

TEACHING & LEARNING

Critiquing the Learning Design of a SENCERized Team-Based Activity

DAVID GREEN

National Center for Science and Civic Engagement

Abstract

A team-based learning activity is presented that was created to support a university-level course with an integrative theme of environmental sustainability. Students in a General Education *Environmental Biology* course were asked to relate academic concepts to real-world scenarios by creating a hypothetical ecoresort on an island that had suffered severe habitat degradation. The Earth Charter helped guide student understanding of how to balance ecological, social, and economic needs. Furthermore, the SENCER approach to educational practice helped teach the science through complex social issues. Student-generated media (in the form of a webpage) helped learners

integrate and showcase their gains in knowledge and skills. The "ecoresort activity" is critiqued against educational best practices, by aligning its design with Fink's Taxonomy of Significant Learning and Merrill's Principles for Instructional Design. Finally, practical recommendations (with an accompanying facilitator's guide) are provided that should help STEM educators calibrate interacting variables during technology-enhanced course designs: permeable learning spaces, assessment strategies, and social learning settings.

Introduction

This article describes a team-based learning activity, where students collaborate in small groups to design an ecoresort and build a website to market their hypothetical resort (see the Appendix for a complete facilitator's guide). The process of designing the resort can launch additional larger discussions—for example, about how our recreational choices deplete, endanger, conserve, or restore natural resources. Students are given the opportunity to consider what should drive their choices of location, transportation, lodging, food, and healthcare when designing a facility in a fragile ecosystem. The activity addresses the concept of "environmental sustainability" and incorporates scientific concepts in ecology, such as habitat loss and population decline of animal and plant species, and social/technological issues surrounding energy systems and renewable and non-renewable resources. It raises civic questions about the role of science when local communities assess and manage the environmental impact of their own growth and development.

Following the description of the activity, learning design is critiqued through three lenses: Fink's Taxonomy of Significant Learning, Merrill's Principles for Instructional Design, and the SENCER Approach to Educational Practice. Practical recommendations are then made to guide learning design. Thus, the purpose of this article is to provide STEM educators with the knowledge, skills, and abilities they'll need to incorporate learner-centered activities into their technology-enhanced learning experiences.

Background Information

Environmental sustainability is the integrative theme of the course for which this ecoresort activity is a major component (SENCER Model Course link: <http://ncsce.net/environmental-biology-ecosystems-of-southwest-florida/>). Within this general education course for non-science majors, learners explore introductory concepts related to ecosystem services, natural resource use, and economic growth (at the expense of the natural world). The "triple bottom line" provides a useful framework to help students guide their thoughts, although there are other ways to approach learning about environmental sustainability. For example, student participation in

Earth Charter–related activities throughout their academic journey may be beneficial in myriad ways (<http://www.earthcharterinaction.org/content/>). The Earth Charter is a movement that promotes "respect and care for the community of life, ecological integrity, social and economic justice, and democracy, nonviolence and peace" (Earth Charter, 2021).

The flagship initiative of the National Center for Science and Civic Engagement is Science Education for New Civic Engagements and Responsibilities (SENCER), an organization that aims to connect science education with civic engagement to promote student participation in science, technology, engineering, and mathematics (STEM) education (SENCER, 2016). SENCER's mission is to "strengthen student learning and interest in STEM by connecting course topics to issues of critical local, national, and global importance" (SENCER, 2016). This ecoresort activity (which originated as part of a SENCER Model Course) connects to several SENCER ideals, by "extracting from the immediate issues the larger, common lessons about scientific processes and methods" (Table 1) (SENCER, 2016).

This SENCER-aligned activity explores an issue of social and scientific significance, the impact of tourism on island ecology. The metaphor of an island can be expanded upon to include explorations into global issues (Island Earth). One way to connect learning to students' daily lives is to align class activities with something meaningful to their social lives. For some of our students, a dream spring break vacation includes spending time in a tropical island resort. What might students' reactions be to the notion that their choice of vacation destination (as tourists) may be contributing to the tension between economic development and ecosystem preservation? This question serves as a potential springboard from which to explore a wicked problem, such as human impacts on the natural world. Learners can investigate how tourists are a blessing and a curse for community members at tourist destinations. Clearly, tourism brings revenue. But tourism has many possible negative impacts as well, including the depletion and pollution of terrestrial, aquatic, and atmospheric natural resources (Garces-Ordoñez, Díaz, Cardoso, & Muniz, 2020; Leposa, 2020; Lowe & Sealey, 2002; Singh, Bhat, Shah, & Pala, 2021).

When designing courses, educators usually align course outcomes with the desired knowledge, skills, and attitudes they want learners to demonstrate upon successful completion. Fink (2003) described a taxonomy that integrates these elements and adds an additional element of learner metacognition (thinking about one's thinking). Merrill (2002) described five core principles that promote active learning and are grounded in problem-based learning. Fink's Taxonomy of Significant Learning and Merrill's Principles for Instructional Design provide two evidence-backed and relevant lenses to critique this SENCERized learning activity.

