Introductory economics courses and the university’s commitments to sustainability

by

Thomas Leslie Green

B.I.S., The University of Waterloo, 1987
M.A., University of Victoria, 1998

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Abstract

The three largest public universities in British Columbia, Canada have signed the Talloires Declaration, committing themselves to promoting students’ environmental literacy and ecological citizenship. As a result, there is pressure to integrate sustainability across the curriculum. Using a case study approach involving these three universities and qualitative research methods, this dissertation explores the potential implications of sustainability commitments for principles of economics curriculum, drawing on a theoretical framework grounded in ecological economics and other literatures.

About 40% of North American university students take a principles of economics course; relatively few go on to take more advanced economics courses. As such, this course is an important vehicle for many students to learn economic theory and the economics profession’s approach to evaluating public policy, and it has the potential to substantially contribute to the knowledge and tools that students can mobilize to foster sustainability.

To examine how sustainability commitments play out in the classroom, this study relied on content analysis of nine principles of economics textbooks and 74 interviews from three populations at the three universities. The first group consisted of 54 students who had recently completed an introductory economics course. The second comprised 11 economists who deliver the course. The third involved nine professors who teach undergraduates in programs that explicitly focus on sustainability and require that students take introductory economics.

Findings suggest that universities’ sustainability commitments have yet to influence principles of economics curriculum and that the curriculum does not support these commitments. The textbooks and courses appear to do little to prepare students to understand sustainability issues or potential limits to growth. Sustainability is not salient to lecturers, and disciplinary culture limits prospects that mainstream economics departments will integrate sustainability into curriculum. In part, this inertia may exist because addressing sustainability has the potential to create problems of plausibility and coherence for mainstream economic theory. Recommendations are offered for reflecting sustainability commitments in economics
curriculum, but it is unclear whether economics departments are interested in, or have the capacity to deliver, such a course.
Preface

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List of Abbreviations

EELS  Environment-economy linkages and sustainability
PoE   Principles of economics
SFU   Simon Fraser University
SOP   Sustainability-oriented program
UBC   University of British Columbia
UVic  University of Victoria
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Chapter 1: Introduction

I don’t attempt to speak for all of my peers, but I know that many of us share an enormous frustration with the way in which our supposedly leading institutions teach us about the economy in a way that is myopic, ahistorical, and devoid of nearly any critical conversation about sustainability or human well being.

Michael Sandmel, student, New York University

1.1 Background of the study

Ecosystems are increasingly under stress, and as a result the ecosystem services that support human wellbeing are being eroded (United Nations Environment Program 2005a). Various drivers of environmental degradation have been identified, including the dramatic increase in the scale of economic activity, which is a combined effect of population growth, rising levels of per capita income, the shift to a consumer economy and the rapid expansion in the use of fossil energy (Rees 2003a; Ayres 2006; Fischer et al. 2007). As evidence of accelerating ecological decline has accumulated, governments and businesses around the world have proclaimed their intentions to embrace sustainability, building on a vision for humanity initially spelled out in 1987 by the Brundtland Commission (World Commission on Environment and Development 1987).

Recognizing the role they can play in addressing the deteriorating state of the natural environment and the implications this deterioration has for human wellbeing, many North American universities have committed to addressing sustainability (Wright 2002; Haigh 2005; Lukman and Glavič 2007). These declarations and commitments typically address curriculum. For instance, the Thessaloniki Declaration of 1997 stresses, “…all subject disciplines must address issues related to the environment and sustainable development and that university curricula must be reoriented towards a holistic approach to education” (cited in Wright 2002, 210). Universities are seen by scholars as having a unique ability to produce new knowledge, to experiment and to critically assess and comment on society’s trajectory;

each of these activities is crucial to achieving sustainability (Cortese 2003; M’Gonigle and Starke 2006a).

Most universities in British Columbia, Canada, and more than 400 universities worldwide, have signed on to the Talloires Declaration\(^2\) of 1990. Points three and four of the declaration’s 10-point action plan involve an explicit commitment by signatory universities to graduate environmentally-literate students who can go on to become ecologically responsible citizens:

3. **Educate for Environmentally Responsible Citizenship**
   Establish programs to produce expertise in environmental management, sustainable economic development, population, and related fields to ensure that all university graduates are environmentally literate and have the awareness and understanding to be ecologically responsible citizens.

4. **Foster Environmental Literacy For All**
   Create programs to develop the capability of university faculty to teach environmental literacy to all undergraduate, graduate, and professional students.\(^3\)

For many scholars, effective implementation of such commitments implies the integration of sustainability across the curriculum (Wright 2002; Haigh 2005; Lukman and Glavič 2007). The UN declared a Decade of Education for Sustainable Development (2005–2015). The UNESCO implementation scheme for this decade stresses, “learning for sustainable development embedded in the whole curriculum, not as a separate subject” (cited on page 5 of Owens and Moore 2008). Since universities are expected to provide their students with skills relevant to meeting the needs of society, as environmental conditions worsen and as society prioritizes sustainability, universities should shift what and how they teach to be relevant to this new priority. Universities are also seen as having a responsibility to ensure that curriculum equips students for informed participation in decisions that have sustainability implications (Moore 2004).

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\(^2\) The declaration and the signatories can be viewed at the website of the secretariat for the declaration, the Association of University Leaders for a Sustainable Future (ULSF): www.ulsf.org (accessed May 17, 2008).

\(^3\) Retrieved from Association of University Leaders for a Sustainable Future (accessed July 11, 2009), based on 1994 revision.
University-wide efforts to integrate sustainability across the curriculum face a number of challenges due to the academy’s unique characteristics and the attributes of disciplines. While universities trace their origins to the study of metaphysical issues, in recent decades they have been reoriented towards more pragmatic concerns as part of the global realignment and rationalization of societies towards economic production, such that Barnett (2011a) now characterizes them as corporate, bureaucratic and constrained by pressures to compete with one another. Disciplines have been described using the metaphor of tribes and territories (Becher and Trowler 2001), a comparison that reflects the ways in which they can be insular and how a few prominent members can have disproportionate power and influence on shaping research priorities and methodologies. Becher and Trowler, as well as Bourdieu (1988, 1998), see academics as tending to shy away from research that may undermine the intellectual capital in which they are invested; in some instances, revisiting theory to account for sustainability might seem an unattractive proposition for that reason.

Scholars value academic freedom, which has created tension between lecturers’ belief that they can choose what to teach in their courses and sustainability commitments that imply the integration of sustainability across the curriculum. Furthermore, sustainability inherently involves interdisciplinarity. While there has been much talk about the value of interdisciplinarity in academic circles, much of the work taking place on campus remains within disciplinary silos, which is a barrier to addressing sustainability commitments (Moore 2005a; Clark et al. 2011). Mainstream economics in particular has been characterized as an insular discipline that does not tend to borrow from other disciplines, despite the fact that its neighbouring disciplines draw on insights from economics (Pieters and Baumgartner 2002; Jacobs and Frickel 2009).

Like other disciplines (Bourdieu 1988; Huber 1990), economics has its own cultural particularities and disciplinary practices (Leijonhufvud 1973; Fourcade 2009; Evensky 2012). In North America, the process of becoming organized as a discipline required that economists generally align themselves with business interests, tempering prospects for more foundational critiques of the economic order (Silva and Slaughter 1984, 150). Due to an
oversupply of PhDs and retrenchment in public funding for higher education, job security for economists pursing an academic career has become more precarious, limiting leeway for criticism of market society (Krause 1996; Holligan 2011).

Each of the above considerations has the potential to complicate the issue of aligning curriculum to reflect institutional commitments to sustainability.

1.2 Purpose of the study

What do sustainability commitments made by universities imply for Principles of Economics courses (hereafter ‘PoE’)

4 taught in mainstream economics departments at North American universities? Is PoE assisting the academy in meeting its sustainability commitments, or should PoE curriculum be revised as one of the many measures universities are or should be undertaking to fulfill these commitments? This research project reports on a case study focused on the three major publicly-funded universities in British Columbia, Canada. It is intended to shed light on these matters by content analysis of PoE textbooks and through the analysis of data generated from three sets of interviews. The first population interviewed involved mainstream economists who teach PoE or shape curriculum. The second involved professors who work in sustainability-oriented departments where the department encourages its students to take PoE. The third involved three types of students who had recently completed a PoE course.

There is no question that, in many instances, economic theory can help provide insights into the causes of many environmental problems and can help inform the design of effective environmental policies. My own pathway towards graduate studies in ecological economics was based in part on the belief that prospects for sustainability could be improved by the judicious use of various economic instruments such as carbon taxes. In recent years, many economists have urged action on the environmental front. Mainstream economists have put

4 In this paper, the short form ‘PoE’ will be understood to include all mainstream permutations of first year economics, whether it is taught as an overarching principles course or as two separate courses, one each in microeconomics and macroeconomics. In the US, undergraduate students are known as “college students” while in Canada, “college students” generally signifies students at community colleges and does not include students studying at universities. I adopt the Canadian terminology in this dissertation.
particular emphasis on the improvements in environmental outcomes that would ensue if
externalities were internalized such that the price signals for various goods and services that
individuals and firms face in the marketplace better reflect their environmental costs to
society (Pearce and Turner 1990). For instance, 2,500 economists signed on to a statement
drafted by prominent economists Kenneth Arrow, Dale Jorgenson, Paul Krugman, William
Nordhaus and Robert Solow that calls for a price to be put on greenhouse gas emissions
(Krugman 1998, 168).

Nevertheless, there is evidence that the mainstream economics discipline has generally paid
little attention to sustainability and has been resistant to the notion that there might be
ecological constraints to economic activity. When the Club of Rome’s *Limits to Growth*
report was published (Meadows et al. 1972), reviews published by economists were hostile
(e.g., Solow 1974). Samuelson included graphs from the report in the ninth edition of his
principles text, accompanied by the dismissive annotation “What mixture of pseudoscience
and common sense do studies like this one by the Club of Rome represent?” (Samuelson
1973, 819). Many criticisms of the report circulated amongst economists were based on
misinterpretations of the report (Turner 2008). A researcher who interviewed prominent
mainstream economists on the environmental crisis showed them to be paying little attention
to the environment, to be displaying a “will not to know” and to be invoking defence
mechanisms so as to evade the facts (Ravaioli 1995, 152).

Luten (1980) argues that the economics profession displays unwarranted optimism that
ecological limits are of little import. Unlike natural scientists, who have argued for
aggressive action to mitigate global warming (Patt 1999; Hansen et al. 2008; Rockstrom et al.
2009), prominent economists, like William Nordhaus, have applied cost benefit analysis to
questions of global warming and have argued that their results show that optimal mitigation
efforts should be modest at first and only gradually ramp up over time (e.g., Nordhaus 1991).
When findings from the Stern (2006) review, which called for decisive action to mitigate
greenhouse gas emissions, were published, some leading economists reacted strongly
(Nordhaus 2007); they were especially critical of Stern’s use of a low discount rate, which
gave greater weight to the interests of future generations (Nelson 2008). These examples
suggest that many of those who are influential within the economics profession, and have helped shape PoE curriculum (Nordhaus is co-author with Samuelson of what is sometimes referred to as the discipline’s textbook of record), may have promoted an approach to understanding the economy that neglects the environment and downplays the sustainability challenge.

PoE textbooks and courses have been criticized from within the profession for not reflecting advances in economic theory and for misrepresenting how economists actually do economics (e.g., Colander 2005a). Recent events may be contributing to the pressure to update the PoE curriculum in a manner that better reflects contemporary economic theorizing, a situation that may also create an opening to attend to sustainability. Some of the profession’s most prominent theorists have recognized that the 2008 economic crisis has called into question the scientific credentials of mainstream economics, as most economists “failed even to see the possibility of this type of crisis” (Krugman 2011, 307). The crisis provides difficult-to-ignore empirical evidence that markets did not behave as theory favoured within the profession, and presented in principles-level textbooks as having scientific credentials, predicted. For instance, the scale of the housing bubble showed that contrary to the efficient market hypothesis, assets prices for houses did not reflect fundamentals (Cassidy 2009, 334–346; Stiglitz 2010, 257–271; Keen 2011a; Evensky 2012).

In 2008, France’s president, Nicholas Sarkozy, asked Nobel laureates Joseph Stiglitz and Amartya Sen to lead a commission into measures of economic welfare. Their report raised profound questions about the environmental and human wellbeing implications of growth in GDP (Stiglitz et al. 2009). There is a high degree of scientific consensus that without aggressive policy interventions, levels of CO$_2$ in the atmosphere are projected to rise to levels that represent, among other concerns, an unacceptable risk of dangerous anthropogenic climate change, ocean acidification, sea level rise and changes in agricultural yields (Intergovernmental Panel on Climate Change 2007; Rockstrom et al. 2009). This new understanding suggests that there may be increasing societal recognition that there are limits to human economic activity.
With this backdrop and recent turmoil in economic thinking, I was interested in better understanding whether economists involved in delivering PoE advocate for revisions in PoE curriculum, especially to account for societal concern over environmental conditions.

However, despite the pressures that the ongoing economic crisis and contemporary concern about environmental trends may be putting on mainstream theorizing, and hence on PoE curriculum, there are other factors that mitigate against the likelihood of curriculum change. These include the socialization process within the profession (Colander and Klamer 1987; Colander 1998, 2005b), the tendency in the economics textbook publishing industry to resist more than incremental changes in theoretical content (Colander 2011), the process by which theories are selected and evolve in economics (Mackie 1998), as well as disciplinary culture and institutional inertia and constraints (Silva and Slaughter 1984; Krause 1996; Slaughter and Rhoades 2004; M’Gonigle and Starke 2006b). Furthermore, ecological economists (see Section 3.2), have argued that addressing environmental constraints and sustainability in a substantive manner causes problems for the coherence and plausibility of standard economics (Georgescu-Roegen 1975, 1977; Daly 1995). For instance, from an ecological economics perspective, achieving sustainability requires that the scale of the economy be constrained to operate within ecological limits, whereas mainstream economics has tended to proceed without the concept of scale and on the basis that limits are not applicable within timeframes relevant to humanity (Georgescu-Roegen 1971; Solow 1997; Daly 2002). Sustainability invites scrutiny of the long-term viability of mainstream macroeconomic policy prescriptions and the relationship between consumption and wellbeing posited in mainstream theory. These challenges might contribute to resistance within mainstream economics departments to undertaking substantive revisions of PoE curriculum in order to address sustainability, since such revisions might call attention to limitations in mainstream theorizing more generally.

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5 For instance, addressing unemployment by promoting growth, improvements in labour productivity and stimulating consumption is likely to result in higher levels of throughput of resources and energy. To some degree, problems occasioned by growing throughput can be held in check via dematerialization and gains in eco-efficiency, but ecological economists for the most part argue that while these avenues should be pursued, they will be insufficient to offset the environmental implications of further growth (see Section 3.2).
Little is known about whether recent theoretical developments, the economic crisis and ever-more severe signs of ecological deterioration are creating pressure or increasing willingness to revise PoE curriculum amongst those economists who teach the courses, set the curriculum, or rely on PoE to give their students adequate training in the foundations of economics (e.g., economists situated in sustainability-oriented programs). This study was designed to shed light on the above matters.

1.3 Significance of the study

Each year, over a million students representing about 40% of first year university students in North America take one or more PoE courses. Of these students, the majority take no further university-level courses in economics. Less than 2.5% of students major in economics and less than one in 1,000 of the students who complete the principles course sequence go on to enrol in a PhD economics program (Salemi and Siegfried 1999).

PoE typically involves around 70-80 hours of lectures over the course of two semesters (not including hours spent on readings, assignments and labs). Via the media, socialization, education prior to university, other university courses, their peers, co-workers, parental influences and every day economic interactions, students have and will be exposed to many conflicting knowledge claims and values that interface with economics and sustainability. In comparison to the many other influences in a student’s economic socialization (Cummings and Taebel 1978; Furnham 1994; Farmer 2005) and the diversity of settings wherein students are exposed to economic beliefs, concepts, theories and values (e.g., possibly hundreds of hours of radio or television programming that touches on economic matters), PoE might be seen as having limited potential to influence students. On the other hand, it is one of the few times that most university students are presented with and expected to master economic theory taught by an economist with the highest level of academic credentials. PoE thus has the potential to serve as an important conduit for the transmission of economic theory that has been sanctioned by the economics profession to the population at large (Benton 1990; Fourcade-Gourinchas and Babb 2002; Fourcade 2006; Sleeper 2007; Marglin 2008). However, elucidating the effects of PoE on students presents considerable challenges.
PoE is important even for students who major in economics and thus will take many economics courses at more advanced levels. With perhaps some exaggeration, Aslanbeigui and Naples (Aslanbeigui and Naples 1996, 12) describe undergraduate economics training with the comment that “…students get most of their economic intuition in introductory courses; upper level and graduate economics concentrate less on explanation and more on modeling or applications of basic theory.” Goodwin (2008) concurs, describing higher-level courses in economics as building from PoE ever-greater levels of abstraction and mathematical rigour and decreased real-world relevance. Thus, there is reason to believe that what economics majors learn in PoE may have a formative influence on their economic worldview and intuition.

The above considerations lend support to the claim that how PoE courses address—or fail to address—environment-economy linkages and sustainability is relevant to whether universities meet their commitments to integrate sustainability across the curriculum, to graduate environmentally-literate and ecologically-responsible citizens and to contribute to more sustainable outcomes.

An argument might be made that just as the integration of sustainability across the curriculum is likely to have little or no influence on what is taught in a class on medieval music, it is likewise irrelevant to PoE curriculum. This argument is rejected in this dissertation. As will be detailed in Chapter 3, the economy and the environment are inextricably linked, and many if not most contemporary environmental problems have economic drivers. If principles courses are intended to provide students with a foundation for understanding the economy, such a foundation must include a basic understanding of what dependence on the environment implies for feasible states of the economy and environment-economy feedback effects.

This dissertation helps address a lacuna in the existing knowledge regarding the integration of sustainability across the curriculum. Since the textbooks have been documented to have significant influence on decisions regarding what material is taught to students in most PoE
courses (see section 2.5), this study proceeds on the assumption that the textbooks provide a suitable proxy for understanding content that might be covered in a typical course. It assesses PoE curriculum by focusing on the textbooks to document the degree of emphasis given to environment-economy linkages and sustainability and to identify potentially problematic content from a sustainability perspective. It documents how PoE lecturers and their students perceive existing PoE curriculum as it intersects with sustainability. It also documents how PoE is seen by academics who are not housed in an economics department, who have economic expertise and whose work focuses on sustainability. Further, it provides a foundation for additional research into how PoE may be affecting students’ knowledge, beliefs and values as they relate to sustainability. Of course, it should be recognized that some lecturers will teach content that departs considerably from the norm. Furthermore, what lecturers teach at the introductory level may have little to do with how they theorize about the economy.

This dissertation sheds light on how the PoE course could be made more relevant to students who are concerned about the state of the environment. It also alerts economics departments to some of the theory found in the course that, from the ecological economics perspective set forth in my theoretical framework (see section 3.2), may be problematic. It is intended to support curriculum renewal in PoE courses that would help students understand and participate in decisions that have sustainability implications.

For scholars of economics education and of sustainability in higher education, this project provides insights with potential lessons for a range of issues relevant to curriculum reform. From a sociology of science perspective, the findings may be relevant to the literature that examines how a discipline responds during a period when the gap between theory and the external world is continuing to widen, and, as a result of changing social priorities, normal science (Kuhn 1962)⁶ is increasingly called into question from outside of the discipline.

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⁶ As defined by Kuhn (1962,10), normal science “...means research firmly based upon one or more past scientific achievements, achievements that some particular scientific community acknowledges for a time as supplying the foundation for its further practice.”
1.4 Definition of terms

1.4.1 Sustainability commitment

A sustainability commitment is interpreted in this dissertation as a commitment made by a university when it signs a sustainability declaration intended for institutions of higher learning that commits it to addressing sustainability in operations, research and teaching. Examples include the 1990 Talloires declaration and the 1991 Halifax declaration. Since some universities have decided to act upon sustainability but have not signed onto any existing sustainability declarations (Wright 2002), it also includes written commitments to address sustainability that have substantially the same provisions as the 1990 Talloires declaration.

1.4.2 Mainstream economics

Heterodox critics often label mainstream economics as neoclassical economics. The neoclassical label is rarely used by practitioners, who refer to their discipline as economics _tout court_, and see non-mainstream schools of economic thought as needing to be identified with an adjective (Colander 2000a). Mainstream economics is an evolving body of thought, and even from within the discipline much of the theory is contested, though practitioners generally share certain methodological commitments. Contemporary mainstream economics is the amalgam of three schools of thought that competed with each other in the mid-20th century, and although many core theoretical propositions remain in contention between these schools, the commonalities in approach between the schools were sufficient to exclude the heterodox (Mirowski 2006). At present, the discipline of economics is much less monolithic than it was in the period that began with the neoclassical synthesis that Samuelson catalyzed in the 1950s and that continued on through the 1980s. As Colander has argued, especially at the leading edge of the discipline, the economics profession is becoming more diverse in its methodological approaches, thanks in part to advances in computer processing capacity, empirical results from experimental and behavioural economics and increasing recognition

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7 Taking Colander's observation into account, in this study, I generally use the term mainstream economics rather than neoclassical or orthodox economics. Where authors I cite have used the term neoclassical or orthodox I retain their terminology.
that economies are complex systems (Colander 2000a, 2000b; Colander et al. 2004). For instance, work by Stiglitz (2000) and Akerlof (1970) on imperfect and asymmetrical information has shown how in real world conditions, where perfect information does not prevail, reliance on markets can lead to suboptimal outcomes. Such work is both mainstream (though it was not initially) and a challenge to certain tenets of mainstream theory. Thus neuroeconomics, behavioural economics, experimental economics, happiness economics and the capability approach have achieved varying degrees of legitimacy amongst mainstream economists.

It should also be noted here that there is considerable scholarship in resource and environmental economics that is relevant to addressing sustainability and fits within the mainstream tent. (By way of contrast, ecological economics is critical of and is considered in this dissertation to be outside of the mainstream approach). For instance, externality theory can be used to argue for a broad range of Pigovian taxes or tradable emissions schemes, which, if implemented, could have a considerable effect in diminishing some polluting activities. Recent research into human wellbeing carried out by prominent economists (e.g., Layard 2005; Helliwell 2006) is giving some credence to the idea that interpersonal utility comparisons might be made, that GDP as an indicator is a poor guide to public policy (Stiglitz et al. 2009) and that policies that both reduce working hours and aggregate output could increase economic welfare. However, contributions at the frontiers of economics that might disrupt disciplinary commitments are often contested and generally take a long time to influence core theorizing (Colander et al. 2009; Colander 2010). There is a particularly long lag between when new theoretical developments first emerge and when they find their way into the PoE curriculum (Ferguson 2011).

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8 As a quick though necessarily oversimplified orientation: neuroeconomics draws on neuroscience to inform models of human decision-making (Camerer et al. 2005); behavioural economics draws on insights from psychology (Mullainathan and Thaler 2000) while experimental economics involves the use of controlled experiments (Gintis 2000) to study individual and market behavior; happiness economics involves quantitative analysis of subjective wellbeing to understand the factors that support and impede happiness and wellbeing (Frey and Stutzer 2002); the capability approach was initiated by Amartya Sen (1985) and shifts the focus of welfare economics towards modifying the conditions faced by deprived people so as to foster the opportunities they have to achieve the functionings that they value.
This study is focused on mainstream economic theory as it exists in PoE textbooks and as it is performed in PoE classrooms. As Hill and Myatt (2010, 2–7) explain in *The Economics Anti-Textbook*, principles textbooks paint a simplistic portrait of economic theory that suggests we live in a world where perfect competition prevails, where externalities are the exception and where markets generally deliver socially optimal outcomes. Furthermore, the texts leave the impression that there is only one form of economics and that the range of opinion in the discipline is much narrower than actually exists amongst mainstream economists.

What then are the key attributes of mainstream economics as they tend to be represented in most PoE classrooms and in textbooks? Synthesizing from Colander (2000a), Marglin (2008) and Hill and Myatt (2010), it is focused on a hypothetical world of perfectly competitive markets where self-interested, rational individuals seek to optimize their utility. More technically, it is centred around the efficient allocation of resources based on marginal trade-offs, favouring an analytic approach of methodological individualism in a partial equilibrium framework where perfect competition prevails and externalities are exceptional. Individuals are assumed to have insatiable demands and to be capable of farsighted rationality. Economic problems are generally analyzed through the use of simple models and graphical analysis. The evaluative framework used has a foundation in utilitarian philosophy, and the existing distribution of wealth is generally taken as given. The environment and the economy are conceptualized as largely separable domains. In Chapter 3, I will argue that this simplified variant of economics offers students limited possibilities for understanding the roots of environmental problems and for evaluating policies intended to enhance prospects for sustainability.

1.4.3 How sustainability is understood in this dissertation

Sustainable development, or sustainability, is a contested concept, a social construction that is inherently normative and subject to diverse and evolving interpretations from various parties that often offer definitions that best suit their own interests (Robinson et al. 1990; Norton and Toman 1997; Robinson 2004). There has been a general shift in language from sustainable development to sustainability, in part because the language is more inclusive and
open to the re-examination of values and lifestyles (Robinson 2004); accordingly, sustainability is the term I rely upon in this study.

I take the position here that for the purposes of this study, there is no need to precisely define sustainability. Sustainability involves a desired state or moral principle like peace, justice or human rights. Each of these is impossible to precisely describe and lacks a widely agreed upon definition; it is often easier to recognize when these desired states or principles have been violated than it is to know when they have been achieved. These desired states and moral principles evolve over time as societies deliberate on and seek to make progress towards their achievement or as new knowledge emerges. Notwithstanding the impossibility of pinning down a definitive definition of sustainability, I proceed in this dissertation on the basis that the concept of sustainability foregrounds the need to reconcile, from a long-term perspective, humanity’s economic, environmental and social priorities in a manner that addresses equity within and between generations, and that takes into account ecological constraints that delimit, over the long run, the range of feasible human activities.

While I do not settle upon a definition of sustainability, it is useful to foreground a key divergence between reformist and transformational interpretations of sustainability. Reformist interpretations of sustainability remain close to the original Brundtland formulation of sustainable development (World Commission on Environment and Development 1987), whereby status quo economic activities and institutional arrangements of liberal market societies are generally considered sound (Rist 2003, 178–188). To achieve sustainability, priority is placed on the greening of economic activity through incremental reforms and the adoption of more ecologically-efficient technologies; economic growth remains a desired macroeconomic policy. In the transformational variants of sustainability, while eco-efficiency is still important, economic growth is no longer seen as desirable; advocates of this perspective argue for implementing stringent constraints on human appropriation of the biosphere, with economic activity limited to that which can take place within such parameters. Furthermore, societies will have to redistribute wealth to ensure greater equity, adopt new values and pursue less materialistic lifestyles (Wackernagel and Rees 1997; Clifton 2010). Whether the end result would still be recognizable as a liberal
market society is openly debated (Speth 2008; Smith 2010; Lawn 2011). However, according to Clifton (2010, 75), the overarching goal of both the reformist and the transformational variants is to achieve a sustainable world that provides for “the flourishing of life, incorporating human and ecological wellbeing, maintained over an indefinite time frame, with this wellbeing grounded in principles of intra-generational and inter-generational justice.” Advocates at the transformational end of the spectrum tend to see the reformist approach to sustainability as unlikely to forestall continued degradation of the biosphere (Rees 2003a, 2010; Jucker 2004).

To be transparent about my own stance, based on my interpretation of the sustainability literature and my engagement with the ecological economics literature, I assume that sustainability requires attention to a complex set of issues so as to ensure that human demands upon ecosystems are within the biophysical carrying capacity of Earth. These issues include deepening society’s understanding of ecological systems, processes and limits; revisiting society’s macroeconomic goals and its understanding of economic development; redesigning modern lifestyles to reduce their ecological impacts; redesigning production processes and products to reduce their resource requirements and waste emissions over their life cycle; implementing institutional arrangements and governance systems to ensure effective management of the commons, resources and landscapes; and redressing inequities in the distribution of wealth (Robinson et al. 1990; Costanza and Patten 1995; Daly 2002; Huesemann 2003; Robinson 2004; Sneddon et al. 2006; Howarth 2007). However, in this dissertation I do not advocate for any one interpretation of sustainability. My primary motivation is instead the belief that universities should equip students to understand and participate in deliberations concerning sustainability and use their knowledge to foster sustainability.

In this dissertation, I have proceeded on the basis that examining how sustainability is addressed in PoE requires that one attend to environment-economy linkages. If students are to have the concepts, tools and framework for addressing sustainability, it would seem reasonable that they would benefit from an improved understanding of linkages between the economy and the environment. These linkages include how the economy depends upon
renewable and non-renewable resources that are extracted from the environment and returned as waste products; how habitats and landforms are often converted in the process of economic development in order to increase the production of desired outputs such as crops; how the state of the environment enhances or constrains various economic activities; and how natural resources and ecosystem services support the economic process. For this reason, this study incorporates an examination of how environment-economy linkages are conceptualized in PoE. Thus, though this study is focused on examining the implications of universities’ sustainability commitments to PoE curriculum, I have proceeded on the assumption that attending to sustainability requires a broader analytical lens that incorporates environment-economy linkages. Thus, I examine PoE using the lens of environment-economy linkages and sustainability (henceforth, EELS).

One further note is warranted here to avoid potential confusion. The terms sustainable and sustainability arise frequently in the financial press. In these contexts, the terms are often interpreted in a narrow financial sense without reference to ecological constraints, such as when debt levels are declared to be unsustainable. In this research project, sustainability has the broader interpretation that takes into consideration ecological conditions and constraints as described earlier.

### 1.4.4 Sustainability-oriented program (SOP)

A sustainability-oriented program is defined in this dissertation as a program whose focus inherently relates to questions of sustainability, whose students are expected to be familiar with the main issues that are deliberated in the sustainability literature, and whose students would be qualified for and/or gravitate towards work in resource management or the environmental sector upon graduation. SOP programs identified at the three case study universities that met the criteria of requiring or encouraging their undergraduate students to take one or both PoE courses were:

- Faculty of Forestry (Forest Resources Management / Natural Resources Conservation), University of British Columbia
- Faculty of Land and Food Systems (Food and Environment Major / Applied Plant and Soil Sciences Major / Global Resource Systems), University of British Columbia
1.4.5 Coherence and plausibility

One of the questions I investigate in this dissertation is whether addressing sustainability in PoE creates issues of coherence and plausibility for the mainstream theory that most PoE students are learning. How do I define plausibility and coherence and why are they important? Nooteboom (1986, 208), in an article that argues for the importance of plausibility as a criterion for theory choice in economics, summarizes the meaning of plausibility as “to be plausible, a proposition should be ‘well connected’ or ‘coherent’ … with established (purported) knowledge.” The process of integrating EELS into PoE may require that theory produced in the natural sciences or other disciplines be brought to bear on economic theory; from the standpoint of this foreign theory, aspects of the economic theory currently in use may be seen to lack plausibility. Furthermore, in this process of incorporating EELS, it is possible that the economic theory being taught will be perturbed in that the logical connections or relations amongst the various components of theory will be weakened, with the end result being that the theory being presented loses coherence. If theory is not coherent, if it does not promote an interconnected, integrated understanding of the world, then it may offer little by way of explanatory power. If students are learning...
incoherent theory they will be left to reconcile incoherency on their own. They may be less likely to develop expert knowledge in a domain since experts are known to organize knowledge in a manner that implies coherence, e.g., creating meaningful relationships between various elements using the principles that are applicable within the domain (Wieman and Perkins 2005; Roseman et al. 2010). A lack of coherence is also likely a sign that the theory itself may lack explanatory power when confronted with novel considerations (e.g., ecological limits). A lack of coherence also implies too much flexibility, such that individual theorists can reinterpret terms, concepts or theories, or engage in ad hoc modification of hypotheses or models so as to suit their own particular interest (Teira 2009). Likewise, if addressing EELS reduces or calls into question the plausibility of theory (e.g., teaching that growth can occur indefinitely despite finite resources while also teaching how the economic process involves throughput of materials and energy\textsuperscript{13}), then students may well wonder why they are learning theory that seems implausible.

1.5 Research questions

The above review provides support for my premise that how PoE courses address—or fail to address—environment-economy linkages and sustainability is relevant to assessing how well universities are performing at addressing their commitments to integrate sustainability across the curriculum, to graduate environmentally-literate and ecologically-responsible citizens and to contribute to more sustainable outcomes.

With the above in mind, the research questions that motivated my research are as set out below.

Central research question

*What are the key implications of sustainability commitments made by universities to the PoE curriculum?*

\textsuperscript{13} See Section 3.2 for a discussion of throughput and its implications.
Research questions applicable to PoE textbooks (Chapter 5)
1. What proportion of PoE textbooks in use in BC, as well as the leading North American textbooks, addresses environment-economy linkages and sustainability, and how does this compare to a pair of textbooks written expressly to attend to sustainability?
2. What does content analysis of PoE textbooks indicate with respect to how environment-economy linkages and sustainability are conceptualized?

Research questions applicable to PoE lecturers (Chapter 6)
3. How do economists in standard economics departments who teach or are involved in setting PoE curriculum perceive the existing PoE course in terms of its relevance to sustainability and the adequacy of its treatment of sustainability?
4. From the perspective of these economists, does the PoE curriculum require revising to address sustainability? If so, what are the nature and the extent of revisions that they deem desirable?
5. From the perspective of these economists, does integrating sustainability into the PoE curriculum result in a course that has the potential to undermine the plausibility or coherence of standard economic theory as it is presented at the principles level? If so, how do they resolve this dilemma?

Research questions applicable to SOP professors (Chapter 6)
6. How do senior administrators, economists and faculty members who have economics expertise and are affiliated with sustainability-oriented programs perceive the relevance of the PoE course to sustainability and its suitability as a principles course for students who are majoring in sustainability-oriented programs?
7. From the perspective of these individuals, does the PoE curriculum require revising to address sustainability? If so, what is the nature and the extent of revisions that they deem desirable?
8. From the perspective of these individuals, does integrating sustainability into the PoE curriculum result in a course that has the potential to undermine the plausibility or coherence of standard economic theory as it is presented at the principles level? If so, how do they resolve this dilemma?

Research questions applicable to PoE students (Chapter 8)
9. How do students who are majoring in economics and who have taken PoE perceive the course in terms of its relevance to addressing sustainability?
10. How do students who are registered in sustainability-oriented programs and who have taken PoE perceive the course in terms of its relevance to addressing sustainability?
11. What aspects of PoE do these two subpopulations of students perceive as providing concepts and tools that enable them to better engage in sustainability issues, what content do they feel should have been added to the course and what content do they feel was problematic from a sustainability perspective?

1.6 Limitations

This study relies on a case study of PoE courses as taught at BC’s three major publicly-funded universities, and faces limitations common to studies that use qualitative research methods. Because of the limited number of students interviewed, the targeted recruitment methods (which deliberately overrepresented SOP students) and the qualitative research methods relied upon (Miles and Huberman 1994; Berg 1998; Creswell 2007), the results presented herein are intended to add to depth of understanding, but are not intended to be generalizable. However, given the documented similarities in economics instruction across North American universities (Walstad et al. 1998; Colander 2000c; Becker and Watts 2001; Knoedler and Underwood 2003; Walstad and Rebeck 2008), I argue that the theoretical insights generated will be relevant to universities beyond BC.

1.7 Delimitations

This dissertation focuses on first year mainstream economics courses offered at universities that are publicly committed to sustainability. It does not attend to higher-level courses, economics as taught in the public school system or heterodox economics courses. It will also be less relevant in those cases where lecturers depart significantly from the norm in the content they teach or the type of PoE textbook that they use.

In the analysis undertaken in this dissertation, I focus on ecological aspects of sustainability and downplay social aspects, especially intragenerational equity. This is for pragmatic reasons. The sustainability literature is quite clear that sustainability has social, cultural and economic dimensions. For instance, improving equity within and between generations is considered an important aspect of sustainability (Hopwood et al. 2005). However, because much of economic theory and policy affects the allocation of resources and the distribution of wealth, and hence touches on equity in some manner, the analytical task of examining how PoE curriculum attends to the social and equity aspects of sustainability could quickly
become overwhelming. Given that ecological sustainability is a prerequisite for the long-term persistence of functional human societies wherein equity is a relevant concern, I reasoned that focusing on the environmental dimension of sustainability would suffice as an initial assessment of PoE, would make the analysis more tractable and increase the likelihood the results would be considered relevant by those who might consider revising PoE curriculum. Nonetheless, aspects of equity are addressed where particularly relevant.

1.8 Assumptions

I have proceeded on the assumption that participants have generally answered questions to the best of their ability without intent to misrepresent.

1.9 Organization of the study

In Chapter 2, I review literature that I identified as relevant to the present study, focusing on the sustainability in higher education and the economics education literatures. I also examine other studies that involve content analysis of economics textbooks and diverse sources that provide insights into the potential impact of PoE courses on students and society at large. Chapter 3 sets out my theoretical framework, which is derived from the ecological economics literature as well as literatures related to the sociology of higher education initiated by Basil Bernstein, Pierre Bourdieu, Margaret Archer and Bruno Latour. In particular, I focus on aspects of these literatures that various scholars have drawn upon for theoretical support in studies related to the field of higher education. Chapter 4 provides a rationale for my choice of qualitative research methods, sets out the methodology used to support the content analysis of textbooks and explains how interview guides were developed and how the resulting dataset was analyzed. Chapter 5 reports on the results of the textbook analysis, attending first to the proportion of the texts devoted to EELS and then engaging with the content to demonstrate how the texts conceptualize environment-economy linkages and sustainability. Chapter 6 reports on the results of interviews with lecturers involved in teaching PoE and contrasts them with findings from the interviews with SOP professors. Chapter 7 reports on the results of student interviews, providing insights on how students perceive PoE as well as data regarding how well the course prepares them to think through a
contemporary public policy issue about the environment. Chapter 8 discusses the results of this dissertation in light of the literature and offers some recommendations for universities seeking to meet their sustainability commitments.
Chapter 2: Literature review

2.1 Chapter overview

Markets organize the production of goods and services, but at the same time markets produce people. Markets shape our values, beliefs and ways of understanding in line with what makes for success in the market. Markets thus exist in a kind of symbiosis with the discipline of economics, shaping people to fit the assumptions of the discipline even as economists shape the world in the textbook image.

– Stephen Marglin (2012, 6)

In this chapter, to better understand what current thinking on best practice in terms of universities meeting their sustainability commitments through teaching, I begin by reviewing the sustainability in higher education literature. This provides a basis for the presumption throughout this dissertation that if a university intends to meet its sustainability commitments, PoE curriculum will need to be re-examined from a new angle.

I then turn to literatures that address the sociology of the economics discipline, socialization within economics, theory choice in economics and economics education to build a foundation for understanding the PoE course, the profession’s concerns about existing curriculum, the student experience and to assess the degree to which PoE courses are standardized. The degree of standardization is important, since it indicates the extent to which the findings of this study may be relevant elsewhere in North America. I also review a limited literature that explores the extent to which biases and hidden normative content are found in PoE textbooks, including content that may be problematic from a sustainability perspective. This review also aids in understanding the methodology that other researchers have used to analyze economics textbooks, informing the methods used in Chapter 5.

Unfortunately there is little in the economics education literature that is directly focused on how environment-economy linkages and sustainability are addressed in undergraduate curriculum.
To establish that what is taught in PoE may have some influence on the economic policies adopted by a society and hence on prospects for sustainability, since there is little direct evidence, I seek out indirect evidence with respect to how economics education and especially the introductory economics variants thereof impact on society. In recent years, a new research program has emerged on what has been called the performativity of economics. In this perspective, economics does not so much describe the world but rather actually shapes the economy because economists generate theories and tools and actively seek to shape institutions and these ideas and changes in the rules of the game influence economic actors, such that the world eventually comes to resemble the theory.

Another source of indirect evidence on how PoE ultimately affects society which I review are the efforts diverse actors have applied to influence what is taught in introductory economics. These efforts suggest that the individuals involved believe that what happens in PoE courses eventually influences society and affects economic policies and outcomes. I then consider research that suggests the business sector in the US has sought to promote and participate in efforts to foster economics education at both the university and the public school level.

The final source of indirect evidence comes from considering a still inconclusive literature on how studying economics affects student beliefs and values. Researchers have sought to determine whether the model of self-interested behaviour that dominates undergraduate economics influences student values and actions through experiments that test students’ willingness to contribute to public goods and to cooperate. A related literature is considered that examines whether undergraduate economics training fosters a shift in political attitudes. Given this dissertation's preoccupation with sustainability, the limited evidence with respect to how economics training affects students’ beliefs and attitudes and values when it comes to the environment is then examined.
2.2 Sustainability in higher education literature

*The conventional wisdom holds that all education is good, and the more of it that one has, the better... The truth is that without significant precautions, education can equip people merely to be more effective vandals of the Earth* (Orr 2004, 5).

The sustainability in higher education literature presents a spectrum of views on the responsibilities held by universities (Sterling 2004a). Scholars whose views are the most compatible with the status quo see higher education’s responsibility as producing graduates who can contribute to a relatively modest course correction towards the greening of production and consumption. At the opposite pole are scholars who have come to the conclusion that fundamental changes that would radically alter production, consumption and distribution are required. In their view, institutions of higher education need to be overhauled to produce graduates able to redesign the socioeconomic system (Haigh 2005; M’Gonigle and Starke 2006a, 2006b; Kahn 2008; Stephens et al. 2008).

A review of sustainability declarations and commitments made by universities found common themes. Universities should ensure that they graduate students who are environmentally literate, guided by environmental ethics and take moral responsibility for promoting sustainability (Wright 2002). These same findings are echoed in an appraisal of efforts around the globe to ensure that Higher Education Institutions (HEI) provide Education for Sustainable Development (ESD):

*Across the board, the pattern of international agreements has evolved... to the notion that every educated person should possess ‘environmental literacy’ and that HEIs should provide good role models for sustainable development. Later documents stress the ethics of environmental sustainability, increased emphasis on the interactive nature of the relationships between society and environment, the notion that ESD should permeate the whole HE curriculum... (Haigh 2005, 36)*

When campus sustainability assessment tools (Shriberg 2004), sustainability declarations, university commitments to sustainability (Wright 2002; Haigh 2005; McMillin and Dyball 2009) and literature on sustainability in higher education (Martin and Jucker 2005; Moore 2005a) are considered, it appears that a consensus has emerged that sustainability must be
integrated across the curriculum, rather than merely being tacked onto existing degree requirements in the form of ecoliteracy courses. From this perspective, graduating students need to have an understanding of humanity’s ecological predicament, the sustainability imperative and interrelated social issues in order to leave university equipped for informed participation in decisions that have sustainability implications (Moore 2004). Furthermore, students must be able to consider, evaluate and use information from diverse disciplinary perspectives (Foster 1999; Pearson et al. 2005; Sherren 2008). However, Sherren (2010, 261) observes that the characteristics of sustainability “make it difficult to define a successful student ‘output’, and harder still to attribute any such success – typically expressed over the long term – to any particular curriculum intervention.”

While universities could develop and require students to complete a sustainability module prior to graduation, such add-ons are seen as ineffectual and problematic. One reason for this view is that add-ons tend to be confined to the introductory level and are seen by students as covering discrete knowledge that must be mastered to meet degree requirements, but can subsequently be forgotten because it is not relevant to the student’s main area of concentration. They can quickly become token courses from both a learning and a provisioning perspective (Haigh 2005). Further, what students learn in ecoliteracy “bolt-ons” is often contradicted by content in the core curriculum that countenances unsustainability (Sterling 2004b), and students are left on their own to deal with such incoherence. The add-on approach also fails to challenge the tendency to erect and defend walls between disciplines, and unnecessarily limits the university’s contribution to a “collective social conversation” (M’Gonigle and Starke 2006a, 331) by adding little to students’ ability to re-evaluate society’s priorities and find broadly supported solutions to complex problems that are not the province of any one discipline.

University curriculum is often explicitly intended to affect values, for example to promote the adoption of liberal democratic values (Ewert and Baker 2001). Some scholars argue that universities have long been an important institution in imparting beliefs in the project of modernity, whereby the world is theorized in a way that locates society beyond nature and where nature’s role is to provide the raw materials to support economic growth (Huckle and
Sterling 1996; Bosselmann 2001; M’Gonigle and Starke 2006a). From this perspective, universities have played an important role in reproducing the dominant social paradigm, with its promotion of consumerism, economic growth and development, its privileging of private property rights and markets and its neglect of nature except to the extent that it can be appropriated for human use. It would not be a coincidence then that the societies that place the most emphasis on education also tend to be those with the largest ecological footprints (Rees 2003b; Jucker 2004). Accordingly, some scholars contend that advocates of sustainability should be more attentive to the role tertiary curriculum has played in undermining sustainability (Orr 1992, 2004). For Bosselmann (2001, 184), in addressing sustainability, “…the grand narratives of modernity are at stake and it is doubtful that the university curriculum is capable of transcending its own traditions.” A recent study found that business schools are sites of socialization “whereby students are inculcated with a particular worldview that draws on the values and assumptions of Anglo-American capitalism” dressed up as technical rationality (Ferguson et al. 2011, 14).

