The Interdisciplinary Approach to Teaching Economics

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The theory of economics does not furnish a body of settled conclusions immediately applicable to policy. It is a method rather than a doctrine, an apparatus of the mind, a technique of thinking which helps the possessor to draw correct conclusions. (Keynes, 1922)

The most exciting science in the 21st century is likely to evolve among not within traditional disciplines . . . yet the education of scientists has historically been constrained by disciplines, paralleling patterns of science funding. (Sung et al., 2003, p. 1485)

If economics is an apparatus of the mind, then interdisciplinary teaching of economics should be the norm: if only it were so. Many economic educators are suspicious of teaching in an interdisciplinary manner, fearing their classroom will lack precision and that they will be forced to abandon formal models – the hallmark of modern economics. Moreover, they believe it is necessary to be a “jack-of-all-trades” or “expert” in a myriad of disciplines in order to explore issues with economics students in an interdisciplinary fashion. The purpose of this chapter is to allay such fears and make the case that economists who are interdisciplinary educators provide their students with a richer understanding of the contribution economic analysis can make to complex policy issues. Moreover, we clarify what interdisciplinary teaching entails, offer tips on how to be an interdisciplinary educator, and describe two examples of how interdisciplinary can provide a more enriching discourse with economics students on topics typically covered in standard economics classes.

WHAT IS INTERDISCIPLINARY TEACHING?

Interdisciplinary instruction entails the use and integration of methods and analytical frameworks from more than one academic discipline to examine a theme, issue, question or topic. Interdisciplinary education makes use of disciplinary approaches to examine topics, but pushes beyond the norm of exploring questions from a single discipline by engaging in an analysis that features the integration of ideas from relevant disciplines, leading to a more complete perspective on the issues under investigation.

Economists are increasingly taking into account notions from a host of disciplines when conducting research on a wide range of topics.1 This development highlights the view that many economic educators are coming to believe that interdisciplinary perspectives are needed to adequately understand complex and multi-faceted issues such as climate change, sources of economic growth, teenage pregnancy, biodiversity loss, new drug development, genetically modified foods, and health care access. Interdisciplinary teaching is different from multi- or cross-disciplinary teaching in that it requires an
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integration and synthesis of different perspectives rather than a simple consideration of multiple viewpoints.²

WHY USE INTERDISCIPLINARY TEACHING IN ECONOMICS?

Improved economics instruction

The discipline of economics is a behavioral science primarily concerned with the production of goods and services and the allocation of scarce resources to promote social welfare. Economics educators are expected to help students master the conventional formal economic models used to explore material that is central to the course they are leading. However, they typically face a number of additional objectives in their role as educators, many of which are well served by incorporating and integrating insights from other disciplines. Many economics courses broach questions of concern to policy makers. Therefore, policy makers and educators are charged with helping students develop the skills needed to analyze tradeoffs associated with alternative courses of action. Not surprisingly, the associated questions economics teachers explore with students are also being investigated in other disciplines, but with different analytical frameworks and methodologies. An interdisciplinary approach that fuses knowledge and insights from other disciplines with an economic framework of analysis to form a more inclusive means of examining questions will foster a richer, more productive, discourse. For instance, economic educators are likely to find an interdisciplinary perspective useful when helping students understand causes and consequences of: joblessness, welfare reform, pollution, educational attainment, and access to health care. All of these issues have psychological, sociological, moral, and political dimensions for which a neoclassical market framework may not provide a sufficient means of exploration.

Improved Contribution to Overall Student Education

College administrators believe that economic educators, especially those teaching introductory courses, should assist students in the acquisition of the broad array of skills and talents associated with a liberal education.³ There is also an emerging viewpoint in higher education (see for instance Fogarty and Pete, 2009) that interdisciplinary instruction is an effective way to engage students and to help them develop knowledge, insights, problem-solving skills, self-confidence, self-efficacy, and a passion for learning that are fundamental general education goals.⁴ For instance, prominent social learning theorists (Bandura, 1977; Gardner, 1983) and education policy researchers (Repko, 2009; Fink, 2003) report that interdisciplinary inquiry leads to gains in cognition and advances a student’s capacity to recognize and overcome – when appropriate – preconceptions. Moreover, Fink (2003) asserts that interdisciplinary instruction leads to “significant learning” – learning that is meaningful and has a lasting impact on a student’s ability to analyze. Thus, teaching economics in an interdisciplinary fashion allows economists to make a greater contribution to their student’s liberal or overall education.
HOW TO TEACH WITH AN INTERDISCIPLINARY APPROACH?