What Students Will Be Able to Do

By exploring current environmental events and investigating and debating sustainability issues, students will be able to

- Conduct basic research related to current environmental issues such as energy consumption, food availability, freshwater supply concerns, waste generation, and habitat restoration.
- Generate evidence-based decisions about the degradation of natural capital that results in human-dominated systems.
- Develop business plans that incorporate environmental sustainability as a fundamental bottom-line consideration, while addressing social needs, economic

interests, and cultural awareness of community members and/or tourists.

- Work in teams to demonstrate effective communication, collaboration, and critical thinking skills.
- Connect issues of civic importance to their daily lives and decision-making processes.

Scientific Concepts Addressed and Related Civic Issues

When development "is greater than the environment's ability to cope ... within acceptable limits of change," (www.unep.org) the depletion and pollution of terrestrial, aquatic, and atmospheric natural resources are one result, and this is the subject of a great deal of scientific attention in ecology and conservation biology. The ecological destruction stands in contrast to the economic benefits that can accrue to communities that invite tourism into such ecologically delicate areas. Local and national governments may tolerate, and even encourage, tourism's environmental impacts if the construction of resorts brings economic benefits such as jobs and tax revenue.

By investigating this question in depth, students explore the complexity of "sustainable" tourism and the tradeoffs involved. Students grapple with the question of whether the goals of environmental protection and economic prosperity are compatible, and, if the answer is no, design tourism facilities that attempt to serve economic and ecological goals at once.

FIGURE 1. This graphical representation describes the ecoresort project's fundamental learning path. A blended learning design facilitates individualized asynchronous activities within the learning management system that are carefully choreographed with team-based application activities in synchronous and face-to-face settings. Within a technology-enhanced learning environment, contextualized learning around a wicked problem helps learners practice, gain real-time feedback, and continuously reflect on their learning.



The Activity

This collaborative assignment uses a hypothetical case study and student-generated media to make course material relevant to a variety of students' academic majors, personal interests, daily lives, and decision-making processes. Students develop a plan for establishing and managing an ecoresort, and then publicize it via a student-created website. The activity can be conducted in a variety of learning spaces, including fully online, blended, and face-to-face settings. The basic learning path for the activity incorporates a technology-enhanced learning environment, so that a carefully choreographed blend enriches learner engagement (Figure 1). While the instructor can take this activity in several different directions, the basic outline is presented in Table 1.

This activity is applicable to a wide range of disciplines and academic levels (Table 3), and instructors can incorporate the activity in multiple ways. For example, they might

- Use this as a capstone project for the course.

- Divide the tasks into weekly modules that students complete one by one in a longitudinal fashion throughout the course.
- Pick and choose the tasks most relevant to course needs and focus only on those, by scaling back the project requirements. For example, parts of this activity could complement lessons and readings related to students' ecological footprints.

TABLE 1. Ecoresort Activity Alignment with SENCER Ideals

Relevant SENCER Ideals
(retrieved from https://sencer.net/sencer-ideals/)
SENCER connects science and civic engagement by teaching "through" complex and unsolved public issues "to" basic science.
SENCER invites learners to put scientific knowledge and methods to immediate use on matters of relevance to them.
SENCER reveals both the power and the limits of science in addressing the great challenges of our time.
SENCER helps all learners connect civic issues of local concern to national and global "grand challenges."

TABLE 2. Descriptions of the Ecoresort Project's Basic Phases

PROJECT PHASE	DESCRIPTION
Collaborating	Working in teams, students brainstorm ways to "restore" degraded island habitat and relate key concepts covered in class (i.e., ecosystem services, natural resources, habitat loss, freshwater supply, etc.) to the decisions they'll need to make about the human impacts behind their sustainable restoration project. Essentially, they are scaling down the entire planet to an island, which allows learners to make better sense of complex environmental processes and social issues.
Researching	The teams conduct research on course-related academic concepts and real-time social issues. In doing so, they locate peer-reviewed scientific literature that will be incorporated into their explanations, inspire their designs, and factually support their ideas.
Creating	Each team creates a webpage that markets and addresses an assigned task list, including both operational and ecological considerations. For students with a business background, a formal business plan (i.e., Business Model Canvas: https://en.wikipedia.org/wiki/Business_Model_Canvas) could be implemented within the project-based learning opportunity to enrich the interdisciplinary composition of teams.
Integrating	By using free website-building software (for example, www.weebly.com) students create webpages that showcase their ecoresort features while simultaneously integrating key course content.
Practicing	In advance of summative assessments and presentations, low-stakes formative knowledge checks with feedback may be provided via a learning management system.
Presenting	At the end of the semester (or conclusion of the activity), each team delivers an oral presentation to the rest of the class.
Reflecting	Students complete continuous individualized critical reflections throughout the exercise.
Evaluating	Each student provides feedback on their group members' performance, effort, and contributions. Additionally, students provide feedback on each of the group presentations. Lastly, students complete a Student Assessment of their Learning Gains (SALG) survey (via www.salgsite.org).

TABLE 3. Alignment of Ecoresort Activity with Appropriate Courses

Courses into which this activity could fit	
High School	AP Environmental Science
College/University	Non-science major introductory-level General Education Environmental Science Environmental Biology Marine Science
	Freshman-level science major Environmental Science Special Topics on Environmental Sustainability

- Use the project as the primary teaching tool for the entire course. For example, instead of lecturing, guide the students through the course by using this as a project-based learning opportunity within scheduled class time.
- Use as part of a study abroad class and include a segment related to respecting the cultural needs of an indigenous population.
- Include a service-learning component, where students are given opportunities to connect their coursework to serving the needs of the community. Students should be given continuous reflective assignments that help them relate the goals of this project to the community service tasks they are performing.