Universities have become increasingly dependent on private funding and collaborations with industry participants, and have evolved toward a more entrepreneurial model, with the end result being a form of academic capitalism (Silva and Slaughter 1984; Slaughter and Rhoades 2004; Metcalfe 2010). This symbiosis of capital and the university seems likely to impinge upon the ability of universities to offer an in-depth critique of the long-term viability of the economic system in which they are enmeshed. Indeed, commitments to reorienting education towards sustainability are in tension with the imperative to prepare students to compete in a global economy driven by neoliberal values (Chapman et al. 2006; Coté et al. 2007).

It would be simplistic to see students as entering universities, encountering curriculum and leaving after having been socialized or indoctrinated with values and worldviews consistent with the dominant social paradigm. In North America, most students enter university after having gone through the public school system. Therefore, most will have been influenced to a degree by whatever ideologies are enmeshed in public school curriculum (Gewirtz and Cribb 2009, 112–120). In the US case, Apple (2004) contends that public school curriculum provides support for the existing social order with its inequitable distributions of wealth,
opportunity and power. Based on a large body of data, economists Bowles and Gintis (1975, 2002), advanced the claim that the public school system mirrors workplaces, teaching students to function as obedient workers in hierarchical modern corporations.

However, by the time students walk through a university’s gates as young adults, their agency is much increased; they may ignore, resist, contest or reshape the values and worldviews they encounter in lecture halls. Furthermore, some disciplines and faculty members will offer perspectives that also call the conventional wisdom into question. While corporate interests may influence the priorities of universities, other interests and values are also at work, and many academics continue to hold the Mertonian belief that the purpose of universities is to foster disinterested, sceptical and non-commercial inquiry (Slaughter and Rhoades 2004, 102–107). While universities have played an important role in creating unsustainable societies by, for instance, training engineers who run factories that degrade the environment, they have also played an important role in graduating scientists who develop climate change models and journalists who expose corporations for degrading the environment. The key issue moving forward is whether, across the disciplines, universities can graduate individuals who are equipped to understand the sustainability challenge, are motivated to act and have the skill set to positively contribute to a more sustainable future (Moore 2004, 2005a).

Universities’ efforts to address sustainability have been described as “lethargic” (Bosselmann 2001, 170) and some of the adjustments made to date have been characterized as rhetorical and cosmetic (Chapman et al. 2006). In the UK, while universities have made progress in greening their operations, they have lagged at incorporating sustainability into the curriculum and will likely continue to do so unless explicit incentives are put in place to encourage and reward this type of innovation (Sterling and Scott 2008). Researchers in Australia found that in diverse disciplines, sustainability was not part of the vocabulary of university lecturers and their definitions and interpretations of the concept were frequently naïve and that they held perspectives that impeded the integration of sustainability across the curriculum (Reid and Petocz 2006).
Initiatives promoting sustainability in higher education have led some academics to raise concerns that in committing to supporting sustainability, academic freedom may be sacrificed, since faculty are being asked to promote a given set of values and to indoctrinate students (e.g., Wimberley 2010). However, while academic freedom is important, universities also have responsibilities to serve the long-term needs of the societies that sustain them (Barnett 2011a, 100–105). Furthermore, it is not controversial that universities seek to imbue their students with certain values; after all, the doctors they convocate are expected to hold certain values pertaining to patient care and ethical conduct (Shephard 2009).

While the debate around education and values is ongoing, the literature of sustainability in higher education seems to be cohering around the idea that meeting a university’s sustainability commitment does not in fact require faculty to inculcate students with a given set of values and beliefs. Instead, faculty’s role is described as helping students develop the capacity to evaluate and clarify their own values in a manner that takes into account humanity’s sustainability challenges and helps students discern how prevailing values can undermine sustainability and wellbeing (Cook et al. 2010; Mulder 2010). Unless predominant values are brought into the open and scrutinized, institutions of higher learning are likely to end up tacitly endorsing and reproducing those same values. Thus, in either case, faculty are engaged in supporting a set of values.\footnote{My own interpretation is that universities’ sustainability commitments entail a responsibility to equip students to critically assess the implications of societal values and to make their own informed judgments as to what values are most likely to sustain human societies in a flourishing state indefinitely.}

At Cardiff University, an audit of 5,800 courses found that compartmentalization, over-specialization and reductionism interfered with the diffusion of sustainability into the curriculum (Lozano 2010).

Barnett, a leading contributor to higher education scholarship, explores feasible utopias for the university, settling on the “ecological university” as his preferred alternative. He argues that a university that does justice to the idea of a university should take “seriously both the world’s interconnectedness and the university’s interconnectedness with the world” (Barnett *%&%!!9!!%%()!%%!!()C!%)%!!!!&%!!%%!%%!

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2011b, 451–452). Such a university would both embody hope for, and critique of, the world order and sustainability; Barnett argues that such positioning would help ensure the continued social licence and relevance of the public university.

The fact that there has been limited progress on integrating sustainability into curriculum is not surprising, since curriculum changes take a long time under the best of conditions. For instance, Desha-Smith et al (2009) found that when it came to adjusting to new industry or accreditation expectations in the engineering field, it took 15 to 20 years for the curriculum to be updated; under a proposed process of rapid curriculum renewal, this time lag might be reduced to 8 to 12 years. McNamara (2010) reasoned that monetary incentives and a reduced teaching load would enable faculty to integrate sustainability into curriculum.

There are few articles in the sustainability in higher education literature that evaluate how the integration of sustainability into the curriculum could call into question the plausibility and coherence of a discipline’s theory, methodology and starting assumptions. In other words, might successful integration require that some theories and analytical tools, developed before current concerns over sustainability surfaced, be discarded in favour of others that better account for human dependence on the natural world? For instance, Rusinko (2010) offers examples of how a marketing course might include sustainability content without critical analysis of the role marketing plays in promoting consumerism. In another case, researchers documented progress at integrating sustainability into the curriculum at 22 Flemish applied economics programs (Ceulemans et al. 2010). Some participants in the study apparently reasoned that because their program was about applied economics, it addressed sustainability since it attended to the economic pillar of sustainability. The other pillars were not considered to be within their program’s purview, hence little or no curriculum change was needed to address sustainability. The researchers in this study do not appear to have considered the possibility that the applied economic theory being taught in such programs could be problematic from a sustainability perspective and require revisiting.

There are a few exceptions to the above pattern which show that when working to incorporate sustainability into the curriculum, some lecturers and departments are willing to
consider the extent to which their discipline relies upon theory that itself may have shortcomings for understanding environment-economy relationships. For instance, an Australian MBA program has experimented with having students think about sustainability by not only drawing on the neoclassical economic framework that pervades the MBA program, but also by contrasting this approach with the implications for sustainability of the ecocentric and ecological modernization frameworks (Stubbs and Cocklin 2008). Springett (2010) describes updating the business studies curriculum to highlight the ideological struggle between business models that remain dependent upon continued economic growth and a growing constituency that question the desirability of future growth given ecological limits.

A recent examination of the business curriculum at an university in Australia argues that the “conventional curricula of business schools reproduce socially and ecologically unsustainable values of affluent consumer society” (von der Heidt and Lamberton 2011, 676). The authors highlight that business schools have a choice to make between integrating weak and strong variants of sustainability into their curriculum, and stress that curriculum modifications will differ substantially depending on what variant is chosen, since some interpretations of strong sustainability call into question the viability of capitalism. For example, at the university where the case study was conducted, one of the required courses now incorporates a critique of neoclassical economics. Proposing an even more radical shift grounded in neo-Aristotelian principles, McKenna and Biloslavo argue that business school curriculum should make students question orthodox views that the end goal of business is to maximize shareholder value. Instead they believe that business schools should teach that the primary goal of the private sector is to promote human flourishing (McKenna and Biloslavo 2011, 699).

I was unable to find academic research that specifically addressed how the sustainability education movement has influenced PoE curriculum to date. While Plumridge (2010) finds that undergraduate economics education in the UK does not engage with sustainability, and though he refers in one section of his paper to ecological economics literature in a cursory manner, his analysis is limited to identifying aspects of mainstream economics curriculum
that are relevant to sustainability. He does not appear to contemplate the possibility that the mainstream theory being taught may be problematic from a sustainability perspective.

2.3 The sociology of the economics discipline

Economics emerged as a discipline and achieved recognition as a profession relatively recently in North America. Initially, funding for universities was precarious and largely dependent on funding from wealthy members of the business establishment or their charitable foundations (Silva and Slaughter 1984). The few social science academics who advocated for fundamental changes to the economic order to improve social justice generally saw their career opportunities wither. A much safer – and more common – course of action was to restrict one’s scholarship to focus on fine tuning the existing social order rather than uprooting it. Thus, most participants in the new profession of economics offered “technical rationalization of industrial capitalism that reinforced public appreciation of the correctness of centralist ideology. In return, they got an opportunity to use their expertise” (Silva and Slaughter 1984, 150).

In the final decades of the 20th century, PhDs were being overproduced in North America, all the while public funding for the academy was stagnating, leading to a loss of guild power for the professions, including the economics profession, such that the average academic economist was left vulnerable (Krause 1996). With a large field of qualified individuals seeking out a small number of positions, individual academics were under considerable pressure to demonstrate that they were productive members of their profession. The result of this loss in guild power was that leeway for criticism of market society contracted within academia (Krause 1996). Krause’s view of the precariousness of academic positions is supported by that of Holligan (2011), who uses the metaphor of feudalism to describe contemporary academia.

To address budgetary shortfalls occasioned by stagnant public funding, contemporary universities have developed partnerships with corporations and sought financial returns from their investments in research, the end result being that they have shifted to a regime of academic capitalism (Slaughter and Rhoades 2004). There are several implications of this
shift, including reduced leeway for critical inquiry into the appropriateness of prevailing economic arrangements: “The idea of a college or university as a space for public discussion, debate, commentary and critique is pushed to the background” (Slaughter and Rhoades 2004, 333).

In the early decades of the 20th century, it was common for non-neoclassical economists and especially institutional economists to hold positions in American economics departments. However, as the century progressed, a number of factors, such as metrics of academic output adopted by the profession, the red scare, McCarthyism and the influence of business interests resulted in most economics departments purging themselves of anything more than one or two token heterodox economists. Likewise, most graduate courses in heterodox economics were dropped from the calendar (Lee 2009; Mata 2009).

Funding of economic research by the Cowles Commission and by the US military through the RAND Corporation was instrumental in privileging a more formal approach to theorizing (Hounshell 1997; Mirowski 2002). Indeed, for most contemporary mainstream economists, economic theory not represented through formal models is not real economics (McCloskey 1998, 143–144). Since transmitting tacit knowledge about the economy from one generation of economists to the next is relatively difficult, knowledge of formal technique, which is easier to transmit, has been overemphasized (Reay 2010, 103). This shift towards formalism devalued much of the research undertaken by heterodox economists, as it tended to address research questions less amenable to mathematical representation.

By 1980, only eight departments offered non-mainstream PhD programs, and departments that eliminated their heterodox faculty positions improved their rankings. Departments also eliminated courses in the history of economic thought and hence reduced the likelihood that students would encounter heterodox theories (Lee 2009; Dow 2011). By Lee’s estimates, from 1941-1970, less than 3% of PhD students in economics had received substantive instruction in heterodox economics (Lee 2009, 40).
Between 1970 and 2000, systems for ranking economic journals and departments were codified, and promotion was increasingly based on publications in higher-ranked journals. Such rankings reinforced orthodoxy and undermined the position of heterodox economists and their journals, many of which were excluded from the ranking system (Lee 2009). Accordingly, mainstream economists value publication in the leading journals and heavily discount publication elsewhere (Harley and Lee 1997; Mackie 1998). Heilbroner and Milberg (1995) found that from 1973-1978, seven economics departments accounted for 54% of the articles in the *American Economic Review*, while for the *Quarterly Journal of Economics* the figure was 74%. Mainstream journals form a tight network of self-citation, with journal rankings creating a “self-reproducing and self-reinforcing logic” (Dobusch and Kapeller 2009, 885). More broadly, other scholars have found that economic theorizing by those who have not completed an advanced degree in economics from one of the leading orthodox departments is heavily discounted or ignored (Fourcade-Gourinchas 2001; Schiffman 2004; Fourcade 2006; Goodwin 2008).

Based on interviews in which American economists working in both academic and applied settings were asked to assess the usefulness of economic theory, Reay (2007) found that practitioners considered economic theory produced within academia to be overly abstract and disconnected to external reality and hence largely unsuitable for substantive use. Nevertheless, despite the fact expert disciplinary knowledge is of little use, economists have been able to maintain their status as professionals offering expert knowledge considered authoritative by society because they are entrenched in diverse institutions and are seen to hold a unique core skill set (Reay 2007). The economics profession crafts an image of itself for public consumption as being engaged in unbiased scientific analysis by referring back to its use of highly formal models (Reay 2010).

### 2.3.1 Socialization within economics

Both Colander and Klamer have conducted primary research on the graduate education of economists. Their initial joint research project (Colander and Klamer 1987) involved surveying graduate students at six top-ranked economics departments in 1985. For them, the key characteristics of graduate school are that it “certifies economists as professionals, it
establishes economists' view of argumentation and guides them as to what is important to study and what is not” (Colander and Klamer 1987, 95). As part of their research, Colander and Klamer asked respondents about the importance of readings in other disciplines to their training as economists.\(^\text{15}\) Their results show that interdisciplinarity is not valued while mathematical competence is highly valued. For the first two years of graduate training, these students were required to focus on techniques relevant to formal modelling, leaving little time to attend to real-world phenomena. When graduate students were asked to nominate factors that contribute to professional success, 57% thought ‘excellence in mathematics’ was very important and a further 41% saw it as moderately important. The authors conclude that in elite graduate programs in economics, “some very real socialization process is going on” (Colander and Klamer 1987, 109).

In an update to the 1985 survey, Colander (2005b) found little change in the profile and educational experience of a typical graduate economics student at an elite institution: “economics today would likely still appear highly technical, theoretical and unconcerned with reality…”(Colander 2005b, 181). Of particular relevance to assessing the prospects for the economics discipline to embrace interdisciplinarity and to draw on the environmental sciences, 81% of this cohort of graduate student respondents had majored in economics, 21% had majored in math, while all other majors came to 22%.\(^\text{16}\) Colander interprets this interview data as showing that elite economics programs emphasize technique over economic reasoning and that prospective economics graduate students are being filtered based on their comfort with applying advanced mathematical techniques. This information raises concerns about what types of thinkers are being scared off from pursuing graduate studies in economics.

Congruent with Colander’s findings, in a 2001 survey of professional economists in the US and Canada, Davis (2007) found that only 4.5% strongly agreed and 21.1% agreed that “economists are amenable to interdisciplinary research approaches.” Also, 16\% strongly

\(^{15}\) Their survey instrument did not offer reading in the environmental sciences or in ecology as categories that respondents could select, an omission that suggests that the researchers also participate in the mainstream tendency to overlook environment-economy linkages.

\(^{16}\) The total sums to greater than 100\% due to some students being double majors.
agreed and 40.6% agreed that one’s school affiliation influences the probability that an article will be accepted, while 25.5% strongly agreed and 42.5% agreed that author recognition influences publication. 20.4% and 39.3% saw a ‘good-old-boy’ network influencing acceptance, and fluency in mathematics was seen as an essential ingredient for publishing research in top journals.

Some sociologists have delved into the socialization of economists and the processes that structure disciplines. Fourcade (2006) argues that due to the globalization of economies and the increasing need for economic experts to service the nation state, transnational corporations and international institutions, training and intellectual development in economics has increasingly been defined at the global level. Not just any economist will do. Unlike credentials in professions like medicine, an economics PhD is internationally transportable, though degrees from the elite institutions in the US (followed by the UK) have the highest credibility. Authoritative work in economics is believed to emanate from the US. As a result, according to Fourcade, what happens in US graduate education in economics influences programs around the world and thereby further shapes the profession as well as the development of economic theory and policy.

2.4 Theory choice in economics

Various scholars have researched the mechanisms that cause the economics profession to either maintain core tenets and methodological positions or to embrace new positions or practices. Theories that explore how scientific knowledge evolves, such as those proposed by Kuhn (1962) and Lakatos (Lakatos and Musgrave 1974), provide a starting point to understanding how PoE curriculum might evolve and how those involved in delivering PoE might react to challenges created by concern over environmental deterioration and societal interest in sustainability. From the Lakatosian perspective, it is extremely difficult for external criticism and data to undermine core theory because the core of scientific research programs is surrounded by a protective belt of auxiliary assumptions. Blaug (1975), examining the applicability of the theories of Kuhn and Lakatos to economics, argues that economists are inclined to disregard empirical refutation of theory and are deeply committed to the welfare implications of economic theory.
Mackie (1998) has carefully examined how theories are adopted, modified or discarded by the economics profession over time. He finds that theory development is influenced by a number of non-scientific criteria and constrained by a number of factors, including a caste system that operates in economics. As part of his research, he conducted a survey of journal referees. Common reasons referees reported for rejecting an article were that it: was without new insights, was poorly written, was uninteresting, contained insignificant results, was low quality, showed insufficient awareness of existing literature or did not prove what it purported to prove. However, only 3% of referees listed “too little contact with reality or lack of relevance,” which Mackie interprets as a sign that referees pay limited attention to empirical appraisal criteria (Mackie 1998, 102). Thus, despite mainstream economics’ enthusiasm for the positivist research paradigm, Mackie documents that empirical falsification is not important in theory choice; theories are not rejected despite poor performance at explaining economic phenomena.

When a significant innovation in heterodox economic theory emerges, it has sometimes been assimilated into the body of mainstream theory in a manner that makes it compatible with the standard model. In this way, more revolutionary aspects that could disrupt the corpus of mainstream theory are discarded or attenuated. Thus, Keynes’ General Theory, initially seen as a threat to the neoclassical project, was absorbed into mainstream thinking via the neoclassical synthesis, but Keynes’ emphasis on uncertainty, liquidity preference, imperfect markets and expectations was lost (Dobusch and Kapeller 2009).

Fourcade (2009) has documented the political and economic forces that influence economic theorizing and professional identities in four countries. She concluded that because economic theorizing in the four countries differed subtly in a manner that reflects domestic political considerations, economic knowledge is intertwined with politics. Despite an external critique regarding the poor fit between economic theory and reality, Fourcade found that economists “remain intensely concerned with, and constantly struggle over, their representations of an underlying economic ‘reality,’ even in their most abstract endeavours” (Fourcade 2009, 262). Yet the profession strives to portray itself as engaged in value neutral theorizing (Hausman
and McPherson 1996, 6). For instance, economists working in American universities characterized economic research as being an objective undertaking, except in instances where they were explicitly researching public policy (Gross 2011).

A form of path dependence has been offered as an explanation for the dominance of mainstream economics. Once one school of thought prevails, mutual dependence amongst scientists, the benefits of coordination, learning effects and increasing returns all reinforce the prevailing school and make it more difficult for other schools of thought to gain adherents (Dobusch and Kapeller 2009). Junior economists have to play within the mainstream sandbox of permitted puzzles in order to be taken seriously, to qualify for funding and to be entered into the pool of economists eligible for awards and recognition. Furthermore, those who subscribe to prevailing paradigms do not have to defend the theoretical foundations of their research; those who engage in heterodox theorizing must be prepared to defend their theories or analysis from a broader range of criticism since the paradigm they operate within is not accepted. Switching allegiance to a less accepted school of economic thought can come at considerable social, positional and financial cost (Mackie 1998, 112).

2.5 Economics education literature

To examine standard PoE courses in the context of university commitments to address sustainability, it is important to understand what the typical PoE course involves and how it is generally experienced by students. This topic is widely discussed in economics education literature, but despite widening my search to include UK and Australasian sources, I was unable to find recent research on how PoE lecturers view sustainability and the environment-economy connection in relation to PoE curriculum.

There is a broad consensus that introductory economics courses are highly standardized across North American universities and rely heavily on textbooks (Boulding 1988; Colander 2000c, 2003). A small number of standard textbooks dominate this market, all of which can be considered descendents of Samuelson’s classic 1948 text (Stiglitz 1988; Skousen 1997; Gottesman et al. 2005; Sleeper 2007). Bestselling principles textbooks have consistently
avoided heterodox content (King and Millmow 2003; Knoedler and Underwood 2003), and textbooks written with a heterodox perspective lag far behind their mainstream equivalents in sales (Sleeper 2007). As a result, few undergraduate students encounter heterodox theory in mainstream economics programs (Skousen 1997; Knoedler and Underwood 2003). When competing schools of thought are discussed, they are often portrayed as unsatisfactory intellectual endeavours not worthy of further study, as theories with less explanatory power than mainstream theories, or as tainted by bias and ideology (Lee, 2004).

Students show low levels of satisfaction with PoE, and other indicators suggest the courses have much scope for improvement. A considerable amount of literature from both inside and outside of the orthodox tent calls PoE curriculum and pedagogy into question (Becker 2000, 2004, 2007; Colander 2000c, 2003, 2005a; Laurenceson 2005; Round and Shanahan 2010). For instance, the emphasis on perfectly competitive markets found in introductory courses and textbooks has been criticized since few—if any—markets meet the required conditions (Hill and Myatt 2007). While most of this literature does not discuss how PoE courses attend to environment-economy linkages and sustainability, I go over some of the key findings and debates to provide broader context for this research project.

Mainstream economics is sometimes faulted for relying on heroic assumptions (e.g., Friedman 1953), a methodological approach that may be losing support within the profession partly as a result of the debate sparked by economists’ failure to foresee the 2008 financial crisis (Colander et al. 2009; Hodgson 2009; Colander 2010; Kay 2011). The problem of heroic assumptions is particularly acute at the PoE level (Nelson 2009; Hill and Myatt 2010; Keen 2011b, Chapter 8). A number of scholars have suggested that PoE presents content that is foreign and alienating, such that students tend to retain little theoretical content. Textbooks have been criticized for content that is too hypothetical and for encouraging students to regurgitate content that involves “fairytale” situations (Becker 2000) or exercises useful for passing examinations but, in the view of some critics, little else (e.g., Boulding 1988; Northrop 2000). As Colander and Landreth (1996), write, “The simple textbook models students learn serve as an operating system for their minds. These models limit students’ imagination and consideration of alternatives…” (cited on p. 59 of Northrop 2000). Also
relevant to the present study is a growing recognition that PoE is alien to many students because it presents a worldview that is distant from student realities by largely excluding dilemmas of wealth distribution, inequality and ethics from course content, despite the fact that students are exposed to such issues on a daily basis (Saunders 2008).

Standard PoE textbooks have been described as encyclopaedic and incoherent (Gottesman et al. 2005). They are critiqued for making so little use of concrete language that students are left “dancing on air” (Mason 1990) and including insufficient references to primary sources (Paxton 2007). Klamer (1990) suggests that understanding economics almost requires a foreign language class. Similarly, Richardson refers to PoE students going through “the shock of the textbook” and describes how they are repeatedly admonished by their instructors to read the textbook – yet his research found that many students are unable to read the text effectively, in part because they find the language inaccessible (Richardson 2004, 510). The teaching style that predominates the principles course has been described as “chalk and talk,” whereby students are passive recipients of the lecturer’s knowledge; inertia in this teaching method has been demonstrated by four different surveys of PoE lecturers conducted at intervals of five years (Becker and Watts 2001; Watts and Becker 2008; Watts and Schaur 2011).

PoE textbooks and courses have also been criticized within the mainstream for avoiding controversy, for failing to raise the moral dilemmas associated with economic theory and policy, and for presenting economics as a largely settled body of theory (Moseley et al. 1991; Becker 2003, 2007; Colander 2003). Students appear to conclude that the best way to do well in PoE is to avoid using examples that raise controversial ethical issues that might call into question the appropriateness of relying on market mechanisms (Richardson 2004). Medema (2011) suggests that, perhaps as a result of the pressure to produce content that students find relevant, textbook authors sometimes massage economic theory to the point that it is invalid.

Some researchers have sought to shed light on the extent to which PoE textbooks are imbued with normative values. A review of 21 one-term first year textbooks found biases were integrated into the texts (Shackelford 1991). Northrop (2000) reviewed 19 textbooks and
found that much of the normative content was hidden and that authors failed to acknowledge the utilitarian ethical system that is implicit in their texts and presented economic efficiency as unambiguously desirable. Authors used words such as “insatiable” or “unlimited” to suggest that there are no limits to human wants in 12 out of the 19 texts, but did not base such claims on empirical evidence or reference the literature in psychology that indicates that human needs are not in fact insatiable. To highlight the normative positions implicit in framing the economic problem as the need to make choices in a world where it is impossible to fulfill the material desires of every person, she writes:

*Of course, not every person’s every material desire can be satisfied. But to say that this inability is our fundamental economic problem is a normative choice. To illustrate, consider an alternative: The economic problem is that every person’s basic needs are not met.... This is a perspective that ignores the impossibility of meeting every person’s desires, no matter how fleeting or far down their priority list those desires might be. Rather, it allows the possibility of meeting everyone’s basic needs....*(Northrop 2000, 54).

Another scholar argues that textbooks wrongly imply that Adam Smith’s use of the invisible hand metaphor provides an endorsement of the benefits of unrestrained self-interest so long as it is channelled through self-regulating markets (Wight 2007).

There has been debate over the extent to which PoE courses help students improve their understanding of the economy and of economic theory. In Australia, PoE increased students’ economic misconceptions and reduced their ability to reason like an economist (Tang and Robinson 2004). The standard instrument for testing student learning in American introductory economics courses is the Test of Understanding of College Economics, or TUCE (Walstad and Allgood 1999; Walstad and Rebeck 2008). A number of studies have found that students who take a PoE course show only modest improvements in their TUCE score (Salemi and Siegfried 1999; Hansen 2001; Hansen et al. 2002; Salemi 2005). Finally, it should be noted that the extent to which an improved TUCE score implies an improved ability to understand economic phenomena is itself open to question. Despite having improved their TUCE scores as a result of taking a PoE course, US students were found to

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17 Northrop cites the work of Lea, Tarpy and Webley (1987), where insatiability is addressed at pages 110-111.
have dismal knowledge of basic economic facts (Wunder et al. 2009). Nelson and Sheffrin (1991) have criticized an older version of the sibling test to the TUCE, the Test of Economic Literacy, which was intended to measure student learning at the high-school level, concluding that it was ideological and hence measures teachers’ ability to achieve changes in students’ ideology rather than their understanding of economic phenomena.

A recent assessment on the state of the economics major in the context of a liberal education, known as the Teagle Foundation report,18 deemed it unfortunate that ‘big think’ questions—such as the appropriate structure of the economy or whether markets lead to alienation—are not put before students (Colander and McGoldrick 2009). Yet the economists invited to comment on the report showed limited interest in modifying curriculum to ensure students would have to grapple with such questions. For instance, one respondent to the report, a long-time contributor to the economics education field, countered the report’s concerns that students are not encountering ‘big think’ questions by arguing, “one simple reason that few students read Marx… is that there are better things to read. … So we leave out Marx to make room for Akerlof, Coase, Lucas and Prescott” (Salemi 2009, 102). In contrast, Marglin’s commentary on this same report complains that while economic programs focus on training students to think like an economist, they fail to foster critical thinking about thinking like an economist, in large part because within the profession, “thinking like an economist has facilitated the celebration of the market” (Marglin 2009, 49).

2.6 Economics textbooks, the environment and sustainability

A number of efforts to assess economics textbooks from an environmental and/or sustainability perspective are relevant to the present research project. To point out how textbooks fail to acknowledge the relationship between the economy and the environment, Daly (1991) searched the indexes of three macroeconomic textbooks, without success, for the terms: “natural resources,” “environment,” “depletion” and “pollution.” Folsom and Brauer

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18 The Teagle Foundation is named after its founder, Walter Teagle, chairman of the board of Standard Oil Company, which is now Exxon Mobil Corporation. Source: http://www.teaglefoundation.org/about/history.aspx, accessed October 21, 2011.
(1998) undertook a relatively informal examination of PoE texts circa 1996 to 1998 for coverage of sustainable development. Over a decade after the Brundtland Commission report, they found that only two of ten texts directly addressed the issue. They conclude that: “Most authors continue to portray environmental issues as a negative constraint on the otherwise desirable goal of increased output” (Folsom and Brauer 1998, 5).

Eriksson (2005) surveyed a number of environmental economics textbooks to examine their treatment of ethical issues. For each textbook he provides a summary of the overall gist of the textbook from a moral/ethical perspective. Eriksson evaluates the merits of the moral/ethical arguments and stances taken in the textbooks. He found that the environmental economics textbooks reviewed ranged from a having a fuzzy and inconsistent ethical basis to an explicit and systematic ethical basis. Some texts showed practically no interest in ethical questions.

To assess how well contemporary textbook incorporate green issues, Reardon (2007) surveyed 17 US PoE texts by perusing each chapter for energy/environmental topics and searching the index for relevant entries. He focused on the quality of exposition rather than on tallying page numbers devoted to energy and environmental issues, arguing that "one energy/environmental issue presented from a contextually holistic green viewpoint is more cogent and efficacious than a dozen examples presented ad hoc and superficially" (Reardon 2007, 207). He concludes that contemporary texts ill prepare students to understand environment-economy linkages.

The above efforts provide a valuable foundation for the present project, but each has limitations. Most rely on methodologies that are insufficiently thorough and many of the results are now dated. One component of the present project is intended to contribute to strengthening and updating this literature on how PoE textbooks address sustainability.
2.7 Impacts of economics education on students and society

The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influence, are usually the slaves of some defunct economist. –John Maynard Keynes

To determine the best means to assess the potential implications of universities’ sustainability commitments to the future of PoE courses, I searched a broad range of literature for studies that might help shed light on the effects of undergraduate economics training on students’ beliefs, attitudes and values and the ultimate influence of this training on society.

2.7.1 The performativity of economics

The notion that economic theories influence the social and material worlds has been around for some time. For instance, Polanyi’s (1944) work documents how beliefs in alleged laws of economics unleashed dramatic social change as public policy in market societies was aimed to achieve laissez-faire ideals. More recently, Callon (1998b), coming from the field of science studies and using Actor-Network Theory (ANT), has instigated a research program on the performativity of economics. In using the term performativity, his contention is that economics does not so much describe the world, but rather, “performs, shapes and formats the economy” (Callon 1998a, 2). In this view, economists generate theories and tools that then shape economic institutions and influence economic actors such that the world eventually more closely resembles these theories. For example, MacKenzie (2006) links the tremendous growth in the value of the derivatives market to options pricing theory developed by the economists Myron Scholes and Robert Merton (who were awarded the Nobel prize in economics) and their colleague Fischer Black.

The performativity thesis is not without critics, in part because it sometimes fails to spell out the mechanisms by which economic ideas act on the world, because by denying macro structures like capitalism it is seen to uphold the status quo and because markets predate the economics discipline (Fine 2003). Critics have also complained that the performativity
scholarship has not paid sufficient attention to how competing parties can be involved in mobilizing or contesting economic theory. Since theories are contested and mobilized towards different ends by diverse actors, the match between theory and the real world may improve to a lesser extent than advocates of performativity have suggested. Mirowski and Nik-Khan (2007) accuse performativity scholars of forming an uncritical alliance with neoclassical economics, for ignoring the social order and for discarding previous scholarship in the social sciences.

In part, concerns over the plausibility of the performativity thesis may be related to some confusion over the degree to which it is being claimed the economic theory reformats the world. Santos and Rodrigues (2009) identify two variants of the performativity thesis. The strong variant implies that by applying economic theory to the world, the world is shaped so that the theory becomes true. In the weaker variant, economics is actively engaged in shaping market society, but its influence while significant, does not result in changes that bring the world into alignment with the economic theories. Santos and Rodrigues propose to amend the research agenda initiated under the mantle of performativity to better focus attention on “identifying the mechanisms through which economics participates and shapes social life” and examining the “consequences of the attempts at making reality conform to economic theories” (Santos and Rodrigues 2009, 999).

Ferraro et al. (2005, 2009) propose three key mechanisms to explain how economic theory can influence the world so that the gap between the world and theory is narrowed. First, an institution can be designed under the assumption that economic theory provides an accurate description of the world, with the result being that the institution reinforces behaviour that fits the model and dissuades behaviour that is inconsistent with it. Secondly, when people come to believe a theory – such as believing that humans act in their own self-interest – social norms can evolve to be more congruent with the theory. Individuals may then make reference to this evolved norm to conclude that they are expected to act in their own self-interest. Finally, the language used in economics affects how people see the world, including what they notice and what they ignore, resulting in changes in decisions and behaviour.
A key contribution of Callon’s thesis in Mitchell’s (2005) view is that it shifts attention away from the deficiencies of neoclassical economics in representing actual economic activity. Instead, the performativity thesis helps highlight how economic theory serves the purposes of framing and disentangling economic activity, allowing some things to be included and others to be excluded from economic transactions in a way that delimits responsibility for the consequences of economic policies and outcomes. Thus, when promoted in the right circles, fairly simple economic ideas can have real impacts on people’s lives and wellbeing. Furthermore, the framing and disentangling that economic theorizing entails can facilitate the benign neglect of the environmental and equity consequences of economic policies.

Though it does not draw upon an ANT framework or use the language of performativity, Marglin’s critique of mainstream economic theory also tackles economics’ role as an enabler that “build[s] a world based on markets” (Marglin 2008, ix). He focuses his critique on the theory’s foundational assumptions regarding nation states and self-interested, autonomous individuals who rationally optimize their consumption and have unlimited wants. There is no room for community in such a framework. Marglin suggests that these foundational assumptions are critical, yet are seldom probed, even by elite practitioners at the frontiers of the discipline who tend to be willing to question existing theory. He also argues that economists seek to construct a world that is consistent with their theory, stating that “Economics is not only descriptive; it is not only evaluative; it is at the same time constructive—economists seek to fashion a world in the image of economic theory” (Marglin 2008, 3).

2.7.2 The influence of PoE on society

Empirical evidence indicating how undergraduate economics curriculum affects economic beliefs, values and attitudes in society, and the extent to which PoE lecturers may be helping to perform the economy, is lacking. Accordingly, it makes sense to examine indirect evidence as to how PoE may be influencing society and economic outcomes. One source of indirect evidence is comments made by economists and other scholars about the social or policy impacts of PoE courses and textbooks. I examine a small number of such claims.
Samuelson explained that in writing and revising his seminal principles textbook, his priority was “…not so much in dollars as in influencing minds” (Cited in: Gottesman et al. 2005, 98). Samuelson was under continual pressure, both from the left and the right, to revise his text (Skousen 1997), presumably because those seeking to influence the content thought that Samuelson’s text would impact students’ minds, and ultimately the likelihood of success for given economic policies.

Joan Robinson, a long time critic of mainstream economics for the apologetic role she saw it playing, sought to challenge orthodox theory by writing a PoE textbook intended to displace the reigning mainstream texts like Samuelson’s. While other heterodox authors had attempted to do the same, Robinson was the first of Samuelson’s contemporaries to have such a high profile. However, her textbook was overly demanding of lecturers, and the level of difficulty was too great for first year students. Not surprisingly, it failed to capture market share and soon fell into disuse (King and Millmow 2003). A Marxist “anti-Samuelson” text also appeared on the market (Linder and Sensat 1977), but as it was heavily steeped in Marxist terminology it was incomprehensible to most freshmen. The key point here is that heterodox economists like Robinson and Linder have sought to change what is taught in PoE because of the perceived influence of the course.

In his various writings, Galbraith makes frequent allusion to the influence of economics education on society’s economic beliefs. For instance, in The New Industrial State, Galbraith (2007, 208) writes,

> If [the reader] suspects that economics, as it is conventionally taught, is in part a system of belief designed less to reveal the truth than to reassure students and other communicants as to the benign tendency of established social relations, he will...be right.

Likewise, in a recent book, Harvard economist Stephen Marglin, who offered a heterodox version of PoE at Harvard, offers several acerbic comments on how PoE promotes self-interest. For instance, he contends that since Adam Smith, “…ordinary people have bought into the virtue of self-interest, though as I have indicated, Economics 101 helps to drive the lessons home” (Marglin 2008, 114).
Another way to approach the question of how PoE could be influencing societal decisions is to examine instances where economic theory has affected society’s reaction to serious social and economic problems. For example, in the early years of the Great Depression, economists’ belief in Say’s Law, which implies that insufficiency of aggregate demand and involuntary unemployment is impossible, seems to have hindered economists from re-examining conventional wisdom on how to respond to a collapse in demand, despite prevailing economic conditions that indicated the law was invalid. Belief in this law influenced public policy and government reactions to the crash of 1929, and thus slowed recovery from the economic crisis. Keynes’ General Theory (1936) eventually provided a theoretical basis for discarding Say’s Law by explaining involuntary unemployment and the idea that government intervention was needed to stimulate aggregate demand. The point here is that until it was discredited by the General Theory, Say’s Law was the type of economic theory that would have been taught to undergraduates during their economics training, thereby influencing the thinking of the educated class and prospects for public policy that was in apparent conflict with the theory.

More recently, the 2008 economic crisis was blamed in part on the efficient market hypothesis, which effectively ruled out the possibility of such a crash (Cassidy 2009; Hodgson 2009). Many bankers, regulators and politicians engaged in shaping the rules that contributed to recent financial troubles would have encountered the efficient market hypothesis in contemporary textbooks. Of course, these two instances do not imply that whatever appears in the undergraduate economics curriculum acts to shape public policy, but they do suggest that some of the content included in the curriculum diffuses into public discourse and the policy-making realm and in this way may influence outcomes.

19 Roughly understood as “supply creates its own demand.”
20 For instance, the hypothesis is explained beginning on page 523 of the 18th edition of Samuelson and Nordhaus. The efficient market hypothesis was developed by Milton Friedman’s student Eugene Fama, and implies that since prices in financial markets factor in all publicly available information, publicly-traded financial assets always reflect economic fundamentals (Cassidy 2009, 39–41).
The leading standard PoE textbooks and courses tend to cover the key policies that facilitate markets and business activity (Goodwin 2004; Marglin 2009; Stanford 2011). By and large, higher-level courses cover few economic policies that have not been described at least at the outline level in PoE. The reason for this is that to a considerable degree, when it comes to discussing economic policies, higher-level courses involve the same material covered in PoE, though elaborated in more formal terms (Goodwin 2008). Thus, the views of even professional economists are likely partially shaped by what they first encountered in PoE. In his analysis of how economic theory is canonized, Mackie (1998) highlights the discipline’s heavy reliance on textbooks early in the training process and refers to the role they play in initiating potential economists. Textbooks are “obligatory passage points” (Latour 1987, 159) into a discipline, and they are intended to represent the distilled wisdom of the profession.

Kreplin (1979), a critic coming from a Marxist tradition, argues that there was a deliberate effort to incorporate mainstream economic theory into the US public school curriculum as a means to legitimate American forms of capitalism, to normalize existing class relations and to quiet growing discontent with the status quo. He examined the work of the Joint Council on Economics Education, which was ostensibly founded to reduce economic illiteracy by promoting economics instruction in public school and college curriculum. He documents that the council’s leadership was made up of educators and corporate executives, and that it collaborated with the US Chamber of Commerce and the American Bankers Association. Reviewing various documents produced by the council, he shows that in the recommended curriculum, society’s interests are presumed to be best served by a growing market economy. The American economic system is portrayed as democratic and tied to natural laws; the curriculum avoids drawing attention to whether the system is fair. Kreplin’s position is congruent with Apple’s, who agrees that economic theory that might be unsettling to the captains of commerce is unlikely to find its way into curriculum (Apple 2004, 7). However, in contrast to Kreplin’s findings, it is intriguing that in the UK context there was little support for the notion that students should encounter economics before attending university (Jephcote and Davies 2007). An explanation of why the private sector in the UK did not see the need to
push economics at the public school level as a means to sell the benefits of prevailing economic arrangements would be useful.

Based on the importance participants in mainstream economics ascribe to undergraduate economics courses, and the importance critics of orthodoxy place on reforming or replacing such courses, it is clear that many commentators perceive the PoE curriculum as having a substantial influence on the decisions that are made by society.

### 2.7.3 Effects of studying economics on student values

Relevant to an evaluation of how the principles course might be modified as part of integrating sustainability across the curriculum is an important but unresolved literature that suggests that, largely through emphasizing that self-interest is the motivating force behind *homo economicus*’ decisions, training in economics may be undermining students’ willingness to contribute to public goods (Marwell and Ames 1981) as well as the importance they place on cooperation (Frank et al. 1993). The finding that economics undermines cooperative behaviour has been challenged (e.g., Yezer et al. 1996) and the challenge countered (Frank et al. 1996). Using an ultimatum game, Stanley and Tran (1998) found that at a small liberal arts university, students with economics training tended to split $10 fairly (contra the prediction of orthodox theory), and indeed were more generous than their peers who were untrained in economics. However, using a dictator game and an exercise in which students were asked to contribute personal vignettes related to greed and to react to quotes from famous economists, Wang *et al* (2011) found that the more economics training students had, the less fair their offers became and the more positive their attitudes were towards greed.

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21 A typical version of the ultimatum game involves two participants. The first gets to choose how a certain sum will be divided. If the second person accepts this allocation, both participants receive their allocation. However, if the second person rejects the allocation, neither gets anything. According to orthodox theory, the first participant should divide the amount in a way that maximizes their own take, say $9.99 / $0.01, knowing that it would be irrational for the second participant to turn down any positive sum.

22 In the dictator game, the first participant decides how a sum will be allocated. The second has no say in the matter. Disbursements are then made accordingly.
There are instances where a single course in economics has been shown to result in substantial changes in student beliefs. Whaples (1995) explored whether an introductory economics course could affect students’ assessments of whether market outcomes were fair, and concluded that the course had a “profound influence” on student attitudes. A Canadian study that compared the performance of undergraduate and graduate economics students to nursing students in a game involving the provision of public goods showed that economics students were markedly less cooperative than nursing students (Cadsby and Maynes 1998). However, it is not clear whether a selection effect, a socialization effect or a learning effect explains the observed differences. In contrast, Laband and Beil (1999) found that professional economists were more honest than political scientists and sociologists about paying their association dues. Other researchers have suggested that if economists are more selfish, it is through self-selection rather than through indoctrination (Frank and Schulze 2000). Using a natural experiment, namely students’ contributions to social funds, economics students did not become more selfish with additional economics training; instead, their more selfish behaviour was explained as a selection effect (Frey and Meier 2005).

Rubenstein (2006) found that students who studied economics were more likely than their non-economics peers to recommend that a hypothetical manager maximize the firm’s profits in a situation where the social impacts of such a decision, namely unemployment for laid-off workers, are ethically troubling. When the question was posed to students in a mathematical form commonly used in economics texts, they did not seem to appreciate that an ethical dilemma was involved or that conflicting interests were in the balance. Rubinstein believes these findings show that the use of mathematical exercises in economics education “contribute[s] to the shaping of a rather unpleasant ‘economic man’” (Rubinstein 2006, C9).

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23 Two of the sample questions were: “2. On a holiday, when there is a great demand for flowers, their prices usually go up. Is it fair for flower sellers to raise their prices like this? 3. Should the government introduce limits on the increase in prices of flowers, even if it might produce a shortage of flowers?” Comparing students’ opinions before and after a PoE course, the proportion of students who advocated government intervention to control flower prices fell by 60%.

24 Rubinstein’s study cannot differentiate between selection bias or training/indoctrination as no pre/post format was used.
Issues of distributive justice and perceptions of fairness were explored with a sample of first and fourth year students (Faravelli 2007). The author found a selection effect: sociology students were more concerned about fairness than their economics counterparts. At the same time, when contextual information on minimum survival needs was introduced, economics students were found to be concerned about fairness. Based on these results, Faravelli contends that there is a learning effect for economics students, but not for sociology students.

Using, amongst other measures, the same dilemma between profits and layoffs as used by Rubinstein (2006), a recent study by Cipriani, Lubian and Zagoof (2009) of a large sample of undergraduates from a variety of disciplines found both a selection effect (students who have chosen to major in economics are deemed “natural born economists”) and a treatment effect (microeconomics encourages an emphasis on efficiency in value judgments). Yet there were no significant differences in how first and third year economics students resolved trade-offs involving social consequences (e.g., profitability vs. employment). Though the authors do not find evidence supporting the view that economics education has the “unpleasant consequences outlined by Rubinstein, i.e., the creation of a selfish economic man,” (Cipriani et al. 2009, 467), they call for further research to assess the extent to which indoctrination is occurring.

Evidence as to whether undergraduate economics training fosters changes in political attitudes is also limited and mostly dated. Harvard University’s Gregory Mankiw, a leading PoE textbook author and well-known conservative, puts forward three reasons that might explain how economics training leads to more conservative attitudes:

There are at least three, related reasons. First, in some cases, students start off with utopian views of public policy, where a benevolent government can fix all problems. One of the first lessons of economics is that life is full of trade-offs. That insight, completely absorbed, makes many utopian visions less attractive.... Second, some of the striking insights of economics make one more respectful of the market as a mechanism for coordinating a

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25 They understand indoctrination to involve uncritical acceptance of a set of beliefs as taught, whereas they deem learning to be involved if, after critical examination, beliefs are accepted.
Most effects detected of PoE on student political values were fairly weak (Scott and Rothman 1975; Riddle 1978). One study that measured shifts in attitude following a one semester survey course in economics found that students became more conservative (stronger support for private vs. public ownership, preference for market allocation) and suggested that the textbooks themselves should be considered a source of influence (Jackstadt et al. 1985). A study that examined whether PoE affects student attitudes toward government intervention unexpectedly found that exposure to an introductory microeconomics course made students more interventionist, while students taking sociology and political science courses became less interventionist. The authors suggest that much of the observed shift in students’ beliefs as a result of the economics course can be explained by the fact that individual instructors placed considerable emphasis on market failures and imperfect competition\(^\text{26}\) (Cobb and Luker 1993).

