Incorporating Ethics Across the Curriculum in the Life Sciences

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Ethics in the sustainability curriculum

- Bringing ethics into a curriculum can help our students understand the processes involved in making the right choices
- Rather than teaching just the science, helping students to place science in an ethical context gives them the opportunity to learn how their scientific expertise impacts and is impacted by economic, legal, political, and other parameters
- The specific connection of this idea to the SDGs will be the topic of presentations after this one

Two 'poles' of ethics in the science curriculum

- One option is to require that all degree-receiving students complete a core course in ethics
- In most cases this course is offered through a philosophy department
- Often a single course for all students
- Team-taught by an ethicist and a scientist
- Course structure varies, but generally starts with introduction to ethical theories and how they are used in ethical decision-making
- Students then explore the ways that ethical theories are used in making decisions on relevant topics

Positive features of a core course

- All students receive a course in ethics
- Frequently course is team taught by an ethicist and a scientist
- Ethicist can help students explore the rigor of ethical theories and methodologies for application
- Scientist can help students with the practice of applying ethics to sustainability issues
- The broad range of disciplines in which students are enrolled can give cross fertilization of topics for the students

Challenges of a core course

- Students are often reluctant to embrace a required course, especially if they don't see the value to their own studies
- If not already required, faculty may be reluctant to add a course to all curricula in an institution (especially an ethics course)
- If not required, students may be reluctant to take an additional course
- The science context of a single ethics course may be perceived as too generic by students and faculty alike
- There is added cost for faculty salaries

Considerations of a core course

- If desired, groundwork will need to be done to convince faculty it is of sufficient value to be required
- Ethicist will need to have background and interest in appropriate sustainability issues
- Scientist will need to have background and interest in ethics
- Faculty will need to determine if course should be taken at a specific place in the curriculum sequence (often near degree completion)
- Must offer multiple times during the day so it can fit into all student course schedules
- Course can be taught in depth (offered 3 times a week) or more as a survey course (once a week)

Decentralized teaching of sustainability ethics

- Another option is to teach topics in ethics within specific content-related courses
- Can include modules in ethics and ethical decision making
- May incorporate ethics into discussions of specific discipline topics
- Can offer the topic in an introductory course, a capstone course, or an upper level course
- Or the topic can be included in a number of different courses and taught once or multiple times in each course

Advantages of decentralization

- It may be less difficult convincing faculty in a single department, or individual faculty members within a department, of the value of ethics teaching
- Ethics are discussed specifically in the context of the students' discipline
- Students can more readily see the relationship of their discipline to ethical decision-making
- No new course is created, it can fit within existing curricula
- Extra faculty salary not required
- Offers flexibility in the amount of ethics covered and where it fits within a curriculum

Disadvantages of decentralization

- Science faculty may not feel qualified to teach ethics
- Faculty may perceive it as a waste of time
- Faculty, even if they see the value, can't fit it into the courses they teach
- If incorporated into some disciplines and not others, then not all graduating students will receive the exposure
- Students may receive little or no exposure to ethical theories
- May be too superficial to be of benefit
- Students in a single discipline or course may be homogeneous, resulting in exposure to fewer perspectives

Considerations of decentralization

- Individual faculty can add ethics to their own courses, but for a discipline (or all disciplines) to require ethics, a central decision would need to be made
- Should an ethicist be brought in for a guest lecture or series, or should faculty be responsible for all ethics instruction?

Arguments against ethics in science curricula

- Not all curricula may have an obvious ethics component
- It is not the purview of faculty to teach ethics, because our curriculum is science, not philosophy.
- Higher education institutions that credential technical skills and knowledge of graduates should not influence moral development or values of students
- Even if there is value in teaching ethics, our curriculum has no room for such topics
- Our budgets are too tight already, we need to employ content specialists, not philosophers
- Ethics hasn't progressed in 3000 years

No room

- Basic science courses are generally designed to provide students with content knowledge and skills. Within the broad range of content, we must be selective in what we include.
- In the United States higher education system, a standard science course without a laboratory meets for 50 minutes 3 times a week for 16 weeks, a total of 40 hours.
- I started my faculty career as a genetics professor in 1977. I was told at the time that global genetic knowledge doubled every three years. If this was true there is now about 4,000 times more genetic knowledge than there was in 1977.
- But the introductory genetics course in 2017 meets for the same amount of time it did in 1977. How can we say that sufficient content is mastered 40 years later?
- And what scientific knowledge mastered by our students in 2017 will be important in 2030?

Do we continue the process?

- There is still the challenge and the need to 'fill the cup' of student learning with the latest information that we feel is the most appropriate 40 hours of knowledge in our discipline.
- Students must learn anatomy if they are training to become surgeons and mathematics if they are going to be engineers
- However, I'm changing my perspective
- I teach an organic gardening seminar course for first-year college students at my university
- The seminar only meets one hour a week for 16 weeks. I thought I should give the students details of managing soil organic matter, seeding and vegetative propagation, weed and insect management, harvest techniques so they would understand the science behind sustainable food production

What should we teach?