Each of these approaches can yield learner successes. And given the flexibility, the instructor may adjust the percentage of the overall grade to match the needs of the curriculum. Likewise, the island location can be modified to suit the needs of the course, depending on the geographic location that is most relevant to students and their campus/university.

What If Projects Were Worth More Than a Letter Grade?

In collaboration with the local chamber of commerce, students could potentially conduct sustainable practice audits for the community as service-learning projects. For example, during these audits, students could work with community partners (local businesses, informal learning

centers, schools, etc.), where they could relate service-learning opportunities to course content by accomplishing the following duties:

- summarize their on-site observations;
- identify environmentally friendly and non-friendly practices at the partner site;
- provide recommendations to the community via an outreach session.

This information could ultimately be used by the chamber of commerce to recognize tourist-oriented businesses that adhere to sustainable tourism practices. Students could also work with the local government and help the town develop a certification program for "sustainable" tourist establishments.

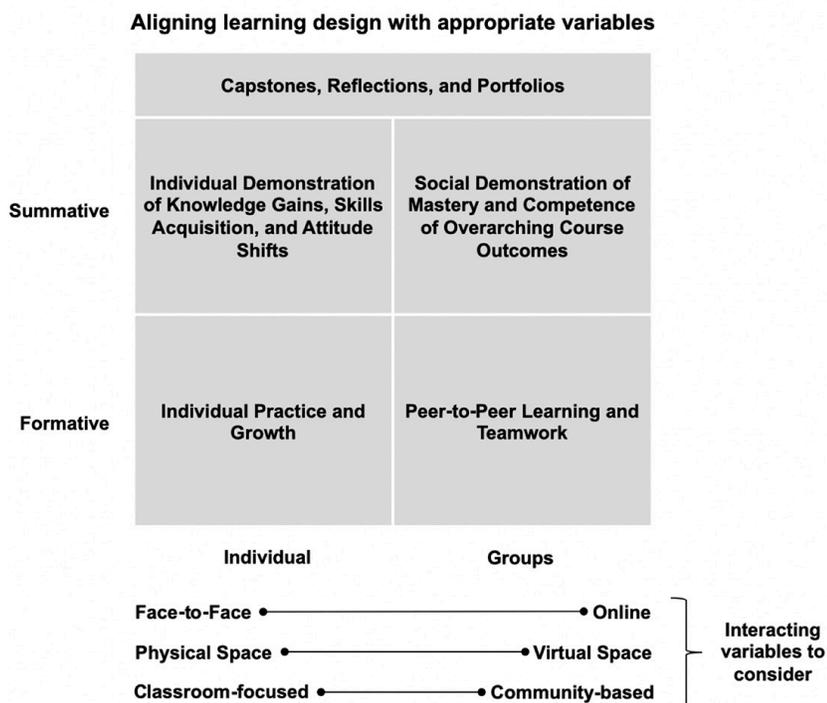
This activity also has the potential to connect students with informal science education centers in their area. Using YouTube videos and quick response (QR) codes, students can create interactive "exhibits" focused on a sustainable practice for regional venues of informal science education (e.g., science and nature centers). QR codes could be displayed on site so that visitors can scan them with a smartphone and view students' projects. An entire class could create any number of these types of videos, which would likely be welcome in budget-limited informal science education institutions.

Enriching Citizen Engagement with Social and Civic Problems That Have Underlying Scientific Issues

Because tourism, in some form, is an experience most students have in common, this activity is likely to be of immediate interest and relevance to them. In a discussion of the environmental impacts of tourism, instructors can teach "through" larger issues such as conflicting economic and environmental interests "to" the underlying science on the environmental impacts of human activity on ecosystems. In addition, the instructor has the opportunity to engage students with broader civic questions such as

- Who is responsible for ensuring that we have clean air to breathe, clean water to drink, and healthy ecosystems to support life?

FIGURE 2. Consideration of interacting variables helps yield effective and efficient formative and summative assessment opportunities in both individualized and peer-to-peer learning settings. Capstone projects, critical reflections, and longitudinal portfolios provide high-impact opportunities for meaningful learning. Instructors should align learning intervention goals with the activity's role in the course.



- What public policies promote or impede environmental sustainability?
- What are the tradeoffs between economic development and environmental sustainability, and how should these tradeoffs be determined? Who should be involved in the decision-making processes?
- In light of the extreme environmental challenges faced in underserved communities, describe your thoughts about social justice, equity, and economic opportunity.

Why This Learner-Centered Activity Works Well

Meaningful learning is optimized when instructional strategies are implemented that manage intrinsic cognitive load, limit extraneous load, and maximize capacity for germane load (Kirschner, Kirschner, & Paas, 2006; Mayer, 2011). These strategies include sequencing curricula, scaffolding content, and encouraging metacognitive behaviors (Deans for Impact, 2015). Critical reflection by learners is

also a key part of meaning-making during the learning process (Dewey, 1933; Dewey, 1938; Rodgers, 2002). Several frameworks exist to help analyze the ecoresort activity, by critiquing how its instructional design is aligned with accepted educational best practices. Fink's Taxonomy of Significant Learning and Merrill's Principles for Instructional Design are two such frameworks (Table 4).