Asked to consider how they would amend the Finnish government’s budget, economics students allocated the highest spending to law and order and technology and cut the most deeply on social programs – such as childcare, health, unemployment insurance and international cooperation – when compared to their peers in other departments (Venetoklis 2007). A recent study found that economics programs tend to attract male students who are more conservative than the average male university student; for female economics students no pattern in political orientation was discerned (Bartlett et al. 2009).

A recent study examined whether changes in students’ opinions on economic issues after an introductory economics course were related to the political orientation of their instructor (Magee 2009). Magee’s analysis found that the effect of other students’ opinions was greater

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\(^{26}\) In emphasizing market failures and imperfect competition, it appears these instructors were offering a course that may have significantly departed from the norm.
than that of their professors’ opinion (one professor had the equivalent influence of six fellow students). Furthermore, it showed that students self-selected into sections with professors whose views were congenial to their own. However, a limitation of this study is that different textbooks were used in different sections, and the author did not account for the influence of the textbooks’ political orientation.27

The divergent results in the literature reviewed above show that further research is needed before more definitive conclusions can be reached about how undergraduate economics courses influence student values and political beliefs. However, there are indications that in some instances economics training influences student beliefs and values in a manner that may be eroding the values and beliefs that advocates of sustainability in higher education contend universities should be supporting.

2.7.4 Effects of studying economics on environmental attitudes and values

I now turn more specifically to the limited evidence available on how economics training, particularly at the PoE level, influences student attitudes and values when it comes to the environment. Smith (1995) analyzed data from the General National Opinion Research Center's (NORC) General Social Survey, conducted in the US in 1993, which allowed him to examine how educational background influenced participation in activities that improve environmental outcomes. He found that “…majoring in economics or business is a negative influence on willingness to donate [to environmental groups] and recycle” (p. 602). A BC-based study examined how a student’s major relates to scores on a modified New Ecological Paradigm28 scale (Ewert and Baker 2001). The study did not include economics majors, but did include students in business administration, whom one would expect to have been exposed to economic theories. It found that both business administration and forestry majors reported lower pro-environment scores than did majors in other disciplines.

27 Email from Chris Magee, dated November 30, 2009, in response to a query from the author.
28 The New Ecological Paradigm scale was initially introduced in 1978 as the New Environmental Paradigm scale, a means to measure the environmental orientation of respondents. It is discussed further below.
The above research is intriguing, yet there is too little of it to come to any clear conclusions as to how PoE courses may be influencing students’ environmental values and beliefs.

### 2.8 Chapter conclusions: implications for this research project

This chapter provides support for my research questions as set out in Chapter 1, the theoretical framework in Chapter 3, the methods as detailed in Chapter 3, and supports the approach and interpretation in subsequent chapters.

By reviewing the sustainability in higher education literature, I documented an emerging consensus that from a learning perspective, sustainability should be integrated across the curriculum, rather than by addressing sustainability in separate modules. This implies that universities’ sustainability commitments may require re-examination of the PoE curriculum.

A deficiency in the sustainability literature in higher education is that there is limited inquiry into ways in which addressing sustainability may call into question the theory that is being taught within a discipline and require that this theory be revisited. This is especially so in the case of economics. This dissertation helps address this lacuna.

I then turned to the literatures more directly related to PoE, addressing the sociology of the economics discipline, socialization within economics, theory choice in economics and economics education. These literatures document how heterodox theories have been suppressed in favour of the mainstream and how they are considered to have little value. Furthermore, this literature provides a basis for understanding how economics has come to downplay attention to the environment. Literature that sheds light on how mainstream economic theory is produced and evolves was reviewed to better understand how PoE took its present form.

Unfortunately, to date the economics education literature has paid little attention to the relevance of environment-economy linkages and sustainability to the POE curriculum. However, there is a broad consensus that in North America, PoE courses are highly standardized. The courses are often seen to be unsatisfactory both by mainstream contributors to the economics education literature and by many of the students who take the
course. Students are widely acknowledged to find the course alienating and to retain little of the economic theory they are taught, and to show little improvement in their understanding of the economy. This literature also documents how undergraduate economics courses avoid engaging with ethical issues. Furthermore, biases and hidden normative content have been found to be integrated into PoE textbooks. Big think questions—such as the appropriate structure the economy or whether markets results in alienation—are not covered in the PoE classroom.

Several literatures were considered to evaluate the extent to which PoE courses may influence student beliefs, values and political views and to ultimately influence public policy and hence prospects for sustainability, yet these literatures were inconclusive. First, various critics of orthodoxy have sought to change what is taught in mainstream economics courses, presumably in part due to a belief such changes could affect social policy over the long term. Second, the performativity of economics literature suggests that economic theory can reformat the world that it theorizes about. In other words, the theory does not merely describe the world, but also acts upon it. Third, an area of research that considers how economics education shapes student values was reviewed, with some researchers detecting important effect, while others contest such findings, suggesting more research is needed. This of course is of interest because it points out the importance of understanding how PoE influences student beliefs and values and ultimately the type of decisions and actions they will take upon graduation that may have sustainability implications.

Synthesizing the theory and findings reviewed in this chapter has led to the following provisional findings that have informed my research design and methods.

There is a sound rationale for studying the PoE course, since best practice in meeting universities' sustainability commitments suggest that sustainability should be integrated across the curriculum. There are reasons to believe that the PoE course influences society’s understanding of what is economically possible, what is desirable and what policies are sound. Furthermore, the available evidence indicates that PoE courses have tended to draw on simplistic conceptualization of environment-economy linkages and pay little attention to
the issue of sustainability. Yet this research is insufficiently thorough and would benefit from updating.

In the next chapter, I set out the theoretical framework that provides the structure underpinning and informing the analysis in this dissertation.
Chapter 3: Theoretical framework

3.1 Chapter overview

Shifting from the literature review in the previous chapter, this chapter provides a theoretical foundation for my research questions and methods, and a lens for interpreting the results. In a recent book oriented towards explaining how conceptual frameworks support the research process, Ravitch and Riggan (2011) distinguish between conceptual frameworks and theoretical frameworks:

*For us, a conceptual framework is an argument about why the topic one wishes to study matters, and why the means proposed to study it are appropriate and rigorous. (Ravitch and Riggan 2011, 7)*

They refer to a theoretical framework, a component of the conceptual framework, as:

*...the way in which a researcher engages with, integrates and argues from existing theories within and across relevant fields. (Ravitch and Riggan 2011, 137)*

In Chapter 1 I set forth my conceptual framework, laying out my argument for why studying how sustainability commitments play out in PoE curriculum is relevant and important. As a component of the conceptual framework, my theoretical framework has to serve several purposes.

In order to assemble the theory, concepts and tools I require to analyze how economics, as it is presented in PoE, conceptualizes environment-economy linkages and the challenges involved in achieving sustainability for industrial market economies, I turn to the ecological economics literature. Ecological economics is focused on improving human understanding of the interdependence of human societies and natural ecosystems; it begins from the perspective that the economy is as subset of the biosphere, a perspective that calls into question the feasibility and desirability of ongoing growth in economic output. To address weaknesses in ecological economics theorizing, I take into consideration key interventions made in the ecological economics literature by scholars working from political economy, institutional economics and feminist economics perspectives.
I also seek to construct a framework that will enable me to investigate the role of undergraduate curriculum and to see how a discipline, departments and lecturers decide upon the corpus of ideas and theories that should be taught—as well as what can be omitted—and how the resulting corpus should be represented. Furthermore, this framework should help assess how the economics discipline positions PoE within the academy, privileging mainstream economics as a field of knowledge that students from diverse disciplines are expected to have an elementary knowledge of and competence in. I focus more specifically on how academic departments and disciplines have been theorized to better understand how academics are socialized into a discipline, how influence is wielded and the ways in which a discipline responds to the knowledge and interests of other disciplines.

I also canvass four competing schools of thought—initiated by Bernstein, Bourdieu, Archer and Latour—that have influenced the sociology of higher education literature. These literatures offer competing perspectives on the degree to which the work of academics is shaped by existing structures and habitual patterns versus being open to reflexive agential action. They also differ in the degree of emphasis that they give to the role of ideas and non-human actors, such as textbooks, in influencing social outcomes and the structure of the economy. I pay particular attention to insights that could help evaluate scope for innovation in curriculum.

### 3.2 The ecological economics critique of mainstream economics

Ecological economics is a young and rapidly evolving transdisciplinary field focused on improving human understanding of the interdependence and coevolution of human societies and natural ecosystems, motivated by concern that the growing scale of economic activity is undermining ecological life support systems (Costanza et al. 1991). What follows below is based on my reading of tendencies within the discipline, informed in part by my own engagement with the field since 1995. Readers should keep in mind that there is a diversity

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29 I was a founding member of the Canadian Society of Ecological Economics, and have participated in Canadian, US, European and International ecological economics conferences. I have also contributed to
of thought in the following descriptions of positions, methodologies or theoretical commitments. The diversity arises partly because of the discipline’s commitment to methodological pluralism as well as from its inherent multidisciplinarity (Norgaard 1989; van den Bergh 2001). Given the breadth of subject matter addressed by ecological economists and the burgeoning literature, I highlight aspects of ecological economics and findings from the literature that are particularly relevant to providing a framework for examining and critiquing PoE and for considering how, under best practices, universities’ sustainability commitments might inform PoE curriculum. I also incorporate in this review some heterodox economic literature, mainly from feminist and institutional economics, on the basis that the literature in question is complementary to, and has had some influence on, the ecological economics approach and helps shore up some areas where ecological economic scholarship has so far been limited. It should also be kept in mind that ecological economics does not reject mainstream theory in toto; some methods are adapted, and some of the policy approaches promoted by ecological economists, such as carbon taxes, are also promoted in the mainstream environmental economics literature.

Ecological economics calls into question the worldview, approach and assumptions of mainstream economics and the appropriateness of many of the economic policies that have been supported by mainstream theorizing and analysis, such as those that favour free trade (Daly and Cobb 1994, 209–235; Ekins et al. 1994; Andersson and Lindroth 2001). In contrast to the mainstream’s longstanding endorsement of economic growth (Nelson 1991, 2001), ecological economists reject growth in GDP as a macroeconomic policy objective (Boulding 1966; Daly 1998; van den Bergh 2011). Instead, ecological economists promote alternative economic indicators (Victor 1991; Daly and Cobb 1994, 443–507; Lawn 2003) and focus on redesigning the economy so that it supports human wellbeing within suitable ecological constraints (Victor 2008; Jackson 2009a), a vision promoted by Daly under the label of a

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30 This endorsement has been somewhat tempered more recently (e.g., Stiglitz et al. 2009) and even historically, such as in John Stuart Mill’s positive assessment of the steady state (Daly 1992a, 14).
steady state economy (Daly 1992a). More recently, some ecological economists have come to advocate for economic degrowth, wherein rich countries deliberately shrink per capita consumption, creating ecological space for a modest increase of per capita consumption in poor countries such that total human demands fit within the planet’s limited biocapacity (Rijnhout and Schauer 2009; Schneider et al. 2010; Kallis 2011).

Based on a survey instrument where respondents were asked to agree or disagree with statements related to sustainability, Illge and Schwarze (2009) reported that ecological economists exhibit commitments to social justice, improving human prospects and ensuring the long-term viability of ecosystems and natural processes. In the ecological economics literature, public deliberation about the end goals of economic activity is promoted (Daly 1992a, 18–20, 2009) as is greater scrutiny regarding the philosophical foundations underlying economics theorizing and analysis (O’Neill and Spash 2000; O’Neill 2007; Spash 2008; Norgaard 2009). Like Nobel laureate Gunnar Myrdal (1990), social science research and education is described by ecological economists as being inherently imbued with values. Accordingly, discussions about underlying values are common in ecological economics literature (Spash and Ryan 2010; Daly 2009). In the public policy arena, where many decisions must be made in a context of uncertainty, ecological economists depict values as contested (Costanza and Wainger 1992; Funtowicz and Ravetz 1994; Common and Stagl 2005). Accordingly, they promote multi-criterion approaches to economic analysis of policy options (Funtowicz and Ravetz 1994; Illge and Schwarze 2009).

Ecological economists seek to ensure economic theorizing incorporates a more realistic specification of the economy’s material and energy stocks and flows so as to be consistent with the first and second laws of thermodynamics (Georgescu-Roegen 1971, 1986; Daly 1992a; Ayres 2007). Thus, in response to the mainstream emphasis on capital and labour, ecological economists stress the contribution of natural capital in enabling economic activity (Victor 1991; Jansson 1994; Green 2000; Vemuri and Costanza 2006). Systems theory has also had great influence on theorizing and analysis (e.g., Meadows et al. 1972) such that ecological economists draw attention to differing hierarchies within systems and the way that systems go through phases of growth, conservation, release and reorganization. Within
ecological economics, sustainability is often interpreted through a resilience lens (Trosper 2009, 154–157), whereby it is understood as the maintenance of a system’s adaptive capacity over time in the presence of shocks, such that the system’s functions and structure are retained. In this formulation, it is also recognized that subcomponents of a system will go through release and renewal (Holling 1973, 2001; Gunderson and Holling 2002).

Following Spash’s (2011) classification, ecological economics can be roughly categorized into two main schools of thought: North American and European. The North American variant of ecological economics was born out of a collaboration between ecologists and mainstream economists, and was thus more desirous of recognition by the mainstream profession and more willing to draw upon and adapt neoclassical methods with limited scrutiny of their underlying assumptions (Spash 1999, 2011; Røpke 2004). This stream of scholarship places considerable emphasis on the valuation of ecosystem services in monetary terms as a means of ensuring decision makers take into account nature’s contribution to human wellbeing (e.g., Costanza et al. 1997). However, ecological economists aligned with the European school are sceptical as to whether the output of such exercises is meaningful, pointing, for instance, to the problem of incommensurable values. They also question the desirability of making public policy decisions on the basis of aggregating individual preferences expressed in market-like settings with the distribution of wealth taken as given (O’Neill 2007; Spash 2008; Norgaard 2010; Krall and Klitgaard 2011).

The variant of ecological economics that dominates in Europe, sometimes termed socio-ecological economics (Jacobs 1996; Spash 1999, 2011), has a greater tendency to incorporate a political economy perspective and is thus more attentive to institutions and power. This school is less amenable to retrofitting neoclassical techniques and is less optimistic than its North American counterpart that if suitable ecological constraints and price adjustments are implemented, the market mechanism can be relied upon to deliver desired social outcomes (Røpke 2004, 2005; Spash 2011).

Ecological economists characterize movement towards sustainability as being impeded in part by an economic worldview that is focused on growth in economic output and per capita
consumption and has downplayed the linkages between economic activity and the state of the environment (Boulding 1966; Georgescu-Roegen 1971; Daly 1992a, 2008; Arrow et al. 1995; Rees 2002; Illge and Schwarze 2009). Accordingly, to mainstream economics’ traditional preoccupation with allocation and to a lesser extent distribution, ecological economists add the issue of scale, which is to say the relative size of the economy in biophysical terms relative to the encompassing biosphere (Daly 1991, 1992a, 1992b; Victor 2009). They often reverse the order in which these objectives are satisfied. Thus, Daly (1992a, 50–76) argues that society’s first priority should be achieving an appropriate scale for the economy, and that second in importance is ensuring an equitable distribution, with efficiency in allocation being a desirable objective only once the two higher-level conditions have been satisfied. Various ways to define the appropriate scale of the global economy (e.g., Rockstrom et al. 2009) and to ensure economic activity stays within these boundaries have been proposed, an underlying assumption being that constraints on the scale of human activity need to be put in place by drawing on findings from the environmental sciences. Since, in a ‘full world,’ growth in the overall scale of the economy is no longer an option that can be used to improve the plight of the poor, ecological economists promote redistribution as a means to reduce inequality, to improve wellbeing and to enhance prospects for sustainability (Daly 1992b, 53–58; Ruitenbeek 1996).

Ecological economists contend that mainstream economic theorizing and analysis has greatly underestimated the importance of energy and natural resources in enabling economic activity. For instance, while growth in standard theory is unrelated to energy use, Ayres (2008a) has documented how economic growth since the industrial revolution has been largely enabled by humankind’s ability to harness fossil fuels. Accordingly, they have worked to develop economic models that are consistent with the first and second laws of thermodynamics, in part by seeking to account for material and exergy flows in economic models (Georgescu-Roegen 1971; Ayres and van den Bergh 2005; Warr and Ayres 2006; Ayres 2008a; Victor 2009).

31 Schabas argues that under the influence of a line of reasoning put forth by John Stuart Mill, mainstream economists came to theorize about the economy independently of the natural world (Schabas 1995, 2006).
One area where ecological economics has been critical of the mainstream approach to the environment is how environmental problems are largely conceptualized as externalities, wherein two parties to a transaction fail to account for costs imposed on third parties. Ecological economists argue that most every economic process involves some form of material transformation and loss of exergy.\footnote{Exergy, a term from thermodynamics, can roughly be understood as the energy available to carry out work. Since the first law of thermodynamics stipulates that energy is neither created nor destroyed, it is imprecise to refer to energy being used up in the economic process as is done in common parlance (though economic processes result in energy going from being in a more available form to a less available form); referring to exergy being used up avoids this problem and is more precise.} They draw attention to throughput, the flow of materials and energy from the environment, which are utilized in the economy and eventually emitted into the environment as waste and dissipated energy. Impacts on the environment are thus inherent in economic activity. Since the mainstream model does not account for the biophysical attributes of the system it depends upon, externalities seem to be appended to it as an afterthought. However, for ecological economists externalities are pervasive such that the concept is of limited usefulness as a tool of analysis and as a guide to action (Georgescu-Roegen 1971; Daly 1992a; Røpke 2010). Kapp’s (1950) notion of social costs is sometimes offered as an alternative.\footnote{For Kapp, environmental problems are pervasive and arise in large part because market institutions have been shaped over time so as to foster private enterprise’s ability to enhance returns by shifting costs to workers, to the public and to the environment.}

While theorizing the human actor in ecological economics is still a work in progress, ecological economists are critical of continued reliance on \textit{homo economicus}, the rational, utility-maximizing, atomistic and selfish individual that still populates many economic models (Kahneman 2003) and most PoE textbooks. Ecological economists have drawn upon behavioural economics literature (see summary in Mullainathan and Thaler 2000), experimental economics (Gintis 2000; Henrich et al. 2001), evolutionary psychology (Jackson 2002) and neuroscience (Camerer et al. 2005) to better understand the human actor and to explore how collective action dilemmas might be overcome. The result is a more nuanced understanding of human motivations that recognizes that individuals are part of a larger social matrix wherein they seek to maintain a desired status level, and that an
individual’s decisions are only partly rational, in part due to weakness of will (Camerer et al. 2005) and in part due to the influence of the behaviour of peers (Vatn 2004). While humans can be self-interested, they can also be altruistic. Human wellbeing is understood to be affected by the state of nature, and people care, to varying degrees, for the non-human world (Dodds 1997; Siebenhüner 2000; Jackson et al. 2004; Becker 2006; Costanza et al. 2007; Ingebrigtsen and Jakobsen 2009).

The insatiability assumption of mainstream economics is rejected in ecological economics; the apparent endless desire to consume in contemporary society is seen in large part as the end result of giving commercial interests free reign to create and stoke needs through marketing (Galbraith 1998, 2007). Accordingly, rather than seeing the satisfaction of preferences as innately good, ecological economists see many instances where satisfying individual preferences does little to support individual and collective wellbeing, and can even erode it (Jackson et al. 2004; Mick et al. 2004). As a result, the notion of, and emphasis on, consumer sovereignty in many economics textbooks is found to be suspect. Government circumscription of consumer choice will likely be needed to foster human and ecosystem wellbeing over the long term (Menzel and Green Forthcoming).

There is also an emerging stream of feminist ecological economics scholarship (Nelson 1997; Perkins 2002, 2007; Perkins and Kuiper 2005; Perkins et al. 2005) that helps draw attention to issues such as the unpaid work and caring labour, largely undertaken by women, that underwrites the economy. Alternative modalities of analysis, such as understanding economic activity through time use studies and other forms of non-monetary valuation are seen to offer a broader basis for understanding the economy and the implications of economic policy. Beyond the traditional focus in ecological economics on the ecological foundations of the economy and material and energy flows, feminist contributors draw attention to social reproduction.

The “model of man” used in economics has been much criticized by feminist economists (Ferber and Nelson 2003). This conception of humans fails to account for the fact that individuals are social beings who are born into families and communities, and who are
dependent on others in childhood and at the end of life. Furthermore, while outside of the home economics assumes that competitive arrangements prevail, within the home it is assumed that all behave altruistically and that there is a harmony of interests despite plenty of evidence that in many households, there is conflict over the distribution of work and resources. As a result, the disproportionate impact of certain economic policies, such as structural adjustment, on women and children is often missed, while differences in outcomes by race, gender and ethnicity are downplayed or omitted and limits to people’s ability to adjust to economic dislocation are neglected. Traditional forms of economic development are seen to have failed the world’s poor and to have failed women. Feminist economists are actively engaged in setting out alternative visions of economic development that are sustainable, equitable, democratic and inclusive (Waring 1988; Beneria 1995, 2003).

Robbins’ (1935, 16) repackaging of economics as the science of human choice – the allocation of scarce means that have alternative uses amongst competing ends – was intended to boost economics’ status as a science by ridding the discipline of normative judgments (Bromley 1990). Feminist economists have been particularly critical of the economics profession’s restriction of its domain to the science of choice (Nelson 1993). As Beneria (2003, 163) writes, “Feminist economists also have emphasized that an excessive emphasis on the study of choice has led to the neglect of the study of provisioning, human welfare, and human development.” Thus, some feminist ecological economists have proposed redefining economics as being concerned with economic provisioning, or “how societies organize themselves to sustain life and enhance its quality” (Nelson 2009, 61).

Ecological economists have also been critical of how mainstream economics takes as givens the context, institutions and historical conditions that set up choice situations (Polanyi 1944; Bromley 2006; O’Neill 2007; Ostrom 2008). For instance, industrial production and economic development often entail processes whereby the commons are enclosed, ecological

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34 The argument being that by focusing on choice, economists could avoid normative questions about what ends were being satisfied when choices were being made. Robbins’ proposal for making economics into an objective science was enthusiastically embraced by the profession in works such as Samuelson (1938), but is now characterized as a misguided strategy by philosophers of science and historians of economic thought (Mirowski 1989, 2002; Mackie 1998).
resources are exploited for private gain and the public is left with the consequences. The end result can be uneven development, with some regions surrendering their natural endowment and retaining little of the proceeds, instead being left with the legacy of a degraded environment while a distant elite benefits from the proceeds it has siphoned off (Martinez-Alier 1991, 2002; Monbiot 1994; Norgaard 1994; Rist 2003). Also, mainstream theorists have pointed to the ways private property arrangements can create incentives for owners to sustain resources over time, but have tended to neglect or downplay the ways private property can create incentives to accelerate ecological deterioration (Clark 1973, 1976; Bromley 1991) and sever linkages between people and the ecosystems that they have traditionally depended upon (Freyfogle 2003; Haddad 2003). Mainstream scholarship has also given limited attention to instances where common-pool resources have been successfully managed through collective means (O’Neill 2007; Marglin 2008; Ostrom 2008).  

Certain strands of institutional economics, and especially the work of Karl Polanyi (1944), Karl William Kapp (1950, 1970), John Kenneth Galbraith (1998, 2007) and Gunnar Myrdal (1990), have had an important influence on the development of ecological economics. Accordingly, rather than seeing markets as spontaneous natural phenomena, they are understood to be created by human actors working collectively and individually to shape institutions and rules, and act to both enable and constrain economic activity.

Ecological economists have drawn from Galbraith’s (1998) insight on how mainstream analysis retains from its classical roots a preoccupation with material insufficiency, and as a result presumes the desirability of increasing the production and consumption of private goods even as consumption levels soar. Like Galbraith, ecological economists recognize that markets excel at ensuring that private goods will be available to those who can afford them, while markets will under supply public goods such as unpolluted air (Daly and Cobb 1994, 

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51–52; Victor and Rosenbluth 2007; Beddoe et al. 2009). Furthermore, the community as an entity is absent from mainstream theorizing, so the impacts of economic policy on communities are neglected (Daly and Cobb 1994; Marglin 2008).

Mainstream economists’ very specific and definition of economic efficiency is seen to be ethically problematic (Bromley 1990; Hausman and McPherson 1996) and at odds with common usage wherein the term efficiency implies achieving a desired result with a minimum of waste. As van Staveren argues (2007, 2009), claims in the economic literature that markets lead to an efficient use of resources (e.g., Hayek 1945) involve conflating the everyday understanding of efficiency with the economist’s specific evaluative criterion of economic efficiency. Waste is not necessarily minimized since rather than evaluating efficiency in resource space, it is evaluated either in utility space or by using monetary measures generated using incomes and prices. Given that redistribution is ruled out when pursuing Pareto optimality since it would make at least one person worse off, resources that might generate great utility for the poor, if only they could afford to pay for them, can be considered efficiently used when they are squandered by the rich, who pay the going price and put the goods to their “most valued” use (Van Staveren 2007, 2009).

When one considers that modern industrial market economies are characterized by profligate resource consumption, disappointing results in terms of the levels of human wellbeing achieved and widespread ecological degradation, it is unsurprising that ecological economists sometimes characterize modern market economies as being remarkably inefficient in their

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36 For economists, an allocation is economically efficient if no person can be made better off without making another person worse off; this type of allocation is termed Pareto efficiency or Pareto optimality. However, in many instances where the term economic efficiency is used, such as cost benefit analysis, a weaker form of efficiency is implied (a potential Pareto improvement or Kaldor-Hicks efficiency) wherein an outcome is efficient if the winners can compensate the losers, whether or not they do.

37 The relevant analysis takes place in utility space since it is based on utilitarian views of the social good, in a framework of methodological individualism wherein individuals assumed to have homo economicus characteristics are maximizing their subjective utility by optimizing consumption so as to best satisfy their preferences. Note that total utility across the population is not being optimized, since opportunities to redistribute resources from the rich with their low marginal utilities to the poor with their high marginal utilities are being foregone.

38 Given that interpersonal comparisons of utility are not admitted and that utility is unmeasurable, social welfare or cost-benefit analysis relies upon monetary measurements generated by the existing distribution of income.
resource use (Schumacher 1993; Wackernagel and Rees 1996; Daly 1998; White 2007; Green 2009). While mainstream economists proceed on the basis that achieving economic efficiency is inherently desirable (Bromley 1990), ecological economists put more emphasis on improving the biophysical efficiency with which resources are used to support human wellbeing and on maximizing the service rendered to throughput ratio (Boulding 1966; Daly 1992a, 36–39).

3.2.1 Criticisms of ecological economics

For the most part, the ecological economics literature is ignored by mainstream economists since it is not considered to be of interest (Daly 1992a, xi). So while there is an implicit rejection of the theory, beyond critiques that focus on countering the limits to growth thesis there is limited published criticism from this direction. Philosopher Mark Sagoff has taken ecological economists to task for believing that the monetary values they assign to ecosystem services are meaningful and relevant (Sagoff 2011). Indeed, as noted above, the effort to value ecosystem services is controversial within the discipline.

While ecological economics involves a critique of mainstream economics, Gammon (2010) argues that much of the analysis undertaken relies upon naïve borrowings of neoclassical technique that fail to consider the ontological premises involved. Ecological economics has also been criticized by scholars who draw on Marxist theory for failing to give much weight to the issue of power (Gale 1998; M’Gonigle 1999) and for being overly optimistic about the prospects for a capitalist economy under the constraints that ecological economists promote in order to achieve steady state conditions (Smith 2010). Feminist economists have expressed disappointment that, despite a convergence of interests, feminist insights have yet to have much influence on theorizing (McMahon 1997; Perkins et al. 2005). Ecological economic theorizing has also been faulted for paying insufficient attention to institutions (Paavola and Adger 2005). As ecological economics is very much a work in progress and tends towards methodological pluralism there are of course many internal debates and theory is in flux, so by no means does this brief summary exhaust the critique.
3.2.2 Implications to draw from ecological economics

I proceed in this dissertation on the basis that ecological economics provides a useful though not infallible toolbox for scrutinizing how environment-economy linkages and sustainability are addressed in PoE. It directs attention to matters of scale, of throughput and, more broadly, to the fact that economic processes take place within the biosphere and that there are feedbacks between the economy and the environment. Because ecological economics calls into question the plausibility of unlimited growth, it brings back to the fore the issue of distribution and draws attention to the extent to which the resources that are being consumed are supporting human wellbeing. It also points to the necessity of finding ways of promoting economic stability that do not make ever-greater demands on the biosphere.

3.3 Academic departments and disciplines

To ensure a productive study of PoE, it is useful to step back and better understand relevant insights from scholars who have investigated university departments and academic disciplines more generally. In his review of the literature on sociological studies of academic departments, Hearn (2007) characterizes departments as a milieu that affects student attitudes, values, knowledge and career outcomes—in brief, they are where much of the socialization into an academic profession takes place. The department is where students typically learn to internalize the discipline’s research norms and come to recognize priority areas for future research.

Disciplines have been described by Becher and Trowler (2001) using the metaphor of tribes and territories, with adherents to a discipline displaying appropriate idols in their offices (e.g., foundational texts, portraits of influential scholars), using specific languages, adhering to sanctioned techniques, respecting the established pecking order and following certain traditions and practices to ensure the continuity of the profession. A small number of intellectual leaders have disproportionate power and influence and act as gatekeepers to jobs, resources and opportunities such that there is a tendency for current practices and research priorities to be perpetuated. Participants in a discipline wish to recoup the investment they have made in their training; understandably then, most emerging scholars (save for a few at
the most elite levels) are unlikely to show much enthusiasm for embarking on research that might undermine that very investment. Furthermore, while controversial work has a low probability of resulting in a dramatic breakthrough that leads to a big career payoff, it has a high probability of damaging one’s professional reputation and depleting one’s social capital. Much safer is to work on problems that are recognized as legitimate by one’s peers and that do not threaten to perturb the theoretical core. The net result of these incentives and controls is that academic disciplines often reinforce “safe mediocrity at the expense of wayward brilliance” (Becher and Trowler 2001, 148), and most academics avoid engaging with colleagues whose views diverge sharply from the profession’s norm.

3.3.1 Criticisms of the literature

Given recent trends in higher education and the evolving nature of knowledge production, the tribes and territories metaphor has been criticized, since it suggests an overly static picture of academic practise and that academics maintain narrow disciplinary identities. For instance, based on interviewing senior academics about their disciplinary affiliations, Brew argues “that more fluid models of disciplinarity are needed… [to] take account of the shifting and changing patterns of association as new disciplinary area come into being, grow and merge with others” (Brew 2008, 436). 39

3.3.2 Implications of the literature

The implications for the current research project set out here involve a synthesis of the above contributions by Becher, Trowler and Hearn contextualized by key findings from the sociology of the economics discipline literature reviewed in Section 2.3.1. This body of theory lends support to my decision to focus on a particular discipline, mainstream economics, and to seek to inquire into how its practitioners confront external pressures to address sustainability in their teaching given that disciplines have tended to see their territories and practices as protected from external scrutiny or top-down interventions from

39 Nevertheless, when it came to participants with expertise in economics, Brew's research disciplinary identity remained relatively strong. Thus, despite its limitations, for the present research project the tribes and territories metaphor retains usefulness as a means of conceptualizing disciplinary identity amongst mainstream economists.
university administration. The economics discipline presents an interesting case that suggests the tribes and territories metaphor remains a relevant frame for research given evidence that heterodox views have been deliberately muted (Lee 2009; Mata 2009), that the training of economists reflects limited concern with reality (Colander 2005b, 181), that straying from core disciplinary commitments has been shown to be costly (Mackie 1998, 112) and that many economists have a shared belief that their research is objective (Gross 2011).

3.4 Sociology of higher education and related literatures

To better understand the context within which PoE is situated and performed, as well as how it evolves or resists evolution, I have examined literature on the intersection between disciplines and post secondary curriculum. To identify analytical tools, I examined the theoretical framework of studies that shared commonalities with the present study. This review suggested that Basil Bernstein’s pedagogic device, Pierre Bourdieu’s theory of cultural production, Margaret Archer’s Critical Realism and Bruno Latour’s Actor-Network Theory (ANT) should be canvassed in developing my own theoretical framework.

3.4.1 Basil Bernstein and the pedagogic device

British sociologist of education Basil Bernstein was motivated by an interest in how educational endeavours, especially at the public school level, shaped social relations, influenced curriculum and produced or perpetuated social inequality. Bernstein was concerned that knowledge was being taken for granted in education research, as if the content being taught was unaffected by power relations, and in turn as if knowledge did not structure fields (Maton 2010). His pedagogic device is intended to elucidate “the ensemble of rules or procedures via which knowledge is converted into classroom talk, curricula and online communication” (Singh 2002, 571).

40 The theoretical perspectives these authors put forward have some commonalities, but also important differences; each has been the subject of much scholarly debate. I have drawn selectively from what are very large bodies of literature, focusing on those aspects most relevant to higher education. I make no claim of reconciling, nor do I make any pretence of being sufficiently well versed in these literatures or disciplines to weigh in on or to adjudicate in the theoretical disputes (and do not see this dissertation as focused on contributing to or elaborating on those literatures, but rather as engaged in examining the work of these scholars to erect scaffolding that I can use in the current project).
Key for the present research project, Bernstein differentiated between three fields of action that are inextricably linked to education: i) a field of production where scholars construct new knowledge; ii) a field of recontextualization where knowledge is appropriated from the field of production and translated into curriculum and pedagogic discourse; and iii) a field of reproduction where curriculum intersects with pedagogy in the classroom (Bernstein 2000, 113). As knowledge has grown exponentially and as it is encoded with increasing complexity, the challenge of recontextualizing and reproducing it has mounted (Singh 2002). Thus, there are even more difficult choices to be made over what knowledge gets privileged, recontextualized into the curriculum and then transmitted to students through pedagogy and assessment. In Bernstein’s view, each of these three fields has its own set of rules that guide the knowledge that gets produced, what output gets repackaged as knowledge, what gets inserted into the curriculum and what gets taught and how.

Bernstein differentiates between “instructional discourse” and “regulative discourse” and contends that the regulative discourse is dominant. The regulative discourse involves the rules of the social order in which instructional discourse is embedded and by which it is dominated — “a particular moral, social and political order of meaning” (Shay 2011, 317). The instructional discourse attends to specific skills, knowledge and their interrelationships. The regulative discourse exists at several levels, such as the department, the university and external to the university (Bernstein 2000).

Bernstein distinguishes between ‘singulars’ and ‘regions.’ The former includes economics and is described as “narcissistic, oriented to [its] own development, protected by strong boundaries and hierarchies,” while regions, such as medicine and architecture, operate both as disciplines and as fields of external practice; they are an interface between disciplines and the technologies they enable (Bernstein 2000, 52). Bernstein also differentiates between horizontal and hierarchical knowledge structures. The latter, like physics, is systematically organized, while the former, which includes the humanities, involves diverse specialized knowledge. In this classification, mainstream economics is a hierarchical knowledge structure that seeks to build a coherent body of theory upon a limited number of foundational
propositions. Bernstein complicates this picture by adding in the dimension of whether
disciplines are oriented towards/controlled within the academy, or whether they are
externally oriented and influenced by “instrumentalities of the market” (Bernstein 2000, 55).

Although Bernstein’s research is mainly oriented towards the public school system, it has
helped inform research at the university level (e.g., Maton 2010; Shay 2011). His analysis
helps explore what constraints on curriculum are necessitated by the knowledge that is being
reproduced (e.g., in the present case, economic knowledge) and draws attention to the
external factors and social relations within the field that shape curriculum (Luckett 2009).
According to Shay, Bernstein’s framework helps elucidate the underlying structures that
pertain to curriculum and shape what is considered valid by identifying “the principles which
regulate why in any given curriculum certain forms of knowledge become privileged over
other forms” (Shay 2011, 316).

For scholars working in the Bernsteinian tradition, knowledge is not a neutral relay, but
rather is better understood as both having sociological and epistemological attributes (Maton
2010). While knowledge structures are implicit to those working within the field of
production, they are only made explicit when they are recontextualized. Those engaged in
recontextualizing—such as textbook authors—may have little current engagement with
knowledge production for much of the domain they cover. Bernstein explains that a
“discursive gap” opens up when knowledge is relocated from the field of production to that
of reproduction, as it is translation that takes place, not a faithful reproduction. As Luckett,
who draws on Bernstein to look at the relationship between knowledge structure and
curriculum in a South African university explains,

> According to Bernstein, this ‘discursive gap’ provides a space for ideology to
> play that is usually filled by the curriculum developer’s ideas around the
> purpose of education, the ideal moral and social order, staged notions of an
> ideal learner or graduate, and notions of how learning occurs. These
> historically and culturally arbitrary ideas, termed by Bernstein the
> ‘recontextualising rules’, shape how knowledge discourses reappear in the
> curriculum and how pedagogic subjects (students) are constituted. This is
done by the selection of content, its sequencing, pacing and the
> establishment of evaluative criteria for judging the production of legitimate
texts by pedagogic subjects (Luckett 2009, 443).
Bernstein's theories have been used to analyze the factors that influence the formulation and evolution of curriculum and how this curriculum then influences what knowledge and student outcomes are privileged (e.g., Shay 2011).

3.4.1.1 Criticisms of Bernstein

Clegg (2011) faults Bernstein for failing to consider scholarship on the sociological and epistemological limitations of traditional disciplines, which has been brought to the fore by feminists and other critical scholars who have been excluded from established academic disciplines. Bernstein is also criticized by Archer (1995a) for neglecting the structure of the educational system, for assuming that changes in the structure of society are transmitted without remainder into educational contexts, and for seeing power relations in terms of class relations, charges Bernstein (1995, 405–407) rejects as being largely due to Archer misreading his work.

3.4.1.2 Implications to draw from Bernstein

According to Clegg (2011, 101), “the work of Bernstein is helpful for understanding how … discipline relates to curriculum and pedagogy.” Bernstein’s analytical framework points to arenas of struggle where various social groups and interests seek to influence what knowledge is constructed or produced and what knowledge is reproduced. It also offers approaches to analyzing the pedagogic discourses of a discipline and the degree to which curriculum for a given discipline is likely to be determined on local versus global levels. As a discipline which, in Bernsteinian terms, seeks a ‘strong grammar’ and has a hierarchical knowledge structure, economics tends to be globally rather than locally determined. This suggests that PoE lecturers might feel that they have little choice over what to teach, since there is broad consensus on what a PoE course should cover to ensure the proper preparation for higher level courses, and little scope for reinterpreting theory.
3.4.2 Pierre Bourdieu

Bourdieu’s work on academia gained prominence with the publication of *Homo Academicus* (1988), an exhaustive study of French academia and its role in the May 1968 crisis (Bourdieu and Wacquant 1992, 89). Bourdieu was concerned that academics, though they present themselves as critics of the existing order, in effect support the dominant classes because they both theorize within the framework of the system they claim to critique and perpetuate its assumptions (Gattone 2006, 105). Thus, for Bourdieu, since intellectuals act within a structure and have internalized its rules, they have limited leeway to chart their own path. Furthermore, Bourdieu contends that much of what is taught in academia is arbitrary and imposes the understandings and perspectives of dominant interests on the rest of society (Gewirtz and Cribb 2009, 46).

Understanding and harnessing Bourdieu’s theory requires familiarity with his definitions of the concepts of field, illusio, doxa, habitus, and capital. A field is a space of play for individuals and/or institutions engaged in competing for the same resources; field boundaries are not fixed, but are defined by an ongoing struggle amongst participants (Bourdieu and Wacquant 1992, 18). For Bourdieu, power, social struggles and competition over status are integral to social life. Academics are engaged in a permanent struggle, a game played for capital and prestige, such that each field has its own “illusio,” “players are taken in by the game… players agree, by the mere fact of playing… that the game is worth playing…. and this collusion is the very basis of their competition” (Bourdieu and Wacquant 1992, 98).

Membership in a field requires investment in and adherence to the illusio. Furthermore, while there will be disputes over theory and methodology within a field, participants share in the doxa, a realm of unrecognized, uncontested and undisputed agreement that is “outside the realm of critique” (Bourdieu and Wacquant 1992, 247).

Capital takes several forms: economic, social, cultural and symbolic, though within the context of the academy Bourdieu also refers to academic and intellectual capital (Bourdieu and Wacquant 1992, 76, 119). The value of each capital varies within a field, with the members of a field determining relative values (Bourdieu 1986; Bourdieu and Wacquant 1992, 98). Within academia, agents are considered relatively disinterested in economic
capital and more focused on accumulating symbolic capital, such as reputation as a scholar and scientific competence; stakes within a field are often of little value to individuals in other fields. Avoiding the ruling class categorization, Bourdieu uses instead “field of power” to reflect the space or site of struggle substantiated by the balance of forces between different forms of power and capital (Bourdieu 1998, 388).

Bourdieu suggests that there are two main strategies for advancing an academic career: acquiring more of the stock of existing capital that is valued by members of one’s field, or seeking to change the relative value of capital such that one’s stock of capital appreciates relative to that of other players (Bourdieu 1998; Bieber 1999). Those who have accumulated stocks of capital within a field have greater influence over the rules of the game and the valuation of capital; this helps explain how structures persist in university settings (Kloot 2009). Academics thus tend to pursue scholarship that maintains the existing valuation of capital. Those who have yet to accrue much capital, such as the newly-minted scholar, may attempt more risky or revolutionary scholarship. However, success on the revolutionary path is far from guaranteed, and in the interim such scholarship can detract from career advancement if it does not result in recognized theoretical contributions that gain adherents amongst other members of the field. The path of least resistance is to work diligently to accumulate the capital that is currently valued (Huber 1990; Bourdieu and Wacquant 1992, 99). Fourcade sees Bourdieu’s work as pointing to hierarchies within intellectual fields that reflect competition amongst the field’s members; the internal struggles within a field mirror struggles in the field of power or in society writ large (Fourcade 2009, 24).

Applying this framework to economics, most mainstream economists would be expected to add to their stocks of capital by working within accepted boundaries of economic theorizing (e.g., subscribing to methodological individualism). On the same note, heterodox economists would be expected to try to undermine the capital of mainstream theory by questioning the choice of methodology, its starting assumptions and the plausibility of its findings. A small number of mainstream economists would be willing to take the risk of challenging a limited number of established methods and assumptions while maintaining allegiance to the overall
mainstream project in the hope of scoring large gains in symbolic capital; the work of Nobel laureates Stiglitz and Akerlof on imperfect information comes to mind.

It is next important to consider Bourdieu’s *habitus*, a concept whose definition is somewhat elusive. Bourdieu introduced habitus in large part as an attempt to reconcile structure with agency in explaining social reproduction. Habitus is distinct from, but related to, habit. As Bourdieu explains,

> ...with the notion of habitus you can refer to something that is close to what is suggested by the idea of habit, while differing from it in one important respect. The habitus, as the word implies, is that which one has acquired, but which has become durably incorporated in the body in the form of permanent dispositions. So the term constantly reminds us that it refers to something historical, linked to individual history, and that it belongs to a genetic mode of thought, as opposed to essentialist modes of thought.... Moreover, by habitus the Scholastics also meant something like a property, a capital. And, indeed, the habitus is a capital, but one which, because it is embodied, appears innate. (Bourdieu, 1993, p. 86)

Habitus can be understood as an individual’s dispositions that tend to persist over time, and that were formed by the individual’s encounter with structural conditions, as well as through life experience and schooling. In other words, our tastes, dispositions and identity are embedded, and to a considerable degree are not open to self-reflection. Being durable, these dispositions influence an agent’s practices and behaviours for some time, even if the original material setting that created these dispositions no longer avails. Habitus provides part of the explanation for the regularity and predictability of social life (Bourdieu and Wacquant 1992, 18). As interpreted by Gemme, habitus connects the social structure to the circumstances faced by the agent, “…and generates practice. We see the world through our habitus, which acts as a classifying lens for our observations, and as an organizing principle for our actions” (Gemme 2009, 24). Likewise, Ignatow sees Bourdieu’s habitus as a holistic theoretical device that addresses two levels of analysis. The first, the micro level, includes an actor’s bodily (e.g., posture, demeanour) and cognitive habits. The second, the meso level, includes the other actors and institutions with which the actor interacts (Ignatow 2009, 103).
This succinct synthesis from Bourdieu draws the concepts of field and habitus together to show how they interact:

A field consists of a set of objective, historical relations between positions anchored in certain forms of power (or capital), while habitus consists of a set of historical relations ‘deposited’ within individual bodies in the form of mental and corporeal schemata of perception, appreciation, and action (Bourdieu and Wacquant 1992, 16).