Economic educators can provide students with interdisciplinary learning experiences by forming an interdisciplinary teaching team or by broadening their own approach to education. However, in either of these settings, instructors must model for students how to approach issues in an interdisciplinary fashion to help them overcome the standard discipline-based learning structure and learn how to synthesize or integrate insights from a range of disciplines into an interdisciplinary framework of analysis.

The framework adopted for delivery of interdisciplinary learning can be discipline neutral or hierarchical. A discipline-neutral form of interdisciplinary education places each discipline on equal footing, with their alternative methodologies and frameworks of analysis, to explore questions of interest. The goal for students and faculty is to identify, evaluate, synthesize, and integrate contributions of each discipline. In a hierarchical arrangement, the conventional methodology or analytical framework of the discipline – typically the home discipline of the instructor or the lead member of the interdisciplinary team – becomes the baseline method of inquiry. This analytical paradigm is then extended to account for and integrate insights from other disciplines to foster an interdisciplinary perspective. Given the importance of formal modeling to economic thinking, a hierarchical approach, with economics as the jumping off point, is likely ideal for most economics educators attempting to teach in an interdisciplinary fashion.

Instructors can structure one or more meetings, particular sections of a course, or the entire course as interdisciplinary. The extent to which interdisciplinary perspectives guide the teaching process will depend on instructor expertise, the comfort level of the educator(s), and the nature of the topics being addressed. There is no explicit or implicit requirement that an economics educator wanting to engage in interdisciplinary instruction must do so at all times. An instructor can selectively choose topics they want to approach in an interdisciplinary manner and over time build up a large stock of interdisciplinary lessons which can ultimately serve as the basis for an entire course. Clearly, the intensity of interdisciplinarity adopted will depend on the type of course being led by the economics instructor (i.e. principles of economics, core theory classes, field course, freshman seminar, capstone course in economics) because of differences in goals, academic level, place in the curriculum, and nature of the enrolled students.

The most challenging part of interdisciplinary instruction is moving beyond the examination of an issue from the lens of multiple disciplines, to the synthesis and integration of insights into a more inclusive framework of analysis. Effective design and implementation of interdisciplinary classroom explorations, regardless of the level or type of class, entails four fundamental steps that are easily within the grasp of all economic educators.

1. **Pre-instructional planning** – establishes topics to be examined in an interdisciplinary manner, and allows the educator to identify and acquire the requisite knowledge, as well as develop an action plan to guide the classroom experience.
2. **Introduce the methodology to students** – explain to students the nature of interdisciplinary, in contrast to discipline-based, learning. Impress upon them the importance of integrating insights and approaches from multiple disciplines to form a framework of analysis that will lead to a rich understanding of complex questions.
3. *Take it to the classroom* – demonstrate for students how to engage in interdisciplinary analysis. Using the hierarchal approach, start with a discipline-based examination and then extend the investigation to identify theories and insights from other disciplines and ultimately build them into an integrated approach to examining the issue of interest.

4. *Practice interdisciplinary thinking* – give students assignments that require them to explore questions from an interdisciplinary perspective. Consider initiating this process using groups, so students can collectively practice this approach prior to attempting it individually. Have students mimic the hierarchical approach, by summarizing an issue discussed in class in a discipline-based manner, then bringing insights from another discipline to bear, and finally attempting to synthesize and integrate their analysis. After practicing this method with guidance in class and from peers, ask them to take a fresh topic and examine it in an interdisciplinary manner on their own.

**EXAMPLES OF TOPICS WARRANTING AN INTERDISCIPLINARY APPROACH**

**Economic Growth**

Every principles of economics student is introduced to the circular flow model/diagram. The most simplified depiction of the flow of inputs, such as capital equipment, technology, and labor, to firms for a fee and the associated movement of goods and services from firms to households for a price allows students to begin to understand the closed-system nature of an economy – how one person’s expenditure becomes another’s income. Students typically learn that an economy grows in the near term through the use of additional labor, subject to the law of diminishing returns, and over a longer horizon by adding more capital and technology. Natural scientists often challenge this characterization of the productive process as incomplete and potentially misleading.