This team-based learning exercise is aligned with educational best practices, as determined by its alignment with two different instructional design frameworks. Active learning yields autonomous opportunities that may increase learner motivation. Multi-tiered assessments (formative and summative) help learners monitor their learning gains and skills development. Additionally, authentic and real-world scenarios promote emotional connections for learners. Team-building and collaboration help foster the conditions needed for inclusive settings where all learners can contribute.

Furthermore, this learner-centered activity promotes cognitive, behavioral, socio-cultural, and affective engagement.

From a practical standpoint, learners are provided opportunities to engage academic content individually and in social groups (Figure 1). They are provided a variety of low-stakes and higher-stakes assessment opportunities within a variety of permeable learning spaces. When used as a capstone project, this learning experience provides learners with opportunities to demonstrate mastery and competence in critical course outcomes in a social setting (Figure 2). The ecoresort project helps learners acquire discipline-specific knowledge and provides opportunities for them to integrate their knowledge gains. Furthermore, learners are able to demonstrate appropriate mastery of skills. Lastly, this activity provides an opportunity for learners to explore their attitude shifts toward issues of social and scientific importance.

TABLE 4. Critique of the Ecoresort Activity through the Lens of Educational Best Practices

INSTRUCTIONAL DESIGN FRAMEWORKS	HOW THE ECORESORT PROJECT ALIGNS	LEARNER OUTCOMES	LEARNER ENGAGEMENT (Cognitive, Behavioral, Affective)
Fink's Taxonomy of Significant Learning			
Foundational Knowledge	Critical information is provided with the anticipation that learners will retain and recall well into the future.	Lifelong learning	C,B
Application	Learners engage in critical, creative, and practical thinking to solve authentic and relevant problems, by using their ecoresort as a contextual case study.	Critical thinking	C,B
Integration	Learners make connections between academic content and their personal lives, by investigating social and scientific issues of global significance.	Self-awareness	A
Human Dimension	Learners collaborate with others in peer-to-peer learning opportunities, which fosters affective engagement in course content as they learn about themselves through these interactions.	Teamwork	C,B,A
Caring	Learners interject their own unique interests, emotions, passions, and values into project deliverables.	Motivation	A
Learning How to Learn	Learners incorporate self-regulated learning skills, teamworking skills, and researching skills to accomplish tasks.	Curiosity	C,B,A
Merrill's Principles for Instructional Design			
Problem-Centered	Learners are acquiring knowledge in the context of real-world problems, specifically by investigating challenges with environmental sustainability.	Civic mindedness	C
Activation	Learners are using their prior knowledge from class activities and life experiences as a foundation upon which to build new knowledge.	Resourcefulness	C,B,A
Demonstration	Learners observe relevant case studies and encounter contextual information within the overall curriculum.	Creativity	C,B
Application	Learners apply their new knowledge by solving novel problems related to their island's ecology and ecoresort requirements.	Question-asking	C,B,A
Integration	Learners reflect continuously, participate in discussions, and present their ideas in both small and large group settings.	Confidence-building	C,B,A

Acknowledgements

This work was conducted while the author was a faculty member in the Department of Marine and Ecological Sciences at Florida Gulf Coast University (FGCU). The author wishes to thank Eliza Reilly, Glenn Odenbrett, and Karin Matchett from the SENCER network for their partnerships and thoughtful reviews. Laura Frost and Douglas Spencer from The Whitaker Center for STEM Education at FGCU supported travel to SENCER Summer Institutes and professional development. At FGCU, Donna Henry, Aswani Volety, Mike Savarese, Greg Tolley, Susan Cooper, and Marguerite Forest also contributed to the success of the internal SENCER team. Finally, from the University of Miami Department of Biology, Kathleen Sullivan-Sealey and Dan DiResta provided early inspiration for high-quality environmental education and critical habitat conservation.

References

- Deans for Impact. (2015). *The science of learning*. Austin, TX: Deans for Impact. Retrieved from http://deansforimpact.org/pdfs/The_Science_of_Learning.pdf
- Dewey, J. (1910/1933). *How we think*. Buffalo, NY: Prometheus Books.
- Dewey, J. (1938). *Experience and education*. New York: Collier Books, Macmillan.
- Earth Charter. (2021). Landing page. Retrieved from <https://earthcharter.org/>
- Fink, D. (2003). *A self-directed guide to designing courses for significant learning*. San Francisco: Jossey-Bass.
- Garcés-Ordóñez, O., Díaz, L. F. E., Cardoso, R. P., & Muniz, M. C. (2020). The impact of tourism on marine litter pollution on Santa Marta beaches, Colombian Caribbean. *Marine Pollution Bulletin* 160, 111558. <https://doi.org/10.1016/j.marpolbul.2020.111558>
- Kirschner, P., Kirschner, F., & Paas, F. (2006). *Cognitive load theory*. Retrieved from <http://www.education.com/reference/article/cognitive-load-theory/>
- Leposa, N. (2020). Problematic blue growth: A thematic synthesis of social sustainability problems related to growth in the marine and coastal tourism. *Sustainability Science*, 15(4), 1233–1244.
- Lowe, A. M., & Sealey, K. S. (2002). Ecological and economic sustainability of tropical reef systems: Establishing sustainable tourism in the Exuma Cays, Bahamas. In *Proceedings of the 1999 International Symposium on Coastal and Marine Tourism: Balancing Tourism and Conservation: April 26-29, 1999* Vancouver, British Columbia, Canada (p. 183). Seattle: Washington Sea Grant Program and School of Marine Affairs, University of Washington.