3.4.2.1 Criticisms of Bourdieu

Bourdieu’s attempt to resolve the issue of structure and agency through the use of habitus is strongly rejected as a theoretical device by Archer because in her assessment it conflates structure with agency and it limits possibilities for reflexive deliberation and agency (2003, 2010a). Accordingly, she resists the notion that social position determines an individual’s behaviour. Furthermore, Bourdieu's habitus implies agents are engaged in only partly conscious, largely automatic actions, and thus gives little guidance for understanding how agents will react to novel circumstances. Yet, while Bourdieu gives little scope for agency, he should not be read as implying that agents have no choice but to reproduce the structure of the fields they participate in; he allows for an agent to have practical sense, spontaneous reactions and to engage in strategic calculation (Kloot 2009).

The extent to which habitus is a useful concept in contexts of rapid social and economic change has been the subject of vigorous debate. For instance, Sweetman would limit habitus to relatively stable contexts, commenting:

To the extent that Bourdieu’s ‘non-reflexive’ habitus depends upon relatively stable conditions and on ‘lasting experience of social position,’ his analysis may thus be said to apply more to simple- or organized- modernity, where the comparative stability of people’s social identities allowed for a sustained, coherent, and relatively secure relationship between habitus and field (Sweetman 2003, 541).

Sweetman suggests that given the constantly shifting social positions characteristic of late modernity, there is a disjuncture between habitus and field that may be resulting in people developing a reflexive habitus.
In stable socio-cultural contexts, the differences between Bourdieu and Archer are less significant, as an unchanging context allows large parts of life to become routine. In this case, initiation and imitation serve to perpetuate the system and preserve contextual continuity (Archer 2010a, 281). In contemporary conditions, where social and economic conditions change rapidly, habitus may be largely irrelevant (Archer 2010a, 289). Furthermore, Bourdieu’s habitus suggests that individuals socialized in similar ways should act very similarly, yet people of the same social background can display diverse approaches to life.

Actor-Network Theory scholars are also unconvinced by Bourdieu and the concept of habitus, largely because, as will be discussed in more detail below, they do not see individuals as having stable dispositions and interests, nor do they recognize a stable social structure (Barnes 2001).

3.4.2.2 Implications to draw from Bourdieu

Despite the criticisms noted above, Bourdieu’s work still has currency in the higher education literature. For instance, Kloot (2009) uses Bourdieu to analyze institutional change at a South African university. Bourdieu’s framework has some interesting implications for understanding the processes by which PoE curriculum has been developed and by which it might evolve. Given PoE lecturers’ interest in accumulating the symbolic capital of their field (especially prominent among those who are seeking to secure tenure), few are likely to disturb the intellectual capital in which they invested years of training. Bourdieu’s notion of habitus also suggests that PoE lecturers are likely to have internalized the rules of the game in the field of economics to the extent that they are unlikely to be critical of the starting assumptions, methodologies and outputs of mainstream economic theory, especially as it is recontextualized in the lecture hall in its principles variant.

3.4.3 Margaret Archer’s critical realism

Margaret Archer has devoted her academic career to seeking to add clarity to theorizing about society, culture, structure, individual agents and the interaction of these elements.
Archer dispels the problem of cultural integration, the idea that culture is an integrated whole, rather than being made up of diverse strands that coexist with varying degrees of cohesion and conflict. A pivotal concern in her theorizing is addressing the problem of structure and agency and the interplay between the two. For Archer, structure relates to material interests while culture includes beliefs, values, norms and ideas. Structure and culture are parallel domains, with socio-cultural interaction leading to the evolution of both. Archer describes her realist social theory, the morphogenetic approach, which has a stratified ontology of structures, cultures and agents and an emphasis on emergent properties as:

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\text{a tool kit for developing the analytical histories of emergence of particular social formations, institutional structures, and organizational forms. In other words, the morphogenetic approach is both an explanatory program... but also a means of accounting for the trajectories and dynamics of social formations. (Archer 2010b, 274)}
\]

In Archer’s usage, the cultural system contains all of the ideas available to be known. Ideas within the cultural system have logical relationships to each other, independent of how they are mobilized by individuals in socio-cultural interactions. Thus, many ideas in the cultural system may be unknown by much of the population, and only a subset of these ideas would be endorsed by any one individual or group of individuals.

In Archer’s framework there are four possible relationships between the ideas in the cultural system: necessary contradiction, contingent contradiction, necessary complementarity and contingent complementarity. Two of these are relevant here. In necessary contradiction, retrieving an idea from the cultural system brings with it a contradictory idea to which it is logically linked. Trosper (2005) gives the term “sustained yield,” a term from natural resource management, as an example of a necessary contradiction; “yield” emphasizes output, but “sustained” emphasizes duration over time. While the use of the concept of sustained yield initially served the forest industry’s interests by providing a rationale for maximizing fiber output, eventually opponents of the status quo redefined and leveraged the idea of sustainability – to which yield had been married – to force changes towards more ecologically-oriented forest management.
A necessary complementarity involves two linked ideas that are complements. Referring back to another example from Trosper, because neoclassical economics is built upon and thus linked to utilitarianism, the two ideas are a necessary complementarity (Trosper 2005). This implies that those who find utilitarianism an unsatisfactory philosophy may well, should the linkage between ideas become clear, reject neoclassical economics, since it is impossible to have neoclassical economics without utilitarianism.

Elder-Vass provides a succinct explanation of the key processes involved in explaining cultural reproduction or elaboration in Archer’s realist social theory:

*In the first phase of this cycle, the agent is conditioned by the prevailing objective culture; in the second, the agent acts, or rather interacts with others; and in the third the actions of the agent contribute to the reproduction and/or elaboration of the culture, thus providing the input to phase one of subsequent cycles. In the objective moment of the cycle, individuals are influenced by the existing cultural context, the cultural system; in the subjective moment, as knowing subjects they choose to act, producing socio-cultural interaction that is influenced by the cultural system, but which in turn reproduces or transforms that system, providing as it does input into the future understandings of the cultural system by other individuals. (Archer and Elder-Vass 2012, 98)*

Ideas from the cultural system need to be activated by a group before they can influence social outcomes. A material interest group (for this example, referred to as a dominant group), canvasses the available ideas in the cultural system, selects ideas congruent with its interests and then mobilizes them in support of its goals. In so doing, a broader public becomes aware of the set of ideas that the dominant group has put in play. But whenever an idea is retrieved from the cultural system and activated, the group mobilizing it becomes entangled in the other ideas with which the initial idea has logical relationships. In some circumstances, this offers opportunities rather than challenges such as if in a given society’s pre-existing ideational environment, the linked ideas turn out to be compatible. However, in other cases, the ideas mobilized by the dominant group introduce logical contradictions that may undermine the group’s interests (Archer and Elder-Vass 2012, 103). If there is an oppositional group, it will examine the ideas mobilized by the dominant group as well as those available in the cultural system that are in logical relation to them, selecting those ideas that can be assembled into “cultural weapons” to use in the cultural struggle (Archer 1996,
To avoid the complications that might be introduced by other groups drawing from ideas that stand in logical contradiction to the ideas mobilized by the dominant group, the dominant group may resort to censorship, manipulation or the implementation of a containment strategy to reduce the likelihood that other groups will identify such ideas and be able to use them to influence the social order. Thus, the dominant groups in society seek to maintain causal consensus and cultural uniformity by imposing the ideas that have their assent on the group at large via mystification, legitimation, persuasion and argument, while also seeking to contain or censor opposing ideas (Archer 1995b, 179).

Archer stresses that within a group there will be divergences in how ideas are held. While there will be a sharing of ideas, this does not mean all members of the group are true believers, as some will be calculative, others hoodwinked and still others may be disillusioned. Those who are disillusioned may examine the ideas currently in use by the group for contradictions, and return to the cultural system library in search of other ideas to support their interests (Archer and Elder-Vass 2012, 110).

Archer points out that structure acts on those who have participated in its elaboration in ways that they never intended. “Thus, cultural elaboration is the future which is forged in the present, hammered out of past inheritance by current innovation” (Archer 1988, xxiv). While structures have the effect of narrowing possibilities for agency, they do not foreclose them, as they condition rather than determine social interaction (Archer 2010b, 276). Structures emerge and evolve over time; they are not self-sustaining, but rather require agential doings to endure. When conditions are stable and the fund of ideas is limited, habits can more easily predominate; when the context is in flux and the fund of ideas expands, reflexivity can come to the fore. In Archer’s view, individuals and groups have the agency to act, either to maintain the socio-cultural system or to promote its evolution.

For Archer, the doings of agents are the result of varying degrees of habitual action and reflexive deliberation over the appropriate response to external influences and the projects of other agents or groups. Reflexive deliberation is carried out through the agent's internal conversation, a conversation that is influenced by social context. Yet Archer recognizes that
the scope of individual action is partially circumscribed, since the internal conversation can be colonized by the social such that, in many circumstances, society has de facto causal powers in an agent’s actions (Archer 2000, 117).

3.4.3.1 Criticisms of Archer

While Archer’s theoretical framework offers intriguing possibilities, her work has been subject to criticism (e.g., Kivinen and Piironen 2006; Elder-Vass 2007; Sayer 2009; King 2010; Archer and Elder-Vass 2012), in part due to her tendency to substitute rather than to build upon previous scholarship. It also appears that, perhaps influenced by her life as an academic constantly immersed in the world of ideas, she may place too much store in the relative importance in the contest of ideas in influencing social outcomes and fail to adequately account for the complexity of power (Luckett 2008). She may also pay insufficient attention to the influence of changes on the natural environment on human societies (Carolan 2005).

3.4.3.2 Implications to draw from Archer

One challenge of drawing upon Archer’s morphogenetic approach is that there has been limited scholarship in the field of higher education that applies her method (Quinn 2006, 19). Nonetheless, there are several insights to be drawn from Archer’s work that are relevant to the present project. Agents are influenced by a cultural and structural inheritance that pre-existed them, and they in turn play a part in recreating culture and structure, though in a manner that allows for evolution. Thus, social structures influence social interactions, while individuals and collectives reproduce or contribute to the elaboration of the structure. In an economics context, economic lecturers are partly shaped by the departmental milieu where they received their training. These same individuals then play a part in perpetuating or elaborating the economics curriculum.

Since the ideas mainstream economics fetches from the cultural system stand in logical relation to other ideas, Archer's framework suggests that attention should be paid to which ideas mobilized in mainstream economics are in complementary or contradictory
relationships to ideas mobilized in sustainability discourses. In terms of understanding how sustainability commitments may influence PoE curriculum, textbook authors and PoE lecturers are facing the prospect of increased pressure to engage with an idea – sustainability – that is in a necessary contradiction with some of the ideas in mainstream economics. Also, ideas linked to those used in PoE that are in logical contradiction, but have not had attention drawn to them, may be foregrounded and mobilized by oppositional groups to call into question mainstream theory.

### 3.4.4 Latour’s Actor-Network Theory

It has also been argued that Bruno Latour’s^41^ Actor-Network Theory (ANT), which was developed to help explain the process of knowledge creation in the sciences, offers important insights into educational processes, the subjects of education and educational outcomes (Fenwick 2010; Fenwick and Edwards 2011; Fenwick et al. 2011). A key contribution of ANT is bringing to the fore the role of non-human entities—such as textbooks—in social relations and in explaining the production and use of knowledge. ANT defies succinct explanation (see Latour 2005 for a comprehensive account) and there are divergences in how ANT is applied and conceptualized by key participants (see debates in Law and Hassard 1999), so after a high-level sketch of key elements, I focus on drawing out insights from ANT that are relevant to the scrutiny of curriculum in higher education and that offer tools for the interpretation and analysis of my results.

ANT was initiated with the intent of understanding the history and dynamics of generating scientific knowledge, but its scope has since been expanded by its proponents, who believe its explanations for many social phenomena are more satisfactory than those of existing theories (Latour 2003). A central concept in ANT is the actor-network (Latour 2005, 128–133), a heterogeneous assemblage of dissimilar elements, both social and material, that are assembled so as to form what appears to be a coherent whole. The principle of radical symmetry requires ANT analysts to pay symmetrical attention to human and non-human entities. Both are considered to have agency, though the latter do not have intentionality; as a

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^41^ Co-developed with Michel Callon and John Law.
label for entities, the term “actant” is preferred, since it includes both people and things (Latour 1987, 83).

ANT theorists do not attend to categories such as micro and macro, agency and structure or local and global. ANT does not generally seek to explain why networks come to be, but rather focuses on understanding the linkages within networks and how the network as a whole achieves or fails to achieve certain outcomes. As Page (2010, 13) explains, the emphasis in ANT “…is on finding, exploring and examining how associations are established between entities and how the emerging network acts as a collective entity to produce new worlds.” Actor-networks are themselves actors; they are performative, since once assembled they have influence upon the world (Callon 1991, 153). For ANT theorists, social relations must be continually performed; social structures and the exercise of power cannot persist over time without the active and ongoing participation of individuals (Latour 2005, 63). Furthermore, the social cannot be separated from the technical, since social life cannot exist without “…non-humans, and especially machines and artifacts. Without them we would live like baboons” (Callon and Latour 1992, 359).

The ‘sociology of translation’ provides ANT theorists with new approaches to understanding power. ANT refers to translation as the process whereby one entity acts upon another to draw it into a network (Callon 1986). Once entities are enrolled in a network, they can be mobilized by parties that advocate on behalf of the network to achieve given goals. Thus, the PoE textbook can be mobilized in the classroom by the lecturer to respond to a student’s question, or by a journalist to explain an economic phenomenon in an article.

ANT scholars have a unique perspective on power; according to them, there is no stock or reservoir of power to draw on (Latour 2005, 64). Rather than being instantiated in economic structures, in social institutions or in beliefs, power is the ability to achieve a desired outcome by drawing on a network. However, networks are not in the control of any one human agent or group; since complex enactments take place in an actor-network, control is contested and may shift over time (Latour 2005, 44).
Fenwick and Edwards (2011) argue that ANT offers a tool for exploring the durability and power of networks in education. ANT provides a novel means of understanding how power is negotiated between the human and non-human actants that have been mobilized in higher education. It also directs attention to which actants are included and which are excluded in a network when actants are enlisted, as well as to when actants will resist efforts by other actants to enrol them in an actor-network.

3.4.4.1 Criticisms of Actor-Network Theory

Given the extent to which ANT challenges existing social theory, it is hardly surprising that it has attracted considerable criticism. One of the challenges of applying ANT is deciding what actants to include or how far to extend the connections when delineating the actor-network (Bloomfield and Vurdubakis 1999). It is characterized as failing to recognize mechanisms or phenomena that exist independent of scientific inquiry (Elder-Vass 2008).

While Latour and other theorists present ANT as a vehicle for transcending the micro-macro divide, critics have suggested that ANT focuses on the micro level and that in this body of thought, the macro is neither explained by the micro nor linked back to it (Gille 2010, 1052). The perspective in ANT that power emerges anew, rather than persisting, is critiqued for failing to “…recognize that once macro dynamics or macro actors emerge from micro level ones, they can become relatively autonomous from their micro foundations and temporally enduring” (Gille 2010, 1053). ANT is criticized for paying little attention to the institutionalized, macro-level social processes and structures, such as capitalism, that shape the micro and local and can causally affect the actions of individuals (McLean and Hassard 2004). In part because ANT rejects concepts like capitalism and modes of production as abstractions, practitioners have been criticized for their apparent aversion to engaging in normative judgments and for legitimizing hegemonic power relations (Fine 2003; Whittle and Spicer 2008, 622–623).

Based in part on Callon’s claim that it is necessary “to abandon the critical position, and to stop denouncing economists” (quoted in Barry and Slater 2002, 301), advocates of ANT are
criticized for naively entering into an alliance with mainstream economists (Mirowski and Nik-Khan 2007). It has also been faulted for an uncritical acceptance of the ideology of markets that is overly abstracted and fails to acknowledge that markets involve deep entanglements (Miller 2002). However, it may be that scholars who draw on ANT have recently shifted to more agnostic perspectives on economics and the market (Blok 2011, 455).

3.4.4.2 Implications to draw from Actor-Network Theory

While this study does not apply ANT methodologies, it draws on this scholarship in terms of recognizing that research can be improved by paying attention to the role of non-human entities and the causal powers they have to affect outcomes. For example, an introductory economics textbook involves one or several authors drawing selectively upon the theoretical contributions of many scholars, discarding those of others and then rewriting the text in response to commentary from peers, feedback from economics lecturers who test it on their students and from marketing professionals and textbook representatives who give their reading of what will sell in the market. The resulting inscription is frozen in a form that conceals—in ANT terms that “black boxes”—the network engaged in its production. Disputes between scholars, diverging interpretations and the evolution of thought over time are for the most part unavailable to the reader. Once published, the textbook itself becomes an actor in a network that is mobilized in the process of educating students; the textbook travels easily and it is immutable, in that it’s content does not change with the end-user’s location (for a thoroughly documented example from economic geography, see Barnes 2002).

ANT also suggests that it would be fruitful to explore the extent to which students react to the ideological content of PoE courses by embracing or resisting being enlisted as actants who will help format and perform the economy in a manner influenced by the tenets of mainstream theory. For instance, does PoE prepare students to accept pollution because it teaches about an optimal level of pollution? ANT suggests that paying attention to PoE textbooks may offer significant returns on understanding how courses are currently performed, what students learn and the opportunities and impediments for curriculum change.
in response to university sustainability commitments. In ANT terms, reading PoE textbooks and taking PoE courses are seen as ‘obligatory passage points’ for much of a university’s student body. ANT also suggests that in understanding PoE curriculum, there is no one seat of power or influence, no leader, no monopoly of power calling the shots from a defined centre. Instead, PoE is brought into being by a broad network that has mobilized a diverse set of actants, all of which have greatly differing influences on what students are taught and differing interests in reprioritizing the content of the curriculum.

3.4.5 Integration of insights

I now consider how the above readings of these literatures, which focus on their implications to higher education, can be synthesized to contribute to a theoretical framework that supports the current research project. Again, what follows is not an attempt to reconcile these different theories, since, for instance, Bourdieu’s habitus is rejected both by Archer and ANT scholars. At the outset, I acknowledge that my reading is provisional. While it would no doubt benefit from further refinement and elaboration, I argue that whatever the limitations of my interpretations—always a challenge for the interdisciplinary scholar—there are some lessons and tools that can be put to use.

Bernstein’s framework is a reminder to pay attention to how knowledge is recontextualized into curriculum, including textbooks, before being reproduced in the lecture hall. Recontextualization is a moment when ideology can be particularly influential in what gets synthesized into curriculum, into textbooks, and set out as desired learning outcomes. Bourdieu’s framework also explains that academics may avoid perturbing curriculum and the knowledge it replicates partly as a rational way of maintaining the value of the capital in which they are vested, and partly as a result of their habitus, their ingrained dispositions which reduce their tendency to question the curriculum they have inherited.

Archer’s framework suggests that ideas that are mobilized in introductory economics curriculum inadvertently drag along other ideas that stand in contradictory relationships to the mobilized ideas. For PoE lecturers, unless this second set of ideas is censored, contained
or otherwise neutralized, mainstream economics may be undermined. How then do other agents, including students and professors in SOP departments, engage with these contradictory ideas? Archer also sheds light on how elaborated structures escape the control of those who created them. In this vein, it must be kept in mind that PoE courses and textbooks may have developed a trajectory that leaves those engaged in their production dissatisfied with the end product, yet with limited ability to foster change. Latour’s ANT provides a strong rationale for paying attention to a pivotal material element in PoE, namely the textbook and how it is deployed in PoE courses. It also invites research into the network engaged in sustaining PoE as courses that students from across the academy are required or encouraged to take. Further, it suggests that that a promising area of inquiry would be to investigate how students react to PoE curriculum – whether they adopt the theory as complementary to their understanding of the world or whether they resist or subvert the theory they are learning.

3.5 Chapter conclusions: implications for this research project

In this chapter, the theoretical framework with which the implications of universities’ sustainability commitments for PoE are examined in this dissertation was constructed. This framework was created by borrowing and integrating theory, concepts and methodologies from a number of research traditions.

As an ecological economist, I have turned to my discipline’s literature to assemble the tools needed to assess the treatment of environment-economy linkages and sustainability in PoE. This decision supports my rationale for paying close attention to how PoE addresses material and energy flows and how it conceptualizes the implications of further economic growth for the state of the environment. Interventions to this literature made by feminist economists also provided a basis for interrogating how the subject matter of economics is defined in PoE and the extent to which the interests of women, children and the poor are represented in PoE. To query how PoE attends to consumerism, scholarship with roots in institutional economics and political economy foregrounds the issue of corporate ability to influence consumer preferences through marketing.
Since PoE is taught by a specific department and discipline, I turned to literatures on the sociology of higher education and the sociology of academic departments and disciplines. This literature suggests a plausible explanation for why most academics will avoid disturbing the theoretical core of their discipline, a factor that might contribute to the apparent stability of core PoE curriculum despite a shifting societal context. It also provides a basis for understanding how those who are involved in shaping or delivering PoE curriculum might react to initiatives to integrate sustainability across the curriculum.

Diverse schools of thought were canvassed in the sociology of higher education, including research programs initiated by Basil Bernstein, Pierre Bourdieu, Margaret Archer and Bruno Latour. These approaches are to a considerable degree incompatible with each other; each has theoretical and practical strengths and weaknesses. I did not commit to any of these schools of thought, but instead borrowed concepts and tools suitable for understanding the shaping and delivery of curriculum in a higher education context.

Before a student enters the lecture hall, knowledge produced by economists must be recontextualized into curriculum and textbooks. Bernstein draws the researcher’s attention to the manner in which ideology is likely to be incorporated during the process of recontextualization, since knowledge must be filtered and interpreted as it is synthesized. The extent to which the ingrained dispositions of academics may result in them reproducing the beliefs and values that they themselves were taught is a matter that Bourdieu’s theorizing suggests warrants investigation. His conceptualization of the capital that academics within a field pay attention to and seek to accumulate provides a plausible explanation of why, for most academics, there may be little value in redesigning curriculum to incorporate new theory that might disrupt the theoretical core.

Archer’s framework implies that in this research project, insights may come from paying attention to the ideas that stand in necessary contradiction to the ideas mobilized in curriculum. Archer’s theorizing suggests that those teaching may take efforts to neutralize, contain or censor those contradictory ideas. Latour’s ANT provides theoretical support for undertaking content analysis of PoE textbooks and paying attention to its role in the course.
ANT also offers a lens for exploring how it is that PoE courses are positioned as courses that students from diverse departments should be taking and how PoE retains this status despite growing questions about the theory it covers. Further, ANT suggests ways of understanding how various individuals who would be open to changing or replacing PoE might become mobilized in an actor-network to achieve such goals.

In the next chapter, building upon my theoretical framework, I set out the research methods that I used in this dissertation to generate the data required to answer the research questions.
Chapter 4: Methodological approach and research methods

... textbooks and lectures are perhaps the most significant vehicle for the transmission of economic ideas to the masses, particularly in the post-1945 period, when courses became increasingly structured around textbooks and the exploding numbers of undergraduate students dutifully amassed the set of textbooks required for their program of study. Given that the textbook literature imposes a degree of conformity to professional norms on the textbook authors and that lectures tend to closely reflect the contents of the textbooks, the textbooks themselves serve as a useful proxy for what is being taught to the masses. (Medema 2011, 6)

4.1 Chapter overview

This chapter takes into account the literature review in Chapter 2 and the theoretical framework elaborated in Chapter 3; it provides a rationale for the multi-pronged approach used in this dissertation. I explain why I settled on a mixed-methods but largely qualitative research approach that involved examining PoE from four angles: textbooks, economists involved in teaching PoE, professors in SOPs whose students take PoE and three categories of students who had recently taken PoE. I also explain how the decision to use qualitative research methods took into consideration the fact that within the mainstream economics profession, there is a lack of familiarity with, and acceptance of, the qualitative approach.

This chapter also explains how the three different interview guides used for the different participant populations were developed in order to produce data relevant to this study’s research questions. Other issues addressed in this chapter include ethical concerns, responsibilities for participants, measures to ensure confidentiality and the recruitment methods used for the different populations of participants. Additionally, I document the measures undertaken to ensure the quality, credibility and trustworthiness of the end product. This explanation includes the steps taken to ensure reflexivity over my own commitments as a researcher and ecological economist.

4.2 Choice of research methodology

The approach I took was informed by literature on qualitative research methods (Berg 1998; Creswell 2003; Marshall and Rossman 2006; Willis et al. 2007). Given that there is limited
research to build on that relates to my topic, this study was exploratory in nature, and I reasoned that a qualitative approach was most suitable. Qualitative research is considered appropriate in instances where researchers are seeking to generate data about perspectives, experiences and opinions. By triangulating data sources, I sought to improve the validity of the study and reduce the prospects of my results misapprehending a phenomenon or issue of interest (Miles and Huberman 1994; Creswell 2003, 2007). I used purposive sampling; the three universities selected for my case study were chosen because their characteristics were in alignment with my research needs. All three have an economics department, offer sustainability-oriented programs and have made sustainability commitments. They are also in part a convenience sample, since all three are within a day’s travel of my home institution and are major, publicly-funded universities. For the interviews with lecturers, SOP faculty members and students, I used semi-structured interviews as this format ensures key research questions are attended to while allowing for data and themes that are unanticipated to be uncovered. Such interviews were considered advantageous for this research because they help generate dense, detailed (or “thick”) descriptions of issues, concerns and motivations (Becker 2001). For the students, as will be detailed below, I also included a couple of exercises that were intended to seed more in-depth discussions about specific topics covered in the courses and to better understand what students are learning in PoE when it comes to environment-economy linkages and sustainability.

In making the choice to proceed with a mixed-methods but largely qualitative research approach, I took into consideration the fact that mainstream economists tend to operate within a positivist research tradition, preferring “hard,” quantitative data; they view this data as more reliable, see quantitative methods as more rigorous and are more confident in results generated using this approach (White 2002; Hulme and Toye 2006). Economists are to a large extent unfamiliar with the use of fieldwork and case studies undertaken with the purpose of generating novel knowledge claims (Finch 2002). This lack of interest in qualitative methods can be seen by the fact that qualitative research is rarely published in the discipline’s leading journals, such as the American Economic Review, and the fact that although there have been a great number of contingent valuation studies conducted, only a handful have asked participants to explain their reasoning in deciding how much they were
willing to pay for some aspect of nature (Schkade and Payne 1994; Svedsäter 2003). More recently, Ongeri (2009, 18) has advocated for the use of qualitative research methods by researchers working in the economics education field. Whether or not the tendency of mainstream economists to discount qualitative research methods has merits, by choosing a qualitative approach I recognized that the results of my study would be less likely to be taken seriously by mainstream economists.

Qualitative research is inherently subjective, and within the qualitative research paradigm the notion that research can be objective and neutral is generally rejected. Accordingly, qualitative researchers are encouraged to be reflexive through the research process (Wellington and Szczerbiński 2007) and to explicitly identify their value orientations, personal biases that may affect their research and the theories of which they are proponents (Willis et al. 2007). My identity as an ecological economist, and my assessment that society’s current pathway implies a future with worsening ecological deterioration, have affected my research interests, the theoretical framework that I bring to the analysis and my choice of research methods. Qualitative researchers are also cautioned to be aware of how respondents may shape their responses in accordance with what they perceive would please the researcher.

I have sought to ensure that my research methods are sound and that the results are credible by being clear about these influences, by seeking feedback from other scholars when presenting results at conferences and to peers and by returning frequently to the primary data to test emerging ideas. These measures were intended to ensure my analysis does not “lose value in the marketplace of ideas” (Weiss 1994, 213) because of perceptions around the trustworthiness of the end product.

4.3 Methodology used to analyze PoE textbooks

As was seen in the literature surveyed in Chapter 2, a number of researchers have probed PoE textbooks. I examined a number of these studies (Feiner and Morgan 1987; Mason 1990; Feiner 1993; Northrop 1996; Robson 2001; Kalmi 2007; Reardon 2007; Sleeper 2007) to develop the methodology used to analyze textbooks with a sustainability lens. The
motivation for this component of the research project was to better understand the course content faced by the typical PoE student. As shown in Chapter 2, most PoE courses closely reflect the content of leading standard textbooks.

The mixed methods used were intended to generate both quantitative and qualitative data on textbook content to help answer two key research questions:

**Research question one**

*What proportion of PoE textbooks in use in BC, as well as the leading North American textbooks, addresses environment-economy linkages and sustainability, and how does this compare to a pair of textbooks written expressly to attend to sustainability?*

**Research question two**

*What does content analysis of such PoE textbooks indicate with respect to how environment-economy linkages and sustainability are conceptualized?*

Because the BC Working Group on Sustainability Education provided me with a scholarship to support my analysis of textbooks during the 2008-2009 year, this work was initiated in 2008. To select the textbooks for this study, I gathered data on textbooks adopted for use in introductory economics courses that took place between January 2008 and April 2009 at nine universities in British Columbia (BC), Canada. The selection process involved viewing course descriptions on university websites, contacting economics departments and inquiring about the course textbooks being sold by university bookstores. From this analysis, eight standard economics textbooks were identified for inclusion in the study on the basis that they were used at more than one BC university and by at least 200 students (six of these eight textbooks were paired micro/macro texts, so when these two-volume texts are

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42 This timing was somewhat unfortunate, as it implied that the editions I was examining were pre-2008 financial crisis, after which most textbook authors sought to bring out new editions to take into consideration (or to be less incongruent with) this period of recent economic turmoil. However, there is little reason to think that because authors revisited how Keynesian ideas are presented in the texts that they also revisited how environment-economy linkages are addressed; casual inspection of more recent editions suggests that their environmental content has not changed substantially.

43 The universities in question are: University of British Columbia, University of Victoria, Simon Fraser University, University of Northern British Columbia, Thompson River University, Kwantlen Polytechnic University, Vancouver Island University, University of the Fraser Valley and Quest University Canada.
“amalgamated” to enable comparisons amongst the textbooks, the BC sample results in the equivalent of five principles textbooks).

Published data on PoE textbook sales is notoriously difficult to obtain; the most recent that I have been able to identify, published by Sleeper (2007), covers the US market over the period 2002-2004. At that time, McConnell and Brue’s text was leading US sales. Since it was not represented in the textbooks identified as being adopted in BC PoE courses, it was added to the list of textbooks to analyze. During this same time frame, Mankiw’s PoE textbook was the runner-up in sales and the informal consensus seems to be that it is now the market leader. Based on my BC data on textbook adoption, it already qualified for inclusion (though in its Canadian edition). Because Samuelson’s textbook (co-authored by Nordhaus) has had such a defining influence on textbooks and economics education (Skousen 1997; Gottesman et al. 2005), and because it has been deemed the profession’s “textbook of record,” the 18th edition was added to this initial list even though it no longer figures prominently in North American textbook sales. Finally, because Joseph Stiglitz, one of the recipients of the 2001 memorial Nobel prize in economics, has written expressing great concern about the environment (see for instance Stiglitz 2006), his pair of microeconomics and macroeconomics textbooks (co-authored with Carl Walsh), was included in the sample since it seemed plausible that he might pay special attention to sustainability. A recent pair of micro and macro economics textbooks, written with the express purpose of teaching PoE from a critical perspective that pays attention to history, gender, ecology and poverty, was also included in the study as a point of comparison. The team of authors of these two texts, headed by Neva Goodwin of Tufts University, has published in the mainstream economics, the heterodox economics and the sustainability literatures (hereafter I will differentiate

44 Two reasons have been suggested for its flagging sales: it has been displaced by texts that make lesser demands of students, such as Mankiw’s; as neoliberal values gained traction in the US, Samuelson’s emphasis on the government’s role in stabilizing the economy lost favour. Nevertheless, contemporary textbooks can still be characterized as borrowing heavily from Samuelson’s original pedagogy (Skousen, 1999).
45 Note that a textbook written by another Nobel laureate, Paul Krugman, is included in the set of textbooks analyzed since his textbook was being used in BC PoE courses. He too has written about the environment. However, the edition analyzed (2007) predated his Nobel prize (2008).
between the “standard” or “mainstream” textbooks and the “sustainability” or “Goodwin” textbooks). Goodwin’s pair of textbooks has yet to achieve significant market penetration.

Based on the above rationale for inclusion, as shown in Table 1, 14 textbooks were identified for content analysis, or the equivalent of nine principles textbooks once the micro/macro pairs are amalgamated. Together, these textbooks are responsible for well over 50% of the market share. While some of the textbooks analyzed here are available in both Canadian and US editions, it should be noted that there is little substantive change in content between the two variants (e.g., while the examples used, the names of institutions and the currency all change, the approach to economic theory and policy remains consistent).

I focused my analysis of PoE textbooks on their treatment of environmental aspects of sustainability and chose to downplay the social dimension. The sustainability literature is quite clear that sustainability has environmental, social, cultural and economic dimensions. For instance, improving equity within and between generations is considered an important aspect of sustainability. However, in order to analyze all instances where textbook content had some bearing on equity, such as the distribution of income, a large proportion of the textbook would have been under the microscope and the analytical task would have become overwhelming. Given that ecological sustainability is a prerequisite for the long-term persistence of functional human societies wherein equity is a relevant concern, I reasoned that focusing on the environmental dimension of sustainability would suffice as an initial assessment of the textbooks and would make the analysis more tractable.

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46 Another textbook that was considered as a point of comparison was *Ecological Economics* by Herman Daly and Joshua Farley. However, this textbook does not attempt to cover the standard curriculum of an introductory economics course sequence and takes an explicitly ecological economics perspective, so it was not deemed suitable for inclusion in the sample.

47 To my knowledge, recent textbook sales data is not available in the public domain. An industry insider did share data with me on condition of anonymity, and this data confirms this assessment. I also was provided with access to data showing which institutions had adopted the Goodwin text. My survey of BC institutions showed that it had not been adopted in the province.

48 Some textbooks come as a one-volume principles text, others as a two-volume set divided into microeconomics and macroeconomics. Each two-volume pair was considered the equivalent of one principles text. To ensure equivalency in comparisons, I report results with textbook micro-macro pairs being amalgamated into the equivalent of a principles text (in cases where specific chapters were repeated in a two-volume set, the chapters in question were only included once in the calculations).
Passages that were not captured by the environmental screen, but were of interest because of the “worldview” they present were also annotated (but not included in the calculations of quantitative measures described above). In particular, I looked for passages that describe the end goals of economic activity, technological progress, economic growth, consumption, the linkage between economy activity and human wellbeing and discussions of equity-efficiency trade-offs. The intent was not to capture all such passages (because the volume would be too large and many passing references to the above issues would be repetitive), but rather to identify representative passages as well as passages that are particularly informative in understanding the implicit assumptions, normative positions and preanalytic vision of the textbook authors.

Having collated passages from the textbooks that were considered relevant to the understanding of environment-economy linkages and sustainability, as well as passages of interest for their worldview, I approached them as “artefacts of social communication” suitable for analysis by qualitative methods (Berg 1998, 306). Rather than using the line-by-line coding that is more typical of grounded theory (Charmaz 2001), I recognized that the textbook passages include complex information; as such, the codes used relate to topics, concepts, rhetorical techniques, knowledge claims, assumptions, normative positions, referencing and the appearance of empirical data. Through this coding process and subsequent analysis, patterns were identified on dimensions of interest.

4.3.1 Conventions used in reporting results

Throughout the remainder of this dissertation, when referring to a text I do so by referring to its first author in conjunction with “micro” or “macro” as necessary (if the textbook is a single principles volume covering both micro and macro there is no need for disambiguation).
<table>
<thead>
<tr>
<th>Main author</th>
<th>Textbook</th>
<th>Reason for inclusion</th>
</tr>
</thead>
</table>
4.3.2 Measuring environmental content in the textbooks

At the time that I proceeded with this component of my study, I did not have access to electronic versions of the texts, which would have facilitated computerized searching, annotation and analysis. Given the fact that there was no accepted and standardized methodology for measuring environmental content in PoE textbooks, there was a need to develop a consistent and standardized measurement procedure that could be applied across textbooks. As an example of the type of measurement issues encountered, if a sentence includes one word that refers to the environment tangentially (e.g., from Parkin’s text on p. 2, “As society we must choose among healthcare, national defense, and the environment.”), what gets counted as environmental content? Is it just the word “environment,” or should it be the entire sentence or paragraph in which the sentence occurs? Measurement was complicated by the fact that different textbooks use different layouts. There was also a trade-off to be made between coming up with a precise measurement protocol that would be onerous to implement and a measurement protocol that would produce sufficiently consistent results across textbooks and could be applied efficiently. The greatest precision might be offered by a word count rather than the estimated proportion of page space (the method used herein). However, there would be little to be gained from such an incremental improvement in precision given the essential coarseness of a quantitative measure that fails to capture the quality dimension (i.e., how sophisticated was the content in question?). The content measurement methodology and the weighting system are described in more detail in Appendix A. Of note are three conventions that were used to estimate what proportion of a page was devoted to environmental content:

1. If one or two environmentally-related words occurred in a sentence, but the sentence was not specifically related to the environment, 1% of the page was credited as addressing environmental content (e.g., “the government budget includes expenditures for defence, health care and environmental protection”).

2. If a single sentence was focused on environmental content, but the paragraph in which it occurred was not, 5% of the page was credited as addressing environmental content.

3. Otherwise, the proportion of the page taken up by environmental content was visually estimated with a value from 0 to 100%.
By reviewing the sustainability literature and looking for commonly-occurring ecological concepts and environmental problems, I developed a list of markers to use for making a comparison of the breadth of sustainability-relevant content across textbooks. The idea was that the more of these markers (or synonyms thereof) showed up in a textbook, the wider the range of sustainability-relevant content a student would encounter. These markers were used to populate Table 2. Textbooks tend not to reference primary sources and often fail to include “hedging” words that indicate uncertainty or dissent, the combined effect of which is to suggest a level of consensus on points of theory when in fact agreement often does not exist (Paxton 2007). I reasoned that if textbooks include actual references to the literature on sustainability and actual empirical data on the state of the environment, they would thereby provide an opportunity for PoE students to deepen their understanding of specific sustainability challenges and environment-economy relationships, and might help students understand the sorts of environment-economy research that authors tend to rely upon. The last two items in this table, “references from recognized journals in the natural or environmental sciences or sustainability literatures” and “empirical data on current state of the environment” were added as indicators of the type of environment-economy content that authors rely upon and that students would encounter.

49 Obviously different researchers might come up with different lists, and I do not intend this to be a definitive list. Nor are these markers intended as a checklist that a PoE text should follow if it is intended to address the need to integrate sustainability across the curriculum.

50 Since textbooks do not usually include references to the author’s sources, one cannot ascertain what authorities the author relied upon. However, looking at the few sources that are identified may give some indication of what the author considered to be credible environment-economy research.
Table 2: Markers of sustainability-relevant content

<table>
<thead>
<tr>
<th>Markers of sustainability-relevant content</th>
<th>Markers of sustainability-relevant content</th>
<th>Markers of sustainability-relevant content</th>
</tr>
</thead>
<tbody>
<tr>
<td>acid rain</td>
<td>bioaccumulation</td>
<td>biodiversity</td>
</tr>
<tr>
<td>complexity</td>
<td>cumulative effects</td>
<td>deforestation</td>
</tr>
<tr>
<td>desertification</td>
<td>discontinuity</td>
<td>ecological limits</td>
</tr>
<tr>
<td>ecological footprint</td>
<td>ecology / ecosystems</td>
<td>ecosystem services</td>
</tr>
<tr>
<td>endangered species / extinction</td>
<td>eutrophication</td>
<td>exotic species</td>
</tr>
<tr>
<td>fisheries collapse</td>
<td>global warming / greenhouse gases</td>
<td>green GDP</td>
</tr>
<tr>
<td>groundwater depletion</td>
<td>habitat / habitat loss</td>
<td>health effects of environmental degradation</td>
</tr>
<tr>
<td>irreversibility</td>
<td>limits to growth</td>
<td>Malthusian predicament</td>
</tr>
<tr>
<td>natural capital</td>
<td>natural areas and “wilderness”</td>
<td>nitrogen cycle</td>
</tr>
<tr>
<td>nutrients</td>
<td>ozone layer / depletion</td>
<td>pesticides</td>
</tr>
<tr>
<td>population stabilization</td>
<td>precautionary principle</td>
<td>salinization</td>
</tr>
<tr>
<td>soil erosion</td>
<td>sustainability / sustainable development</td>
<td>thermodynamics / first and second laws / throughput</td>
</tr>
<tr>
<td>toxics</td>
<td>** references from recognized journals in the natural or environmental sciences or sustainability literatures</td>
<td>** empirical data on current state of the environment</td>
</tr>
</tbody>
</table>

A draft version of the above protocol was tested on an earlier American edition of Mankiw’s textbook (the Canadian version was used in the final study) and the protocol was refined to the version described in this chapter. The protocol was then applied to the main sections of each of the textbooks in this study, but any preface, glossary, index, web-based chapters and other online materials were omitted from the analysis.

4.3.3 Textbook data analysis

As textbooks were read, content that was of interest because it related to environment-economy linkages was identified, measured (as described above), checked for markers of sustainability-relevant content and coded for future analysis. Analysis of the more quantitative textbook content data proved relatively simple and consisted of summarizing the data using spreadsheet software and calculating results for various indicators of interest. As I read the texts, I also wrote my observations in the form of brief memos and notes. Codes
were developed to fit predefined analytical categories of interest and also emerged through the process of seeking to characterize what a given passage of text was theorizing, describing and /or advocating. Codes were refined through the coding process and coding proceeded iteratively, such that if a new category of analysis emerged, I would revisit relevant passages in the textbooks to recode them as required and to explore patterns, commonalities and divergences. Once all the textbooks were coded, I examined the resulting codes and developed more conceptual, higher-level codes. In the process of analyzing data and developing theory, I often returned to the source texts to test ideas and to ensure that my interpretations were plausible.

I also consulted authorities on content analysis (see Chapter 11 of Berg 1998; Krippendorff 2004) to ensure the approach was systematic and effective and would suit my purposes of screening for content of interest from an EELS perspective and identifying and analyzing worldviews, normative positions, unstated assumptions. Key to this approach was ensuring that patterns and analytical findings emerged from the data.

4.4 Interviews of economists delivering PoE

4.4.1 Why interview PoE lecturers?

The intent of the interviews with members of economics departments was to explore how faculty members / instructors involved in delivering PoE courses view the handling of sustainability in these courses and whether and how recent theoretical developments (e.g., the 2009 Nobel memorial prize in economics awarded to a contributor to the ecological economics literature), contemporary concerns around sustainability (e.g., global warming) and the sustainability commitments made by their university have affected their views of what should be addressed in PoE curriculum. Furthermore, did they anticipate that integrating sustainability into the PoE curriculum would create problems of coherence and plausibility for mainstream theory? If so, how would they react to such tensions and how amenable would they be to substantive curriculum change? I expected that those delivering PoE might point to the many ways in which PoE can help students understand environmental problems, such as natural resource management issues (e.g., resources are depleted because
of a “tragedy of the commons” situation) and inadequate provision of public goods (e.g., due to free riding problems), as well as potential solutions (e.g., unless a price is put on carbon, individuals and firms do not have the incentive to internalize climate change externalities). Yet I also expected that many economists would have spent limited time interrogating shared disciplinary norms, modes of thought and theoretical frameworks that could limit more critical examination of standard theory’s approach to the environment and sustainability.

### 4.4.2 Design and administration of economics lecturer interview guide

I used a semi-structured interview process whereby the questions included in my interview guide (see Appendix C) were open-ended to allow participants greater leeway to answer questions and to give me the flexibility to probe more deeply into topics of interest that emerged in an answer. Furthermore, a semi-structured approach was deemed preferable because the range of answers that participants might offer was not known in advance. Since my participants are experts within their field, and while the interview guide helped ensure that there was some structure to the interviews, the interviews were conducted conversationally, such that a participant’s previous answer informed the order in which I asked remaining questions or generated questions that had not been anticipated in the interview guide.

#### 4.4.2.1 Quotes for discussion by economists

My interview guide included seven index cards, each with a quote and an associated question, which were used to generate discussion with participants that might attend to issues of plausibility and coherence per research question 3.

