



Teaching with Sustainability

A course offered during IAP - January 2022

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Overview of Topics

Week 1 - What is sustainability education?

- Defining sustainability using the Brundtland Report & sustainability education
- Brief timeline of education to accomplish sustainability initiatives
- Explanation of a Jigsaw Activity
- Jigsaw activity of foundational sustainability documents

Week 2 - What is effective teaching?

- Effective teaching is complex
- Learning theories provide a framework for how people learn
- Theoretical perspectives used in sustainability education
- Sustainability Learning Approaches
- Positivism vs Postpositivism
- Positivism and Postpositivism Activity
- Practicality of Sustainability Education

Week 3 - How do we teach sustainably?

- Asset vs Deficit Approaches
- Criticism of US Education
- Bloom's Taxonomy
- Sustainability education looks to paradigm shifts
- Levels of implementing sustainability
- Level 1, Level 2, Level 3
- Transitioning through Sustainability Levels

Week 4 - What does this look like for me?

- Explanation of Categories of Sustainability Literacy Competencies
- Explanation of Sustainable Instructional Approaches
- Overview of Understand by Design (UbD)
- Modified UbD template
- Sticking Points

What does this look like for me?

Week 4

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Learning Objectives for Today

- Participants will consider if they want to modify their content, their practices or both!
- Participants will use a modified backwards design approach to start the planning process to (re)vision their activities

Opening Activity

What type of activity/lesson/course did you bring to work on today? What do you want students to know and be able to do after your modifications?

Where do I start?

Categories of Sustainability Competencies	Sustainability Instructional Approaches
<ul style="list-style-type: none">□ Sustainability Knowledge□ Systems Thinking□ Social Justice□ Futures Thinking□ Active Citizenship□ Content Knowledge	<ul style="list-style-type: none">□ Collaborative, Small Group Learning□ Inquiry-based Learning□ Experiential Learning□ Service Learning□ Place-based Learning□ Culturally Sustained Learning

Categories of Sustainability Literacy Competencies

These categories help us think about the different ways that sustainability is present in the courses we teach.

- Numerous different scholars have weighed in on the knowledge, skills, and dispositions necessary to be considered sustainability literate
 - Wide variety in what and how much is included in these lists
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- Each of these lists start to fall into the following categories:
 - Sustainability Knowledge
 - Systems Thinking
 - Social Justice
 - Futures Thinking
 - Active Citizenship
 - Content Knowledge



Categories of Sustainability Literacy Competencies

Sustainability Knowledge	
Explanation	<ul style="list-style-type: none">● Addresses the interconnection of environmental, social and economic perspectives● Builds past the tradition of an environmental or ecological way of knowing● Embracing and including the interplay between the social and economic perspectives.
Focus of this Category of Competency	<ul style="list-style-type: none">● Builds capacity for greater understanding of sustainability through environmental, social, human health, and/or economic perspectives● Explicit connection to course content and sustainability perspectives
Examples	<ul style="list-style-type: none">● Drawdown● Discussion Questions● Reading Guide● Homework 1 & 2 in the list



Categories of Sustainability Literacy Competencies

Systems Thinking	
Explanation	<ul style="list-style-type: none">● Encourages a return to thinking about the “whole” instead of individual “parts” of a system● Looks at the links between systems and how one decision affects another system
Focus of this Category of Competency	<ul style="list-style-type: none">● Emphasizes how the content being taught is part of a larger system● Encourages explanations or thinking about how the “part” is connected to the whole● Incorporates at least two out of three perspectives of sustainability - environmental, social and/or economic
Examples	<ul style="list-style-type: none">● Paper 1 & Paper 2● Technology Critique● Hometown Analysis● Assignment 1 & 3



Categories of Sustainability Literacy Competencies

Social Justice	
Explanation	<ul style="list-style-type: none">● Clearly articulates a need to provide equitable and inclusive opportunities to all● Acknowledgement of, and action towards dismantling the deeply embedded systems that support and perpetuate inequality● Empowers learners who have been underrepresented
Focus of this Category of Competency	<ul style="list-style-type: none">● Recognizes diversity within the context of the course material(s)● Focus is on equity and identifying existing social barriers that may prevent equity● Equity can be broad from equitable distribution of resources to gender-equity in decision making
Examples	<ul style="list-style-type: none">● Assignments 1, 2 & 4● Reading Guide● What can a body do?● Site Probes



Categories of Sustainability Literacy Competencies

Futures Thinking	
Explanation	<ul style="list-style-type: none">● Often called anticipatory thinking or intergenerational thinking● Encourages instructors and learners to think about how current choices will influence the long-term future● Encourages reflections on how current decisions impact future generations
Focus of this Category of Competency	<ul style="list-style-type: none">● Emphasizes how choices now will impact future generations, 150+ years from now● Focus is on meeting current needs without jeopardizing the needs of future generations● Could use forecasting or backcasting to draw connections between here and then
Examples	<ul style="list-style-type: none">● Dream Project & Term Project● Urban Plans● Problem Set 1