- Mayer, R. E. 2011. How learning works. In *Applying the science of learning* (pp. 13–37, 44–49). Boston: Pearson Education.
- Merrill, M. D. (2002). First principles of instruction. *Educational Technology Research and Development*, 50(3), 43–59.
- Rodgers, C. (2002). Defining reflection: Another look at John Dewey and reflective thinking. *Teachers College Record*, 104(4), 842–866.
- SENCER. (2016). About us. Retrieved from <http://www.sencernet/About/aboutus.cfm>
- Singh, S., Bhat, J. A., Shah, S., & Pala, N. A. (2021). Coastal resource management and tourism development in Fiji Islands: A conservation challenge. *Environment, Development and Sustainability*, 23, 3009–3027.

About the Author



David Green specializes in advancing learner-centered curricula in health sciences, medical education, and STEM education. He has taught award-winning university-level courses, mentored undergraduate and graduate students, and facilitated faculty development initiatives that support innovation and creativity. He enjoys evaluating the effectiveness of high-impact educational opportunities by continuously monitoring critical program-level and student-level success metrics. As a Leadership Fellow with the National Center for Science and Civic Engagement and a Collaborating Partner with the Learning Spaces Collaboratory, he actively champions conversations centered on the intersections of physical, community-based, and technology-enhanced learning spaces. David holds a Doctor of Education from the University of Southern California Rossier School of Education.

APPENDIX A:

Facilitator's Guide

Timeline

The actual duration and time requirements are dependent upon how the instructor chooses to implement the project within their overall course design. As previously explained, this activity could be accomplished as a mini-activity within a single class session or it could serve as a longitudinal capstone project for an entire 15-week semester. Each student group would complete these general project phases:

- Planning, brainstorming, and team-building
- Research
- Webpage design
- Presentation
- Outreach/dissemination
- (Continual) Knowledge checks and formative feedback
- (Continual) Critical Reflection
- (Optional) Community-based service-learning project

Prior Knowledge Required

This activity is geared for first-year non-science majors. Thus, the average student in class has little to no content background when this project is assigned.

Considerations

- Student and instructor skills development with free website-building software
- Intentional connections to course academic content
- Local informal science education center site visits (to help explain regional ecosystems, ecology, and human impacts in an experiential manner)
- Online databases, search engines, and library support
- Digital presentation support (face to face or online)
- Group dynamics, peer-to-peer learning challenges, and grading team deliverables

Context and Concepts for Instructors

- This assignment constitutes a component of a SENCER Model course, described at <http://ncsce.net/environmental-biology-ecosystems-of-southwest-florida/>
- The following assessment materials are attached as supplemental digital content:
 - *Student version of the assignment*
 - *Simplified grading rubric*
 - *Midpoint assessment*
 - *Group assessment, final evaluation*
- To help foster authentic, emotional connections, consider introducing this exercise by showing students a picture of an island in Bimini (pre-development) that is pristine and serves as an important shark nursery. Then, show that same island with a picture that displays habitats completely bulldozed because a developer came in to build a resort. Next, explain that the developer departed following an economic downturn and this degraded island is all that is left. From that point, introduce the project goals, background information, and deliverables. Here is the link to a video that could be shown as an introductory exercise, to be followed by a discussion about key concepts: "Fabien Cousteau Presents: Bimini - Paradise in Peril".

- Because students become active producers of content rather than passive learners, they will use their higher-order thinking skills and are more likely to retain key academic concepts on which the assignment is based. Some of the instructions are intentionally left vague to help promote student creativity, enhance investigation, and enrich problem-solving. For example, common questions from students include the following:

- *What is the size of the island?*
- *What is the budget for our proposal?*
- *What materials do we have available to us?*

These are all fine questions, and an instructor could choose to answer them in any number of ways. But minimizing the constraints and not providing all information allows students to reflect broadly on sustainable practices that they have encountered in their classes.

- To avoid the use of large amounts of paper and ink that are consumed in printing hard-copy brochures, students create a webpage to publicize their resorts. Free and relatively easy-to-use resources are available that maximize inclusion and minimize extraneous cognitive load. Instructors may want to familiarize themselves with the webpage builder in advance and provide a brief tutorial in class.
- Students generally want to present their products to the class. Thus, an oral presentation opportunity for students is usually built into the final grade. For efficiency and livelier presentations, students focus on three key points (their Earth Charter learning module, the triple bottom line Venn diagram, and one "coolness" factor), rather than talking about their entire webpage.