51 For the complete quote, see interview guide in Appendix C.
<table>
<thead>
<tr>
<th>Authority quoted</th>
<th>Topic</th>
<th>Rationale for quote and question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marglin</td>
<td>Marglin’s claim that PoE promotes self-interest.</td>
<td>Given the literature suggesting that sustainability requires other-regarding behaviour and that humans are not merely self-interested, as well as studies suggesting that economics education makes students more selfish, do lecturers themselves see the emphasis in PoE on self-interest as problematic?</td>
</tr>
<tr>
<td>Frey</td>
<td>Ostrom’s contribution to theorizing around common-pool resource management.</td>
<td>Do PoE lecturers see any need to update the textbook treatment of the tragedy of the commons given research initiated by Nobel laureate Elinor Ostrom documenting successful management of the commons under various cooperative arrangements devised by local communities or resource users?</td>
</tr>
<tr>
<td>Daly</td>
<td>Paying attention to basic insights regarding the economy’s dependence on the natural world and its environmental impacts would require extensive revisions throughout PoE textbooks.</td>
<td>Exploring whether, in the view of PoE lecturers, the inclusion of environment-economy linkages in PoE textbooks would require textual changes to avoid presenting students with incoherent theory.</td>
</tr>
<tr>
<td>Ayres</td>
<td>Textbooks include potentially misleading models, such as a bakery that produces bread using capital and labour, but no flour or energy.</td>
<td>Exploring whether PoE lecturers view the textbooks’ tendency to omit natural resource inputs and the environment as perhaps resulting in students misapprehending the role of energy and materials in the economic process.</td>
</tr>
<tr>
<td>Northrop</td>
<td>Normative positions found in PoE texts.</td>
<td>Do PoE lecturers see the values included in PoE texts regarding the desirability of economic growth and consumption as potentially problematic for sustainability?</td>
</tr>
<tr>
<td>Goodwin</td>
<td>Circular flow diagram without resource flows or waste streams.</td>
<td>Do PoE lecturers see any benefits in seeking to incorporate more rigorous conceptualization of environment-economy linkages in workhorse PoE models?</td>
</tr>
</tbody>
</table>
The seven quotes critical of economic theory as it is presented in PoE that were included as part of one of the questions in the interview guide were not used as initially intended (i.e., handing the participant the cards one by one and asking the participant to consider the quote and answer the question on the card), in part due to time constraints (e.g., in the more time-constrained interviews, we rarely made it that far through the interview guide). In practice, I found that it was awkward to proceed with the quote exercise as it had been initially designed. It seemed out of place for me, as a PhD candidate, to ask a professor or lecturer to perform this task, which in some ways resembled a series of questions on a test, or an exercise question that might be found in an undergraduate textbook. Furthermore, participant reactions suggested that the quotes and questions associated with the quotes were coming from a perspective that seemed too foreign, too far removed from the interviewee’s usual paradigm, to foster meaningful and useful discussion. After an initial attempt to proceed with the exercise as planned in earlier interviews, in later interviews, rather than risk undermining the congenial atmosphere that had been created during earlier portions of the interview, I shifted instead towards drawing on the content of the quotes at opportune times in order to formulate questions, as can be seen from the following transcript where the Goodwin quote concerning the circular flow diagram was used to shape one of the questions I posed to a participant:

*Interviewer: I have a couple of quotes here from some people who have been somewhat critical of the content in introductory textbooks, and this one is by, is actually from another introductory economics textbook which was explicitly written to address sustainability. So there’s a quote, the question is about would there be a benefit to improving understanding of environment-economy linkages. Basically they’re saying, well “the fact that natural resources can be used or polluted is not portrayed. Because of this, the circular flow diagram is a little like a perpetual motion machine, the economy it portrays can apparently keep on generating products forever without any input of materials or energy; the necessity of resource*
maintenance activities is ignored.” So the question is, they come up with the circular flow diagram and they put in inputs and wastes. Would that kind of input to a textbook help students see that there are these environment-economy linkages that—

Participant: Possibly. It may actually confuse them. To be honest, circular flow, the purpose of the circular flow diagram it really goes back to Keynes back in the 30s when he was essentially inventing macro. And I don’t think students really appreciate just how subtle and important it is.... {Gorski a113}

Typically, due to time constraints, if quotes were discussed or drawn on in framing questions (for Brennan, Felton, Gorski, Moffet, Napier, Reynolds; attempted but aborted with Karsten), the participant would have been asked questions that related to a couple of the quotes, but not all of them.

4.4.3 Recruitment of economics lecturers

In June 2010, three letters introducing the research project were mailed to department chairs and 13 invitations to participate in the study were sent out to individuals who were listed as teaching PoE on the case study universities’ websites. The result was a zero response rate. With such disappointing results, rather than making further efforts to recruit this population at that time, I turned my attention to recruiting student participants. After student interviews were largely completed, over the period January to February of 2011, a second invitation (see Appendix B) was sent out to 19 individuals identified as teaching PoE at least once during the interval of January 2010 to April 2011 at the three universities; this second invitation mentioned that interviews with students taking PoE in support of my research had already taken place. By this time, as a result of my efforts to recruit students, which included advertisements and poster, my study was better known. The response rate improved. Early participants also encouraged colleagues to participate, such that 11 participants were ultimately recruited who were currently teaching or had taught PoE in the 12 months prior to

52 These names are pseudonyms; see explanation in Chapter 6.
53 Note that initially, I was hoping to interview instructors before interviewing students. This would have had the advantage of allowing instructors to raise questions about and comment on the interview guide that I intended to use with students. Without any instructors having agreed to participate at that time, this approach was not possible.
the interview. Interviews were conducted from February to April of 2011. There was no incentive or honorarium for participation.

To ensure candid interviews and to meet ethical standards, measures were taken to respect the confidentiality of informants. See Section 4.7 for a description of how the interview data was processed, coded and analyzed.

4.5 Interviews of professors in sustainability-oriented programs

4.5.1 Why interview SOP professors?

The main purpose of interviewing SOP professors was to document their perspectives on why SOP students are encouraged to take PoE as part of their program, how suitable the existing PoE course was, what they believed SOP students should get out of an introductory-level economics course, whether they had observed any changes in student thinking as a result of having taken the course and what they had heard about student reactions to the course. It was also intended to ascertain if there had been collaboration between the SOP and the economics department regarding meeting the needs of SOP students and whether the SOP had participated in any discussions with respect to revisions of the introductory economics curriculum.

4.5.2 Design and administration of SOP professor interview guide

The development of the interview guide for the SOP professors (see Appendix D) was relatively straightforward. The interview guide was administered in a manner that took into consideration the fact that the various participants within SOP departments had less in common than did the economics department participants (all of whom were teaching PoE), so for some respondents, not all questions were applicable. Although the SOP interview guide included the same set of quotes and questions as used for the PoE lecturers interview guide (described above), in practise this section did not end up being used, in large part because issues motivating the quotes were already arising in the interviews without this construct, and because it drilled down to a level of detail in the PoE curriculum that was beyond most SOP professors’ familiarity.
4.5.3 Recruitment of SOP professors

From January 2011 to March 2011, 15 invitations to participate in the study were sent out to faculty members associated with SOP programs at the three case study universities. Those selected for recruitment belonged to one or both of the following categories. The first included current or former senior administrators of a SOP program whose administrative responsibilities included undergraduate education (equivalent to dean or associate dean, department chair or director). The second category included faculty members who had expertise in economics and were involved in teaching undergraduates in sustainability-oriented programs.

My definition of having expertise in economics is broader than would be understood by the mainstream economics discipline, and included those whose training and accreditation was in mainstream economics, including natural resource and environmental economics, as well as those with expertise in heterodox economics (e.g., political economy, ecological economics) and those with expertise in political ecology. My inclusion of political ecology practitioners may seem somewhat expansive, but was based on considering that this admittedly difficult-to-delineate body of thought has roots in Marxian political economy, overlaps with economic geography and is engaged with analysis of environment-society relationships and the critique of the global capitalist economy (McCarthy 2012). This casting of a wider net reflects my belief that one does not have to be an accredited, mainstream economist to offer a rigorous and insightful commentary or critique on mainstream economic theory or to consider the economics education needs of SOP students.

Potential participants were identified by consulting SOP websites, through discussions with my supervisor (himself an economist) and via referrals from given interviewees who suggested that I contact a colleague. Eventually, nine individuals were interviewed over the period of February 1, 2011 to April 15, 2011. There was no incentive or honorarium for participation. To ensure candid interviews and to meet ethical standards, measures were
taken to respect the confidentiality of informants. See Section 4.7 for a description of how the interview data was processed, coded and analyzed.

4.6 Student interviews

4.6.1 Why interview students?

I examined the students’ perspective because students can be seen as the end users or beneficiaries of PoE. An alternative, more contentious viewpoint put forth by Galbraith (1998, 2007), Marglin (2008) and a number of other critics of orthodoxy (Heilbroner and Milberg 1995), and that is even discernable in the writings of some economists who contribute to the mainstream tradition in economics, but are critical of PoE education (see discussion in Cipriani et al. 2009), is that PoE students are a population that the course has the effect of indoctrinating. My decision to focus on student perceptions does not imply that student perceptions should be the basis for choosing what theory is taught, but rather that their observations and perceptions about the course offer insights as to what transpires in the classroom, how students respond to and interpret course content related to environment-economy linkages and sustainability and what they saw as the strengths and weaknesses of PoE’s treatment of such topics.

4.6.2 Design and administration of student interview guide

Given that there was limited prior work examining PoE’s sustainability content from the perspective of students, I decided to draw on qualitative research methods and emphasize the generation of dense, detailed descriptions (also characterized as “thick”) (Becker 2001) of how students see PoE content and how they experience the course. The interview guide was developed so as to include several approaches designed to explore how PoE addresses

54 I do not mean to imply that the individuals who write textbooks, who set curriculum or who teach PoE are deliberately seeking to indoctrinate students (though some may have such an intent). Critics generally seem to portray most of those involved in teaching or shaping PoE curriculum as believing that they are transmitting objective scientific knowledge to students. Indoctrination is used in the sense that authors and lecturers are seeking to inculcate a certain set of economic beliefs and specific approaches to understanding economic phenomena; they often refer to the goal of training students to “think like an economist.” For the critics, these beliefs and approaches are contested and critiqued for their ideological content, and the scientific credentials of the theory are very much at issue.
environment-economy linkages and sustainability. A semi-structured interview process was selected so as to allow the interviewer to probe promising leads arising in student answers.

The interview guide (see Appendix E) was designed such that before there was any content that would indicate that the study was motivated by understanding how PoE addresses environment-economy linkages and sustainability, students were asked to describe the key characteristics of a healthy economy, to describe their PoE course as if speaking to a fellow student and to identify theory from their course that they found particularly insightful as well as theory that they found problematic. This sequencing was designed to see if students would raise, before the focus of the study became clear, issues with respect to how their PoE course addressed—or omitted—EELS. Students were then asked to describe how the environment and sustainability were addressed in their PoE course, what they deemed to be the most important contribution made by the PoE course to understanding the root causes of environmental problems and potential solutions and what content they would recommend adding to the course to better address sustainability.

The next section in the interview guide was developed by drawing on findings from the textbook analysis reported on in Chapter 4. It involved presenting students with 17 quotes, one at a time, in random order. Each quote was printed on its own card. Students were then asked to sort the quotes into one of three categories / piles by comparing each quote to what they had learned in PoE. The first pile was to be for those quotes that were “supported by or consistent with” PoE; the second was for those quotes that were “contradicted by or inconsistent with” PoE; and the third pile was for those quotes that were unrelated to PoE or quotes that the student was uncertain of where to put. Three envelopes labelled in large print with these same categories were placed on the table so that students could easily refer to the categories as they sorted quotes. Each quote was either representative of a theoretical claim or a normative position that is commonly found in introductory economics textbooks, or was an incorrect or contradictory version thereof. The inclusion of quotes that deliberately misrepresented prevailing textbook positions was intended to ensure that the quote sorting exercise was meaningful and required some effort from the students as they compared the quotes to the course content.
Before commencing, and at times during this exercise, students were instructed to put aside their personal agreement or disagreement with the quotes and to make their sorting decisions on the basis of whether the quote was consistent with, inconsistent with or unrelated to course content. Questions of clarification, though infrequent, were permitted. The way each student sorted quotes was tabulated on a standardized form. After the interview, this data was entered into a spreadsheet for later analysis.

In part, some of these quotes were based on testing the containment strategy that I had identified in textbooks (see Section 5.4), whereby it seemed the textbooks had been written to include a number of elements that together contain arguments that humanity is exceeding ecological limits and stop these arguments from undermining other sections of the textbook. However, the main purpose of the quotes exercise was to get students to talk about content that was covered in their course so as to see from their answers what might be learned with respect to content they found to be useful or problematic, how they recalled content being taught, whether they had found content believable and how they reconciled their pre-existing beliefs with new theory.

After the students had finished sorting the quotes into these three piles, they were then asked to pick three quotes from the first pile (“supported by / consistent with”) that they would be happy to discuss. One quote at a time, they were first asked to describe how the quote related to the course content and second to give their personal opinion on the quote. This procedure was intended to ensure that the students separated their opinions or feelings about a quote from their assessment of how the quote related to course content. It was also intended to explore the extent to which students embraced or rejected course content. They were then asked to repeat the same process for three quotes from the second pile (“contradicted by / inconsistent with”). By the end of this process, a student would typically have discussed six of the 17 quotes.\(^55\) In a small number of cases, when discussing a quote, a student would realize that they had initially sorted the quote into the wrong category (e.g., in the process of

\(^{55}\) If a student had only sorted one or two quotes into either of the consistent or inconsistent categories, they would have had fewer than three quotes to discuss in one of the two categories that were discussed.
considering and discussing a quote, a student might realize that when initially sorting the
quotation, they had missed or misread a word that changed the meaning of the quote). In such
cases, the tabulation was corrected and the student was instructed to select one of the
remaining quotes from the applicable category to discuss instead. Students were not asked to
discuss any quotes from the third category, since there was no point in discussing quotes that
the student had deemed to be unrelated to course content.

Part of the intent of the quote sorting exercise was to produce quantitative data relevant to
understanding whether content commonly found in PoE textbooks that may be relevant or
problematic from a sustainability perspective was content that students recalled being taught.
The intent was to analyze the resulting quantitative data on how the cards were sorted in
order to measure whether there was consistent teaching and messaging across PoE courses
(e.g., if a high proportion of students sorted a given quote as “consistent” with the course, it
would be an indication that content similar to the quote is likely being taught in many PoE
courses). The card sorting results were also intended to assess the extent to which the
containment strategy discussed in Chapter 5 was present. However, while quantitative data
was thought to be potentially useful, the most importance was placed on the qualitative data
generated by having students discuss a subset of the quotes that they had categorized as
consistent or inconsistent with the course in order to collect dense, detailed descriptions of
their recollections of course content.

4.6.2.1 Rationale behind the quotes used: two examples

For illustrative purposes, I explain the rationale behind the selection and wording of two of
the 17 quotes.

*Quote A:* “Life for most Canadians improves when Canada’s economy grows.”

56 In the discussion in Section 8.6.4, I explain how the quote sorting exercise would benefit from further
refinement (in the form of wording changes for some of the quotes, and a reduction in the number of
quotes) and a greater number of participants in order to simplify the exercise, reduce potential sources of
error and support statistical analysis of the results.
Quote A was worded to be consistent with the standard view presented in PoE textbooks, which typically emphasize the desirability of economic growth, though usually this endorsement of growth is qualified with fine print specifying the conditions under which economic growth is seen to be beneficial. From an ecological economics perspective, the endorsement of growth is problematic given that growth in rich countries is seen as implying higher levels of resource throughput and associated environmental impacts. Furthermore, the pursuit of growth in rich countries is considered to have little justification from a human welfare perspective given that notwithstanding growth, the last couple of decades have shown disappointing results in terms of self-reported life satisfaction and have revealed that the benefits of growth have not gone to those who need it the most (Daly 1998; Victor 2008; Jackson 2009a).

"Because people's preferences are manipulated by advertising and because individuals are not good at making rational decisions, governments should restrict the products that can be sold in the marketplace to those that are environmentally benign."

Quote H was intentionally worded to clearly contradict the standard view presented in PoE textbooks, but in a way that represents a position that can be defended by reference to the sustainability literature. Within the PoE incarnation of mainstream economics, textbooks typically assume that individuals are rational (and hence not open to manipulation by advertising), that consumers are sovereign and that each consumer is usually the best judge of what goods and services contribute to their wellbeing. The textbooks generally do not argue that restrictions should be placed on the sale of consumer products to protect the environment (tending to emphasize Pigovian taxes, tradable emission schemes and clear delineation of property rights as the most economically defensible solutions to environmental problems).

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57 To maintain the coherence of the mainstream model used in PoE (wherein preferences are defined to be exogenous), textbooks sometimes consider, but downplay, evidence that advertising is manipulative (which would imply endogenous preferences).
Thus, while the view encapsulated by quote H is highly unlikely to be found in a mainstream textbook, an argument in favour of this quote can be made from the ecological economics literature. The form and level of consumption in the rich world are requiring resource extraction and the appropriation of ecosystems, resulting in waste emissions that together degrade the environment and its capacity to support human wellbeing (Wackernagel and Rees 1996; Clapp and Dauvergne 2005; Dauvergne 2005; United Nations Environment Program 2005a). If society desires sustainability, taking into account the evidence regarding human decision-making traits and how corporations sometimes manipulate consumers, an argument can be made for the abridgement of consumer sovereignty via constraints on what corporations can sell and what individuals can buy (Menzel & Green, in press).

4.6.2.2 The carbon tax exercise

The interview guide also included a backgrounder on a carbon tax proposal that was to be handed to the interviewee. The students were asked to describe the implications of a carbon tax on a company that installs windmills, to provide economic arguments for and against such a carbon tax and to explain his or her preference for either a carbon tax or regulations as a means of mitigating CO₂ emissions. In part, this research strategy was inspired by research in physics education, which showed that with traditional teaching techniques, students were not understanding theories in the manner that their lecturers were intending, but could nonetheless perform well on a standard physics exam. However, misapprehension of theory would be detected on an assessment tool carefully designed to test students’ ability to apply theory in a real-world context rather than their ability to apply formulas or the like (Wieman and Perkins 2005; Wieman 2007). Since a potentially beneficial outcome of PoE courses might be that students better understand the potential role of economic instruments in mitigating pollution, I wished to explore their ability to consider a contemporary policy initiative designed to mitigate carbon emissions in BC.58 I explain here the rationale for the first question of the carbon tax exercise.

Q24 a) What effect would a carbon tax tend to have on a company that 

installs windmills that generate electricity?

The rationale for the first question in the carbon tax exercise was to explore whether students, having taken PoE, would see beyond the direct impact of a carbon tax on a windmill company. The answer sought in this case was that the carbon tax would tend to improve the competitiveness of a company that installs windmills that generate electricity because the relative cost of energy services supplied by fossil fuels would increase with a carbon tax. Hence, even though this company might face increased costs in some aspects of its operations due to a carbon tax (e.g., the carbon tax increases the cost of fuel burned by the vehicles used to transport and install windmills), overall a carbon tax would likely lead to increased business as the economy shifted to a less carbon-intensive energy mix. Given that the policy proposal described in the backgrounder to the question also specified that the carbon tax would be revenue neutral, such that other taxes could be reduced accordingly, the windmill company’s costs on some other line items might actually decline. The usefulness of Pigovian taxes to contribute to sustainability largely derives from the effects described above.

4.6.2.3 Student interview guide, closing questions

The final questions in the interview guide asked students to weigh in on the usefulness of their PoE course for students interested in contributing to sustainability, and invited students to comment on any issues that had arisen during the interview process.

4.6.3 Recruitment of students

From June 2010 to March 2011, 54 students who had taken PoE in the previous nine months and who had yet to take more advanced economics courses were recruited from the three leading public universities in British Columbia, Canada by means of posters, advertisements in student newspapers, classroom announcements and peer referrals. The study’s purpose was described as being “…to learn more about student experiences taking first year economics courses.” All students were paid an honorarium of $15 or $20 (the honorarium was increased during the course of the study to enhance recruitment); a typical interview lasted an hour. I closed off further recruitment ten months after the first student was
interviewed when it was clear that diminishing marginal returns had set in and additional interviews were providing little in the way of new conceptual insights.

My sampling strategy targeted two distinct populations of undergraduate students who had taken PoE, with a third population emerging opportunistically. The first population involved students affiliated with a program that focuses on economic matters, here understood as students who major or minor in economics or who are in a business or commerce program (henceforth labelled ECON students). The second population involved students affiliated with Sustainability-Oriented Programs (henceforth labelled SOP students), such as students majoring in environmental science or natural resource management. Recruitment of SOP students proved challenging, in part because the potential pool of students who met the study’s eligibility criteria was fairly limited. The third population involved those PoE students who fit neither of the first two categories (labelled NES, for Neither Economics or Sustainability). This group was heterogeneous, with students coming from diverse programs such as engineering, international relations and sociology. While my recruitment strategy was not intended to seek out such students, when they responded to the advertisements during the time that I was having difficulty recruiting SOP students, I decided to add a relatively small number of NES students to see what might be learned from the experiences of students whose programs are not focused on economic matters or sustainability and who are not required to take more advanced courses in economics.

My sampling rationale took into account evidence pointing to the fact that students who elect to specialize in economics, business or commerce have been found to be differentiated from the general student population on certain characteristics. Previous research has suggested that students who choose to major in economics or business tend to be more politically conservative, have a more positive view of markets as a means of allocating resources, are more willing to accept market outcomes as fair and are less enthusiastic about government involvement in the economy (Faravelli 2007; Bartlett et al. 2009; Cipriani et al. 2009). The population of students majoring in economics and business may well be more likely to accept standard theory and less likely to problematize it. At the same time, it would seem that these students would be more likely to develop fluency in economic theory and discourse and
would display greater technical competence than their SOP and NES peers. This could help them to engage critically with economic theory. Finally, these students are relatively unlikely to have encountered courses that are focused on environmental issues or sustainability before or during the time they study PoE.

The second category of students, labelled SOP students, was made up of students who were studying, and likely to end up working in, areas that are closely related to sustainability; it seemed reasonable to expect that these students would tend to be more attuned to and interested in sustainability issues than the average student. As well, this was a population of students who presumably would have benefited from PoE courses that explicitly address sustainability. As such, these students might be expected to be more likely than the average PoE student to note content in the PoE course that they felt was helpful for elucidating sustainability issues as well as content that they felt was problematic from a sustainability perspective. They also might be expected to be more likely to have a knowledge base that would enable them to look more critically at PoE’s conceptualization of environment-economy linkages. At the same time, this population was less likely to have the theoretical background or technical skills that would assist in learning and engaging more technically with economic theory. Indeed, it may be that despite their greater knowledge of, and engagement with, sustainability issues, many of these students lacked the requisite knowledge or confidence in economics to probe the theory being taught in PoE. As a result, they may, in some respects, have been less able to assess whether such theory might be problematic from a sustainability perspective than their ECON peers.

Given that most students in the sample had recently completed their first year of university at the time of their interview, the difference between the theory, knowledge and ways of knowing that SOP vs. ECON students were likely to have encountered at university was not necessarily that large. By the time of the survey, in order to be eligible, participants could not have taken more than a few hours of any second to fourth year economics courses. Likewise, most SOP students would not have had more than a couple of courses that focus on the environment or sustainability by the time of the interview.
### 4.7 Processing, coding and analysis of interview data

Given that the different sources of interview data were handled in similar ways, I describe the methodology used once, but note important differences between the student versus PoE lecturer / SOP professor interviews.

I conducted all interviews, recording them digitally such that they could be transcribed. Two research assistants\(^{59}\) and I transcribed the interviews.\(^{60}\) I reviewed all transcripts and corrected transcription errors, referring back to the digital recordings as needed. The professor data set was of 65,000 words for the PoE lecturers and 30,000 words for the SOP professors (both figures include interviewer questions in the word count). Excluding standardized questions posed by the interviewer, the end result was a dataset of about 150,000 words for the students.

I imported interview transcripts into ATLAS.ti. Rather than using the line-by-line coding more typical of grounded theory (Charmaz 2001), I recognized that that the issues being discussed were complex and often part of an extended answer or opinion offered on a topic (hence not fitting in one line or one sentence), and instead used several approaches to coding. My approach to coding and analyzing the data was influenced by considering guidance from a variety of authorities (Miles and Huberman 1994; Creswell 2003, 2007; Wellington and Szczerbiński 2007; Saldaña 2009) and then developing a pragmatic approach that suited the research questions at hand. My coding does not show allegiance to a given methodology, but is a hybrid of several. Using the typology offered by Saldaña (2009), my coding could be described as a pragmatic combination of methodologies:

- **Initial Coding** (tentative, provisional codes used to break the data down into discrete parts)
- **Values Coding** (capturing values, attitude, beliefs and worldview)

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\(^{59}\) Kirsten Harma and Aneeta Dastoor.

\(^{60}\) In some cases for the professor interviews, portions of a given interview that were clearly off topic were not transcribed.
- Evaluation Coding (capturing participants’ perspectives on the merit of content they were learning)
- Provisional Coding, since prior to undertaking fieldwork I had identified initial concepts that were of interest for analytical purposes.

Alternatively, using Charmaz’s (2001) typology, in part my coding process could be described as Focused Coding, whereby earlier codes are honed down to key codes that make the most analytical sense for categorizing data.

The initial step was to code the interviews descriptively, such that all answers to a given interview question (e.g., question 1, 2, 3…) and topics that came up frequently (e.g., comments on textbooks) could be called up as needed. At the same time, I also coded for concepts that had been identified as being of interest prior to undertaking fieldwork. I then shifted to a more analytical or concept-based approach to coding. In some cases, codes were combined into categories that captured higher-order concepts as appropriate. As new themes of analytical interest emerged, I returned to previously coded interviews to recode for the new theme.

Software is but an aid to analysis, and as an adjunct to this approach, I relied on paper and pen analysis. Throughout the coding and analysis process, I wrote memos, took notes and marked up printed output. Analysis proceeded iteratively. I would often revisit transcripts to check on the context for a given comment to make sure I had interpreted it correctly, sometimes returning to an audio recording to better understand a given discussion. The process of writing up the analysis and discussing results with colleagues resulted in further iterations.

With respect to the SOP professor interviews, though transcripts were also imported into ATLAS.ti and coded, I took a more pen and paper approach to analyzing the data. This was because with fewer interviewees and less commonality in the participants’ positions and responsibilities, there was a wider range of topics covered and less data to organize and analyze.
4.7.1 Edits made to participant quotes

In quoting informants I have made some edits that do not affect the speaker’s intended meaning in order to provide consistency, to facilitate interpretation by the reader and to reduce the likelihood that the individual speaking can be identified. The main edits are as follows. PoE courses have different numbers at different universities, so I have removed all course numbers and replaced them with ‘principles,’ ‘microeconomics’ or ‘macroeconomics’ as appropriate (e.g., if an informant referred to SFU’s Econ 103 course, it is transcribed as ‘[microeconomics]’); all first year economics courses that are not intended to serve as prerequisites for upper level courses have been labelled ‘policy’ courses. To respect confidentiality, I have removed the names of universities and have omitted names of colleagues mentioned by participants. Further, I have reduced the specificity of potentially identifying characteristics tied to a speaker (e.g., if a speaker said in a quoted passage, “I have been teaching 22 years,” this might be changed to, “I have been teaching [over twenty years]”). Where a quote has been edited to remove less relevant content in the interest of brevity, ‘…’ indicates omitted text. Note that places where a participant stopped speaking midsentence or truncated a thought are indicated with a dash, as in “Whether it’s environmentally, or—, we teach students badly” {Phelps}.

4.8 Chapter conclusions

In this chapter, I explained that because of the pragmatic, problem-oriented and interdisciplinary nature of my inquiry, my mixed methods, but largely qualitative, research methodology was developed by drawing on a number of qualitative research methods. I detailed the research methodology, how interview guides were developed, how participants were recruited and how interviews were transcribed and analyzed. I have sought to be transparent about my biases, the pre-analytic vision that I brought to my analysis and the measures I have taken to ensure my research meets expectations of quality, credibility and trustworthiness. This transparency required reflexivity on my part (Peshkin 1988; Morrow 2005) as I had to ensure that I managed my subjectivity and made sure that the results were driven by the data collected in a manner that reflects the conceptual framework set out earlier.
In the following three chapters, I turn to the results from the three different types of data as generated by applying the methodologies described above.
Chapter 5: Introductory economics textbooks and sustainability

Many students will not pursue economics beyond the introductory course; for them, the textbook helps shape their attitudes toward economic institutions and policies and helps establish the authority of economists, whose pronouncements they will continue to encounter long after they have left school. (Klammer 1990, 158).

5.1 Chapter overview

This chapter summarizes the results of a content analysis of the coverage of environment-economy linkages and sustainability in introductory economics textbooks. Textbooks analyzed include the leading texts in current use in British Columbia during the period 2008/2009 as well as three leading US textbooks. These standard texts were contrasted against a pair of micro/macro introductory texts explicitly written to address sustainability. The content analysis was based on the methodology described in Section 4.3. This chapter documents that in comparison to the sustainability textbooks, mainstream textbooks devote relatively little space to addressing environment-economy linkages and concentrate this coverage in chapters on externalities and public goods. They also make reference to fewer sustainability-relevant concepts.

I argue that because environment-economy linkages receive little notice in the sections of the textbook that cover the core theory, students may get the impression that linkages between environment and the economy are weak and thus unimportant. By reviewing certain passages in the textbooks I highlight particular problematic content, such as the textbook treatment of common-pool resource management dilemmas.

During the process of analyzing the content of PoE textbooks, I noted a pattern that I eventually labelled the ‘containment strategy.’ This strategy is made up of various elements which, I argue, when mobilized serve to contain concerns about limits to growth or environmental degradation from undermining normative positions on the desirability of growth and consumption and the plausibility and coherence of the textbooks’ theoretical core (e.g., scarcity, utility, trade-offs, gains from trade, consumer behaviour, supply and demand.
analysis, competitive firms, monopoly power, national income, comparative advantage, fiscal policy, monetary policy).

I propose that these findings will be useful in assessing the suitability of PoE textbooks for use in universities that have committed to integrating sustainability across the curriculum. Readers should note that this review was not intended to assess the textbooks’ quality of exposition, pedagogical value or the validity of theory where that theory does not intersect with the environment or sustainability.

5.2 RQ1 – Proportion of textbook addressing sustainability

What proportion of PoE textbooks in use in BC, as well as the leading North American textbooks, addresses environment-economy linkages and sustainability, and how does this compare to a pair of textbooks written expressly to attend to sustainability?

In this study, individual textbooks are identified with the first author's last name in conjunction with “micro” or “macro” as necessary (if the textbook is a single principles volume covering both micro and macro there is no need for disambiguation). To ensure equivalency in comparisons, I also report results with textbook micro-macro pairs being amalgamated into the equivalent of a principles text (in cases where specific chapters were repeated in a two-volume set, the chapters in question were only included once in the amalgamated calculations).

The methods and process for selecting textbooks are described in Section 4.3. The total sample analyzed consisted of 14 textbooks, or the equivalent of nine principles textbooks after the amalgamation of the micro/macro pairs (see Table 1).

As is documented in Table 4 and shown graphically in Figure 1, the proportion of total content that relates to the environment in the standard textbooks ranged from a low of 0.7% (Stiglitz macro) to a high of 5.4% (Krugman micro). If one considers the content students would encounter in the combined micro/macro sequence in PoE, McConnell's text, at 1.8%, was at the lowest end of the scale; Stiglitz was the next lowest at 2.6%, while the other texts
ranged from 3.1% to 4.0%. If chapters on public goods and externalities are excluded, the standard texts ranged from a low of 0.4% for McConnell to a high of 1.5% for micro editions of both Krugman and Frank; as amalgamated textbooks, the upper end of the range was 1.3% for Ragan.

The most pages students could read sequentially without encountering any environmental content ranged from a low of 64 pages (Krugman micro) to a high of 289 pages (Krugman macro). From a low of 2% (Stiglitz macro) to a high of 15% (Samuelson) of textbook pages had at least some environmental content (i.e., at least one word per page); as amalgamated textbooks, Stiglitz, Mankiw and McConnell set the low end of the scale at 6%.

Turning next to the proportion of chapters with environmental content, as shown in Figure 2, McConnell, at 25%, had the lowest number of chapters meeting the environmental content criterion of including at least five environmentally-related words, or one sentence per chapter, while Krugman micro at 77% had the highest. In amalgamated form, the high end of the range was 56% for both Samuelson and Krugman. Note that this criterion of five words

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Table 4: Quantitative results, sustainability-linked content

<table>
<thead>
<tr>
<th>Author</th>
<th>Configuration for Reporting Results</th>
<th>Year</th>
<th>Edition</th>
<th>Used in RC</th>
<th>% Pages Main Sections Only</th>
<th>% Env/Excl Ext &amp; Public Goods</th>
<th>Longest Pages withEnv</th>
<th>Pages with Some Env</th>
<th>Chapters with Some Env</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frank</td>
<td>Combined Micro/Macro</td>
<td>'05</td>
<td>2</td>
<td>Can</td>
<td>Y</td>
<td>816</td>
<td>3.1%</td>
<td>1.2%</td>
<td>117</td>
</tr>
<tr>
<td>Krugman</td>
<td>Combined Micro/Macro</td>
<td>'06</td>
<td>1</td>
<td>Can</td>
<td>Y</td>
<td>952</td>
<td>3.3%</td>
<td>1.0%</td>
<td>289</td>
</tr>
<tr>
<td>Mankiw</td>
<td>Combined Micro/Macro</td>
<td>'08</td>
<td>4</td>
<td>Can</td>
<td>Y</td>
<td>819</td>
<td>3.1%</td>
<td>0.7%</td>
<td>157</td>
</tr>
<tr>
<td>McConnell</td>
<td>Economics (Principles)</td>
<td>'08</td>
<td>17</td>
<td>US</td>
<td>N</td>
<td>703</td>
<td>1.8%</td>
<td>0.4%</td>
<td>220</td>
</tr>
<tr>
<td>Parkin</td>
<td>Economics (Principles)</td>
<td>'06</td>
<td>6</td>
<td>Can</td>
<td>Y</td>
<td>788</td>
<td>4%</td>
<td>1.2%</td>
<td>201</td>
</tr>
<tr>
<td>Ragan</td>
<td>Economics (Principles)</td>
<td>'08</td>
<td>12</td>
<td>Can</td>
<td>Y</td>
<td>885</td>
<td>3.4%</td>
<td>1.3%</td>
<td>193</td>
</tr>
<tr>
<td>Stiglitz</td>
<td>Combined Micro/Macro</td>
<td>'06</td>
<td>4</td>
<td>US</td>
<td>N</td>
<td>905</td>
<td>2.6%</td>
<td>0.7%</td>
<td>163</td>
</tr>
<tr>
<td>Samuelson</td>
<td>Economics (Principles)</td>
<td>'05</td>
<td>18</td>
<td>US</td>
<td>N</td>
<td>715</td>
<td>4%</td>
<td>1.1%</td>
<td>108</td>
</tr>
</tbody>
</table>

**Averages:**

| Frank      | Combined Micro/Macro                | '05  | 2       | Can        | Y                         | 816                           | 3.1%                    | 1.2%                 | 117                   | 7%                    | 41%                  |
| Krugman    | Combined Micro/Macro                | '06  | 1       | Can        | Y                         | 952                           | 3.3%                    | 1.0%                 | 289                   | 9%                    | 56%                  |
| Mankiw     | Combined Micro/Macro                | '08  | 4       | Can        | Y                         | 819                           | 3.1%                    | 0.7%                 | 157                   | 6%                    | 36%                  |
| McConnell  | Economics (Principles)              | '08  | 17      | US         | N                         | 703                           | 1.8%                    | 0.4%                 | 220                   | 6%                    | 25%                  |
| Parkin     | Economics (Principles)              | '06  | 6       | Can        | Y                         | 788                           | 4%                      | 1.2%                 | 201                   | 9%                    | 44%                  |
| Ragan      | Economics (Principles)              | '08  | 12      | Can        | Y                         | 885                           | 3.4%                    | 1.3%                 | 193                   | 7%                    | 34%                  |
| Stiglitz   | Combined Micro/Macro                | '06  | 4       | US         | N                         | 905                           | 2.6%                    | 0.7%                 | 163                   | 6%                    | 29%                  |
| Samuelson  | Economics (Principles)              | '05  | 18      | US         | N                         | 715                           | 4%                      | 1.1%                 | 108                   | 15%                   | 56%                  |

**Averages:**

| Goodwin    | Combined Micro/Macro                | '08  | 1 & 2   | US         | N                         | 884                           | 6.9%                    | 4.5%                 | 86                    | 25%                   | 85%                  |

**Averages:**

| Goodwin    | Combined Micro/Macro                | '08  | 1 & 2   | US         | N                         | 884                           | 6.9%                    | 4.5%                 | 86                    | 25%                   | 85%                  |
or one sentence referring to the environment for a chapter to qualify as including environmental content sets a low threshold. Students might miss a single sentence or five words in a whole chapter and thus not be reminded of environment-economy linkages. Furthermore, a chapter that just met the minimum threshold of five words or one sentence is likely to be unable to communicate that much about such linkages.

In comparison with the standard texts, the sustainability-oriented texts by Goodwin had higher scores on almost all measures. Although at 4.4% the proportion of total content that addresses the environment in the Goodwin micro volume came in below Krugman micro’s 5.4% and Frank’s 5.1%, the Goodwin micro textbook clearly outscored the others when sections devoted to externalities and public goods were excluded from the standard texts (Goodwin does not follow the standard presentation of externalities; the section in Chapter 6 of the macro volume on “Accounting for the Environment” was considered an equivalent since it is focuses on the environment and is omitted in the second calculation; though arguably an instructor using Goodwin’s text would be unlikely to omit this material). The Goodwin macro text, with 9.6% (6.6% if the aforementioned section is subtracted) far exceeded the other macro volumes. In amalgamated form, the Goodwin texts came in at 6.9% (4.5% excluding the aforementioned section). Environmental content was more evenly dispersed in the Goodwin texts, as the number of consecutive pages without environmental content was at the low end of the scale; 23% to 27% of pages had at least some environmental content; 84% to 87% of the chapters had environmental content using the same criterion of at least five environmentally-related words or one sentence.
Figure 1: Sustainability-relevant text as a proportion of total text in textbook

- **SUSTAINABILITY-RELEVANT CONTENT IN FULL TEXT**
- **EXCLUDING CHAPTERS ON EXTERNALITIES & PUBLIC GOODS**

*Separate micro and macro volumes amalgamated.

<table>
<thead>
<tr>
<th>Standard Textbooks</th>
<th>6.9%</th>
<th>4.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRANK*</td>
<td>3.1%</td>
<td>1.2%</td>
</tr>
<tr>
<td>KRUGMAN*</td>
<td>3.3%</td>
<td>1%</td>
</tr>
<tr>
<td>MANKIW*</td>
<td>3.1%</td>
<td>0.7%</td>
</tr>
<tr>
<td>MCCONNELL</td>
<td>1.8%</td>
<td>0.4%</td>
</tr>
<tr>
<td>PARKIN</td>
<td>4%</td>
<td>1.2%</td>
</tr>
<tr>
<td>RAGAN</td>
<td>3.4%</td>
<td>1.3%</td>
</tr>
<tr>
<td>STIGLITZ*</td>
<td>2.6%</td>
<td>0.7%</td>
</tr>
<tr>
<td>SAMUELSON</td>
<td>4%</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

*GOODWIN
Figure 2: Distribution of environmental content in textbooks

- % PAGES WITH ENVIRONMENTAL CONTENT
- % CHAPTERS WITH ENVIRONMENTAL CONTENT (AT LEAST 5 WORDS OR ONE SENTENCE PER CHAPTER)

*Separate micro and macro volumes amalgamated.
The results show that despite the fact that literature on linkages between growth and environmental degradation dates back over 30 years (e.g., Meadows et al. 2004), most of the environmental content was concentrated in the micro volumes of the texts, and the environment received relatively little emphasis in the macro volume. This finding seems to be consistent with Daly's (1991) argument that the economics discipline lacks an environmental macroeconomics.\footnote{Daly (1991) points out that while at the microeconomic level mainstream economics theory is adequate as a means to analyze the externalities created in economic transactions and it can assist in optimization by equating marginal benefits to marginal costs, in macroeconomic theory there is no accounting for the issue of the scale of the overall economy relative to the biosphere. Optimization is not carried out at the macroeconomic scale to ensure the marginal costs of growth are set off against the marginal benefits of growth.}

While the quantitative assessment reported above gives some indication of the emphasis placed by the various textbook authors on covering environment-economy linkages, it gives little insight on the content. For instance, it does not illuminate the perspective taken in the standard textbooks towards the challenge of sustainability (e.g., whether content takes environmental problems seriously or is dismissive of them) or the sophistication involved in such coverage. This issue is addressed later in this chapter.

### 5.2.1 Breadth of coverage

Table 5 provides an overview of the breadth of sustainability-relevant issues, concepts and terms that appeared in the different texts (see Section 4.3 for an explanation of how the issues/concepts/terms included in this table were selected). It indicates that even if a student were to read all the standard texts included in this study, they would be exposed to a narrower range of issues, concepts and terms than they would by reading the pair of Goodwin texts. Some caution is needed in interpreting this table. The fact that one of the markers shows up in a given textbook and is reported in this table does not imply that the text provides information that will help students better understand a particular aspect of the sustainability predicament. For instance, note that all of the standard textbooks (in amalgamated form) address the limits to growth debate. However, as will be shown below,
Table 5: Occurrence of selected concepts relevant to sustainability

<table>
<thead>
<tr>
<th>ISSUES/CONCEPTS/TERMS</th>
<th>FRANK</th>
<th>KRUGMAN</th>
<th>MANKIW</th>
<th>McCONNELL</th>
<th>PARKIN</th>
<th>RAGIN</th>
<th>STIGLITZ</th>
<th>SAMUELSON</th>
<th>GOODWIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acid rain</td>
<td>✓</td>
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<td>✓</td>
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</tr>
<tr>
<td>Bioaccumulation</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>✓</td>
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<td>✓</td>
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the debate is generally presented in a manner that implies that those who have learned to “think like an economist” should come to see how concerns about limits are misplaced.

5.3 RQ2 – How textbooks conceptualize the environment

What does content analysis of such PoE textbooks indicate with respect to how environment-economy linkages and sustainability are conceptualized?

In the process of coding the texts it became apparent that from an EELS perspective, the mainstream and sustainability-oriented variants were substantially different. It should be noted that the standard texts do vary somewhat in the degree to which they express confidence in the market mechanism, their enthusiasm for government involvement in the economy and their emphasis on distributional issues. As is shown above, the emphasis given to environment-economy linkages and other sustainability-relevant content also varied amongst the standard textbooks. However, there was relatively little variance with regard to promoting economic growth or presuming that higher levels of consumption are desired. Of the standard textbooks, no major differences were found between Canadian and US editions on dimensions of interest for this study. Accordingly, in the following discussion, the standard texts are treated as a representative body of literature.

Selected passages from the standard textbooks are quoted and discussed below to give the reader a richer understanding of how the standard textbooks treat a number of environment-economy linkages. Other passages are discussed in the context of what I label as the containment strategy, which appears in Section 5.4 below. I begin by examining how the standard textbooks describe the subject matter of economics and the perspective they take on markets, since this sets the overarching context in which EELS are considered.

The textbooks tend to limit the scope of economics, focusing on the science of choice under scarcity.

Economics is the study of how people make choices under conditions of

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62 It should be kept in mind that the issues discussed in the following section apply in varying degrees to individual textbooks.
Since Robbins’ (1935) influential essay on steps that could be taken to make economics more scientific, this focus on choice as the realm of economics is well-accepted within mainstream economics. Feminist economists have advocated for economics to be recast as being concerned about provisioning to meet society’s needs (Nelson 1993), the approach used in the Goodwin textbooks. Indeed, before Robbins, the subject matter of economics was not so narrowly cast, as a quick perusal of Marshall’s (1920) introduction to the discipline or even Smith (1776) original treatise will confirm.

From a sustainability perspective, it is problematic to characterize the domain of economics as being the science of choice under scarcity. The lens of choice results in textbook content and students’ attention being heavily weighted towards issues of market exchange, price formation and exploring the implications of marginal changes, since these all have to do with the making of individual choices and optimization. It limits attention to environment-economy linkages, such as where natural resources come from, how resources are utilized and where waste products end up, since these matters are not merely issues of individual choice. Further, since the consumer’s preferences, which are assumed to guide choice, are taken as givens, an examination of whether consumption is in fact contributing to wellbeing, and the possibilities that less consumerist lifestyles might offer for reducing environmental impact, are avoided (Lutz and Lux 1979; Costanza et al. 2007; Konow and Earley 2008). It should also be noted that the lens of choice focuses on the individual (since individuals choose) and neglects the community (Marglin 2008). It also downplays the fact that the poor, with their limited income, are largely unable to make meaningful choices in market settings. In addition, it tends to push out of view issues such as why market economies can result in the superfluous wants of the rich being attended to while the pressing needs of the poor remain unmet (Nelson 1993; Beneria 2003; Van Staveren 2009, 2011), an issue whose importance escalates as human demands on the biosphere begin to exceed available biocapacity (Daly 1992a).

Since the existing distribution of wealth and income is largely taken as given, the focus on choice reduces the relevance or importance of scrutinizing the distribution of wealth and how
wealth is accumulated (e.g., what wealth is due to actual wealth creation, such as value-added through production, vs. what wealth is derived from the liquidation of natural resource stocks or is merely reallocated through such processes as the seizure of lands from indigenous peoples). Because choice is largely understood within economics as choice within markets, there has been a tendency to downplay provisioning activities within the household and other informal economic activity (Waring 1988; Ferber and Nelson 1993; Nelson 1993; England 2003). The standard textbooks also tend to take as given or leave unexamined institutional aspects of markets. This despite the key role that institutions play in shaping market society and hence the context in which choice takes place (Polanyi 1944; Bromley 2006; O’Neill 2007; Ostrom 2008).

