Integrating Sustainability Across the Curriculum: Microeconomics
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Introduction

Integrating Sustainability Across the Curriculum is a new undergraduate research program at the University of Pennsylvania. The goal of this program is to integrate themes of sustainability into course syllabi across various academic departments.

Integrating sustainability into Dr. Rebecca Stein’s Introduction to Microeconomics course was a challenge. However, as a result of the research, many lectures and a student assignment now encourage students to think about the intersection of sustainability and economics as these fields apply to the real world.

Context

In some ways, sustainability and economic theory complement each other. In other ways, sustainability and economics contradict each other. These contradictions created a major challenge: how to integrate sustainability without sacrificing the importance or integrity of fundamental economic theory.

Sustainability

• The needs of the environment should take priority over the economy.
• Economic growth must be curbed so it remains at a rate that the planet can sustain.

Economics

• To determine the best financial policies and maximize social benefit, externalities such as pollution should be taken into account.
• Improvement in economic output per capita is a positive thing since it indicates a rise in the standard of living.

Both

• To determine the best financial policies and maximize social benefit, externalities such as pollution should be taken into account.

Economics and sustainability as these fields apply to the real world.

Process

-Search for similar courses online to see if other universities are incorporating sustainability into introductory economics

-Collect data to demonstrate exponential growth in the real world
  • Graphs of consumption over time
  • Graphs of total GDP and per capita GDP
  • Graphs of total energy usage and per capita energy usage
  • Estimates of externality impacts (such as estimates of economic damage caused a global temperature increase)
  • Effect of discounting in evaluating externalities (to show how the cost of future environmental damage is undervalued when converted into a corresponding “present value”)
  • Literature related to sustainable economic development

-Read lectures to determine where sustainability can tie in

-Add new definitions and data to PowerPoint lectures

-Update a student assignment to incorporate sustainability concepts and current environmental events

The image below is an excerpt from a student assignment that combines sustainability and economics.

Externalities: Taxing Emissions

Part I

Fossil fuels are crucial sources of energy in our daily lives, and the energy industry is a vital component in the economy. However, burning fossil fuels is known to release greenhouse gases such as carbon dioxide into the atmosphere, which negatively impacts the environment through global warming. As a result, many parts of the world are taking action to curb carbon emissions. In the Canadian province of British Columbia, a carbon tax is currently in effect. In July 2012, the tax increased from $25 per metric ton of carbon to $30, further increasing the cost that polluters must pay. Greenhouse gas emissions have decreased 4.4% since the tax was created over four years ago, even though the province’s population and GDP have continued growing. Some economists support the idea of creating a carbon tax in the United States, although the issue is debated. Should a tax on emissions be established, and what should the basis be for calculating a household or company’s emissions footprint?

Suppose you are an economist working for the Department of Energy, and your task was to convince the Secretary of Energy to adopt a carbon tax. Follow the steps below to show how such a tax would work and what its benefits are. You should have a series of well-labeled graphs, and you should use these graphs to explain your position.

Results

-While many universities offer advanced economics classes that specialize in environmental topics, an introductory economics course that comprehensively incorporates sustainability seems to be less common.

-Some lectures now feature new slides showing quantitative data, graphs, and definitions relating to sustainability.

-A student assignment allows students to apply economic theory to current issues, such as the possibility of a carbon tax, and the problems with mountaintop removal.

-Overall, it is possible to incorporate sustainability into an economics course without sacrificing the fundamental aspects of economic theory.

Selected Works Cited