Additional Resources

The following resource from the KQED QUEST project (<http://science.kqed.org/quest/>) relates to this assignment:

Taylor, Helen. (2012). *Help the Sea on Your Next Overseas Vacation*. Retrieved from <http://science.kqed.org/quest/2012/07/02/help-the-sea-on-your-next-overseas-vacation/>

The following resources also contain useful information:

Commission on Sustainable Development. (1999). *Tourism and sustainable development*. New York, NY: United Nations Department of Economic and Social Affairs. Retrieved from <http://sustainabledevelopment.un.org/content/documents/400iclei.pdf>

Economic and Social Commission for Asia and the Pacific. (1995). *Guidelines on environmentally sound development of coastal tourism*. New York, NY: United Nations Economic and Social Commission for Asia and the Pacific. Retrieved from http://www.unescap.org/ttdw/Publications/TPTS_pubs/Pub_1371/Pub_1371_fulltext.pdf

Conservation Gateway. (2018). *Marine conservation agreements: A practitioner's toolkit*. Arlington, VA: The Nature Conservancy. Retrieved from <https://www.conservationgateway.org/ExternalLinks/Pages/marine-conservation-agree.aspx>

Sealey, K. S., Binder, P. M., & Burch, R. K. (2018). Financial credit drives urban land-use change in The United States. *Anthropocene*, 21, 42-51. Retrieved from: <https://doi.org/10.1016/j.ancene.2018.01.002>

Earth Charter International. (2000-2021). *The earth charter*. San José, Costa Rica: Earth Charter International. Retrieved from: <http://earthcharter.org/discover/the-earth-charter/>

TourismConcern - Action for Ethical Tourism. <https://www.travindy.com/thirty-years-of-tourism-concern/>

World Travel & Tourism Council, International Hotel & Restaurant Association, International Federation of Tour Operators, International Council of Cruise Lines. (2002). *Industry As a Partner for Sustainable Development: Tourism*. Nairobi, Kenya: United Nations Environment Programme. <http://www.unep.fr/shared/publications/pdf/WEBx0012xPA-IndustryTourism.pdf>

APPENDIX A: Facilitator's Guide (continued)

Student Version of the Assignment

Team Project: Ecoresort and Sustainability

Learning Objectives

By the end of this team-based learning exercise, you will be able to:

- Conduct basic research related to current environmental issues such as energy consumption, food availability, freshwater supply concerns, waste generation, human health, and habitat restoration.
- Generate evidence-based decisions about the degradation of natural capital that results in human-dominated systems.
- Develop business proposals that incorporate environmental sustainability as a fundamental bottom-line consideration, while addressing social needs, economic interests, and cultural awareness of community members and/or tourists.
- Collaborate in teams to demonstrate effective communication, collaboration, and critical thinking skills.
- Connect issues of civic importance to your daily lives and decision-making processes.

Introduction

Imagine the world in 2030! Given your new knowledge of environmental sciences, your consulting firm was asked to create a pitch proposal for a sustainable eco-friendly island resort, while simultaneously mitigating ecological damage and restoring disturbed areas. You have several endangered species that must be protected on your island; they need access to upland and freshwater habitat, estuarine habitat, and offshore coral reef habitat.

As a team, complete a summary of your ecoresort proposal by building a webpage that addresses in detail all the questions listed below. You'll need to align with the concepts covered in class related to sustainability of natural resources, economic services, and ecological services. In short, what world do you want to create for humanity in 2030?

Tasks

- Elect a Board of Directors for your business and assign positions related to your majors.
- What is the company name of your resort?
- Why do people come to your resort? How many visitors do you receive annually? What recreational opportunities do you offer them? How do you mitigate environmental damage left behind from these recreational activities?
- How does your resort obtain the following?
 - Water
 - Food
 - Energy
- How does your resort get rid of waste?
 - imply shipping it to another location or dumping it in a landfill is not acceptable.
- What is the transportation plan?
 - On the island
 - Between the island and other places
- Describe housing that is available to employees. Where is it located? How does it minimize ecological impacts?
- How will you address public health issues? In what ways will you manage healthcare for your employees and guests?
- What types of wildlife areas have you included in your restoration plan?
 - Watershed
 - Inland, terrestrial, and freshwater reserves
 - Mangrove, salt marsh, and estuarine preserves
 - Marine and reef protected areas
- In what ways will you establish wildlife corridors? Why did you choose this type of ecological habitat restoration plan? Explain how this restoration plan preserves biodiversity.

- Choose a key indicator species found on your island and describe its total way of life (or niche) and its interactions with the biotic and abiotic components of the ecosystem. Make sure this organism has access to all the wildlife areas outlined above. Describe the organism's interactions in each ecosystem type.
- How will you protect your island from climate change impacts, including sea level rise, while maintaining ecological integrity and connectivity?
- Develop a learning module focused on the "4 Guiding Principles of The Earth Charter." Explain, *in detail*, how your resort will provide education and outreach to the local community regarding your sustainable development plans.
- How do you minimize the overall ecological footprint of the eco-resort? (Refer back to the ecological footprint exercise from earlier this semester to help gather ideas!)
- Create a digital "map" that illustrates the components and layout of your ecoresort.
- Generate a digital Venn Diagram that includes the following: Environmental Responsibility, Social Well-being, and Economic Growth. Explain how your resort relates to each of these underlying themes and to sustainability and the triple bottom line.