The texts argue that scarcity emerges because humans have insatiable desires:

*For better or worse, most people have virtually unlimited wants. We desire various goods and services that provide utility. Our wants extend over a wide range of products, from necessities (for example, food, shelter, and clothing) to luxuries (for example, perfumes, yachts, and sports cars).*  
*(McConnell, p. 7)*

Northrop (2000, 54) has argued that in beginning with scarcity in the context of unlimited material desires, textbook authors are engaged in an ad hoc formulation of society’s core economic problem and implicitly adopt a problematic normative position, lumping as equivalent a poor person’s desire for food with a well-off person’s desire for jewellery. In this framework, there is thus no differentiation made between basic needs and conspicuous consumption. The desirability of expanding the amount of private goods that a given individual can consume is taken as given. The environmental impacts of consumerism are not subjected to critical examination. As will emerge below, the notion emphasized by the texts that scarcity is inherent to the human condition seems inconsistent with the texts’ argument that natural resources in aggregate are not scarce in terms of acting as binding constraints on growing levels of economic activity.

The textbooks leave the impression that economists have given the market a scientific seal of approval. Mankiw’s text contains one of the more enthusiastic endorsements of the market:

*We can now better appreciate Adam Smith’s invisible hand of the*
marketplace…. The benevolent social planner doesn’t need to alter the market outcome because the invisible hand has already guided buyers and sellers to an allocation of the economy’s resources that maximizes total surplus. This conclusion explains why economists often advocate free markets as the best way to organize economic activity. (Mankiw micro, p. 158)

However, the textbook endorsement of the market is elsewhere qualified, since externalities or other distortions may impede economic efficiency:

But the invisible hand isn’t always our friend. It’s also important to understand when and why the individual pursuit of self-interest can lead to counterproductive behaviour. (Krugman macro, p. 3)

The default presumption regarding the desirability of market outcomes in the standard texts contrasts with the more nuanced and sceptical assessment of what markets can deliver commonly found in the sustainability literature (Bromley 1998). Of particular relevance to sustainability is the tendency of markets to oversupply private goods (e.g., stereos and jewellery) and undersupply public goods (e.g., a clean atmosphere and conservation areas) (Galbraith 1998), as well as their inability to factor in the needs of future generations (Norgaard and Howarth 1991). Such issues would ideally receive more attention.

The textbooks are strongly supportive of economic growth, although this enthusiasm for growth is somewhat tempered by the small amount of space given over to documenting the limitations of GDP as an indicator of social welfare. Growth is also presented as enabling a reduction in pollution as well as investments in improved environmental quality:

Growth has allowed economies to reduce pollution, be more sensitive to environmental considerations, set aside wilderness, create national parks and monuments, and clean up hazardous waste, while still enabling rising household incomes. (McConnell, p. 315)

Note how in the above passage, that which is sacrificed or lost as a result of growth is omitted. For instance, natural areas that children once explored are paved over. With ever more cars on the streets, the neighbourhoods that were once tranquil become noisy and polluted. Also, “wilderness” existed before growth and without growth, there would likely be less need to protect wilderness areas.
Under current conditions, despite some progress in dematerializing and reducing the energy intensity of industrial economies, increased GDP generally implies increased throughput of matter and energy. Rather than seeing increasing throughput as a sign of economic health, ecological economists argue that a healthy economy would be one that achieves high levels of wellbeing with a minimal amount of throughput (Boulding 1966; Daly 1992a; Hall et al. 2001). Except for a small number of local pollutants, empirical data does not support the notion that nations create less of an environmental burden and better protect the environment as their income increases (Rees 2003a; Dinda 2004). This becomes especially evident when one factors in the environmental impacts that are associated with imported products, since so much manufacturing has been outsourced to developing nations (Wada 1999; Muradian et al. 2002). A comparison across nations found there was limited variance in ecological footprint per unit of GDP. Although affluent nations have been shown to have a somewhat higher level of eco-efficiency, or lower impact per unit of GDP, the improvement is insufficient to offset the footprint created by the increased levels of consumption associated with higher levels of income, and is far below that which would be necessary to achieve sustainability (York et al. 2004). Given that continued economic growth has been shown to do little to advance human wellbeing in rich countries, while at the same time growth poses fundamental challenges to achieving sustainability, the relevance of re-examining the textbooks’ commitment to growth in GDP becomes apparent (Ayres 2006; Victor 2008; Jackson 2009b; van den Bergh 2009).

The standard textbooks downplay the importance of energy and natural resources to industrial economies and fail to explore both the implications of such high rates of resource throughput for sustainability and the viability of ongoing economic growth. For instance, McConnell appears to have concluded that natural resources and energy are of limited interest to most instructors since the chapter on the topic is not included in the textbook and instead must be downloaded. The environment is generally dealt with by the texts in a stylized manner that is not drawn from actual environmental problems, and is frequently abstracted away from such problems entirely:

*Suppose that two factories—a paper mill and a steel mill—are each dumping 500 tonnes of gloop into a river each year. (Mankiw micro, p. 217)*
Traditionally, economists also have highlighted the importance of a third input, land, but in modern industrial economies land is of secondary importance. For most purposes, it suffices to focus attention on the three major markets—product, labor, and capital—and this text will follow that pattern. (Stiglitz micro, p. 15)

Mankiw’s use of “glop” rather than an actual pollutant makes his case easier to fit into a mathematical form, but reduces the value of the text’s lesson on actual pollution problems. In abstracting away from land (which includes resources), textbooks tend to proceed with analysis in a manner that violates the first law of thermodynamics, the conservation of matter and energy, by including production functions where output in the form of material goods that have energy embodied within them are produced without requiring any inputs or generating any wastes. Conceptualizing economic problems in this way seems unlikely to contribute to enhancing students’ understanding of environment-economy linkages, since much of our contemporary environmental predicament has to do with the effects of extracting and processing resources and disposing of resulting wastes.

Many passages recognize the aesthetic value of the environment but downplay the essential role it plays in supporting human wellbeing, recalling the simplified portrayal of environmental issues common in the 1960s and 70s. Given the everyday connotations of terms like “dirty” and “clean,” which are sometimes used in such passages (connotations such as “the bathroom is dirty, please clean it”), this terminology might encourage simplistic notions that should environmental problems occur, the environment can generally be “cleaned up” to a pre-existing state.

Put another way, in a very dirty environment, a little cleanliness will be much prized, but in a very clean environment, a little more cleanliness will be of only small additional value. (Ragan, p. 410)

The characterization of the environment in the textbooks is difficult to reconcile with contemporary understanding of ecosystems as complex, interrelated and hierarchical systems, and fails to recognize how human pressure on the environment can lead to discontinuous and irreversible changes (Ludwig et al. 1993; Holling 2001; Limburg et al. 2002).
Sometimes language and examples trivialize the extent of the current ecological predicament. For instance, in a discussion on limits to growth, Samuelson acknowledges that growth can imply the loss of natural habitat using the wording: “…displace trees, wolves and marsh reeds…” (p. 363). It seems unlikely that students would link this mention of displaced marsh reeds with how the loss of wetland ecosystems can have significant effects on other natural systems as well as on human wellbeing or sustainability. As a result of this type of stylized description of the environment and the trivialization of environmental issues, the standard texts are unlikely to add to student knowledge about environment-economy linkages or to result in students appreciating the severity of the environmental predicament and the challenges it entails for how society organizes economic activity.

The textbooks generally downplay how environmental deterioration affects human health. Indeed, it often appears as though there are no linkages between health and the environment or that one must be traded off for the other:

*As society we must choose among healthcare, national defense, and the environment.* (Parkin, p. 2)

Where the linkage between health and the environment is discussed, it is described in an abstract and euphemistic manner that misses an opportunity to convey to readers the consequences of environmental degradation for human wellbeing:

*Air pollution continues to cloud major U.S. cities, imposing large costs in terms of reduced property values and increased health care expense.* (McConnell, p. 592)

Some of the passages may have the effect of reassuring students that, aside from some difficulties in resolving problem areas like global warming, environmental trends are improving:

*Today, Lake Erie supports a fishing industry, just as it did in the 1930s. No longer treated as a garbage dump for chemicals, the lake is regenerating its ecosystem.* (Parkin, p. 383)

While it is undesirable to make students feel despondent about future prospects and important to show that effective environmental policies can be devised and implemented, an
overemphasis on reassuring students may result in a misapprehension of the extent of the sustainability challenge. The fact is that globally, despite three decades of discussions and policies intended to improve sustainability, many environmental indicators continue to worsen (United Nations Environment Program 2005a; Fischer et al. 2007).

The standard texts provide an introduction to the limits to growth debate that favours dismissing concerns about limits and is unreliable and out-of-date. For instance, the Club of Rome study, which initiated the modern limits debate, is incorrectly described by Ragan:

*Extrapolating from the oil shortages caused by the OPEC cartel, the Club of Rome concluded that industrialized countries faced an imminent absolute limit to growth.* (Ragan, p. 634).

As the foreword to *Limits to Growth* makes clear, the computer modeling exercise was initiated following a meeting of the Club of Rome in April 1968. The results were published in 1972. The OPEC oil embargo did not begin until the fall of 1973. Clearly, the authors of *Limits* could not have based their analysis on the oil shortages caused by OPEC. Nor did they describe the limits as imminent, as many of the scenarios showed that several decades of growth would be possible before the system reached overshoot and collapse (Meadows et al. 2004, xx).

One strategy that is used to defeat the limits to growth arguments is to attack a strawman:

*Most economists, however, agree that absolute limits to growth, based on the assumptions of constant technology and fixed resources, are not relevant.* (Ragan, p. 635)

This argument fails because neither Malthus, the original *Limits to Growth* report nor many exemplars of more recent analysis are based on the assumption that technology remains constant (Swart et al. 2005; United Nations Environment Program 2005b; Raskin et al. 2010). For instance, Malthus assumed that food production would keep expanding (though not exponentially) in part via improvements in tillage (Malthus 1806), while the Club of Rome study included a scenario that explored the implications of unlimited availability of nuclear energy, resources and pollution control (see Chapter IV of Meadows et al. 1972).
The essential role of energy in supporting economic activity and in explaining past growth (Cleveland et al. 1984; Hall et al. 2003; Ayres and van den Bergh 2005; Ayres 2008b; Warr et al. 2008) is neglected in the standard textbooks. Instead, the textbooks rely on population growth, technological progress and capital investment as variables to explain economic growth.

In fact, the huge changes in living standards that modern economies have experienced over the past two hundred years and the truly amazing differences between the economy in 1900 and the economy in 2000 are in large part due to technological change. We are not manufacturing more of the same goods as the economy in 1900. We are making goods that the people of 1900 never dreamed of. Key to the whole process of economic growth, then, is technological progress—thinking up new ways to do not just old things but also entirely new things. And for this reason, ideas are central to explaining economic growth. (Stiglitz micro, p. 453)

There is of course nothing wrong with helping students appreciate the extent to which knowledge has improved, the ways that technology has advanced and societies have invested in manufactured capital, or how these factors have played an important role in enabling economic growth. From a sustainability perspective, however, it would be advantageous for students to be aware of the extent to which technological progress has both enabled and depended upon dramatic increases in the levels of energy and material used, and how these increases have led to environmental impacts.

The textbooks present an optimistic perspective on the future supply of non-renewable natural resources. With little theoretical justification or empirical evidence, Samuelson claims that the market does an adequate job of allocating such resources over time:

Important examples of appropriable, non-renewable natural resources are fossil fuels such as oil, gas, and coal. Economists argue that because private markets can efficiently price and allocate their services, such natural resources should be treated the same as any other capital asset. (Samuelson, p. 379)

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63 The textbooks rely on the neoclassical production function, \( Y=F(K,L) \), with resources usually omitted; energy is downplayed, though gasoline and oil often appear in the textbooks as commodities used to illustrate market phenomena, such as using the effect the OPEC oil embargo had on prices to illustrate the interaction of supply and demand.
The fact that the prices of natural resources have not risen over long time periods is presented as evidence that scarcity is not increasing and that concerns about natural resource scarcity are unfounded:

*If we were depleting natural resources faster than their discovery, we would see the prices of those resources rise. That has not been the case for most natural resources; in fact, the prices of most of them have declined. And if one natural resource becomes too expensive, another resource will be substituted for it.* (McConnell, p. 315)

There are problems with the arguments suggesting that markets can be relied upon to allocate natural resources over time and that falling resource prices indicate that concerns about natural resource scarcity and limits to growth are unfounded. First, it should be noted that such arguments sidestep key contemporary concerns with respect to sustainability because they approach the issue of limits by focusing on the potential for resource exhaustion, but downplay the impacts on ecosystems caused by resource extraction (e.g., habitat loss from developing the tar sands) and disposing of the wastes generated by high levels of natural resource consumption (e.g., accumulation of heavy metals in the environment). Current thinking suggests that when it comes to how non-renewable resources constrain growth, the more pressing problem is not depletion, but rather how high levels of natural resource extraction and consumption threaten to overwhelm the environment’s assimilative capacity (Meadows et al. 2004; Simpson et al. 2005). For instance, there is enough coal remaining to supply demand for several more centuries, but if it was all combusted without sequestering the resulting CO₂, the resulting global warming would be catastrophic (Jaccard 2005; Haberl et al. 2009). With respect to renewable natural resources, most of the economically important stocks are already being overharvested (United Nations Environment Program 2005a). Even if one were to accept the textbooks’ focus on assessing the potential constraints to growth by focusing on the supply of non-renewable resources, there are a number of reasons that market prices cannot be relied upon as an indicator of scarcity. These are discussed below under Section 5.4.2.3.

The textbooks sometimes mobilize the argument that since countries like Japan are rich despite being resource-poor, natural resources are no longer important to rich countries:

*The second classic factor of production is natural resources... the possession*
of natural resources is not necessary for economic success in the modern world... Many countries, such as Japan, had virtually no natural resources but thrived by concentrating on sectors that depend more on labor and capital than on indigenous resources. (Samuelson, p. 558)

The above statement would be less likely to mislead students into believing that rich economies have dematerialized were it made clear that the economies of Japan and other industrialized nations actually consume prodigious amounts of natural resources and can thrive despite having limited resource stocks within their borders only so long as other nations have and are willing to sell them the raw materials needed to support industrial production (Wada 1999; Muradian et al. 2002). Furthermore, much of the South to North trade in resources results in the displacement of environmental burdens to poorer countries (Muradian et al. 2002, 2002; Giljum and Eisenmenger 2004).

Parkin and McConnell both contain, but do not substantiate, the claim that human knowledge can transcend resource limits, which was commonly made by Cornucopians like Julian Simon (1981) in the early limits to growth debate:

Moreover, say economists, economic growth has to do with the expansion and application of human knowledge and information, not of extractable natural resources. In this view, economic growth is limited only by human imagination (McConnell, p 317)

More broadly, improvements in knowledge and technological progress are often portrayed as reducing the economy’s resource requirements and environmental impacts and hence reducing the likelihood that there might be limits to growth:

The technological advances that bring economic growth help us to economize on natural resources and to clean up the environment. For example, more efficient auto engines cut gasoline use and reduce tailpipe emissions. (Parkin, p. 452).

Human knowledge and information can help improve the eco-efficiency with which resources are used and can help expand the pool of resources where exploitation is technically feasible (though such expansion typically involves ecological consequences). However, human knowledge and technology do not allow for doing away with resources. People eat food, not ideas, and live in houses made of wood, cement and steel rather than
those constructed out of mere information. Thus, in an economic context, knowledge’s usefulness depends in large part on there being raw materials to work with; while knowledge may improve efficiency of use, it is not a substitute for natural capital (Victor 1991, 2009; Daly 1992a).

Discussions of the environment are sometimes accompanied by passages that describe positions taken by environmentalists. The environmentalists’ perspectives are caricatured in PoE textbooks and they are regularly portrayed as being ignorant of rudimentary economic theory:

\[
\begin{align*}
\text{Despite the stated goals of some environmentalists, it would be impossible to prohibit all polluting activity. For example, virtually all forms of transportation—even the horse—produce some undesirable polluting by-products. But it would not be sensible for the government to ban all transportation. (Mankiw micro, p. 217)} \\
\text{Many environmentalists are sceptical about the efficiency and desirability of markets. Some do not understand economists' reasoning as to why markets can be, and often are, efficient mechanisms for allocating scarce resources. Others understand the economists' case but reject it, although few complete their argument by trying to demonstrate that direct government controls will be more effective. (Ragan, p. 420)}
\end{align*}
\]

It is unclear who the authors intend to include under the environmentalist label; does this label include professionals working in the environmental sector, scientists with advanced training conducting research to better understand ecosystem processes or merely campaigners paid by ENGOs and volunteer activists? The diversity of perspectives held by the environmental community is largely lost in the standard textbooks and it seems as though many textbook authors have drawn upon the least sophisticated exemplars of environmental thought. Consistent with the lack of referencing and attribution that other researchers have found in principles texts (Paxton 2007), rarely do the texts quote specific environmentalists or provide sources that allow readers to verify the accuracy of the text’s description of the positions and claims supposedly put forward by environmentalists. Most importantly, cogent critiques of prevailing economic policies offered by those who are concerned about the state of the environment do not appear in the texts.
The textbooks perpetuate the unfortunate confusion introduced by Hardin’s (1968) classic but poorly named\(^{64}\) article, “The Tragedy of the Commons” (Hardin 1998; see Dietz et al. 2003). Concerned about the implications of population growth, Hardin sought to shed light on situations wherein common-pool resources are overharvested or degraded due to a misalignment between individual incentives and collective interests. The problem occurs because like Hardin, the textbooks conflate open access (where no property rights are defined and there are no management rules, enforcement mechanisms or sanctions for overharvesting) with common property regimes (where the members of a group have defined property rights to exploit a common-pool resource under a set of collectively derived rules and use enforcement mechanisms and apply sanctions to ensure compliance (Ostrom 1991; Ostrom and Cox 2010). This confusion is reproduced in Parkin:

*The term "tragedy of the commons" comes from fourteenth century England where areas of rough grassland surrounded villages. The commons were open to all and used for grazing cows and sheep owned by the villagers. Because the commons were open to all, no one had an incentive to ensure that the land was not over grazed. The result was a severe overgrazing situation. During the sixteenth century, the price of wool increased and England became a wool exporter to the world. Sheep farming became profitable, and sheep owners wanted to gain more effective control of the land they used. So the commons were gradually enclosed and privatized. Overgrazing ended, and land use became more efficient. (Parkin, p. 370)*

As a result, the standard texts often misdiagnose natural resource management problems and provide a pessimistic assessment of the viability of collective responses to resource management and environmental challenges, instead tending to favour a property rights approach. The textbooks explain the enclosures that took place in England as a necessary step towards improving the productivity of agricultural land, ignoring the empirical data showing that in the open field system predominant in England, rights to use were carefully defined, enforcement mechanisms were in use, sanctions for non-compliance were applied, management was effective and innovative and enclosure did not result in increased yields (Allen 1982, 2001; Marglin 2008, 299–307). The textbooks fail to mention that the enclosures took place in part because members of a dominant class forced a change in

\(^{64}\) Hardin (1998) conceded that he should have added “unmanaged” before commons.
property rights entitlements to better suit their personal interests, and that a large portion of the population lost its means of subsistence and suffered gravely as a result (Neeson 1993).

Beyond the issues of the common-pool resources, there is other content that seems to be oriented towards having students accept that by creating property rights, the management of natural resources can be improved and pollution can be abated:

In each of these instances [referring to timber overexploitation, restrictions on oil imports, excessive withdrawals from groundwater], private property rights and market outcomes would have supplied solutions that almost everyone in society would regard as better than what happened. (Stiglitz micro, p. 418)

As part of the discussion of property rights solutions, the textbooks devote considerable space and give significance to the Coase theorem:

Ronald Coase...was the first to see clearly that if people can negotiate with one another at no cost over the right to perform activities that cause externalities, they have the incentive to arrive at an efficient solution. This insight, which is often called the Coase theorem, is a profoundly important idea, one for which Coase (rhymes with "dose") was awarded the 1991 Nobel Prize in Economics. (Frank micro, p.284)

The attention given to the Coase theorem bears examination, since it comes with the proviso that there must be no transaction costs, and only applies in those rare instances that bargaining is possible and efficient. It is thus inapplicable except in circumstances that are generally trivial from an environmental perspective. Furthermore, Coase was wrong to ignore the wealth effects involved in the initial assignment of property rights (Bromley 1991) and failed to consider how more clearly-defined private property rights may undermine other mechanisms for addressing environmental problems such as by drawing on people’s norms (Bowles 2004, 499). The economic profession’s enthusiasm for the theorem may be in part due to a misreading of its implications; since it initially appears to indicate that well-assigned property rights will do a better job than the government, it seems to undermine the case for

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65 Coase himself acknowledged that efficient bargaining was an unrealistic assumption and pointed out the costs involved in determining whom one needed to bargain with, in carrying out the negotiations, in drafting a contract, and in ensuring the terms of the contract were being followed (Coase 1960, 15). As soon as there are more than two parties then free riders can undermine the agreement to compensate.
government intervention in the economy (Bowles 2004, 227). This is how Mankiw uses the theorem in his textbook (see page 230), stretching the theorem’s implications well beyond what is plausible (see discussion in Chapter 6 of Hahnel 2010). Textbook authors may believe that it is important to introduce students to the Coase theorem because it reflects a way station visited by the economics profession as it sought to adjust economic thinking to address increasing social concern over worsening environmental conditions. However, covering the Coase theorem at a first-year level seems unlikely to add much to student capacity to understand the environmental and resource management challenges of sustainability.

While clearly defining private property rights can sometimes lead to improved environmental outcomes, the textbook story is often too simplistic. The coverage these ideas receive in these texts would seem to contribute to what Ostrom refers to as the panacea problem (Ostrom and Cox 2010), wherein a simplistic institutional solution is applied to a diverse set of problems in a way that does not reflect the underlying complexity of managing social-ecological systems. In many instances, both past experience and economic theory show that private property regimes can lead to resource overexploitation or environmental degradation. For certain common-pool resources, reinstituting and reinvigorating common property regimes or public ownership (in a manner that reflects the concurrent need for governance systems, monitoring and the like to reflect the complexity involved in social-ecological systems), is a more likely route towards sustainable management (Clark 1973; Bromley 1991, 1992; Ostrom 1991; Dietz et al. 2003; Freyfogle 2003; O’Neill 2007).

The textbooks place considerable emphasis on the use of economic instruments to improve environmental outcomes. There is some acknowledgement that estimating the marginal external costs of pollution so as to determine the efficient level of pollution can be difficult:

*It may not be easy to calculate the social costs and benefits of pollution... Calculating the marginal social costs of pollution requires that we put a dollar value on the environment. But what is the cost of the extinction of a species like the spotted owl? What is the cost of the acidification of lakes that kills the fish—and with them any possibility of freshwater fishing? Calculations are possible, but there will always be a range of uncertainty.* (Krugman micro, p. 488)
Despite such hedging, the considerable space devoted to the exposition of pollution charges and tradable emission schemes in the standard texts, and the space invested in demonstrating how such tools are more efficient than regulation, may leave students with the impression that the estimation of marginal external costs can generally be undertaken, and that pollution charges and tradable emission schemes can be applied to most environmental problems (and that regulation is generally inefficient and best avoided). Given current economic structures there is little doubt that getting prices to better reflect environmental impacts through the application of market mechanisms will be an essential component of moving towards sustainability, and in this sense the texts make a useful contribution to enhancing student knowledge. However, the texts generally do not do justice to the many instances where pollution charges and tradable emission schemes are impractical, unlikely to succeed or have been found to be of limited effectiveness. In part, this is because such instruments are largely geared toward dealing with “end-of-pipe” environmental impacts, which offer limited possibilities for environmental improvement (Ayres 2008b). As well, modern production processes involve a diversity of inputs and outputs and entail a level of complexity that complicates the textbook story to the point that it is unlikely to be able to address a broad range of environmental problems. How and where environmental burdens are distributed must be considered for ethical, environmental justice and ecological reasons (given variations in population density, socioeconomic status and geographic factors that affect the assimilation and health effects of pollutants), yet economic instruments are not always able to address these dimensions of the problem effectively (Beder 1996; Bailey 2002). In practice, research in the US has shown that during the process of implementing economic instruments, politicians redesign them in a way that leaves the economic optimality of their theoretical form behind, in part to take into account ethical considerations (Tietenberg 1998).

While the textbooks largely confine their coverage of environment-economy linkages to sections that cover externalities and public goods, these sections stand disconnected from the remainder of the text where the environment receives scant notice, leaving students with economic theory that would seem to lack coherency. For instance, if in one chapter it is acknowledged that market prices do not reflect environmental costs, it is somewhat
disingenuous to presume the desirability of growth in other chapters, as taking those costs into account might show that further growth would involve marginal costs that exceed marginal benefits. In part, such problems arise because the textbooks ground their discussion of environmental matters in the concepts of market failures and externalities. I now turn to some criticisms that have been made of the market failure / externality model.

Given that ecosystems are complex, interconnected systems subject to discontinuities of which humans will always have incomplete knowledge (Limburg et al. 2002), it is not possible to fully understand how ecosystem services support human wellbeing and how human activity can erode this capacity in the future. Efforts to estimate marginal external social costs are quickly overwhelmed by the analytical task of working through interdependencies and complex causal chains that cannot be completely specified (Kapp 1970). In order to correct market failures through a property rights approach, it would have to be possible to define property rights over all environmental attributes. However, many environmental attributes cannot be bounded and demarcated in a manner that would make property rights meaningful (Bakker 2005, 2010), and compressing all the information on an environmental attribute into a single metric involves a loss of information that is important to the choices being made (Vatn and Bromley 1994). The cost of either developing pollution charges / tradable permit schemes / markets to reflect external costs or of precisely defining property rights for all environmental attributes would be prohibitive in many instances (Marglin 2008, 283).

Critical of these types of approaches, Herman Daly has suggested that approaching the environment through the externality lens involves tacking on the environment as an afterthought, meaning that the commonly used wording of “internalizing externalities” is “revealingly contradictory” (Daly 1992a, 88). Other scholars have argued that the externality lens limits the conceptualization of the environmental predicament and thereby fails to identify potential policy solutions (Norgaard 1985; Berger 2008). For instance, the

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66 An extreme case can be used to show how the externality lens offers limited insight on causes of and solutions for environmental problems. Consider the case of Crusoe living on a small, isolated island (without Friday). In the course of the economic activity of provisioning himself, through ignorance or
externality lens does not deal with the scale of the overall economic system relative to the encompassing natural systems upon which it depends (Daly 1992a, 43). Nor does it adequately address environmental degradation that is not directly associated with human economic interests (since there will be no external social cost to add as a corrective to prices), give sufficient weight to impacts on the poor (whose income is insufficient to demonstrate willingness to pay for environmental quality) or acknowledge the myriad instances when the environmental impacts of economic activity cannot be predicted or are distant in time (since future generations cannot intervene in current markets). Further, much externality literature suffers from theoretical incoherence because the analysis uses a framework of methodological individualism whereby agents are assumed able to independently analyze situations in which there is inherent physical interdependency between agents (Vatn and Bromley 1997). Since they are focused on restoring economic efficiency, in a context where the existing distribution of wealth is a given, they are seen to prioritize decisions made in markets over decisions that might be made with democratic institutions to address pollution (Bromley 2007). Finally, because the approach of solving externality problems via accounting for marginal social costs is premised on motivating changes in the behaviour of individual agents, it is ill-suited for dealing with certain issues that require collective action, such as land use planning and investing in suitable infrastructure. For instance, even if Pigovian taxes that increased the price of gasoline to reflect environmental impacts were put in place, it would be hard for individuals to opt for low-emission transportation in a sprawling city where public transit is infrequent and stretched to capacity.

The theoretical coherence of internalizing externalities is also brought into question by the incommensurability involved in equating the value of a given state of the environment to the value of market goods. In other words, the externality approach assumes that making choices between producing stereos or computers is equivalent to making choices between producing necessity, he degrades resource stocks that he depends upon for subsistence and contaminates streams that he drinks from. Since there is no market exchange and no third parties are involved, there are no externalities (since there are no other islanders and environmental impacts are localized). In this instance, "getting prices right" does not apply (there is no exchange). Thus, through the economic activity of producing food and shelter, Crusoe has created a sustainability problem that the externality lens does not help him understand or solve. The biophysical throughput perspective, on the other hand, still draws attention to the relevant problems.
stereos or protecting critical habitats that certain persons depend upon for sustenance. Yet there is no universal unit that can adequately represent all values. Since individuals and communities have certain ethical value commitments and abide by principles that exclude particular objects and activities from being exchanged in market transactions (e.g., selling one’s child is not acceptable, National Parks are not for sale, no matter the price offered), in many instances there is no defensible means of estimating marginal social costs (O’Neill 2007). Finally, it is important to recognize that if prices are not actually changed through the application of pollution charges and the like, then the values calculated to capture externalities are merely “rhetorical devices in arguments with governments” (O’Neill 2007, 43).

Were the texts to complement the externality lens with a broader conceptualization of environment-economy linkages, they would have the potential to provide students with greater insight into the nature of the environmental predicament. For instance, if texts provided a brief overview of the implications that the first and second laws of thermodynamics have for the economic process, students could come to understand that although the economic process conserves matter and energy, production and consumption require withdrawals from natural resource stocks, the loss of usable energy and the generation of wastes that are emitted to the environment (Georgescu-Roegen 1971; Daly 1995; Ayres 2008b). Grounding models of the economy in biophysical reality brings to the fore issues that have both economic and environmental dimensions and that deserve students’ attention: what resources are being used, at what rate are they being extracted, what wastes are being generated, what ecosystem services are being degraded as a result—and what can be done to improve the sustainability of the economy. Nor does taking this broader perspective deny the contribution to sustainability that might be made by an appropriate set of environmental taxes or other market instruments, which ecological economists have themselves long called for (Daly 1992a, 61–68; Weizsäcker and Jesinghaus 1992; Ekins 1999).
5.4 PoE textbooks: are they written so as to contain a green critique?

In the course of coding and analyzing the textbooks, I noticed that they seemed to follow a template that I eventually labelled the “containment strategy.” While ecological economics textbooks highlight the challenges that economic growth causes for sustainability, and discussions of limits occur throughout the text, the mainstream texts acknowledge this debate, critique the position of growth pessimists and confine consideration of limits to this section. It seemed that the mainstream textbooks had been written to ensure that arguments a student might encounter about the sustainability of modern economies in general and economic growth in particular (which the standard textbooks all advocate for) would be neutralized or contained. By acknowledging that arguments in favour of the existence of limits exist and offering rejoinders to them, a firewall is constructed and the remainder of the textbook can be written in a way that takes as given the desirability of continued economic growth, per capita income and increased consumption levels.

In arguing that textbooks incorporate a containment strategy, I do not wish to imply that authors necessarily intend to undermine their readers’ openness to limits to growth arguments. Authors may merely be following the template given by Samuelson’s textbook, which as of the ninth edition, tackled the limits to growth argument, or may be reiterating various arguments mainstream economists have made against the limits thesis (e.g., Solow 1974), rather than intentionally mapping out the best way to ensure limits to growth arguments do not undermine the plausibility of the textbook’s commitment to growth. However, the persistence of such arguments in contemporary editions of textbooks examined suggests that the content of the containment strategy is useful to lecturers and/or is endorsed by the profession.

When it comes to the actual impact of the containment strategy on students, some students will not read the pages in question and lecturers may well skip the relevant pages in class (especially if their students seem uninterested in environmental issues). Other students, even

\[67\] For instance, by p. 16 of Daly and Farley’s (2004) Ecological Economics textbook, students learn about limits. Chapter 7 is entitled: “From empty world to full world.”

\[68\] Samuelson was responding to the Club of Rome’s report, which had just been published in 1972.
if they encounter the relevant content by reading the textbook or via lectures, may be little influenced by the arguments marshalled against limits. Such students may still find aspects of the green critique convincing and hence may question the plausibility or desirability of the textbook’s normative positions concerning growth and consumption. However, these passages also give lecturers who face questions about limits the option of referring students to the relevant passages and then carrying on as before. Further, they could serve to refresh the lecturer’s memory of the profession’s accepted arguments for rebutting the limits to growth thesis. Finally, these passages signal to the lecturer that the textbook author subscribes to a position that seems to be widely accepted in the discipline (Barnett and Morse 1965; Solow 1974, 1997; Stiglitz 1974; Beckerman 1995).

Seeking to move from the uncertain ground of an impression to a fuller and more transparent analysis, I decided to methodically analyze how the textbooks set up their presentation of the potential for resource depletion and ecological limits, such as the accumulation of waste products, to affect the viability and desirability of economic growth and ever-increasing levels of per capita income. This section summarizes this analysis and evaluates whether the textbooks have been written in a way that could contribute to containing the impact of arguments founded on resource and ecological limit concerns and prevent these arguments from calling into question prevailing macroeconomic theories and policies.

5.4.1 Elements of the containment strategy

Using the content analysis of textbooks, I identified elements that related to the presentation of the limits to growth argument, including the textbooks’ overarching rationale in favour of economic growth and arguments and evidence used to reject the notion that there are limits. This list of elements was used to populate the rows of Table 6. I then tabulated the elements found in each of the texts.
Rows a-d of the table summarize the key arguments in favour of growth. All texts portray the problem of scarcity as one of the key economic problems that society must address. Growth is presented as a way of attenuating scarcity and GDP as a measure of growth and progress. Wellbeing improves with growth and a rising GDP. Rows 1-17 contain the various elements of the containment strategy, which include introducing the ideas of Malthus and then explaining how history has shown him to be wrong.

With respect to how the containment strategy is assembled in each textbook, the authors vary in the elements they include, the order in which they are presented and the degree of emphasis given. It should be noted that the total amount of space devoted to the elements of the containment strategy in a given textbook is limited to about two to five pages. Much of this content tends to be addressed in one chapter and is concentrated in one place, with some elements addressed in other chapters. The average textbook draws upon 13 of the 17 elements of the containment strategy; Samuelson draws upon the most using 16; Krugman the least, at seven. While Krugman references Malthus, he is also the only author who does not cover the contemporary limits to growth debate. Thus, the containment strategy is only weakly present in the Krugman text.

Once this tabulation was completed it became clear that there was remarkable consistency across textbooks. Although, as documented earlier in this chapter, little space is devoted to addressing environment-economy linkages, the textbooks mention that various people have raised concerns about resource depletion, environmental degradation and potential limits to growth. These inclusions contribute to the credibility of the textbooks because they demonstrate familiarity with the issues. The textbooks then provide plausible arguments as to why concerns about limits to growth can be set aside. With these arguments in place, the desirability of growth, ever-increasing levels of per capita income and consumption into the indefinite future can be taken as unproblematic in the remainder of the text. At the same time,

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69 The term scarcity is used somewhat imprecisely in the texts, since it is used interchangeably to refer to: i) a situation where people want more of a good than is available; ii) in the definition of economics as the challenge of allocation when human wants are (assumed to be) unlimited; 3) in the contexts of limits to growth discussions to an absolute limit in the availability of natural resources. Various authors have discussed this issue including Daly (1992a, 39–44), Baumgärtner et al. (2006) and Daoud (2010).
the texts provide explanations for the overexploitation of common-pool resources, the undersupply of public goods and other environmental problems that are seen as arising because of externalities. They also offer solutions to such problems such as economic instruments, clearly defined property rights or appropriate regulations. Thus, while the textbooks counterattack and neutralize concerns about limits, they do not ignore environmental problems altogether. Rather, they offer the economist’s way of thinking on how to understand both the origins of environmental problems and the most efficient solutions. However, the textbooks generally do not link resource depletion and the degree of environmental degradation to economic growth.

Of interest is the degree of consistency in the arguments mobilized across all the textbooks, save Krugman’s. This unity suggests that authors, or the lecturers and departments who make textbook adoption decisions, consider it important to address the limits to growth debate and contain its possible impact on core economic principles and the normative positions infused through PoE on the desirability of growth, production and consumption.

5.4.2 An analysis of how the containment strategy is deployed

In the following section I illustrate selected elements of the containment strategy by quoting and discussing relevant passages from the Canadian edition of Mankiw’s Principles of Macroeconomics and Principles of Microeconomics. My focus is on providing evidence that substantiates my claim that there is a containment strategy at work and to document my reasoning for believing that this strategy and the arguments that it incorporates are problematic if universities are serious about their sustainability commitments. I do this by drawing on the theoretical framework developed from the ecological economics literature documented in Section 3.2.

5.4.2.1 The claim to defend: growth as beneficial

The textbooks in this study contend that scarcity is an inherent economic condition faced by humanity, that growth helps attenuate scarcity, that GDP is used to measure economic progress and serves as a proxy for progress and wellbeing and that wellbeing tends to
improve with growth and rising GDP. These arguments are shown as rows a) to d) in Table 6. For instance, Mankiw refers to the desirability of policies that “enlarge the economic pie” (p. 13). He takes as given that maintaining a high standard of living (more precisely, high average per capita income) in rich countries should be an overarching public policy objective and an important priority for economists:
Table 6 Occurrence of containment strategy elements by textbook

<table>
<thead>
<tr>
<th>Arguments for growth to defend</th>
<th>Textbook with example page references (a=macro, m=micro)</th>
<th>Total Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Economic problem = scarcity</td>
<td>88a 5a 4a 4 2 4 71 4 8</td>
<td></td>
</tr>
<tr>
<td>b. Growth helps alleviate scarcity</td>
<td>44a 4a 12a 125 9 193a 4 7</td>
<td></td>
</tr>
<tr>
<td>c. GDP as measure of growth / progress</td>
<td>44a 169a 98a 106 417 393 93a 408 8</td>
<td></td>
</tr>
<tr>
<td>d. Wellbeing improves with rising GDP / economic growth</td>
<td>44a 4a 139a 36 40 179 93a 408 8</td>
<td></td>
</tr>
<tr>
<td>Containment strategy element</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Acknowledge limitations of GDP as a measure of progress / welfare</td>
<td>122a 177a 113a 118 447 492 105a 438 8</td>
<td></td>
</tr>
<tr>
<td>2. GDP can be inflated by proceeds from depleting natural capital</td>
<td>122a 116a 452 105a 439 5</td>
<td></td>
</tr>
<tr>
<td>3. GDP can be inflated by pollution clean up costs</td>
<td>122a 177a 119 452</td>
<td>439 5</td>
</tr>
<tr>
<td>4. GDP does not account for changes in environmental quality</td>
<td>122a 177a 113a 119 242 492 105-116a 438 8</td>
<td></td>
</tr>
<tr>
<td>5. GDP &quot;good enough&quot; indicators notwithstanding limitations</td>
<td>125a 177a 113a 125 447 493 442 7</td>
<td></td>
</tr>
<tr>
<td>6. Malthus early economist who questioned growth</td>
<td>283a 157a 743 179 202a 561 6</td>
<td></td>
</tr>
<tr>
<td>7. History has shown Malthus to be mistaken about limits</td>
<td>203a 157a 179 202a 563 5</td>
<td></td>
</tr>
<tr>
<td>8. Introduce the contemporary limits to growth debate</td>
<td>138a 146a 314 440 634 208a 562 7</td>
<td></td>
</tr>
<tr>
<td>9. Limits persist even after hearing</td>
<td>138a 146a 315 440 617 562 6</td>
<td></td>
</tr>
<tr>
<td>10. Substitution occurs as a resource becomes scarce</td>
<td>138a 146a 317 440 635 208a 563 7</td>
<td></td>
</tr>
<tr>
<td>11. Technological innovation can increase efficiency of resource use and decreases impact</td>
<td>138a 304a 146a 317 440 636 208a 563 8</td>
<td></td>
</tr>
<tr>
<td>12. Price signals counter emerging scarcity by providing incentives to conserve resources</td>
<td>138a 7a 317 440</td>
<td>208a 360 6</td>
</tr>
<tr>
<td>13. Resource prices have trended down over the long term, indicating that scarcity is not increasing</td>
<td>138a 146a 317 404 360 5</td>
<td></td>
</tr>
<tr>
<td>14. Growth generates wealth, that can be spent on protecting the environment</td>
<td>138a 125a 347 614 105a 379 6</td>
<td></td>
</tr>
<tr>
<td>15. Growth increases per capita income and a richer society demands tougher environmental standards</td>
<td>138a 316 347 614 379 5</td>
<td></td>
</tr>
<tr>
<td>16. Each country tends to have a cleaner environment / better environmental standards</td>
<td>138a 224a 315 347 614 105a 379 7</td>
<td></td>
</tr>
<tr>
<td>17. Clean sectors can be the source of future growth</td>
<td>138a 315 452 636</td>
<td></td>
</tr>
<tr>
<td>Occurrences of containment strategy elements</td>
<td>15 7 13 14 16 13 11 16 13 1</td>
<td></td>
</tr>
<tr>
<td>Finding: containment strategy present?</td>
<td>Yes Weakly Yes Yes Yes Yes Yes Yes Yes 7</td>
<td></td>
</tr>
</tbody>
</table>
5.4.2.2 Element 7: Limits and Malthus’s mistake

After introducing Malthus and his thesis that the human population can grow faster than agricultural output, and therefore humanity must either find ways to restrict population growth or face eventual catastrophe (element 6), Mankiw gives the economics profession’s perspective on why Malthus was wrong:

*Where did Malthus go wrong? As we discussed in a case study earlier in this chapter, growth in mankind’s ingenuity has offset the effects of a larger population. Pesticides, fertilizers, mechanized farm equipment, new crop varieties, and other technological advances that Malthus never imagined have allowed each farmer to feed ever-greater numbers of people. Even with more mouths to feed, fewer farmers are necessary because each farmer is so productive.* (Mankiw macro p. 157)

Mankiw’s characterization of Malthus’ writings on population as a forecast that has been proven wrong is somewhat problematic, as Malthus was seeking to describe the tendencies of a system and he did not forecast specific outcomes or dates when the population might crash. He also identified measures that might be taken to correct this tendency, namely postponement of marriage and sexual abstinence, so the fact that the population has not collapsed does not mean his theory has been falsified. If taken too literally, Malthus’ theory can be faulted on the math (e.g., his assumption that population grows in a geometric ratio while agricultural output grows in an arithmetical ratio does not reflect the functional forms that current researchers would use to model agricultural and population systems), and the normative conclusions he and others drew from his theory are deeply problematic (Robbins 2012, 17–18). However, it is more useful to interpret his theory as an early attempt to spell out the consequences of the combined interaction of a population and its environment, taking

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70 Malthus’ theory might be recast in a more suitable functional form by describing population as having the potential to grow exponentially if unchecked, while describing agricultural output as having the potential to increase over time subject to diminishing returns, since even with plausible improvements from genetic engineering, there is only so much solar energy that photosynthesizers can capture and convert into matter that humans can use as food; there is only so much land that can be utilized for food production.
into account the combined effect of increasing population and the diminishing marginal returns of applying labour and capital to land to produce food.

The consensus amongst economists that Malthus was wrong about the possibility of the human population outgrowing its food supply and hence about limits more generally may be eroding. An article recently published in a journal with mainstream economics credentials, the *Canadian Journal of Economics*, suggests that Malthus’ concerns remain valid and that a demographic transition is essential to achieving sustainability, “which is very much a modern translation of what Malthus wrote in 1798” (Brander 2007, 36). Additionally, Jeffrey Sachs has asserted that Malthus has not yet been proven wrong (Sachs 2008). The assertion common to the standard texts that Malthus was wrong may also not resonate well with the 1/3 of the population that suffers from chronic food insecurity, especially as population climbs by another two or three billion.

### 5.4.2.3 Elements 8, 10, 11: Limits, substitution and technological progress

Mankiw introduces the limits to growth debate (element 8) and acknowledges that one’s intuition would suggest that the implications of resource consumption for future growth might be worthy of consideration—but reassures students that economists have reasons for not raising the alarm:

> ...most economists are less concerned about such limits to growth than one might guess. They argue that technological progress often yields ways to avoid these limits. If we compare the economy today to the economy of the past, we see various ways in which the use of natural resources has improved. Modern cars have better gas consumption. New houses have better insulation and require less energy to heat and cool them. Technological advances have also allowed us to access resources previously thought to be too difficult to extract. Such advances have, for example, made it possible to extract much more oil from the oil sands in Alberta than once was thought possible. Other technological advances have resulted in recycling, causing some non-renewable resources to be reused. Finally, the development of alternative fuels, such as ethanol instead of gasoline, allows us to substitute renewable for non-renewable resources. (Mankiw macro p. 146)
The above quote includes two containment strategy components: the potential of technological innovation to increase the efficiency of resource use (element 11) and the potential to substitute one resource with another as scarcity emerges (element 10). The combined effect of these two elements is to suggest that fears about resource limits are likely unfounded. However, there are several problems with Mankiw’s appeal to technological progress and substitutability. First, it should be noted that in this passage, the limits debate has been narrowed down to an issue of availability of non-renewable resources; potential shortages of renewable resources are set aside. Furthermore, the ability of ecosystems to absorb the wastes emitted by a growing economy, and to function and deliver ecosystem services despite the pollution and loss of habitat typically implied by growing consumption levels, are omitted. This despite the fact that in contemporary discussions, these issues are recognized as the factors that are most likely to impose binding constraints on the viability of future economic activity and growth (Simpson et al. 2005; United Nations Environment Program 2005a; Rockstrom et al. 2009).