Ecologists have argued for decades that the economy does not function on its own or in a bubble separate from the natural world. They assert that there are ecological constraints or planetary boundaries that govern the economy and alter the conventional economic characterization of the link between inputs and output growth. They offer three insights that an interdisciplinary economics educator could incorporate into the circular flow framework. First, natural resources need to be included in any model of economic growth and should be viewed as a potential input to growth, but also a constraint on the process. Second, the production process creates waste which must be assimilated back into the biosphere and the environment may be coming under severe stress due to this inefficiency in the production process. This idea/concept leads directly to the third insight that the contribution of inputs to output is contingent upon the level and status of natural resources. For example, the combination of boats and fishers in the Gulf of Mexico is unable to produce any seafood for a period due to the condition of the Gulf waters as a result of the 2010 British Petroleum (BP) oil leak. Thus, expanding the circular flow framework to account for ecological insights can enrich the understanding of production and growth.
The circular flow framework can be expanded to account for ecological insights by placing economic activity within the biosphere and adding energy and natural resources as inputs and wastes, and pollution as an output. By taking a conventional economic model and incorporating insights from ecology to produce an interdisciplinary framework for exploring economic growth, students are likely to ask a number of questions that would be neglected otherwise, including (1) How big can the economy get before it starts to push up against these planetary boundaries? (2) Where does the pollution go and how might this affect the environment and the productivity of other inputs? (3) How much energy and what amount of natural resources are used to sustain the economic system? and (4) What is the effect of a degraded environment of the economy and the quality of life? Clearly, this interdisciplinary discussion with students will lead to a richer understanding of how economic growth occurs than a more narrow discipline-specific conversation.

The Black–white Wage Gap

The racial gap in wages is a longstanding feature of the US economy. The source and consequences of this phenomenon are covered in most principles of economics classes in the section on poverty and inequality and it is a central theme discussed in every labor economics class. This topic also highlights the value of teaching economics in an interdisciplinary manner.

Conventional, neoclassical, economic theory asserts that firms are led by managers who act rationally – engaging in activities at the point where the additional costs of an action (i.e. the marginal costs) are equivalent to the additional benefits from that action (i.e. the marginal benefits) and seek to maximize profits. Thus, firms are assumed to hire labor to the point where the cost of an additional worker or real wage \( W \) is equivalent to the output gains generated by that worker, referred to as the marginal product of labor \( MP \). Moreover, economists typically assume that worker productivity is primarily governed by their level of formal schooling or human capital \( H \).

\[
W = MP(H). \tag{22.1}
\]

According to this set of propositions, if black \( b \) and white \( w \) workers are equally well educated \( H^e = H^p \), their levels of productivity would be equivalent, \( MP^e(H^e) = MP^p(H^p) \), so they would be paid the same hourly wage.

In order to assess the validity of this hypothesis, i.e. equal pay for workers with equivalent levels of education regardless of racial background, economists have estimated the following model of wage determination:

\[
W = \alpha + \beta (H) + \delta (X) + \psi (b) + \epsilon, \tag{22.2}
\]

where \( H \) is the level of formal schooling, \( X \) is a set of additional factors expected to influence worker productivity, such as workplace experience, age, and marital status, and \( b \) identifies workers who are black, and \( \epsilon \) is an error term.

The estimated coefficient \( \psi \) reveals the impact of being black, relative to white, on the wage rate \( W \) for workers who are otherwise equivalent (i.e. they have the same level of
human capital and all elements in $X$). Countless empirical studies using data from the US provide evidence that $\psi < 0$ and is roughly $-0.20$ or that black workers earn 20 percent less than white workers with apparently equivalent productivity based characteristics (i.e. $H, X$). The standard economic explanation for this is that black workers possess poorer quality schooling, so they are less productive than their white peers even when they have accumulated the same level of education. When school quality ($Q$) is controlled for, estimates of the racial wage gap continue to be negative: however, they decline in magnitude to about 15 percent (i.e. $-0.15$). Some economists interpret the negative estimate of $\psi$ when school quality is accounted for as evidence of discrimination, while others assert that additional factors which favor white workers remain unaccounted for. But, what are these mysterious elements and why do they matter? Posing this question and appealing to insights from other disciplines to help uncover the remaining source of the racial wage gap reveals the power of approaching a topic of interest to economist in an interdisciplinary manner.

Worker productivity may depend on a number of factors that are typically ignored by economists but that are central to the process governing productivity advanced by other disciplines such as sociology or psychology. For instance, sociologists see worker productivity as influenced by human interaction and expect a person's productivity to depend on the talents or human capital of their coworkers ($H^c$). But, they also recognize that the rate at which co-workers share their talents ($\varphi$) may depend upon factors such as group identity, trust, comfort, power, and status. In the US, black workers on average have accumulated less formal schooling than white workers, putting them in a position to contribute less to white worker productivity than white workers could contribute to black worker productivity. However, given the historical nature of black–white relations in the US, black workers are often in a subaltern position and white workers in a dominant position in the labor market, resulting in a situation where black workers feel compelled to share their skills to a greater extent with white co-workers than white co-workers share with black co-workers ($\varphi^b > \varphi^w$). Thus, it is possible, in racially mixed worksites, that black workers contribute more to their white peers than they gain from white peers ($\varphi^bH^w > \varphi^wH^b$).