- What would it look like if we taught our students the reality of achieving sustainable development goals?
- I'm becoming more comfortable with 'letting go' of the need to re-explain critical knowledge content in a lecture when students can obtain this on their own
- Increasingly I believe we should consider helping our students learn how to learn
- Emphasize critical thinking and problem solving, not memorization
- But what if our students don't have the content knowledge when they graduate (in my case genetics and horticulture)?
- In most cases, they can learn
- Personal example – our son graduated from college with a degree in psychology
- He recently received his second major promotion with a financial management firm
- He never had a single economics or business class

Changes in the course

- A number of years ago I decided that students in the organic gardening class should grow their own food in the field and greenhouse
- But we still only had one hour a week in class
- I was forced to lecture less about food production principles in class
- I realized students could read!
- And I could determine whether they understood concepts with various types of evaluation
- "Eating my own food 30 seconds after I harvested was the greatest experience I've ever had"
- "You taught me the reality of food"

Who should teach?

- Some argue that one should have a doctorate in ethics to bring the topic to undergraduate students
- Are only doctorates in ethics people with ethics?
- Workshops, short courses, readings, etc. can help scientists become familiar with ethical constructs
- Grounding ethical discussions in the discipline will make a big impact for students
- Adding a component in ethical decision-making to science curricula can help our students see that they have an important role in addressing SDG components to:
- 'Promote peaceful and inclusive societies'
- 'Reduce inequality'
- 'Ensure energy access'
- 'Ensure water-related sanitation'

Responses

- Economic, political, and social decisions impacting sustainability will be made in our society
- Individuals with science background should insure that decision-makers base their actions on an understanding of science
- We must provide our students with understandings of the role science and society interact if the world is to reach the 17 sustainability goals
- After our students leave our universities, we want them to be active participants in reaching the goals, which in most cases can only be met if science is applied in an ethical manner

Responses

- Appropriate teaching of ethics does not influence values of students, but helps them examine and understand their own values, how they originate, and how they are used in making many decisions, including scientific ones
- Ethical decision-making has been part of the human situation for thousands of years. We still use that same method, because it has allowed humanity to reach ethical decisions all this time.
- Students have a right, a privilege, and a responsibility to know how their technology will impact the world.
- We should educate them so they can be a part of the application of that technology in society, not leaving it to politicians alone.

Ethical values and how they connect to science

- Where do our values originate?
- *A value is an enduring belief that a particular end or mean is more socially or individually preferable than another end or mean.*
- Notice a key word in the definition of a value: *belief*.
- All of our values come from underlying beliefs.
- How did we get to our values, do they change, and how can we help our students reflect on their values?

Teaching ideas

- Straight lecture probably not the best
- An important place to start may be to ask students (and ourselves!) for the basis of their decisions about what is right and wrong
- Discuss what influences in our lives shape our values
- Family
- Peers (social influences)
- The workplace (work ethics, job roles)
- Educational institutions
- Significant life events (death, divorce, losing jobs, major accident and trauma, major health issues, significant financial losses and so on)
- Religion
- Music
- Media
- Technology
- Culture
- Major historical events (wars, recessions, etc).

Student values

- After exploring origins of their values, we can help students reflect and define what is valuable to them
- Many different types of questionnaires/surveys can be used to help. Some examples:
- What person do I most respect? Why?
- What are the top three qualities of my best friend?
- What are three things I hate (tie to 17 goals?)
- What are the three most important values I want to pass on to my children?
- What values do I see being valid 100 years from now?