Also lacking in Mankiw’s reliance on technology to forestall limits is consideration of factors that tend in the other direction (Huesemann 2004), including the Jevons paradox, wherein improvements in the efficiency of resource use can result in an expansion of the number of industries or processes that a given resource can be economically used for, such that consumption of the resource accelerates with efficiency improvements (Sorrell 2009). For instance, cars get better mileage and so people drive further, or builders get better at insulating houses and people expect them to be warmer (or cooler). Historical evidence has shown that aggregate material and energy use in industrialized countries has increased, despite improvements in efficiency, because of the increased scale of the economy. For instance, while the efficiency of steam engines has increased by 50 times from Newcomen’s 1712 model to present, Britain went through a 2,000-fold increase in the use of steam power from 1760 to 1910, such that the effect of scale outpaced efficiency by a factor of 40 or more (Victor 2009). After an extensive survey of the literature on material intensity of use, Cleveland and Ruth (1999, 45) concluded, “Despite claims to the contrary, there is no compelling macroeconomic evidence that the U.S. economy is decoupled from material inputs.”
Mankiw’s argument also fails to account for how the second law of thermodynamics imposes theoretical limits on the efficiency improvements of various technologies (e.g., while a car manufacturer could improve the efficiency of its car engines from, say, 15% to 30%, it is impossible to achieve greater than 100% efficiency and, in fact, the manufacturer is constrained to achieving considerably less). While Mankiw relies on technological progress to solve potential problems of resource scarcity, he fails to account for the ways in which improvements in human knowledge and technological progress can reduce the options available or accelerate environmental degradation. For instance, with improved knowledge, it becomes evident that human activity is stressing the natural environment in unexpected ways and that technologies intended to be deployed will cause unanticipated environmental problems. Better analysis shows that making ethanol from corn has a low Energy Return On Investment (EROI), that GHG emission savings are limited, that growing crops for fuel impinges on the land available for food cultivation and that there is insufficient cropland to produce the ethanol needed to substitute all of the fossil fuel currently used for transportation (Field et al. 2008; Haberl et al. 2009). Developing the technology to exploit Alberta’s oil sands leaves behind the ecological consequences of mining the landscape, extracting the oil and burning the resulting fuel. In the context of a limits to growth argument, it is important to understand that a positive growth rate implies an exponentially increasing GDP, while eco-efficiency improvements made possible by increased human knowledge involve diminishing marginal returns. Since net resource and energy throughput and environmental impact involve multiplying the first exponentially increasing number by the second number, which gets smaller ever more imperceptibly over time, eventually, if unchecked, growth will cancel out even the most aggressive investments in eco-efficiency. The aggregate effect would therefore involve increasing environmental impact over the longer term (Luten 1980; Huesemann 2004; Victor 2009). Furthermore, there are environmental problems that do not easily lend themselves to technological solutions, such as flips in the state of the climate or crashes in fish populations (Victor 2008, 2009).
5.4.2.4 Element 13: Resource prices indicate scarcity is not increasing

A falling trend in resource prices is used by Mankiw to support the claim that resource scarcity is not increasing:

In a market economy, scarcity is reflected in market prices. If the world were running out of natural resources, then the prices of those resources would be rising over time. But, in fact, the opposite is more nearly true. The prices of most natural resources (adjusted for overall inflation) are stable or falling. ... Market prices give no reason to believe that natural resources are a limit to economic growth. (Mankiw macro p. 146)

Mankiw’s argument is weak and distracting. First, note that it focuses on a small subset of resources, most of them non-renewable, whereas as noted above the limiting factors for future human wellbeing are more likely to emerge from the declining availability of renewable resources and degraded ecosystem services. Setting these issues aside, there are a number of reasons that market prices cannot be relied upon as an indicator of the scarcity of non-renewable natural resources (Norgaard 1990; Victor 1991, 2008). Resource owners may face economic incentives to liquidate natural resource stocks if they feel they may lose the right to extract the resource in the future. Victor (1991, 201) argues that prices cannot be considered to provide a signal of natural resource scarcity if markets are not working in accordance with the neoclassical model because the assumptions required for prices to carry normative significance will fail. Norgaard (1990) argues that there is a logical fallacy involved in relying on cost or price paths to detect scarcity, as those exploiting the resource must be informed about the existence of scarcity in order to make decisions about what rate of extraction to use. If they are not informed about scarcity, then prices will be affected by their ignorance. Finally, markets are incapable of dealing with most future contingencies (Marglin 2008); as future generations do not get to bid in today’s markets, they thus do not get to participate in intertemporal allocation decisions (Padilla 2002). Yet the incomes of future generations and therefore the amount they will be willing to pay for resources are affected by decisions about resource use that are made today (Victor 2008).
5.4.2.5 Element 16: Rich countries care about the environment

Mankiw does not directly mobilize the arguments that a richer population cares more about the environment and therefore sets more stringent environmental regulations and that a richer society can invest more in environmental cleanup or national parks. However, these elements can be seen in McConnell and Parkin:

\textit{Growth has allowed economies to reduce pollution, be more sensitive to environmental considerations, set aside wilderness, create national parks and monuments, and clean up hazardous waste, while still enabling rising household incomes. (McConnell, p. 316)}

\textit{...as our incomes increase, we demand a larger range of goods and services, and one of these "goods" is a pollution-free environment. We value clean air, unspoiled natural scenery, and wildlife, and we are willing and able to pay for them. (Parkin, p. 347)}

The argument that increased income leads to better environmental quality (the supposed Environmental Kuznets curve, see (Dinda 2004) for a recent review) is not well-supported by empirical data. While rich countries have had some success in reducing local pollutants and addressing specific environmental problems, by many indicators their impact on the environment has not decreased with growing GDP, and their enthusiasm for environmental initiatives has not been strongly linked to growth. The argument also fails to consider how many rich countries export their ecological footprint by importing raw materials or manufactured products from other nations, in effect displacing environmental impacts. While there have been some notable successes, such as a reduction in SO$_2$ emissions, emission levels of toxic chemicals and CO$_2$ emissions have continued to climb (Rees 2003a; Dinda 2004; York et al. 2004). And the increased income argument does not address the loss of habitat or habitat fragmentation that often occurs as a nation has more money for infrastructure, larger houses, second homes and the like. Ironically, the textbook contention that rich countries have more stringent environmental regulations is incongruent with the sceptical stance towards government intervention taken elsewhere in the text.
5.4.2.6 Element 17: Clean sectors can be the source of future growth

A further defence of growth is the explanation that the characteristics of growth can change, such that polluting sectors of the economy stop growing or even shrink while growth becomes concentrated in clean or non-polluting sectors of the economy. Mankiw does not include this element and so the following passage from Frank serves as an example:

*Increases in real GDP can also arise from new or higher-quality products and services, such as an expanded number of TV channels, higher-quality and more efficient vehicles, and environmentally benign human services (like education or childcare). Thus, economic growth need not take the form of more and more of the same old stuff; it can mean newer, better, and perhaps cleaner and more efficient goods and services. (Frank macro, p. 188)*

The argument that GDP can continue growing without increasing total impact on the environment usually relies on the premise that growth will be concentrated in sectors that have virtually no environmental impacts. However, even solar farms and schools require resource inputs, generate wastes and cause environmental impacts. While from a sustainability perspective, certain forms of growth and changes in consumption patterns are desirable (e.g., growth in solar PV industry, people switching spending from resource-intensive consumption like jet-skiing to environmentally benign consumption such as music lessons), the fact that future growth could, in theory, be more benign is no guarantee that it will be. Furthermore, given that most consumption requires some resource use, even if people shift towards less material-intensive forms of consumption, if the average income grows year after year, eventually the aggregate environmental impacts of such incredibly wealthy, clean-sector favouring consumers will exceed the impact those same consumers would have generated without all the additional wealth, even if in this less wealthy state they did not favour the clean sector. In a precautionary framework, given the existing levels of environmental impact, it seems risky to pursue additional growth without strong evidence that doing so will reduce aggregate environmental impacts.
5.4.3 Mainstream versus sustainability texts and the containment strategy

In contrast to the mainstream textbooks, Goodwin weaves questions of sustainability throughout the text. Rather than seeking to contain the damage that might be done to the main body of the text by student probing about the desirability of growth and the presumption that increasing consumption levels are desirable, worsening environmental conditions are discussed with sophistication in a variety of contexts. In addition, limits to growth are noted and sustainability is taken to be a goal that societies seek to achieve. For example, when the authors conclude their section explaining the Keynesian model, the implications of reducing environmentally harmful consumption for employment levels are discussed:

*But take a moment to consider the implications of this model as it relates to contemporary controversies over consumerism and the environment. In the Keynesian model it does, indeed, appear that keeping consumption and spending at high levels is necessary to keep the economy humming. The idea that cutting back on consumption spending would be "bad for the economy" is based on the Keynesian notion that reductions in aggregate spending lead to recessions or depressions, and that these could potentially be deep and persistent...* (Goodwin Macro, p.228)

5.5 Chapter conclusions

5.5.1 Content analysis

The results of this content analysis show that introductory economics textbooks in use in 2008/2009 in BC, as well as three leading US textbooks – one of which features a Nobel laureate who has written with great concern about the environmental crisis as its lead author – are poorly suited for PoE courses at institutions that have made a commitment to sustainability and are seeking to integrate sustainability across the curriculum. The standard textbooks give little space to content that addresses environment-economy linkages or that is significant to sustainability; many chapters and large blocks of text are devoid of environmental content. Further, the standard textbooks treat the environmental implications of economic activity in an overly-stylized manner that is unrealistic, that will do little to add to student knowledge and that may well confound or even impair student understanding of
the nature of the environmental predicament. They presume that increased consumption is desirable and that it enhances wellbeing despite the fact that beyond modest levels of income, further wealth has little impact on wellbeing. They imply, regardless of empirical evidence that indicates otherwise, that richer countries have less environmental impact than poorer countries. The standard textbooks provide an outdated and skewed presentation of the “limits to growth” debate that in some cases includes factual errors. The textbooks advocate for property rights solutions with little recognition of how private property can contribute to habitat fragmentation, incentives to deplete resources and other environmental insults. They also fail to describe instances where common property regimes or state action have worked to sustain the productivity of natural ecosystems and downplay the prospects for collective action to address sustainability challenges. They include little or no content that might enhance student understanding of how less consumerist lifestyles and the redistribution of wealth might contribute to a move towards sustainability. They also tend to dissuade reliance on government regulation as a vehicle for improving environmental stewardship.

Because the standard textbooks tend to compartmentalize material that relates to the environment in chapters on externalities and public goods, and because some textbook authors explicitly suggest in their preface that those chapters are not core chapters and may be omitted in the event of time constraints (e.g., Parkin, p. xxii), many students in PoE classes that use these textbooks likely receive even less exposure to content that explains environment-economy interactions than the above analysis suggests. Compartmentalization of environmental content implies that the ecological viability of status quo economic policies is left unexamined in other chapters of the textbooks.

5.5.2 Containment strategy

Through content analysis, I documented how the standard textbooks mobilize various elements of what I have labelled a containment strategy. This strategy seems designed to reduce the potential for arguments about limits to growth in order to undermine overarching normative positions in the texts about the desirability of growth and consumption. Selected elements of the strategy were discussed by focusing on how they appear in Mankiw’s textbook.
In the next chapter, building on a fuller understanding of PoE textbooks, I examine how the economists who teach PoE courses at the case study universities view the implications of sustainability commitments for the PoE curriculum.
Chapter 6: Faculty perspectives on principles of economics courses

When I look at a lot of what prominent economists have been writing in response to the ongoing economic crisis, I see no sign of intellectual discomfort, no sense that a disaster their models made no allowance for is troubling them; I see only blithe invention of stories to rationalize the disaster...

Nobel laureate and textbook author Paul Krugman71

6.1 Chapter overview

Having now reported the analysis of how introductory economics textbooks address environment-economy linkages and sustainability in the previous chapter, I first report on how the 11 economists who shape and deliver PoE curriculum at the three case study universities viewed the implications of their university’s sustainability commitments with regard to the integration of sustainability into PoE. I then document the perspectives of nine SOP professors, all of whom have students who are encouraged or required to take PoE.

The interview data reviewed below documents that for the PoE lecturers interviewed, sustainability was not considered to be a salient concept. For the most part these instructors were unaware of their university’s sustainability commitments. While they recognized that environment-economy linkages are downplayed in the course, over half of the lecturers nevertheless characterized PoE as offering tools and insights that assist students with attending to sustainability. While the PoE lecturers described various aspects of the course that are problematic, there was little enthusiasm for, and considerable resistance to, integrating sustainability into the curriculum, especially as doing so might reduce the time to teach what they considered to be ‘core theory.’ I also found little to indicate that lecturers foresaw that the integration of sustainability might create problems for the plausibility or coherence of the economic theory being taught in PoE.

In contrast to their colleagues in the economics department, sustainability was a concept that was salient for the SOP professors. They generally expressed dissatisfaction with the PoE course—in part because they saw it as overly ideological and unacceptably naïve about environment-economy linkages. Indeed, during the time frame of the study, one of the departments dropped it as a required course for its students and replaced it with an in-house course in ecological economics. Thus, I argue that within the academy, PoE may have arrived at a juncture where, though it has long been positioned as a foundational course for a significant proportion of students, it may be losing its status and credibility. Economics departments at some institutions are facing new competition in the instruction of economic theory from elsewhere in the academy. However, at the present time, only a small number of students would have the opportunity of taking courses that offer an alternative to the mainstream perspective on economics.

6.1.1 Notes on reporting conventions

To protect participant confidentiality, the names of economics lecturers and SOP professors have been replaced with pseudonyms. To differentiate the two populations, the PoE lecturers have been given names that begin with a consonant, while those of SOP professors begin with a vowel.

All participant quotes are identified by an attribution in curly brackets/gull wings, such as the following:

It was specifically designed for that purpose, yeah {Simmons a43}

Note that interviewee Younge did not want the interview recorded digitally but was willing to accept note taking; quotes from this person are thus not verbatim.

As explained in the methodology chapter, in the analysis that follows, it must be kept in mind that not every participant answered every question in the guide and that some answered additional questions. This should be taken into account when interpreting the tabulation of results.
6.1.2 Population of economists participating in the study

The characteristics of the population of the 11 economists associated with economics departments from the three case study universities who participated in the study are detailed in Table 7.

Table 7: Breakdown of the sample of economists participating in the study

<table>
<thead>
<tr>
<th>Participant type</th>
<th># of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenured faculty</td>
<td>6</td>
</tr>
<tr>
<td>Tenure-track faculty</td>
<td>1</td>
</tr>
<tr>
<td>Contract (sessional) faculty</td>
<td>4</td>
</tr>
<tr>
<td>Males</td>
<td>8</td>
</tr>
<tr>
<td>Females</td>
<td>3</td>
</tr>
<tr>
<td>UBC participants</td>
<td>3</td>
</tr>
<tr>
<td>SFU participants</td>
<td>4</td>
</tr>
<tr>
<td>UVic participants</td>
<td>4</td>
</tr>
<tr>
<td>Microeconomics only</td>
<td>6</td>
</tr>
<tr>
<td>Macroeconomics only</td>
<td>1</td>
</tr>
<tr>
<td>Principles</td>
<td>3</td>
</tr>
<tr>
<td>Economic Policy</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
</tr>
</tbody>
</table>

The study population included full professors, tenure track professors and contract (sessional) faculty; at least two of the tenured department members interviewed also had current or past experience at higher levels of university administration/governance (department chair or above). Both women and men were represented at each of the study sites; however, if my analysis made clear the gender of a given participant, some interviewees could easily be identified. Given that eight of 11 of interviewees are male, I have reported all results using the male pronoun. I did not make this decision lightly and before doing so I checked for, but did not find, clear patterns in participant responses when they were analyzed by the participant’s gender.

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72 Many sections of PoE courses are taught by contract faculty / sessionals. Two of the sessionals interviewed had recently obtained a PhD and at the time of the interview they were focused on landing a tenure-track position that would allow them to pursue their research interests. The other two sessionals interviewed were teaching more than one section of PoE each term, were not actively engaged in research, were not seeking tenured positions and had already taught as sessionals for 5 or more years.
Some participants, especially sessionals, teach several sections of PoE every year, while others, notably tenured faculty, usually only teach one section per term and do not necessarily teach PoE every year. While there might be some modest benefit in reporting the level of seniority for each participant in the analysis that follows, respecting the confidentiality of participants was a priority, and assurances of confidentiality likely helped ensure that the interviews were candid. Accordingly, all participants from economics departments are labelled as lecturers (since this is the one attribute they share in common) while the SOP participants are all labelled professors (for the same reason). There is no intent in using these labels to imply a hierarchy between the two populations.

6.1.3 Analysis of interview data

Before focusing on what the data shows with respect to my research questions, I set out the broader context of participant views with respect to current environmental predicaments, the conceptualization of environment-economy relationships, societal interest in sustainability, sustainability commitments made by universities and schools of economic thought that might call into question aspects of mainstream economics theory.

6.1.3.1 Perspectives on current environmental conditions and trends

Since the interview guide did not include specific questions on participant assessments of sustainability or current environmental conditions and trends, data on these topics mostly arose spontaneously as a reaction to the interviewer describing the study’s purpose. Since past research has shown that many mainstream economists tend to downplay the environmental crisis (Ravaioli 1995), it is relevant to review how participants perceived current environmental conditions and trends and how the views they expressed about sustainability when they volunteered this information.

The participants ranged from those who were dismissive of environmental concern {Brennan, Karsten} to more moderate positions that appeared to accept current environmental conditions and trends as a legitimate cause for concern {Felton, Moffett, Napier, Phelps, Simmons, Reynolds}. Even so, individuals who promote an environmental
agenda were sometimes portrayed by participants as making unreasonable demands that need to be balanced against economic priorities. Of the participants, four stated or volunteered information that suggested they were personally concerned about current environmental conditions and trends {Napier, Phelps, Simmons, Reynolds}.

Karsten, a climate change sceptic, spoke of “general hysteria with global warming” {a421}, attacked the Limits to Growth report and referred to environmentalists in disparaging terms. In response to the interviewer mentioning recent studies which suggest troubling environmental trends, Karsten mocked those who raise environmental concerns:

\[\text{Oooouuu [gestures, as if he is a ghost trying to spook someone, then he laughs]. Now we enter the doom phase. I've been around this for a long time. So you realize you know [laughs] so you know we've got all kinds of flim flam artists coming in and saying “oh we have to worry about this, oh we have to worry about that.” No, you know the CO}_2\text{ levels that we have, the anthropogenic part of it is incredibly small to begin with.} \{\text{Karsten a339}\}\]

6.1.3.2 Perspectives on sustainability

Sustainability as it is understood in this dissertation is not a concept that appears to have great resonance amongst the interview participants: there were several critics of sustainability, but no clear advocates of sustainability. At the more sceptical or hostile end of the range, Brennan directly contested the concept of sustainability, seeing it as a loaded word, an undefined concept that carries with it a set of values that are not explicitly defined; as he stated, there is a “religion of sustainability” {a127}. For Brennan, there is no sustainability problem. Since the market system creates incentives to conserve resources {a29-35}, human self-interest implies an interest in sustaining ourselves; the fact that humanity is still around implies we have been doing something right:

\[\text{Brennan: Here we are, we've been around for 5000 years or 10,000 years or 10 million years, whatever you want. I mean we sustain ourselves, we survived, so it [sustainability] has got be more than that that. Out of pure self-interest. Well here we are, and I'm an economist, so Adam Smith kind of articulated this, pure self-interest is enough to sustain us because out of our own self-interest we have an interest to sustain ourselves. So what do I need someone telling me to do, which is only natural for me to do anyways?}\]

\[\text{Interviewer: So what if we looked at civilizations from the past that have collapsed because they didn't survive—}\]
Brennan: That's my whole point, we are the sustainers.

Interviewer: How do we know we are not on a collapse path?

Brennan: Yeah, the world could end tomorrow, right. So we've been doing something right forever but now suddenly, it seems like the onus is on somebody else to show us that this is wrong. So on the empirical side that doesn't make much sense but on the theoretical side as well if it's in our interest to sustain ourselves, why do we need a course on sustainability? {Brennan 15-23}

Felton described sustainability as an idea that for the economics profession is problematic because it is not well-defined {a137}. Quillen appeared to be amenable to societal interest in sustainability, but as will be discussed later, this may be because his interpretation of sustainability includes an economy that grows indefinitely {a89}.

Phelps was concerned about the state of the environment, supportive of university education promoting environmental literacy, but appeared to be sceptical about the concept of sustainability, labelling it as a “fluffy catch-all phrase” {a29}. It should be noted that Phelps’s scepticism appeared to be grounded in a careful reading of the literature that explores how sustainability might be operationalized in economic terms:

And so, there are these different sort of ways economists have tried to kind of think analytically about sustainability, and sort of nail down what it means. So the sort of natural one to start is this sort of idea of there being a natural capital stock, and this sort of idea that we should hand over to future generations some adequate amount of the natural capital stock. And some people’s notion of sustainability is an unchanged quantity of the natural capital stock. But then you—. What’s the natural capital stock? What is that? Does that mean we never use any depletable resources? Do we not mine any exhaustible resources? I mean there are good environmental resources to think about not necessarily mining all the coal out of the ground, but leaving them aside, it’s not clear that groundwater shouldn’t be necessarily depleted at one time or another in a certain place or a certain time. {Phelps a25}.

Other than Phelps and Simmons it seemed that PoE lecturers were not familiar with or did not tend to engage with the environmental science or sustainability literatures. This might in part be explained by the process required to gain credentials in economics. Quillen described
the need for PhD students in economics and junior scholars to specialize during their apprenticeship, limiting the time available for learning from other disciplines:

So you have a very, very long apprenticeship in economics. In the sense that you take something like 16 courses during your graduate studies, you have three comprehensive exams that you need to write, and so this is before you ever write a paper, before you ever do any research. So you’re in third year of your PhD or 4th year of your PhD before you start writing and people that we hire are people that often haven’t published a darn thing. ... So it’s a very, very long apprenticeship period and it’s a huge mistake to become unfocused, about wanting to be a generalist. What you’re doing is you’re working on some very narrow little problem. Now is that different from the other social sciences? Absolutely, big time. But what it’s like is the sciences. So I’m not saying that’s good or bad, it’s just the way it is. {Quillen 137}

6.1.3.3 Perspectives on sustainability commitments made by universities

Three participants, Brennan, Karsten and Phelps, specifically commented on the sustainability commitments made by their university—none favourably. The first two were dismissive because they rejected the premise behind such commitments that environmental trends are worrisome and that societal interest in sustainability is warranted. Karsten was initially concerned that the interview was an attempt by the university to audit whether its sustainability commitment had been implemented in the classroom, although he had received no notice that this was the administration’s expectation {a7 and email correspondence with author, 11/01/25}. After some clarification on the purpose of the study and my assurances that he was not being audited, he elaborated on his strong scepticism of sustainability:

Yeah. It’s all this rhetoric right. And its absolutely the Emperor has no clothes what so ever. We could teach the principles of economics. We could have a section dealing with sustainable economic development. If there was any content to that idea. {Karsten a19}

Phelps was sceptical, despite his professed concerns about the state of the environment, because he did not know what it means for a university to be sustainable:

What does it mean for a university to be sustainable? I don’t know what anyone means by that. Is it economically sustainable? Environmentally sustainable? Sustainable in that we’re providing good education to each generation of students? I don’t know. But I know that if we talk about particular goals I know what we mean. I know, I find it a slippery phrase and one that people sort of throw around and pull out of their pockets and
lay on the table as some kind of “Thou Shall Be Sustainable” that doesn’t actually get us anywhere. That’s my view. {Phelps a29}

6.1.3.4 Perspectives on heterodox economic theory

While it was clear that most participants wanted to imbue their students with an interest in mainstream economics, there was little or no interest in introducing students to non-mainstream schools of thought. This despite the fact that a couple of the participants differentiated themselves somewhat from the mainstream, such as an economist who described himself as an economist working in the neoclassical tradition, but in a manner that takes institutions into account. None of the participants who discussed ecological economics, Marxism or feminist economics during the interview did so in a positive light.

While Phelps explained that he was not sure about the current state of ecological economic theory, it was, in his view, not that fundamentally different from mainstream economics, except that ecological economists sometimes engage in questionable methodologies such as those utilized in Costanza’s (1997) paper on the value of the world’s ecosystem services {a67}. However, he is amenable to “more opening up of these sub-disciplines that carve themselves off from each other” {a95}.

6.1.4 RQ3 – Perceptions of PoE’s relevance and adequacy w.r.t sustainability

How do economists who teach or are involved in setting PoE curriculum in standard economics departments perceive the existing PoE course in terms of its relevance to sustainability and the adequacy of its treatment of sustainability?

One of my motivations for conducting the interviews was to generate data on how economists in standard economics departments who teach, or are involved in setting introductory economics curriculum, perceive the existing introductory courses in terms of their relevance to addressing sustainability and the adequacy of their treatment of environment-economy linkages and sustainability. I found that sustainability was not a salient concept for these lecturers; none of them explicitly addressed sustainability in PoE and all 11 participants acknowledged that EELS do not get much attention in the course.
In Table 8 below, participants’ views are tabulated for a number of attributes relevant to understanding their views on the relevance of PoE courses to sustainability and the adequacy of their treatment of sustainability. As can be seen, all 11 participants at one point or another in their interview indicated that PoE curriculum downplays EELS, yet at the same time, 6 offered that nevertheless, the courses offer some insights that help students understand EELS. Only one participant offered the opposing view that the typical PoE course would be of little value in helping students understand EELS.

While none of the participants could be described as wholeheartedly embracing sustainability or as characterizing it as a societal priority, lecturers portrayed economics as having a contribution to make to understanding and taking action on problems such as climate change and the management of common-pool resources. They also recognized that it provides guidance for taking a balanced approach to addressing environmental problems so as to avoid undue constraints on economic activity that would limit human welfare.

Lecturers brought up a range of issues with respect to the PoE course that provide relevant context to interpreting this research question. Issues they raised included the challenges involved in teaching a course that is for economics majors and non-majors alike, the amount of material that is to be covered, the difficulty of finding a satisfactory textbook, challenges students encounter in thinking using abstract models and the level of student preparedness.\textsuperscript{73}

\textsuperscript{73} Although I do not detail it here, some participants also described aspects of PoE that they enjoyed teaching and positive feedback about the course they had received from students.
Sustainability has no merit

As documented in Section 6.1.3.2 above, for Brennan and Karsten, there is no sustainability problem, or sustainability is a concept that has little or no merit. Accordingly, sustainability has no relevance for PoE curriculum. Though Brennan had many complaints about the curriculum used in most PoE courses, this has nothing to do with adequacy from an EELS perspective. Karsten questioned whether the current generation has obligations towards future generations since their consumption preferences are unknown, and explained that he stays “completely away from anything that has to do with sustainability, I can assure you” [a139].

### Table 8: Categorization of responses relevant to research question three

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Brennan</th>
<th>Felton</th>
<th>Gorski</th>
<th>Karsten</th>
<th>Quillen</th>
<th>Moffett</th>
<th>Napier</th>
<th>Phelps</th>
<th>Simmons</th>
<th>Reynolds</th>
<th>Younge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainability has no merit</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EELS not within scope of PoE</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PoE curriculum downplays EELS</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>PoE textbooks downplay EELS</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>PoE curriculum unsatisfactory with respect to EELS</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PoE delivers tools and insights relevant to addressing EELS</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>PoE can help address misconceptions held by SOP students</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Student values change with PoE</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A blank indicates that the participant did not comment on this particular topic, a checkmark indicates that their view as interpreted from the available interview data is consistent with the attribute as described, while an 'X' indicates that the view they expressed is inconsistent with the attribute.

## 6.1.4.1 Sustainability has no merit

As documented in Section 6.1.3.2 above, for Brennan and Karsten, there is no sustainability problem, or sustainability is a concept that has little or no merit. Accordingly, sustainability has no relevance for PoE curriculum. Though Brennan had many complaints about the curriculum used in most PoE courses, this has nothing to do with adequacy from an EELS perspective. Karsten questioned whether the current generation has obligations towards future generations since their consumption preferences are unknown, and explained that he stays “completely away from anything that has to do with sustainability, I can assure you” [a139].
6.1.4.2  EELS outside PoE mandate

Three participants volunteered that until the interview, they had never considered the relevance of sustainability and environment-economy linkages to the PoE curriculum. When asked what environmental content students will encounter in first year economics, Younge interrupted the interview, went to his desk, pulled out the PoE textbook he was using and spent 2 or 3 minutes examining the table of contents before explaining how the question had reminded him that there is a chapter on the environment in the textbook that he has not covered in recent iterations of the course:

You’ve reminded me that there is a whole chapter on the environment. The problem is that there is a time constraint in teaching introductory economics. I would like to include the environment in the course. The question is, if I do it, how do I do it? I have included it in the past. I’ll have to give it some thought. It’s certainly an option. But I can’t do it unless I cut something else out. In a first year course, once you subtract time for exams and other disruptions, you basically only have 11 weeks to teach. {Younge a43}

As an example of someone who sees PoE as unrelated to EELS, Moffett noted that EELS are not in the course textbook: ⁷⁴ “It’s not even in this book, so I don’t think externalities is even a standard topic… I have never seen externalities covered. I wouldn’t say it’s a standard practice to cover that part.”  {a123}.

Most participants run out of time to cover material and therefore prioritize teaching the ‘core’ economic theory, or as Brennan explained, “We are to talk about cost, value, equilibrium, maximization”  {a225}. As a result, they are not usually able to devote adequate time to content that is relevant to understanding and addressing environmental problems.

⁷⁴ Note that the leading textbooks considered in this study do have sections on externalities that attend to the environment. This comment was unexpected.
6.1.4.3 PoE textbook and curriculum downplay EELS

Felton, Quillen, Phelps, Simmons and Reynolds described PoE textbooks as omitting, downplaying or addressing EELS simplistically or as an afterthought. Four participants, Napier, Phelps, Simmons and Reynolds, suggested that the PoE curriculum is unsatisfactory in its treatment of EELS. Napier explained that he had never considered including the environment in PoE, but that as he is personally concerned about the environment, as a result of the interview process he will probably include more such content in future iterations of the course {a54}; however, the potential curriculum changes that this lecturer contemplated during the interview were incremental in nature.

6.1.4.4 PoE curriculum unsatisfactory with respect to EELS

Two of the participants, Phelps and Simmons, were highly critical of the typical PoE courses; they saw students as leaving the standard PoE course without having learned much. The fact that instructors often fail to cover public goods and externalities is unsatisfactory. In their assessment, too much time and emphasis is placed on covering technical material that is too abstracted from reality and does not actually help students understand the economy; this leaves little time for covering externalities and other EELS-relevant material. Phelps’s disappointment with most PoE courses is palpable:

*It has the potential to give good insights [with respect to environmental issues]. I think, frankly, the way we teach often times with many universities, with many instructors across the board across the entire world of education that I've experienced, I think we teach introductory economics badly. On all dimensions. Whether it’s environmentally, or—, we teach students badly. Like we give them a very bad sense of what economics is and we sort of drive away good students in droves, ‘cause they walk away thinking we’re on crack. {Phelps a41}*

He described the typical PoE course acerbically, highlighting all its shortcomings {a53-a55}. He was frustrated with the fact that when he has taught upper year economics courses, about 75% of his students claim to have never encountered the concept of externalities in earlier economics courses {a55}. This helps explain why students get the incorrect impression that economists always love markets:
He commented on his disappointment that students can come out of an economics course and not understand how a carbon tax provides an incentive to change individual behaviour, explaining that his students believe that people would just pay a carbon tax without their decisions being influenced {a255}. He is an advocate of dramatically reshaping PoE so as to better emphasize market failures (of various types) and would like to throw out the textbooks, but his attempts to go beyond incremental reforms have been met with resistance from fellow faculty {a55, a171, a183}.

Reynolds said that personally he believes more attention should be put on EELS in PoE, but based on how the economics department has designed the course, he has to focus on core concepts and theory:

So personally, I think we should spend more time on that [environment-economy linkages]. And based on the design of the course, my understanding is that is not our focus, so our focus is just on economic issues and how we use concepts and theory to analyze economic issues. Yes and personally, I think, yes, that is important. Yeah, we should include more connection between the environment and economic issues. It’s closely related. And every economic activity will generate some unintended outcome. So we’ll damage the environment, so it should be considered, definitely. {a75}

### 6.1.4.5 PoE courses offer insights relevant to addressing EELS

Although PoE courses do not address sustainability head on, 6 of the lecturers suggested that the course offers tools and insights relevant to addressing sustainability and understanding environment-economy linkages. The topics, concepts and tools addressed in PoE include

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75 Note that this comment was not referring back to the carbon tax exercise that is discussed in the next chapter.
market failures, the concept of opportunity costs, the limitations of GDP as a measure of welfare and the need to carefully weigh both costs and benefits when making public policy decisions. Reynolds explained that SOP students would gain from learning about benefits and costs and the intended and unintended consequences of a policy, and then referred to the environmental impacts of growth:

So students should have the knowledge and the tools to do the policy analysis. And of course it can be applied to the consequence of economic growth, right, the damage to the environment. And if the country has a pro-growth policy, and what is the downside of the policy. {Reynolds a83}

Despite his deeply felt scepticism of sustainability and climate change, Karsten stated that he believes PoE provides students with knowledge that will help them engage with environmental issues, for instance helping students understand how GDP is calculated and its limitations {a115, a139}.

6.1.4.6 PoE clears up misconceptions held by SOP students

While Simmons has seen that many students are interested in the economics of the environment, he finds that students arrive from other programs with the view that economics is the problem, not part of the solution {a111}. In his view economics can be “extremely useful to deal with environmental problems” {a107}. For Younge, PoE is a place where misconceptions and biases held by SOP students, such as the idea that the environment must be saved at all cost {a109}, can be remedied:

Students who come from some environmental program come with their built-in biases, for instance that any growth is bad. One of our jobs is to open up their minds. These students have this idea that economics is biased towards consumption and using up resources. An important question to ask is why are those environmental students coming in with those biases, why are they already alienated from economics? I can tell you, it’s frightening to have to deal with these biases, whether it be about democracy or about the environment. {Younge a105}

Brennan explained how he spends time going over the limits to growth debate to explain why the Club of Rome’s projections were wrong:

I will use my Club of Rome stuff, go through a bunch of graphs that they have and I have graphs that show things ending long before the turn of the
6.1.4.7 Influence of PoE on student values

When discussions of how PoE might influence student values came up (prompted by Marglin’s quote, which suggests that PoE promotes selfishness, and the related literature reviewed in Section 2.7.3 on whether studying economics makes students more selfish because mainstream models typically assume that individuals act in their self-interest), three interviewees {Moffett, Napier, Reynolds} rejected the notion that PoE might induce student values to shift towards more selfish behaviour. Other participants did not comment on the matter.

6.1.5 Summary findings, RQ3

The economists interviewed deemed PoE curriculum to be problematic. Lecturers described how students, especially those who are not majoring in economics, have difficulty relating to the abstract content. For the most part, changes that participants contemplated making to PoE curriculum or instruction had little to do with EELS. While the PoE lecturers acknowledged that textbooks and curriculum downplay EELS, only a minority saw this as a problem. There are a variety of reasons that this is the case. First, two participants did not see sustainability as a legitimate concern. In other cases, the environment was conceptualized as being outside of the scope of PoE, and hence not a topic requiring much course time or emphasis. On the other hand, two lecturers were profoundly dissatisfied with the lack of emphasis given to externalities in PoE by their economics department peers. Even when it does not explicitly attend to EELS, they saw PoE as offering students transferable concepts and tools that can be applied to understanding environmental problems. PoE was also seen as helpful in clearing up misconceptions held by SOP students and as able to bring balance into students’ thinking on environmental issues; however, some of this content, such as showing that concerns about

millennia, so what was wrong? I mean they were obviously wrong so why were they wrong? And they were wrong because they fundamentally missed the idea of equilibrium, they thought they were using the latest computers the latest technology, just like today we think the same thing but they fundamentally missed the way the world worked and as a result their predictions were wrong. {Brennan a59}
limits to growth are unfounded, would be strongly contested by ecological economists. PoE was not seen to be leaving students with problematic values.

6.1.6 RQ4 – Revisions of PoE curriculum to address sustainability

*From the perspective of these economists, does the PoE curriculum require revising to address sustainability. If so, what are the nature and the extent of revisions that they deem desirable?*

The next priority motivating the interviews was to generate data on whether economists involved in delivering PoE think that the PoE curriculum requires revisions in order to address environment-economy linkages and sustainability. If they do support revisions, I wanted to document the nature and the extent of revisions that they deem desirable. One of the challenges is that most of the interviewees appeared not to have considered what addressing EELS might imply for revising PoE curriculum prior to this matter being raised with them in the context of the interview. Thus, in the responses below and as summarized in Table 9, it must be kept in mind that participants may not have thought through whether addressing EELS might require a more thorough rethink of what theory should be taught in PoE. There were some inconsistencies in participants’ answers (e.g., Gorski initially described EELS as not relevant to PoE and later mused on how it ought to be addressed), perhaps due to participants considering the issues at hand in greater depth as the interview proceeded.

6.1.6.1 Relevance of EELS for PoE

Seven of the eleven lecturers expressed the view, at least initially, that sustainability should not be addressed in the PoE curriculum. Brennan expressed the view that just as calculus courses should focus on the math and thus no changes would be needed to integrate sustainability into the calculus curriculum, so PoE does not need to be altered (Brennan a269). Karsten was strongly opposed to amending the curriculum in large part over concern

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76 Invitations to participate in the study did specify that the study was intended “...to examine the potential implications of recent sustainability commitments by BC universities to the introductory economics curriculum.”
that sustainability cannot be defined quantitatively, but also because the course description is already clear on what is to be included \{a59\}. Quillen explained that PoE should not attend to the environment since students need to learn the tools of economic analysis before they can examine environmental problems \{a57\}. Younge disagreed that EELS deserves more attention in PoE, and suggested that in its current inception, it attends to sustainability adequately since it addresses scarcity, trade-offs and opportunity costs:

*I wouldn’t have to change anything [in the PoE course to address sustainability] because we already address the issues of scarcity, trade-offs and opportunity costs. {a81}.*

Table 9: Tabulated responses to research question four on revision of curriculum

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Brennan</th>
<th>Felton</th>
<th>Gorski</th>
<th>Karsten</th>
<th>Quillen</th>
<th>Moffett</th>
<th>Napier</th>
<th>Phelps</th>
<th>Simmons</th>
<th>Reynolds</th>
<th>Younge</th>
</tr>
</thead>
<tbody>
<tr>
<td>EELS does not belong in PoE</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>Concerned about appropriateness of teaching or imposing sustainability values</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>PoE should be focused on the core economic theory</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Addressing EELS would water down PoE</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>EELS inclusion not appropriate for first year level course</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Empirical data / formal models required before EELS can be included in PoE</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amenable to incremental curriculum change to address EELS</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Desires more fundamental curriculum change in PoE</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

A blank indicates that the participant did not comment on this particular topic, a checkmark indicates that their view as interpreted from the available interview data is consistent with the attribute as described, while an ‘X’ indicates that the view they expressed is inconsistent with the attribute.
The contrary view, that EELS deserves considerably more attention in PoE, was put forth by two participants. Phelps explained that he has plenty of problems with the curriculum of the typical PoE course since it gives “a very bad sense of what economics is” and the very last thing covered in the course is externalities. He acknowledged that, contrary to the impression that might be left from a PoE course, there are economic questions for which mainstream economics still lacks satisfactory answers.

However, while Phelps expressed dissatisfaction that PoE courses give so little attention on externalities (amongst other complaints), this does not imply that he would like to add content that reaches beyond what is classified as mainstream. He does not draw on ecological economics in class as he does not want to expose students to ideas that are not considered useful. He appeared satisfied that mainstream economic theory suffices for addressing EELS, but advocated that it be interpreted in a more nuanced way that takes into account externalities and reasons for government intervention in the economy (e.g. in a way that leaves students less likely to believe economists are enamoured with markets and that government action inevitably causes deadweight losses).

Simmons also said he believes the average PoE course is quite unsatisfactory and that most lecturers tend to skip material on market failures, public goods and the economics of common property resources, even if they are in the course description. He himself ensures that he attends to these topics and finds the environment to be a topic that interests students. He is satisfied to rely on the standard neoclassical approach to the environment.

6.1.6.2 Concerns about imposing sustainability values on students

Brennan, Karsten and Moffett were concerned that incorporating sustainability into the curriculum would put them in the position of imposing particular values on students. Moffett explained his discomfort: “I don’t want to come into the room and preach about that we should save the environment and all that” all the while explaining how, “very mildly” he encourages students to become, “a member of society. Of course, I would like them to develop some values”.
6.1.6.3 PoE needs to focus on core economic theory

Brennan, Felton, Quillen, Moffett, Reynolds and Younge expressed the view that the focus of PoE needs to be on core economic theory, which limits possibilities to attend to EELS:

*We are to talk about cost, value, equilibrium, maximization—we're going to talk about the core ideas.* {Brennan a225}.

~

*It's very difficult to extend discussion of one thing without dropping out other things which are pretty basic.* {Felton a73}

Moffett describes how PoE students struggle with the basic concepts and this limits the possibility of adding EELS:

...the rest [90% of students] are really struggling with the basic concepts. So for me to make it more complex [by addressing EELS] would be really hard. {Moffett a151}.

He explained that if he really wanted to, at most one hour of lecture time in a semester could be used to address EELS in PoE {a163}, which suggests a compartmentalized approach wherein attending to EELS would not require that the other lectures be revised. Furthermore, it seems that many lecturers do not see opportunities to use environmental examples to illustrate what they consider to be the core theory.

6.1.6.4 Addressing EELS would water down PoE

Brennan, Quillen and Younge explained that addressing EELS would water down PoE. For Brennan the result would be a “Mickey Mouse” course with sustainability content taught by those who know little about the topic {a103}. For Younge, adding sustainability by teaching an introductory course that is more issue focused and less geared towards technique and preparation for second year courses was an unattractive proposition, his fear being that it may be “dumbed down till it’s the equivalent of a sociology course” {a117}.

6.1.6.5 EELS inclusion not appropriate for first year level course

Brennan and Gorski said they consider matters raised by EELS too complicated to bring into a first year course. Quillen explained the benefits of focusing the course on giving students
tools of economic analysis that will allow them to study the environment in upper level courses:

> You know one of the big things that you’re doing in introductory economics is providing the students with tools so that they can then go on to understand what you’re going to say, about environmental economics for example at the second year level. It’s a bit like learning the math or whatever you want to think of as the tools or the perspective. ... And so we give them all these tools, perspective you might call it, but it’s also tools. {Quillen a57}

From Younge’s perspective upper division courses in environmental economics are the place for students to learn about the economics of the environment. He reasoned that students first need to learn about how economics handles trade-offs through accessible, everyday examples such as the trade-off between beer and pizza before they can move on to consider more complex trade-offs such as those between economic output and the environment {Younge a77}.

### 6.1.6.6 Empirical data / formal models required to include EELS in PoE

Gorski, Karsten, Moffett and Napier do not feel comfortable addressing EELS in PoE until there is empirical data, quantitative measures or formal models that address environmental conditions and trends that they can refer to, an intriguing position given the amount of data on the state of the environment that is now available and the projections of future environmental conditions made by IPCC and other reputable scientific bodies. As Napier explained,

> Yeah, none of those [resource depletion, emissions of wastes, CO2 levels] are addressed in econ books, I haven’t seen them. And um, to what extent, if I did have a textbook with those issues, how much would I cover it? Unless I can give them more empirical evidence in terms of how it is impacting the environment, and what aspects of the environment would be affected, I would not be touching that issue. So if I can’t give them a true and quantitative... if I can’t give them examples of quantitative measures of changes I would not be touching on that issue. {Napier a118}
Amenable to curriculum change to address EELS

Brennan and Karsten ruled out curriculum change to address EELS, while Gorski, Moffett, Napier, Reynolds and Younge expressed willingness to implement some modest changes. Phelps and Simmons said they would like their department to undertake a fundamental rethinking of PoE curriculum to address the fact that too much of what is currently taught is not useful or meaningful to students; changes they advocated for included greater attention to externalities and public goods. Gorski, whose position shifted towards greater openness to curriculum change during the course of the interview, explained that until the interview he had not given much thought to the relevance of EELS to PoE and as a result of the interview he will be more sensitive to such issues. He also provided an example of the type of curriculum changes he would consider, describing how there is the scope to incorporate greater attention to sustainability issues when discussing long run issues and growth:

But I do teach a section on long run issues and growth that’s coming up. And there’s certainly more scope to bring in some sustainability issues and I’ll probably—. You know it’s there in the book, the way it presents, it’s been a while since I looked at it, but the Limits to Growth arguments and so forth, and could certainly address it and see how sceptical, one of the things I’m telling my students all [emphasis] the time is to be sceptical about everything I’m telling them and everything else everyone else is telling them. {Gorski a145}

Missing in such responses is consideration of the possibility that attending to EELS might actually require amendments to the core material that it is important to get through.

As a result of the interview prompting Napier to think about how and whether EELS belongs in PoE, he observed how “It’s always thought of environment as a separate topic all together… so it seems like a separate topic all together. Separate, which it shouldn’t be.” {a146}. He conveyed a willingness to see some change to the PoE curriculum to attend to EELS. For instance, after discussing the Goodwin quote, he agreed with her that resource and waste flows should be added to the circular flow diagram {a138}. In contrast, Younge seemed unlikely to embark on revisions to PoE curriculum unless they are countenanced by leading economics departments. For instance, he said he does not want to adopt an outlier
textbook “that I have to justify when my students transfer to the University of Toronto economics department” {a55}.