Workplace experience ($E$) leads to informal learning, a form of human capital that economists expect to influence productivity. However, employers rarely have direct evidence on the quality of prior workplace experience a worker possesses. Thus, they must make an assessment of how much on-the-job learning has occurred due to prior work ($\pi$). Psychologists note that persons, including managers, tend to hold stereotypes and there is a tendency to possess more favorable views of those from a group with which they identify. In the US, where most managers are white, psychologists would expect managers to place greater value on the prior workplace experience of white workers than of black workers ($\pi^w > \pi^b$), so white workers would be considered more productive – leading to higher pay – than black workers with equivalent levels of prior workplace experience ($\pi^wE > \pi^bE$).

Industrial psychologists note that customers ($C$) can also influence the productivity of workers, especially those with direct customer contact, such as workers involved in sales. The level of rapport ($\mu$) a salesperson develops with their customers is therefore likely to govern their effectiveness as a salesperson. It is possible that white salespersons are able to build greater rapport with white customers than black sales persons
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($\mu^* > \mu^b$) which can lead to greater sales on the part of white salesmen ($\mu^*C > \mu^bC$) and thus contribute to the racial wage gap in earnings. Sociologists and psychologists have identified a number of channels that can account for lower rapport with white consumers for black salesmen than white salesmen, including white consumers perhaps being less comfortable interacting with black sales persons or less trusting of black salespersons due to a lack of prior interaction (Pettigrew, 1998 and Wilson and Eckel, 2007), and they may believe they are less knowledgeable (Harrison and Thomas, 2009).

The standard economic model of wage determination can be extended to integrate insights about worker productivity offered by psychologists and sociologists leading to the following characterization of wage determination

$$W = MP(H, X, Q, \phi HC^{\phi}, \pi E, \eta C)$$

(22.3)

Discussion of the racial wage gap using this interdisciplinary framework is likely to be more informative and enriching than a conversation confined to the more narrow conventional specification of wage determination.

CONCLUSION

Interdisciplinary teaching can help students view economics in a broader way, seeing it as more relevant to their daily lives and helping them to better understand the world around them. Learning to analyze by integrating insights from other disciplines into economic models will be challenging for economics majors and economics educators. However, through this process, students are likely to see economics as a more valuable framework for interpreting diverse information (Powlick, 2009).

NOTES

1. See for instance Bedard and Dhucy (2006), who explore the biological advantages associated with "red-shirting" children or delaying their entry into kindergarten, or Berns, Laibson, and Loewenstein (2007) who draw on neuroscience scholarship to examine how persons make decisions about outcomes today: such as marriage, enrolling in school, saving and alternative outcomes at a future date.
2. Cross-disciplinary analysis: examine an issue typically germane to one discipline through the lens of another discipline (i.e. how physicists explore music, sociological perspectives on the purpose of religion). Multi-disciplinary analysis: examine an issue from multiple perspectives, without making a concerted effort to systematically integrate disciplinary perspectives.
4. Gardner (1983) established that students bring multiple forms of intelligence to the learning process and that students are heterogeneous in their learning styles. Thus he believes that drawing on a broad array of frameworks and methodologies will enhance student engagement.
5. For more examples of interdisciplinary teaching in economics, see the economic pedagogic portal Starting Point: Teaching and Learning Economics, (http://serc.carleton.edu/econ/index.html (accessed 1 January 2011))
6. See Steffen, Czuchta and McNeill (2007) and Rockstrom et al. (2009) for easily accessible essays by natural scientists that explore these ecological constraints.
7. For a discussion of dominant and subaltern groups and their interaction, see Lewis (1955).
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8. Goldsmith, Hamilton, and Darity (2006) offer evidence that managers value prior workplace experience acquired by white workers more than that of black workers, and that they revise their view the longer workers are with their firm, but not to the point where they are treated equally.

9. Becker's (1971, chapter 5) taste for discrimination model can also be extended to explicitly account for a link between customer discrimination and worker productivity or performance.

10. In the US white households possess far more wealth than black households and are thus responsible for a much larger share of total product sales, so racial differences in customer rapport can account for a substantive share of the racial wage gap.

REFERENCES