. Furthermore, since there is quite a few numbers of studies that can serve as a basis for such unpopular teaching pedagogy in higher learning in most universities in Vietnam, readers should interpret the result with caution since the authors do recognize the limited generalizability in different educational settings and qualitative contexts regarding online learning. Nonetheless, the findings of this case study have shed light on the potential of shifting the traditional face to face classes in Vietnam. It is with hope that environmental education in most Southeast Asian education system would start to strengthen because of such research initiatives. Furthermore, Southeast Asian teachers should also begin to retool themselves on maximizing as many online techniques as possible. In spite of the preparation that can burden most educators, the open-mindedness of most Vietnamese educators in terms of innovating their teaching practices would definitely see such recalibration not as a liability but rather as an opportunity.

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**Supplementary Table 1.** Frequency of student responses in the questionnaire about seven principle of good online teaching adapted from Bangert (2004)

CRITERIA	ITEMS	RESPONSES			
		Strongly agree	Agree	Disagree	Strongly disagree
<b>Student - Faculty Contact</b>	The instructor communicated effectively during the online classes	89.5	10.5	-	-
	The instructor was enthusiastic about on-line teaching	94.7	5.3	-	-
<b>Contact</b>	The instructor was concerned about student learning	89.5	10.5	-	-
	The instructor was generally respectful of student learning	89.5	10.5	-	-
	The instructor was accessible to me outside of the on-line course	89.5	10.5	-	-
	The instructor used other online platforms to create a comfortable learning space	89.5	10.5	-	-
	The instructor personalized interactions with me whenever necessary	89.5	10.5	-	-
<b>Cooperation Among Students</b>	The instructor used online platforms to promote cooperative learning activities	78.9	21.1	-	-
	The instructor used online platforms to encourage students to interact with one another	68.4	31.6	-	-
<b>Active Learning</b>	The course was structured so that I could discuss my assignments with other students	68.4	31.6	-	-
	The online games increased my interest in the topics of the subject	88.9	11.1	-	-
	The instructor used online platform to facilitate thoughtful discussions	83.3	16.7	-	-
<b>Prompt feedback</b>	The course was designed to allow me to take responsibility for my own learning	84.2	15.8	-	-
	The instructor responded promptly to my questions and clarifications about the topics	94.7	5.3	-	-
	The instructor responded promptly to my questions about general course requirements	84.2	15.8	-	-
	The instructor responded promptly to my questions about course assignments	78.9	21.1	-	-
<b>Time on task</b>	The instructor motivated me to do my best	78.9	21.1	-	-
	The course was well organized	84.2	15.8	-	-
	The course was designed to allow assignments to be completed across different learning environments	84.2	15.8	-	-
	The instructor facilitated the course effectively	89.5	10.5	-	-
	Different online platforms were used to create an efficient learning environment	84.2	15.8	-	-
<b>High expectations</b>	This online course helped me to learn environmental policy more quickly	73.7	26.3	-	-
	The instructor provided models or examples that clearly communicated expectations for weekly group assignments	77.8	22.2	-	-
	The instructor provided models or examples that clearly communicated expectations for individual online activities	72.2	27.8	-	-
	The instructor used good examples to concepts in environmental analysis	77.8	22.2	-	-
	The assignments for this course were of appropriate difficulty level	72.2	27.8	-	-
<b>Diverse talents and ways of learning</b>	The instructor designs instructional materials that were understandable	70.6	17.6	11.8	-
	The instructor adapted to students's instructional needs	78.9	21.1	-	-
	The instructor was tolerant of other's ideas and views	94.7	5.3	-	-
	The instructor designed the course so that technology would minimally interfere with learning	78.9	15.8	5.3	-
	The instructor was flexible regarding the completion of assignments	84.2	15.8	-	-
<b>Overall Impression</b>	The instructor provided several ways for students to demonstrate understanding of important course concepts	84.2	15.8	-	-
	This online course was valuable	84.2	15.8	-	-
	This course improved my understanding of environmental policies	78.9	21.1	-	-
	The instructor designed the course so that technology would be maximize for learning	83.3	16.7	-	-
<b>Student Personal Attitudes</b>	Taking this course increased my interest in environmental science and management	77.8	22.2	-	-
	The schedule allotted for our online class is too long	31.6	15.8	26.3	26.3
	I find the online class activities boring and uninteresting	10.5	10.5	31.6	47.4
	During online classes, I feel very focused and attentive to listen	31.6	57.9	10.5	-
	The online classes made me appreciate the environment and its services	68.4	26.3	5.3	-
	Because of this online class, I become more socially aware about important environmental issues	63.2	26.3	5.3	5.3
	The online class helped me to become more environmentally responsible	68.4	31.6	-	-
	I became more critical on local and environmental policies	63.2	36.8	-	-
	The online class motivated me to create my own environmental advocacy	42.1	52.6	5.3	-
	The online class taught me the importance of time management	78.9	21.1	-	-
This online class have increased my creativity	57.9	42.1	-	-	
I have achieved all the objectives set for this online course	21.1	68.4	10.5	-	