Categories of Sustainability Literacy Competencies

Active Citizenship	
Explanation	<ul style="list-style-type: none">• Positions the learner to connect what they are learning to either their local place or as a global citizen• Encourages the connections between content and positive action within the defined community
Focus of this Category of Competency	<ul style="list-style-type: none">• Emphasizes involvement in local and/or global community• Involves learning about local and/or global community and ties content back to local/global community• Learning and/or action about governments, policies, laws, norms etc• A reading or a lecture likely will not be active citizenship because students are not acting
Examples	<ul style="list-style-type: none">• Health Care Reform• Famine Relief• Big Plan• Final Communication



Sustainable Instructional Approaches

These approaches help us think about the different ways that our teaching practices can embody sustainability

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- *How* we teach is almost as important as *what* we teach
- Make sure our method mirrors our message (Widhalm, 2011)

- Sustainability Instructional Approaches (Nolet, 2016)
 - Collaborative, Small Group Learning
 - Inquiry-based Learning
 - Experiential Learning
 - Service Learning
 - Place based Learning
 - Culturally Sustained Learning

Sustainable Instructional Approaches

Collaborative, Small Group Learning	
Explanation	<ul style="list-style-type: none">● Working in groups of 26, students engage in a learning experience where the initial parameters are often defined by the instructor
Examples of this type of Learning	<ul style="list-style-type: none">● Think-Pair-Share● Jigsaw Activity● Roundtable● Discussions
Examples	<ul style="list-style-type: none">● Discussion Prompts● Case Writeup Questions● Project of Change or Research Paper● Final Project

Sustainable Instructional Approaches

Inquiry -based Learning	
Explanation	<ul style="list-style-type: none">● Students engage in authentic, selfdirected learning.● Often, inquiry-based learning is collaborative● In more guided inquiry experiences the instructor sets initial parameters and students follow a line of inquiry tied to the parameters
Examples of this type of Learning	<ul style="list-style-type: none">● Project-based learning● Problem-based learning● Design-based learning● Labs
Examples	<ul style="list-style-type: none">● Papers 1-4● Term Project● Tutorials; Drawdown; Dream Project Exercise; Dream Project Project● Project

Sustainable Instructional Approaches

Experiential Learning	
Explanation	<ul style="list-style-type: none">● Provides students with direct experiences, accompanied with critical reflection● Instructors select experiences for students and then serve as the facilitator while the experience is occurring● Commonly conducted in informal education settings, but also serve a valuable role in formal education settings
Examples of this type of Learning	<ul style="list-style-type: none">● Field trips● Field Work● Internships● Hands-on Lessons
Examples	<ul style="list-style-type: none">● Shading Studies & Sun Path Diagrams● Problem Set 1● Field Research and Report● Personal Energy Consumption● Field trip

Sustainable Instructional Approaches

Service Learning	
Explanation	<ul style="list-style-type: none">● Students engage in learning through community-based service, where both the learner and the community benefit● More than just volunteering● Often has components of inquiry-based, experiential, and collaborative learning● Stages include: Investigation, Planning & Preparation; Action; Reflection; Demonstration/Celebration
Examples of this type of Learning	<ul style="list-style-type: none">● Experiences vary greatly● Event to support local community● Tutoring in a local school/after school program● Conducting research with community members
Examples	<ul style="list-style-type: none">● Group Response to a Proposal● Service-Learning Standards for Quality Practice

Sustainable Instructional Approaches

Place-based Learning	
Explanation	<ul style="list-style-type: none">● Students interact with their local community● Students are encouraged to ask questions and investigation their local place on topics of environmental, economic and or social equity● Includes components of inquiry-based, experiential and/or service learning
Examples of this type of Learning	<ul style="list-style-type: none">● Field Trip● Guest Speaker● Primary source documents from community● Questions/Dialogue about community
Examples	<ul style="list-style-type: none">● Elemental Case Study● Re-designing Massachusetts Avenue● Investigating a Site in the Past or Present Neighborhoods of MIT● Hometown Analysis● National Environmental Policy-making

Sustainable Instructional Approaches

Culturally Sustained Learning	
Explanation	<ul style="list-style-type: none">● Affirms and sustains students' cultural backgrounds● Often takes place behind the scenes in the development of lessons, experiences, and conscious awareness of teaching behaviors● Takes place throughout all of the other practices, but as been intentionally identified as its own approach to signify its importance
Examples of this type of Learning	<ul style="list-style-type: none">● Reflection on one's own cultural lens● Addressing biases in systems● Utilization of students' culture to guide instruction● Removing barriers to access instruction
Examples	<ul style="list-style-type: none">● Culturally Sustaining Pedagogy: An Introduction● A Conversation about Instructional Equity by Zaretta Hammond● Culturally Sustaining Pedagogy from CA Dept. of Ed



Where do I
start?