Team Project Deliverables

- Create a webpage that answers and advertises all the points outlined above in a highly descriptive and creative manner. Market your island resort as if you were an actual Board of Directors representing a major green-friendly resort. The actual layout of the webpage is entirely up to the team, but this advertisement must completely relate, in detail, all the above information, and you must demonstrate a thorough understanding of all concepts.
- Your team will collaborate in class and online (via Google Docs and/or the Canvas Learning Management System). Then, you'll submit your project via an online webpage. Here are a few options for your team to consider using:
 - <https://sway.office.com/>
 - <https://sites.google.com/>
 - www.weebly.com
- Please create a free account and provide me with your team's username and password information.

Due Date

- 2DEC20XX (Each team will also present their webpage to the class on this day.)

Please Note

- This project will be conducted in teams of three students that you will choose. Again, your team will evaluate and rate your participation and performance, which will ultimately be used to determine your individual final grade on the project. For full credit, your team must present a professional product that completely addresses the items outlined above.
- Creativity is highly encouraged! You must, however, perform all tasks outlined on this document and submit a project that includes alignments with the discussions of the topics covered in class this semester. Simply answering the questions above may not necessarily guarantee a desired grade. You must demonstrate complete and detailed understanding of the crucial concepts covered this semester in class and from the readings.
- Keep in mind that this is worth XX% of your final average, so that amount of effort must be put into the final product and deliverables. There will be no opportunity for late and/or make-up work.

APPENDIX A:
Facilitator's Guide (continued)

Simplified Grading Rubric

Group:		Ecoresort Name:	
Students:			
	Possible Points	Points Earned	Comments
I. Resort Background Info	10		
Board of Directors	2		Yes = 2
Resort Name	2		Yes = 2
Visitor Information	3		Yes = 3
Ecological Footprint from activities	3		Yes = 3
II. Resort Infrastructure	30		
Energy, Food, and Water	15		15 = Very Good; 12 = Good; 9 = Fair
Waste removal	5		5 = Very Good; 4 = Good; 3 = Fair
Transportation Plan	5		5 = Very Good; 4 = Good; 3 = Fair
Employee Housing	5		5 = Very Good; 4 = Good; 3 = Fair
III. Wildlife and Ecology	25		
Wildlife area types	10		10 = Very Good; 8 = Good; 7 = Fair
Wildlife area corridors	5		5 = Very Good; 4 = Good; 3 = Fair
Key Indicator Species and Niche	10		10 = Very Good; 8 = Good; 7 = Fair
IV. Overall Ecological Footprint of Resort	10		
Annual visitor info addressed	10		10 = Very Good; 8 = Good; 7 = Fair
V. Map of Resort	5		
Map Included	5		Yes = 10
ORAL PRESENTATION			
VI. Venn Diagram	15		
Includes all three sustainability themes	15		Excellent Description 15, 14, 13, 12, 11, 10, <10 Poor
VII. Education and Outreach	5		
Describes program designed to educate w/ strong relationship to G.P.'s of E.C.	5		5 = Very Good; 4 = Good; 3 = Fair
VIII. Oral Presentation	10		
Evaluation of presentations skills	10		

Continues on next page >

APPENDIX A:
Facilitator's Guide (continued)

Simplified Grading Rubric (continued)

Group:	Ecoresort Name:		
Students:			
	Possible Points	Points Earned	Comments
VII. Education and Outreach	5		
Describes program designed to educate w/ strong relationship to G.P.'s of E.C.	5		5 = Very Good; 4 = Good; 3 = Fair
VIII. Oral Presentation	10		
Evaluation of presentations skills	10		
IX. Webpage Presentation	40		
Organization and Flow	10		Great 10, 9, 8, 7, 6, 5 Fair
Transition between Topics	10		Great 10, 9, 8, 7, 6, 5 Fair
Creativity in Design	10		Great 10, 9, 8, 7, 6, 5 Fair
Professionalism in Final Product	10		Great 10, 9, 8, 7, 6, 5 Fair
Total Score:	= _____ / 150	(_____ %)	<i>Please see comments on back.</i>
X. Group opinion	Group Avg.	Deduction/Addition	Individual Final Score
1			
2			
3			
4			
5			
6			

Midpoint Assessment

Group Project Mid-point Assessment

Instructions: Please answer each question honestly. Your responses will be kept by me and are completely confidential. Circle the number on the scale that best applies to your views. This is an excellent opportunity for me to help your group, if you need it!

Your name: _____

Group Case Study Location: _____

1) Our Group is making good progress on our project:

0 **1** **2** **3** **4** **5**
Have not started Satisfactory Excellent progress

2) Our group is collaborating and working well together:

0 **1** **2** **3** **4** **5**
Not at all Somewhat well Excellent collaboration

3) Each group member is contributing equally to the project:

0 **1** **2** **3** **4** **5**
Not at all Satisfactory Excellent contributions by all

4) I am learning a great deal about the content of this course because of this project:

0 **1** **2** **3** **4** **5**
Not learning Some learning Excellent learning opportunity

Free-write responses (use back of handout if needed):

(a) Please write any additional comments about group dynamics that you would like to bring to my attention:

(b) Please share with me how this project is impacting your learning:

Final Feedback: Ecoresort Team Project

INSTRUCTIONS

Thank you for your participation in this team project. Please take a moment and provide us with authentic feedback. Your thoughts and perspectives are useful to us as we prepare future courses. This short survey is anonymous and will take about five minutes to complete.