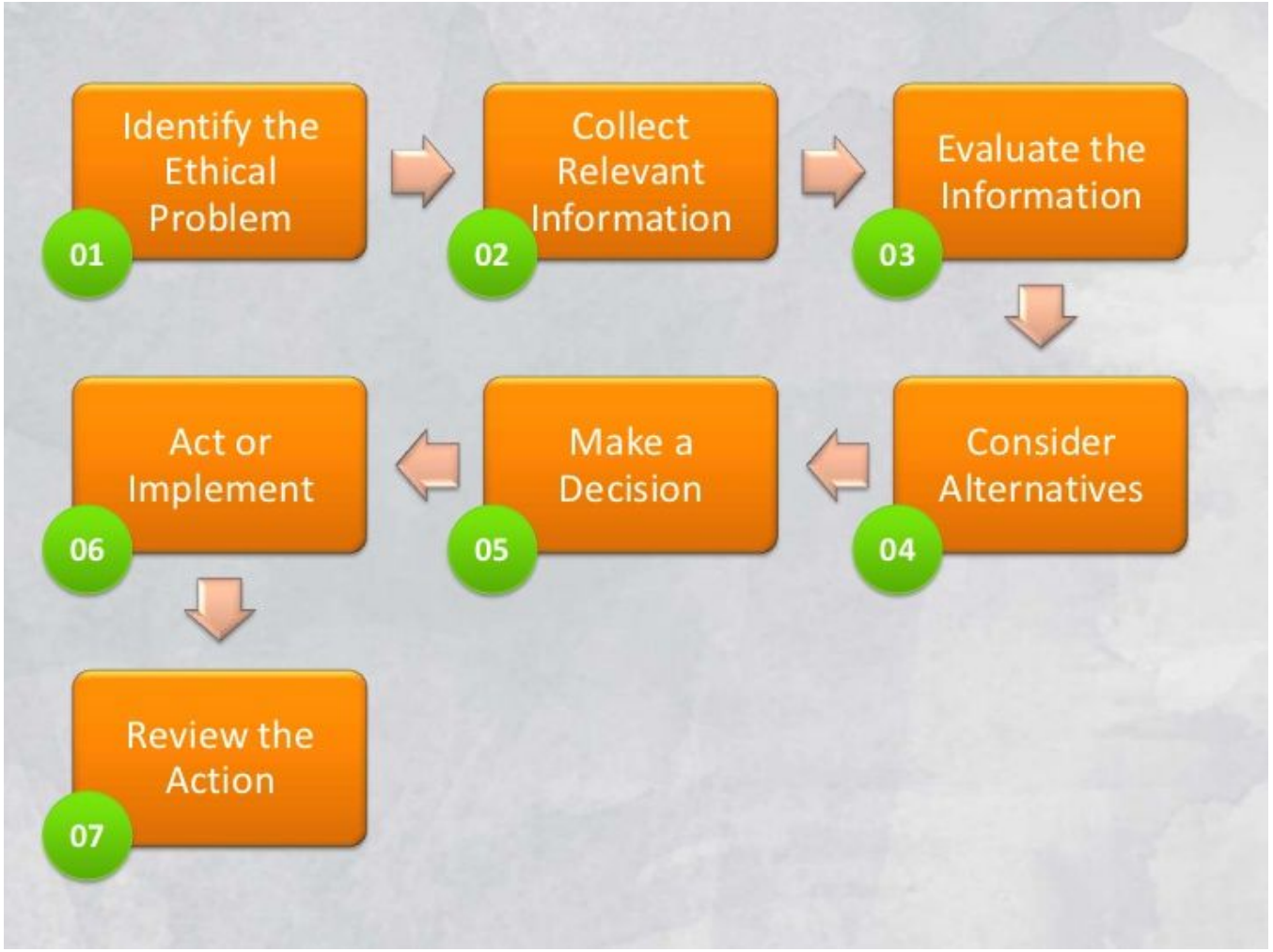
Teaching techniques

- Even with assigned readings and a variety of evaluation techniques of student competencies...
- Lecturing doesn't work any better in ethics than in any of our disciplines
- Case studies are particularly effective
- Many are published
- Create your own
- Make them tight, sometimes students pick on the details and don't benefit from the broader issues
- Have students create case studies
- Group work, inside or outside of class, can be particularly effective, especially if there is variation in experiences, values, and opinions

Techniques

- Stand and speak on a topic with different student perspectives
- Student debates, taking sides opposite their own and arguing effectively
- Have students take quizzes on content topics and interpretation
- Grade quiz and then have students work in groups to answer
- Re-grade
- Create posters on a topic, connecting presentation to something in popular culture
- Bring in the fine arts, where students sculpt, sing, or dance their responses to an issue
- Important to have solid rubrics for evaluation
- Topics for discussion or assignments can frequently be taken from news media

Process for ethical decision making



https://www.slideshare.net/cokyfauzialfi/ethical-decision-making-process

Closing thoughts

- Regardless of the method, exposing science students to systematic ethical decision making is critical to their future contribution to the 2030 SDGs.
- As faculty, we need to help them place their science discipline in these broader contexts and see how science responsibly contributes to ending poverty, protecting the planet, and ensuring prosperity for all.
- Questions or comments?
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Discussion questions

- Students, regardless of their program of study, frequently don't see the need to studying ethics. How would you articulate the value to them?
- How would you convince your colleagues that teaching ethical and sustainable values in their courses is important?
- For your own institution or program, would a core ethics course or ethics decentralized across the curriculum be more successful? Why?
- What are some of the challenges you see for incorporation of ethics in your curriculum?
- How could you address those challenges?
- Do you think values and ethics change over time, or are they constant once a person reaches adulthood? Why?
- Is it appropriate for us to facilitate our students' examination of the values they bring to their science discipline? Why or why not? What is the impact of teaching ethics in your curriculum?