Backwards
Design

- *Understanding by Design* (UbD) is a curriculum design process commonly known as Backwards Design

- Instructors start with their learning goals for students and design experiences, where students build their understanding and demonstrate their knowledge, working backwards, to support those goals

- Works to answer the questions
 - What do I want my students to know and be able to do?
 - How will I support them in building the knowledge, skills and/or dispositions to accomplish those goals?

Where do I start?

Start here if you want to focus on the content that is taught

Categories of Sustainability Competencies

- Sustainability Knowledge
- Systems Thinking
- Social Justice
- Futures Thinking
- Active Citizenship
- Content Knowledge

Start here if you want to focus on the way you are teaching

Sustainability Instructional Approaches

- Collaborative, Small Group Learning
- Inquiry-based Learning
- Experiential Learning
- Service Learning
- Place-based Learning
- Culturally Sustained Learning

Where do I start?

(Re)Visioning Instruction for Sustainability - IAP January 2022

The following prompts are designed to help you pick a learning experience (a lesson, activity, unit, course, continuing education experience, professional development) and start to revise that experience to be more sustainable. You are not required to answer any of the questions but space is provided below each prompt for you to share what you're thinking. This document is yours and yours alone, you do not need to share it with anyone.

Reflect on the original learning experience that you'd like to revise.

What did students do? What did the instructor do? What evidence for learning did students share?

Are you looking to modify the content of the learning experience, the instructional approach, or both?

Which category of sustainability literacy competency OR sustainability instructional approach would you like the new learning experience to embody?

What are your goals for students in this learning experience?

What content standards, course objectives, program objectives or learning outcomes will this experience address?

What do you want students to understand at the end of this learning experience?

What are the big ideas? What specific understandings about them are desired? What misunderstandings could be predicted?

What could be an essential question that you could use to engage and hook students in the learning experience?

What do you want students to know and be able to do by the end of their learning experience?

What key knowledge and skills will students acquire as a result of this experience?

Students will know...	Students will be able to...
<input type="text"/>	<input type="text"/>

How will students show their understanding of the material?

What authentic performance tasks will students complete and how will it be assessed? What other evidence (quizzes, tests, papers, homework, journals) will students use to demonstrate their understanding of the material?

What learning experiences and instruction will enable students to achieve the desired results?

How will the lesson or series of lessons move forward? What will the teacher need to do? What will students do?

Please also create any instructional materials that students may need during this instruction. Will you need to create a rubric? A worksheet? An outline of expectations? A list of resources?

How do you want to work?

- I want to work...
 - A. individually.
 - B. in a group, where discussions are frequent and we can dialogue about the progress we're making, even if it is different.
 - C. in a group for accountability; discussions are infrequent but could occur.

Workshop Time

The next 30 minutes are for you to workshop your ideas. We'll be available to provide support if there are questions.

What do you hope to accomplish during your time?

We'll briefly share out what we did and/or what we're working on after our workshop time has concluded.

Sticking Points

- You're changing the norm for:
 - Students
 - *Students are familiar with the status quo and they become more familiar the older they get. If you shake it up on them there is some inherent push back because they know the system and you're changing the system.*
 - Colleagues
 - *Colleagues may bristle at you teaching differently than you have in the past.*
 - You
 - *Not everything you try will be a success the first time. That doesn't mean you should give up!*

Going Further

Articles that address topics from class today:

- Brundiens, K., Barth, M., Cebrián, G., Cohen, M., Diaz, L., Douchette-Remington, S., Dripps, W., Habron, G., Harré, N., Jarchow, M., Losch, K., Michel, J., Mochizuki, Y., Rieckmann, M., Parnell, R., Walker, P., Zint, M., (2021). Key competencies in sustainability in higher education: Toward an agreed-upon reference framework. *Sustainability Science*, 16, 13-29. <https://doi.org/10.1007/s11625-020-00838-2>
- Widhalm, B. (2011). Educators as architects of living systems: Designing vibrant learning experiences beyond sustainability and systems thinking. *Journal of Sustainability Education*, 2
- Redman, E., Murphy, C., Mancilla, Y., Mallon, B., Kater-Wettstaedt, L., Barth, M., Ortiz M.G., Smith, G., & Kelly, O. (2021). International scaling of sustainability continuing professional development for in-service teachers. *Interdisciplinary Journal of Environmental and Science Education*, 17(3), e2243. <https://doi.org/10.21601/ijese/10936>

Review of Learning Objectives

- Participants will consider if they want to modify their content, their practices or both!
- Participants will use a modified backwards design approach to start the planning process to (re)vision their activities

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1. What did you learn today?
 2. How will people you interact with know and benefit?

Thank you!

Thank you for your time, energy and effort in our
IAP course!

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