Let's get started!

I. GENERAL FEEDBACK

I will recommend this project to my friends.

Circle one number that best describes your response on the 10-point scale below.

1	2	3	4	5	6	7	8	9	10
Not likely									Likely

And please explain your answer:

APPENDIX A:
Facilitator's Guide (continued)

Final Feedback: Ecoresort Team Project (continued)

II. PROJECT FEEDBACK

To what extent do you agree with the following statements?

Please place an "X" in the box that best represents your choice from the agreement scale for each of the prompts.

	Strongly disagree	Disagree	Agree	Strongly agree
This project held my interest.				
The project helped me to learn.				
What I learned from this project is relevant to my daily life.				
The project helped me to value what might be needed to live in an environmentally sustainable manner.				
The project helped me apply my knowledge gains to an authentic scenario.				
I will apply the information I learned to my own life.				

APPENDIX A:
Facilitator's Guide (continued)

Final Feedback: Ecoresort Team Project (continued)

III. YOUR LEARNING

When thinking about what you learned during this project, how would you rate the degree to which each of the following factors contributed to your learning?

Please place an "X" in the box that best represents your choice from the agreement scale for each of the prompts.

	Not at all	Low	Medium	High
The project topics				
Conversations with my team members				
My prior knowledge				
The online course materials (RLOs, online assignments, etc.)				
The face-to-face activities (labs, in-class activities, etc.)				
The "ecoresort" contextual situation				
The textbook				
The ability to be creative				
The personalized nature of the project				

APPENDIX A:
Facilitator's Guide (continued)

Final Feedback: Ecoresort Team Project (continued)

IV. OUTCOMES

When thinking about what you learned during this project, please rate your degree of confidence by circling one number that best describes your response on each of the 10-point scales below.

a. I can conduct basic research related to current environmental issues such as energy consumption, food availability, freshwater supply concerns, waste generation, human health, and habitat restoration.

1	2	3	4	5	6	7	8	9	10
Cannot do at all									Highly certain can do

b. I can generate evidence-based decisions about the degradation of natural capital that results in human-dominated systems.

1	2	3	4	5	6	7	8	9	10
Cannot do at all									Highly certain can do

c. I can develop business proposals that incorporate environmental sustainability as a fundamental bottom-line consideration, while addressing social needs, economic interests, and cultural awareness of community members and/or tourists.

1	2	3	4	5	6	7	8	9	10
Cannot do at all									Highly certain can do

d. I can collaborate in teams to demonstrate effective communication, collaboration, and critical thinking skills.

1	2	3	4	5	6	7	8	9	10
Cannot do at all									Highly certain can do

APPENDIX A:
Facilitator's Guide (continued)

Final Feedback: Ecoresort Team Project (continued)

e. I can connect issues of civic importance to my daily life and decision-making processes.

1	2	3	4	5	6	7	8	9	10
Cannot do at all									Highly certain can do

V. FREE RESPONSE

Please describe what you enjoyed most about this project:

Please describe what you would like to see added to future iterations of this project:

Please add any general comments you may have:

APPENDIX A:
Facilitator's Guide (continued)

Final Feedback: Ecoresort Team Project (continued)

Thank you for your thoughtful feedback. We are grateful for the time you spent completing our survey.

Your first and last name:	Your team's ecoresort name:
----------------------------------	------------------------------------

Please rate the performance for each team member by circling the appropriate number value for each prompt below.

Student Name:					
Please rate this member's effort toward each of the following project components:	No effort	Below average effort	Average effort	Above average effort	Excellent effort
Conducting research	1	2	3	4	5
Project organization	1	2	3	4	5
Attending group meetings	1	2	3	4	5
Project preparation	1	2	3	4	5
Webpage production	1	2	3	4	5
Overall contribution and effort	1	2	3	4	5

Student Name:					
Please rate this member's effort toward each of the following project components:	No effort	Below average effort	Average effort	Above average effort	Excellent effort
Conducting research	1	2	3	4	5
Project organization	1	2	3	4	5
Attending group meetings	1	2	3	4	5
Project preparation	1	2	3	4	5
Webpage production	1	2	3	4	5
Overall contribution and effort	1	2	3	4	5

Student Name:					
Please rate this member's effort toward each of the following project components:	No effort	Below average effort	Average effort	Above average effort	Excellent effort
Conducting research	1	2	3	4	5
Project organization	1	2	3	4	5
Attending group meetings	1	2	3	4	5

APPENDIX A:
Facilitator's Guide (continued)

Final Feedback: Ecoresort Team Project (continued)

Project preparation	1	2	3	4	5
Webpage production	1	2	3	4	5
Overall contribution and effort	1	2	3	4	5

OPEN-ENDED FEEDBACK ABOUT TEAM DYNAMICS

Please feel free to add any additional information about team dynamics in the space below.