6.1.7 Summary findings, RQ4

While critiques by ecological economists, and to a lesser extent other heterodox economists, imply that incorporating EELS would require an overhaul of the PoE curriculum, PoE lecturers displayed limited appetite for curriculum change to attend to sustainability or ecosystem-economy linkages. Changes to curriculum contemplated by participants during the interviews seemed to be mainly motivated by their desire to address pedagogical aspects of PoE that are widely perceived to be unsatisfactory. Based on the various perspectives put forth, it seems that were curriculum changes to be debated within the department, agreement might be reached that greater emphasis should be placed on ensuring the theory of externalities and public goods is addressed in PoE, but beyond that, other changes would likely be resisted.

It seems that PoE lecturers proceed on the basis that core economic theory can be taught in a way that presumes that the state of environment has little effect on the economy and that economic activity is not a major driver of environmental change. This suggests that the environment is just a special topic that economics can shed insights on, and that the environment and the economy are conceptualized as domains that can be theorized in isolation from each other, with the proviso that externalities require consideration and that, once students reach upper years, environmental amenities should be factored into the analysis.

6.1.8 RQ5 – Plausibility and coherence

From the perspective of these economists, does integrating sustainability into the PoE curriculum result in a course that has the potential to undermine the plausibility or coherence of standard economic theory as it is presented at the principles level? If so, how do they resolve this dilemma?

My third major focus in the interviews was to generate data on whether the integration of sustainability into the PoE curriculum is seen by lecturers as having the potential to
undermine the plausibility or coherence of mainstream economic theory as it is presented at the principles level. If questions about plausibility or coherence are at issue, I wanted to understand how these lecturers would respond. At the same time, I knew that this part of my research was exploratory, as I had not come across other studies that attempted to uncover such issues amongst mainstream economists. Therefore it was not evident what questions might elicit indications that lecturers are encountering such problems (if they are in fact encountering them).

I had reasoned that problems of plausibility and coherence might surface through several means, which had informed the design of the interview guide and the selection of quotes to be discussed. This included discussing with participants:

- the textbook treatment of the *Limits to Growth* study and the common contention in the texts that limits do not avail;
- the fact that the circular flow diagram fails to include inputs or wastes, such that it suggests the economy is a perpetual motion machine (per the Goodwin quote, Appendix C);
- the fact that production functions in textbooks include capital and labour, but no raw materials or energy, such that a bakery can magically produce bread without inputs like flour and without using up exergy or generating waste (per the Ayres quote, Appendix C);
- whether the emphasis on self-interest in PoE might promote self-interested behaviour amongst students who take the course (per the Marglin quote, Appendix C and/or discussion of the relevant literature as reviewed in Section 2.7.3);
- how SOP students should reconcile being taught about the linkage between economic growth and worsening environmental degradation in their home department with learning in PoE that growth is desirable and that concerns about limits are unfounded;
- whether the privileging of consumer sovereignty in PoE textbooks makes sense if consumers are manipulated by advertising and consumption does not map to wellbeing (see discussion in Section 3.2).
None of the participants openly acknowledged that addressing EELS could create problems of plausibility or coherence for mainstream theory. The participants’ responses sometimes seemed to involve manoeuvres that sidestepped or avoided potential problems. However, at the same time, I did not detect that any of the participants had recognized a problem of plausibility or coherence and responded strategically as a result. In other words, it seemed that the participants truly believed what they were saying and did not see that engaging with the issue of sustainability or incorporating environment-economy linkages into theory presented in PoE creates inconsistencies in mainstream theory. In fact, they often appeared to be puzzled by some of the questions I was asking or seemed to be anxious to spell out the details of mainstream theory so as to dispel what they appeared to view as ill-informed critiques. At the same time, the interview data suggests that most participants have spent limited time considering ways in which addressing EELS might present challenges for mainstream theory.

Of course, there are several plausible explanations for the fact that participants did not acknowledge problems of plausibility or coherence. It may be that there are no such problems; mainstream economics can incorporate EELS without remainder and the ecological economics critique is misguided. Perhaps the interview guide required further refinement, or a one-off, hour-long interview was insufficient to bring such problems to the surface. On the other hand, the limits to growth thesis has been discussed for over three decades and many environmental problems are frequently in the news, yet within mainstream economics there is little sign of soul-searching over whether the theory might be deficient in this regard. This suggests that other phenomena may be at work; perhaps, as laid out in Chapter 3, the type that might be explained with Bourdieu’s habitus (see Section 3.4.2), or through Archer’s description of how competing groups mobilize ideas from the Cultural System that suit their purposes and seek to suppress or contain the impact of ideas that stand in logical contradiction to the first set of ideas (see Section 3.4.3). Thus, there are theoretical grounds for proceeding on the basis that academics devoted to knowledge production might avoid, discount or suppress ideas that are at odds with their theoretical commitments.
I now review several instances from the interviews where I expected issues of plausibility and coherence to arise, explaining why I thought such problems might occur and offering some observations on how participants seemed to avoid them.

Younge, quite atypically, described how he teaches that there are two limits, overpopulation and overconsumption \{a47\}^{77}, which seemed to be a significant opening for problems of plausibility or coherence to come to the fore. Despite the fact that he raises these limits in his course, there was no indication during the interview that he finds that this creates tensions for mainstream economics. Despite his focus on overconsumption, he described SOP students as biased towards believing “that any growth is bad” and “that economics is biased towards consumption and using up resources” \{a105\}. When I suggested that mainstream economics fails to address generalized scarcity, such as the possibility of overwhelming resource sinks, Younge rejected this line of criticism, asserting that economics puts emphasis on scarcity yet without substantiating his assertion or addressing the issue of sinks:

> Interviewer: When scarcity comes up in economics, it often comes up as if there is scarcity in one resource, prices will rise, triggering substitution and conservation of that resource. But it doesn’t seem that the possibility of generalized scarcity comes up, especially the more critical problem of overwhelming the sinks that have to absorb all of our waste products.

> Brennan: That’s not correct. Economics puts huge emphasis on scarcity. Scarcity informs the overall approach. \{a51\}

Brennan acknowledged that SOP students who encounter discussions of the environmental impacts of economic growth in their home department might find this view difficult to reconcile with the pro-growth perspective taken in PoE \{Brennan a105-a111\}. Despite this acknowledgement, Brennan averted problems of plausibility or coherence this might have created by suggesting that the SOP curriculum needs to be revisited so that students do not arrive in economics courses with wrong-headed notions that interfere with their learning and acceptance of economic theory:

\[\text{--------------------------------------}\]

\textit{77} For ecological economists, population and consumption would not generally be described as limits. Instead, they are seen as drivers of anthropogenic environmental impact that influence the likelihood that humanity will breach ecological limits.
...then maybe you [the SOP] need to rethink your program as opposed to why should we have to rethink economics, and introduce all the sustainability ideas they don’t make all that much sense to us [Brennan a111]

Although Brennan’s main emphasis during the interview seemed to be contesting sustainability as a legitimate matter of social concern, a fallback position emerged that involves characterizing the incorporation of environment-economy linkages as a matter of merely adding an additional constraint or an additional input to existing neoclassical models:

Again the neoclassical guy is going to say, “you want me to add a third input? Okay fine. Add a fourth one, add a fifth one.” …The math doesn’t change, the model doesn’t change, nothing changes, in fact… [Brennan a269]

However, as I probed Brennan’s position that mainstream theory can easily account for additional constraints by presenting him with the Ayres’ bakery quote (see Appendix C), he eventually conceded that adding resource and energy inputs to the production function changes the equilibrium outcome of optimal output for the bakery:

Brennan: …In the neoclassical model is a cost function now and we’ll add your fuel and whatever residual and we’ll have some crap that comes out and there’s a cost and it's just not a problem for the neoclassical model.

Interviewer: But it’s not the model the students will be exposed to at the first-year level.

Brennan: Suppose that you could legislate that every economics textbook had to have that [inputs of raw materials and energy] in, you would be very disappointed with the outcome just thrown in there and say fine here’s the crap here’s the thing here’s a new equilibrium condition, away we go, la de da de da...

Interviewer: And it wouldn’t change the outcome?

Brennan: It would change the actual equilibrium instead of having and, you know instead of producing 12 loaves of bread now you produce 9. But that’s not the real problem you’re trying to get at, which is how do we stop the crap going out the back. Which wouldn't come from just adding more inputs in [to the model]. [Brennan a283]

This concession was unimportant in his view, yet from the perspective of ecological economics it is significant. Acknowledging that adding inputs and wastes into textbook examples might change the equilibrium condition of optimal output for a bakery from 12
loaves of bread to 9 may seem to be a minor concession. However, if the implications of adding inputs and wastes are scaled economy-wide, it may well be that the optimal level of economic output for a nation could be substantially lower than when resource inputs and waste emissions are omitted from consideration. It may even imply that an economy is already beyond its optimal scale and that further growth reduces welfare.

Several respondents referred to how EELS are accommodated by standard theory via the internalization of externalities through property rights and Pigovian taxes. Napier added to this that the welfare function used in mainstream economics can easily accommodate a sufficiently broad conceptualization of wellbeing that extends beyond consumption to include other matters that support an individual’s happiness, such as concern about the environment [Napier a166].

In the following incident, Phelps described his efforts to show a student that something the student recounted being taught in a SOP course is incorrect (the lecturer is thereby acting to defend mainstream theory against criticism), without, it would appear, conceding the ways wherein the claim might contain some truth. The SOP student had apparently told Phelps how he had learned in a SOP course that mainstream economics fails to attend to the Jevons paradox.78 Phelps responded to the student’s comment by giving a lecture during the next class on how the Jevons paradox can be understood in terms of elasticities and hence is well understood by the economics discipline [Phelps a95]. The lecturer’s point is well-taken: mainstream economists working on modelling the greenhouse gas implications of new automobile fuel-efficiency standards would surely take pains to factor in the Jevons effect. However, the Jevons effect seems to be conveniently forgotten in mainstream economics textbooks and discourse when enhancements to ecoefficiency are described as measures that

78 Wherein improved efficiency in the utilization of a resource leads to increased overall consumption of the resource. This happens because technologies that improve the efficiency with which a resource can be used tend to expand the set of processes wherein use of the resource is financially viable. Jevons first noted this phenomenon with coal; as steam engines made more efficient use of coal, they provided cheaper power, such that it became profitable to use these engines in a growing number of applications. Thus, though improved efficiency meant that each engine used less energy than its predecessor, the total amount of coal required to stoke the growing number of engines kept going up.
can be taken so that economic growth can continue despite a finite endowment of natural resources.

One opportunity for problems of plausibility and coherence to become apparent was the fact that PoE textbook authors added environmental content in response to increasing concern about the environment in the 60s and 70s, without readjusting core theory. However, when Felton described how he has seen textbooks evolve for close to three decades, his observation that the core theory in the textbook remained unchanged when chapters on environmental issues were added did not lead him to observe that there might be some problems with retrofitting in the environment without making any adjustments to the core theory:

But I must say there’s a remarkable homogeneity in these books.... And microeconomics books, I mean I’ve been teaching introductory micro theory since I started teaching, and that’s [close to three decades]. And the material in the books has barely changed, you know they got a bit more game theory than they had before, and there is extra sort of chapters being stuck in on environmental issues. But the core of the books are exactly the same as they used to be. [Felton a29].

Gorski acknowledged that the textbook he uses fits the pattern common to several PoE texts in that it concludes that the Limits to Growth study was wrong. He then responded to my question about whether it makes sense that textbooks still present this study as if it was wrong when the IPCC and the Millennium Ecosystem Assessment report such disconcerting environmental trends, in a way that suggests he conceptualized the environment and the economy as being separate realms. In his answer, economic growth is disconnected from environmental degradation; improvements in productivity are the main determinants of the economy’s growth trajectory and such improvements increase the efficiency of resource use.79

So, um, the 3% growth, which is for Canada, really closer to 2, that’s going to happen. It’s not so much a question of “it should happen.” It is primarily driven by improvements in productivity and that’s what we’ve experienced

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79 As elaborated in Section 3.2, ecological economists contend that since the industrial revolution, improvements in labour productivity have largely come about through the substitution of human and animal muscle power with energy supplied by using up fossil fuels, such that increased productivity as it is conventionally measured often increases the throughput of energy and resources and net environmental impacts.
over the last 150 years. Whether that will continue or not really just depends upon whether we continue to make productivity improvements. Meaning we can produce more with less resources, in particular capital or labour and land and so forth. {Gorski a65}.

Increasing GDP and consumption levels are presented in textbooks as desirable, without much consideration being given to the ecological implications of increasing consumption. This point seems to be a natural entry into exploring whether incorporating EELS might call these normative positions into question. However, when I raised this matter with Quillen, he explained that when teaching PoE, he clarifies for students that consumption is not restricted to produced goods and services, but includes environmental quality. He further asserted that economics students would be well aware that the environment is scarce. He then proceeded to dismiss concerns over the supply of non-renewable resources:

You know that [environmental quality] is part of what we consume. That’s one of the critical things that we consume. And so, it [consumption] isn’t narrowly defined as something that you produce. The environment is part of this production possibility frontier. I mean it would be very clear to economics students that it’s something that is scarce. Yeah. I think the way we [economists] would do things would be offensive to some people, but the fact that it’s offensive, you know that’s part our job, right, is questioning the conventional wisdom and being politically incorrect. … We would say stuff about, for example the amount of oil reserves that you have depend on the price of oil. It’s as simple as that and people don’t understand. When it becomes very expensive your reserves go up, right. I mean the whole, “we’re going to run out oil” thing. So there’s stuff like that. {Quillen a65}

Quillen also interpreted the steady state and sustainability such that they conform to existing ideas in economics, describing sustainability as a focus of macroeconomics and a steady state as a system that continues growing off into the future:80

I mean it is, certainly sustainability in an economic sense is something that you’re thinking about all the time in macro. Sustainability in the sense they’re looking at steady states, they’re looking at models over time and then what you’re looking for is a steady state, what does a steady state mean? It means something that is sustainable; it can go off into the future. {a65}

80 Linking a growing economy to sustainability is criticized by Daly (1993, 267) for involving the oxymoron of sustainable growth.
Quillen then mobilized the argument that models are an imperfect representation of reality that necessarily involve omitting various factors and variables. This allows him to move from describing economists as being well aware that resources come from the environment to acknowledging the fact that many of the models they use abstract away environmental quality and natural resources. He then conceded that some of these abstractions may not be warranted:

In principle, what you should have in all of your models, in principle as opposed to what’s going to actually happen, I’ll explain in a minute. You have everything that people consume, you have every resource, right. And no economist would disagree with the notion that resources come from the environment. Period. Natural resources, all that stuff. The quality of the air that we breathe, all those things. … So do models abstract from these things? Absolutely. That’s what models do. They, we want to find out how to get from a to b in a city we don’t use a two-scale picture of the place, right, we use a map and it’s false and it’s a model. And do we make the right modeling assumptions assuming away the right set of things? Not necessarily. It’s an art rather than a science. [a89].

Yet, in none of the above does Quillen volunteer that the plausibility and coherence of what is taught in PoE might be disrupted by addressing EELS.

Reacting to a question about the limitations of GDP as a measure of progress, Karsten seemed to avoid potential problems of plausibility and coherence by presuming the primacy of human interests over the state of the environment. If there are limits, we may be forced to live under very constrained conditions; such a lifestyle involves regression and is undesirable, so those who promote living within environmental constraints are incompetent and unethical:

…if it’s all pie in the sky and wide-eyed eco what whatever you want to call um, anarchists or environmental jack-asses that are running around talking about, “no we ought to stop economic development because it’s hurting the environment and we all should go back and live in caves.” You know, I don’t listen to that. I really don’t. I mean I find that the rhetoric is so surreal and the tactics are so disgusting… See the thing is, if they actually had some numbers, quantitative evidence that was clear that this would have these consequences for our way of life. But they don’t. It’s all about measuring CO$_2$ [makes mock scared sound]. [Karsten a401].
One of the ways that participants appeared to avoid problems of plausibility and coherence might be described, using Marglin’s terminology, as pointing to the fine print\(^8^1\) behind mainstream theory. As Marglin and others have noted, once the fine print is pointed out, mainstream texts often proceed as if such provisos are immaterial to the matter at hand when evaluating policy options. For instance, when asked whether the atomistic, self-centered\(^8^2\) model of human behaviour used in PoE is sufficiently up to date with current thinking, Felton acknowledged that this model is mostly applicable to describing consumer decisions in supermarket-type situations and explained that if a PoE student were to challenge the model as presuming self-centered behaviour, he would clarify that this is not necessarily so because the utility function can be amended to reflect a broader range of motivations \{Felton a85\}.

Another realm where I reasoned that addressing sustainability might raise issues of plausibility and coherence was the focus in PoE textbooks on self-interest as the main driver of behaviour. However, in his response to the question associated with Marglin’s quote (“Economics 101 helps to drive the lessons [on self-interest] home”) regarding whether the emphasis on self-interest in PoE might be problematic, Moffett defended the assumption of self-interested behaviour by arguing that in a competitive market, only self-interested firms will survive. Further, Moffett conceptualized self-interest as applying to the realm of consumption, but not necessarily being the driving force behind other aspects of human behaviour:

\[
I \text{ don’t think there’s anything wrong with the idea of self-interest per se, but it’s really nothing wrong or bad about the idea because when we think about competitive markets, the only firms that will end up surviving are the ones who maximize profit. So, but people being, again at that level, I don’t think there’s too much emphasis on anyone being specifically driven by self-interest because yes, we buy food, we buy clothes with our money that’s our demand, but consumption is only such a little part of our behaviour, and I don’t think, at least in my class, there is really—.} \{\text{Moffett a179}\}
\]

\(^8^1\) Drawing on Marglin’s discussion of the fine print in economic theory in his book *The Dismal Science*, I define fine print as the qualifiers and delimitations that apply to theory and that ought to be reiterated when the policy implications of models are described. These provisos are documented to varying degrees, but do not necessarily receive ongoing emphasis in PoE classrooms or textbooks when economic theory is applied to real world policy issues.

\(^8^2\) “Self-interested” is the more technically correct terminology, but in asking the question I used “self-centered.”
In addressing the critique that PoE tends to presume the desirability of growth, Felton averted problems that limits to growth might create for standard theory by pointing to mainstream economics literature on the costs of growth, suggesting that it is likely to be politicians, rather than economists, who endorse growth:

But I don’t know how much is economists as opposed to politicians who are pushing the pro-growth. I mean growth solves all sorts of problems for politicians. Because then they don’t have to make the trade offs. So this business about how we sort of have to have growth, pushing on. If you actually dig around in economics literature it’s not really that way. There’s a lot of discussion about the costs of growth and whether it really makes anybody happier. There’s all this happiness research going on right now. So I don’t know if that’s really the economics of it. {Felton a133}.

Yet in my assessment, this position does not seem to fit the available evidence. As was documented in the previous chapter, the desirability of growth is implicit in much economic theorizing and it pervades textbooks. The mainstream literature on the costs of growth gets little attention from the discipline. When the Limits to Growth report was released, economists were amongst its most vociferous critics (e.g., Solow 1974), and most contemporary economists pay little or no attention to the issue of limits (Turner 2008). Likewise, the happiness literature has made limited inroads into mainstream theory (Frey and Stutzer 2002; Layard 2005; Helliwell 2006) and is downplayed in PoE textbooks. A fellow PoE instructor, Karsten, dismissed wellbeing research as a “boondoggle” {a299}.

In responding to a question about whether the textbook presumption of the desirability of economic growth might be problematic from a sustainability perspective, Napier appeared to acknowledge problems that might undermine the coherence of theory and work through the possibility of offering students a more balanced presentation, all the while remaining committed to the mainstream position on the desirability of economic growth. While Napier acknowledged that further growth in rich countries might be environmentally problematic, he shifted to stressing the benefits of growth for the poor in developing countries:

Because GDP is, growth is important because it increases consumption, it is bad because it is affecting the environment and giving examples of how the environment is affected would have to be included with how increasing GDP is pulling people out of poverty. Because a lot of people tend to think about,
especially in the developed world, when they think about growth and how it is beneficial for us, they are thinking about mostly the luxury goods and they are thinking about waste. A lot of people in the developing world think about increase in GDP they’re actually thinking about people not starving to death, thinking about people being pulled out of poverty. So high growth rate in India right now is appreciated because it is pulling people out of poverty, when [emphasis] it is pulling people out of poverty, which is happening right now... That’s when the issue needs to be raised, that, "hey, so what is this GDP, how is it affecting the environment.” So balancing both sides. {Napier a123}

Each claim in the above passage is plausible. Together, they build towards a conclusion that sounds imminently reasonable. Although the question was posed in the context of understanding how the implications of growth are presented in an economics course in one of the world’s richest countries, Napier shifted the discussion to the relevance of growth to a country where much of the population lives in poverty. With low GDP, some people are close to starvation, an untenable situation that demands action. Growth seems to be a one-way street that always improves people’s lives; in this passage, there is no attention paid to the fact that growth might be pushing some individuals into poverty. It also seems that while this participant conceptualized the environment as being affected by the economy, he did not consider how the state of the environment might in turn affect the economy. There is no acknowledgement that growth-induced environmental degradation might eventually preclude future growth or harm vulnerable populations, potentially worsening the plight of those who provide the primary justification for growth. From an ecological economics perspective, arguments about the impacts of growth-induced environmental degradation on the poor are conspicuous in their absence (e.g., resource extraction to meet the needs of a growing economy by degrading ecosystems that rural poor depend upon) (Martinez-Alier 2002). Thus, while Napier acknowledged that addressing EELS might require a more nuanced presentation of the implications of economic policies, attending to such nuances does not put the theory itself into question.

The above review of the issues of plausibility and coherence suggests that if EELS are integrated into the PoE curriculum through lecturers associated with the economics department, the changes would likely be quite modest. There was little indication that the
lecturers would agree with the claim put forth in the ecological economics literature that they are working within a paradigm, worldview or theoretical framework the foundations of which were devised before the degree of human dependence on the biosphere was understood, and that in a contemporary context of a deepening ecological crisis, it may need revisiting. It also did not appear that they would willingly subject their theoretical commitments to scrutiny as part of addressing sustainability in curriculum. Thus, it would seem unlikely that they would probe the ecological economics literature to see how PoE might need to be amended more substantively.

6.2 SOP faculty participants

I now turn to the SOP faculty to see their perspective on the PoE course, since their undergraduate students are often encouraged or required to take PoE.

6.2.1 Population

As a result of the recruitment process, a total of nine professors in sustainability-oriented programs at the three case study universities agreed to participate (see Table 10) and were interviewed over the period of February 1st 2011 to April 15th 2011. All of the participants had at least the rank of associate professor. Only one female faculty member was recruited, largely due to the fact that there were few women in SOPs who fit in either of the above two categories and agreed to be interviewed. Four participants were recruited mainly on the basis of being current or former senior administrators in the SOP, while five participants were recruited for being SOP faculty with economic expertise (as defined above).

Table 10: Breakdown of SOP professors participating in the study

<table>
<thead>
<tr>
<th>Participant type</th>
<th># of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenured faculty</td>
<td>9</td>
</tr>
<tr>
<td>UBC</td>
<td>5</td>
</tr>
<tr>
<td>SFU</td>
<td>2</td>
</tr>
<tr>
<td>UVic</td>
<td>2</td>
</tr>
<tr>
<td>Male</td>
<td>8</td>
</tr>
<tr>
<td>Female</td>
<td>1</td>
</tr>
<tr>
<td>Recruited given position as senior administrator (current or past)</td>
<td>4</td>
</tr>
<tr>
<td>Recruited given expertise in economics</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
</tr>
</tbody>
</table>
6.2.1.1 Reactions to sustainability

Before addressing the research questions, as relevant context I review how SOP professors viewed sustainability and their university’s sustainability commitments. Reactions from the participants to my description of the purpose of my study suggested that this group of participants accepted that it is legitimate for universities to work towards sustainability. Participants were familiar with their university’s sustainability commitments, though Ulrich noted that even within the SOP, some faculty may not be aware of the commitment, or policies and initiatives the university had taken to meet this commitment {Ulrich 40.5}. Averton commented that there are many definitions of sustainability and argued that while mainstream economists have an understanding of sustainability, this understanding may not be consistent with that held in other parts of society {Averton 41.8}. The university’s commitment to graduate ecologically-literate students lacked credibility with Underwood, who claimed that universities fail to graduate individuals with citizenship skills {Underwood 54.4} and argued instead that they train students for obedience, promote rational individualism {Underwood 53} and socialize for consumerism:

Universities don’t train citizens. Universities don’t want to train citizens. They want obedient students. ...universities are socialization machines for stamping out good consumers and participants in the dominant system. {Underwood 53.1-56.4}

6.2.2 RQ6 – SOP professors on the relevance of PoE courses

How do senior administrators, economists and faculty members who have economics expertise and are affiliated with sustainability-oriented programs perceive the relevance of the PoE course to sustainability and its suitability as a principles course for students who are majoring in sustainability-oriented programs?

SOP professors felt that much more needs to be done to ensure that students from across the academy leave university well-prepared to engage with sustainability. They tended to express the view that sustainability should be suffused throughout a student’s university education, rather than being addressed through stand-alone units or courses in an otherwise unchanged curriculum. As Appleby explained:
Olten explained that student interest in sustainability has risen in the last decade {Olten 15.5} and said that he views high-level support within the university administration as pivotal to integrating sustainability across the curriculum {Olten 21.8}.

My first priority in interviewing senior administrators, economists and faculty members who have economics expertise and are affiliated with sustainability-oriented programs, was to understand how they perceive the relevance of the PoE course to sustainability and its suitability as an introductory course in economics for students who are majoring in sustainability-oriented programs.

### 6.2.2.1 Characterization of PoE

Two of the informants qualified their interview responses by specifying that they were not familiar with the detailed curriculum of PoE {Appleby 1.6; Ulrich 32.1}.

PoE was described by Ulrich as being focused on “educating future economists” and hence of limited relevance to SOP students {Ulrich 32.5}; in part, he saw economics department economists as being very theoretical, “trying to develop the next Nobel-prize winning idea in economics” rather than being focused on making practical contributions to real-world problems {Ulrich 34.0}.

Underwood drew on a political ecology perspective to critique the mainstream approach prevailing in PoE that conceptualizes environmental problems through an externality lens that can be solved via Pigovian taxes. Underwood saw this view as naïve given that, in his
view, capitalism is dependent on the externalization of costs, and as a result of the predominance of vested interests, resistance to policies seeking to internalize costs would be fierce {Underwood 50.0}.

6.2.2.2 **Rationale for having SOP students take PoE**

Several reasons were offered by SOP faculty to explain why their students are required or encouraged to take PoE, such as meeting requirements set by accreditation bodies for graduates in professional programs {Appleby 1.8; Ulrich 32.2; Edwards 28}, preparing students for upper-level SOP courses with economic content {Appleby 2.1; Ulrich 35.2}, the need to understand the language and methodology of economics given its influence in contemporary society and the need to understand how economic instruments can play a role in addressing environmental problems {Averton 42.3}. Iserman suggested that there was no “deeply-reasoned” rationale for requiring students to take PoE {Iserman 10.9}. Edwards referred back to the overarching goal of the SOP program, and hence the context in which SOP students are being requested to take PoE. In his view, the goal is to produce literate ecological citizens, so the various course requirements, such as PoE, should ultimately sum to that {Edwards 29.3}. As for specific content to cover, Edwards wanted to ensure students had basic economic knowledge such as how the GDP is calculated {Edwards 28}. Microeconomics was characterized by Olten as being more valuable to SOP students than macroeconomics, in part because it prepares students to understand the rudiments behind financial analysis so that they can participate in making decisions with financial implications within a firm {Olten 16.7}.

With respect to specific learning objectives, Ellington said it is important that students understand concepts such as: opportunity costs, the importance of incentives in shaping behaviour, and profit maximization. Furthermore, he wanted students to learn about linkages within systems {Ellington 69.7} and how natural and social systems interact {Ellington 69.4}. Expanding on this later objective, Ellington thought that PoE should promote awareness of the issues created by our existing, growth-oriented, resource-depleting and degrading economic system and students should come out “feeling that it [economics] is a useful way to help inform them about how our social systems work” {Ellington 75.4}.
6.2.2.3 PoE as a foundation for upper-level SOP courses

Olten characterized introductory microeconomics courses as too academic, theoretical and narrowly disciplinary, the result of which is that the SOP students do not seem to retain content and arrive ill-prepared for SOP courses that require practical application of economic knowledge {Olten 17.0} (though Olten also acknowledged that upper-year students seem to recall little of first year courses, whatever the subject matter) {Olten 19.2}. Ulrich, whose upper level SOP courses require some proficiency in economics, was dissatisfied that despite having taken PoE, students had little recall of basic economic concepts. For example, when he referred to the concept of return on investment, students who had completed PoE would claim they had not encountered the concept before {Ulrich 35.3}. Iannucci explained that students who had taken PoE and even second year economics were “still not connecting the dots in a way the one might have expected” {Iannucci 65.2}. This statement was confirmed by Ellington, who explained that the majority of students in his upper year SOP course appeared to benefit from a two-week intensive review of the fundamentals of PoE that he inserted at the beginning of his course, because the students take notes and ask questions. PoE “just doesn’t seem to stick with them as much as I would have thought” {Ellington 71.2}. He reasoned that SOP students are perhaps not retaining what they learned in PoE because the course relies too heavily on idealized content and lacks real-world examples {Ellington 75.4}, especially those relevant to resource management {Ellington 71.6}.

6.2.2.4 SOP professor reports of student reactions to PoE

Based on the views of 7 of the 8 faculty who commented on student reactions to PoE, it would seem that a high proportion of SOP students have been dissatisfied with PoE. SOP professors reported that students struggled with PoE, questioned its implicit values and the worldview it offered, saw it to be of limited usefulness, were generally frustrated with the course {e.g., Appleby 3.5} and did not find it interesting {Ulrich 32.4}.

Averton offered the lone dissenting view, describing student reactions to PoE as being “quite positive.” He said that students could understand why taking PoE was important, since, “most of them understand there has to be solutions that make business sense as well as
ecological sense” {Averton 42.5}. At the same time, Averton described students as being very open-minded, critical and aware of the limitations of how environment-economy linkages are addressed in PoE and the mainstream perspective on growth:

…the students would note that as part of the framework that that course maybe is taught under. But they understand what the, see the limitations or the fallacies of that model. Because if you’re talking about sustainability, all you gotta do is crank that thing out a few more years, another generation and it’s bound not to be sustainable. {Averton 42.8}

SOP students are introduced to the limits to growth debate as well as to the concepts of ecological economics within SOP courses. Iserman suggested that as a result, they develop “paradigmatic awareness” that often induces them to react critically to PoE’s characterization of economics as value-free and objective {Iserman 11.6}.

Concerns raised by SOP students who had taken an upper level environmental economics course offered by the economics department in part to meet the needs of SOP students led to dialogue between Edwards and the economics faculty member teaching the course.83 Edwards reported that SOP students felt that the view of economics that predominated in the course was that the discipline offers a toolkit of neutral tools; SOP students reportedly thought the course content could be subjected to a “more ideological critique.” He described how SOP students reported to him that though this critique was sometimes allowed to emerge in classroom discussions, it was not well received on tests, since tests tended to emphasize mathematical performance {Edwards 23.8}. SOP “students struggled to learn the material because they didn’t understand its application to the real world” and needed “to have a social or political context to understanding how these ideas made sense” {Edwards 27.5} The end result of ongoing SOP student dissatisfaction with the course and “rigidity [from the economics department] around maybe transforming curriculum” was that the SOP faculty no longer encourage SOP students to enroll in this environmental economics course, despite the fact that it should, in theory, be directly relevant to sustainability {Edwards 23.8}.

83 Edwards explained that most SOP students would ultimately complete this course with a satisfactory grade, so he was satisfied that student complaints were not motivated by them having difficulties completing course requirements. {Edwards 25.2}
Underwood described learning via student emails as well as from classroom discussions during a SOP course that he taught how SOP students who tend to identify with an ecological worldview end up dissatisfied with PoE:

... [SOP] students who go in with an ecological worldview, into economics, get really upset. They get angry, they get angry at the closure of debates so that there's certain things, anything that doesn't fit is an assumption so you can put it outside the discussion and the inability to talk more broadly about economics. And so that’s, the ones who go into our program and they’ve got this orientation, they go into economics ’cause they kind of have an expectation that economics is actually the second type, the Schumacherian\textsuperscript{84} type of economics and they find that it's not... And so those students, they go to the economics department and they get upset because they say it’s exactly the opposite of what they want to do. \cite{Underwood 49.4}

Iannucci identified PoE as a “very clear area for some improvement” in the SOP program \cite{Iannucci 63.8}. Ellington felt that it was unfortunate that many SOP students thought economics was not useful and inherently bad since this is not a useful way to proceed in the world and it hinders the search for creative solutions \cite{Ellington 75.5}.

6.2.3 RQ7 – Does addressing sustainability imply curriculum revision?

\textit{From the perspective of these individuals, does the PoE curriculum require revising to address sustainability and if so, what is the nature and the extent of revisions that they deem desirable?}

The next priority was to understand whether, from the perspective of relevant professors in the SOP department, the Econ101 curriculum was seen as requiring revisions to address sustainability. If revisions were seen to be desirable, I sought to document participants’ insights on the nature and the extent of revisions that they deemed desirable. Consistent with the views reported in the previous section, participants wanted to see PoE curriculum undergo a substantial overhaul.

\textsuperscript{84} Underwood was referring to the late economist E.F. Schumacher, author of \textit{Small is Beautiful}, whose writings have influenced the ecological economics literature.
6.2.3.1 Meeting the economics education needs of SOP students

At each of the case study universities, the fact that PoE does not seem to be meeting the needs of SOP students and is not providing a suitable foundation for upper level SOP courses that touch on economic matters has either been discussed within the SOP or acted upon. SFU has already developed a third-year course in ecological economics that SOP students can take instead of PoE; PoE is thus being phased out as a required course. At UBC and UVic, discussions have occurred within SOPs and/or between SOPs as to how to set up an alternative to PoE that is better tailored to the needs of SOP students; such an alternative would allow SOP students to acquire the needed expertise in economics, the prevailing view being that this course needs to be from outside of the economics department. The economics department was seen as being unlikely to provide a sufficiently practical, ecologically-grounded course, and so the course needs to be housed either within the SOP or in a congruent department/program {e.g., Ulrich 32.3}.

Discussion on the shortcomings of PoE and its potential SOP-based replacement was described as not having involved much, if any, interaction with the economics department {Appleby 4.7}. In part, this willingness by the SOP to consider ending reliance on the economics department for the principles-level training of SOP students had arisen recently thanks to the university’s new, more market-driven funding models where funding goes to the unit offering a given course. Under the old model, departments like economics received as part of their funding a set amount of money for the service courses like PoE that they offered to meet the needs of departments such as the SOP {Appleby 4.4; Ulrich 32.6}.

In planning for a SOP-oriented replacement to PoE, participants anticipated or had already experienced resistance from the economics department. Ulrich described encountering the view that “only a trained economist can teach economics” {Ulrich 33.0}. He also expressed the concern that the economics department might claim that the only reason the SOP would want to teach an economics course in house is that SOP students are not strong enough to do the existing PoE course, when in fact the driving motivation is that the SOP sees the need for a course “that takes a different angle on it [economics] and giving specific case studies that the students can relate to” {Ulrich 33.7}. 

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SOP students have “nowhere to go to acquire economic literacy, I mean an economic literacy that serves their values and agenda” according to Iserman {P03-12.0}. Olten argued that an economics course taught within the SOP would be “far better” for the SOP students, in part because it could be shaped to be more pertinent to the topics they study in other SOP courses {Olten 18.2}. He rejected the line of argument expressed by some economics department participants that integrating sustainability into PoE would lead to a less rigorous economics course {Olten 19.5}. Rather than presenting market society and economic arrangements as natural, Underwood offered that a PoE course that meets the needs of SOP students would help the students see how the economy is socially constructed, opening up a new imaginary as to possible futures {Underwood 59.5}.

As an alternative to PoE, Edwards reasoned that it would be useful to teach SOP students about ecological economics as a way of introducing them to strains of thought that integrate ecosystems, energy, social and political systems {Edwards 28.8}. Ecological economics was seen as helping to provide synthesis, a more critical perspective to potential solutions to environmental problems and a critical perspective on the use of mainstream economics; students don’t get “a sniff” of a critical perspective from the economics department, even in courses on environmental economics {Edwards 29.4}. Student and faculty interest in offering SOP students an ecological economics perspective fits well with existing efforts to offer SOP students literacy in political ecology {P07 29.1}.

Iannucci argued that a SOP replacement to the PoE course is better positioned as a third year course, when students are familiar with working in a university environment, have more experience with critical thinking and have been exposed to different perspectives. The course should be without economics prerequisites given all the prerequisites that SOP students already face {Iannucci 60.5}. Even when positioned as a third year course, such a course would face the challenges encountered by any introductory course, in that students must be introduced to the basic building blocks of a discipline, even if the assumptions and methods at that level appear to students to be implausible (e.g., starting with the perfect vacuum in
physics), before the course can address the more nuanced material useful for tackling sustainability challenges {Iannucci 61.8}.

Iannucci and Ellington thought that one of the challenges of replacing PoE with a SOP-based equivalent would be the fact that there are few textbooks or other teaching resources currently available that address the economics of sustainability or ecological economics with sophistication {Iannucci 65.4; Ellington 72.7}. Iannucci suggested it may prove desirable to require non-SOP students to fulfill an ecological prerequisite before taking a SOP-based economics course such as ecological economics, especially if this course is at the third-year level. Doing so would avoid the problem of slowing down the SOP students by spending time bringing external students up to speed in their knowledge of ecological systems {Iannucci 66.9}. While Ellington advocated an economics course for SOP students that was cognisant of the interactions between natural and social systems, he also wanted to ensure such a course would have sufficient rigour {Ellington 69.5}. A related challenge Ellington saw in setting up such a course is that some SOP students think economics is antithetical towards the environment, rather than seeing it as a way of analyzing economic systems {Ellington 71.6}.

6.2.3.2 Prospects for collaboration

Olten explained that there has been little or no communication between the economics department and the SOP; in part, the fact that the economics department has much more influence in the university than the SOP department means the former has little motivation to meet the SOP’s needs {Olten 21.4}. Olten has participated in discussions with the economics faculty that suggested that there is “paranoia” within the economics department about the SOP, and his efforts at dialogue did not break through {Olten 24.3}.

Olten also reported that, on a separate occasion when the economics department consulted with the SOP over a new economics department course that would emphasize environment-economy interactions, it only consulted at the last minute, did little to address concerns raised and stopped consulting the SOP once university approval for the new course was given {Olten 24.6}. Ulrich doubted that anyone in his program had ever formally commented on
PoE curriculum, in part because opportunities to comment mainly arise when new courses are proposed; as a consequence, there is a certain academy-wide “lack of course updating” {Ulrich 38.3}. Averton explained that because the SOP is under-resourced, no one had taken the time to comment on PoE curriculum {Averton 43.7}.

While Edwards described the SOP as enthusiastic about, and used to, cross-faculty collaboration {Edwards 27.2}, he viewed the economics department as a “world unto itself” {Edwards 26.2}; members of the economics faculty “don’t necessarily rub shoulders very easily with the rest of the social sciences” {Edwards 37.7}. Edwards suggested that if an economics department member could be found who was sympathetic towards sustainability and ecological economics, a course jointly taught by faculty from the SOP and the economics department would be interesting and stimulating both for students and for those involved in teaching the course {Edwards 29.8}.

When the SOP program initiated a proposal to develop a course aimed at addressing economics and sustainability, Iannucci described how the economics department expressed its opposition to the use of the word economics in the title of a course offered by the SOP, while at the same time showed no interest in offering an equivalent course to meet the needs of students {Iannucci 62.2}.

6.2.4 RQ8 – Implications of sustainability for plausibility and coherence

From the perspective of these individuals, does integrating sustainability into the PoE curriculum result in a course that has the potential to undermine the plausibility or coherence of standard economic theory as it is presented at the principles level? If so, how do they resolve this dilemma?

My final interest was to better understand, from the perspective of professors in SOP departments who have economic expertise, whether integrating sustainability into the PoE curriculum might undermine the plausibility or coherence of standard economic theory as it is presented at the principles level. If problems of plausibility arise, I wanted to understand how they resolved this dilemma.
For most of the SOP professors, economic theory in PoE courses already suffers from problems of plausibility and coherence. As Iserman explained,

"...as a social scientist interested in environmental problems and interested in human-nature relationships, I have noticed this tremendous divorce between the science of economics and the agenda of ecological services and ecological sustainability. Discussions about economic policy and pricing mechanisms and the structure of incentives and disincentives in the economy, still appears to be lagging behind in terms of internalizing what are the real ecological costs of running the show."

The economics discipline and mainstream economic theory were seen sceptically by a SOP faculty member given the failure of the economics discipline to anticipate the 2008 economic crisis {Ulrich 39.3}. Underwood portrayed the economics discipline as entrenched in current economic arrangements and as justifying the “operating system of capitalism.” He thus thought it was unrealistic that the economics department would be able to deliver a more critical perspective on economics that addresses sustainability {Underwood 49.3}. Further, Underwood characterized economics as a hegemonic mindset {Underwood 57.8} wherein practitioners are stuck in the box of presuming a competitive capitalist economy:

You know, economics is a fabulously persuasive discipline for closing your mind. Everything can be translated into economics—how can you not use the pricing mechanism? You have to use the pricing mechanism because if you put the price up it changes people’s behaviour, bla bla. And it’s very persuasive.... And yet the fundamental assumption is a competitive capitalist economy. It’s in the box, and you don’t want to get out of the box because as soon as you get out of the box, there’s no bearings, you’re lost. Just casting around. {Underwood 51.5}

Edwards had come to the conclusion that the economics department is unlikely to embrace sustainability as the economics discipline is grounded in “ideological commitments” that are threatened by sustainability; “the discipline has a long way to fall” {Edwards 30.6}.

6.2.4.1 Constraints and opportunities in modifying PoE

One of the informants discussed in detail the curriculum review process (from department up to the senate level) and its implications. As an existing course, PoE is unlikely to get much

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85 They would not necessarily have used that terminology.
scrutiny from outside the economics department unless a considerable degree of change is proposed. This lack of external scrutiny was seen by Appleby as having a conservative effect on curriculum change {Appleby 6.3}. There is no university-level mechanism to ensure a given department’s curriculum doesn’t get out of date; this task is the responsibility of the department and individual instructors {Appleby 7.8}. Beyond the department level, the main safeguard against a stale curriculum is provided by external departmental reviews {Appleby 8.3}, though if the external reviewers themselves are adherents of the same school of thought as the department under review, changes to curriculum content may come about more slowly {Appleby 8.7}.

Olten saw as a major impediment to curriculum change the fact that the economics department had yet to hire faculty trained in ecological economics or in the economics of sustainability and foresaw difficulties in getting those already involved in teaching economics to learn new, sustainability-relevant material {Olten 18.6}. Initiatives that the SOP was considering taking to create a SOP-oriented economics course would, in Olten’s estimation, be resisted by the economics department as a way to defend its staffing complement {Olten 21.5}. However, based on the program’s experience asking an applied science program to reshape one of its courses to better meet the needs of SOP students, Olten foresaw that while individual PoE instructors might be flexible in this regard, flexibility would be less likely at the level of the economics department. However, fine-tuning PoE by working with individual lecturers is a solution that is unlikely to endure as lecturers assigned to teach PoE will change over time such that curriculum would need to be renegotiated on an ongoing basis {Olten 21.6}.

6.3 Chapter conclusions

In this chapter, the perspectives of PoE lecturers and SOP professors with respect to the implications of the universities’ sustainability commitments for PoE curriculum were explored. Amongst the PoE lecturers, sustainability did not appear to have much currency. The prevailing perspective was lukewarm willingness towards incremental adjustments to more explicitly integrate environment-economy linkages and sustainability into the PoE curriculum; in some cases there was outright resistance. Two participants advocated strongly
for changes to PoE curriculum to ensure the course pays adequate attention to market failures. Beyond the issue of the integration of sustainability, there was considerable frustration with the overall PoE curriculum and the textbooks.

The interview data also suggests that for economics lecturers, addressing EELS does not generally give rise to problems such as the plausibility and coherence of standard economic theory. EELS was seen as able to be readily accommodated within mainstream theory with minimal adjustments such as adding a new constraint. Other reactions involved invoking the fine print behind economic theory or referring to the limits of models as a simplified representation of the world. Challenges to mainstream theory that come from an EELS perspective, were at times described as being based on erroneous or misinformed arguments, or as being caused by a misapprehension of mainstream theory.

The perspectives of SOP professors with respect to the implications of the universities’ sustainability commitments for PoE were also explored in this chapter. In contrast to their economics peers, the SOP professors who participated in this study were acutely concerned about trends of increasing environmental deterioration, were advocates for sustainability and support the integration of sustainability across the curriculum. While the SOP professors believe that their students benefit from learning economic theory, and from understanding how the economy functions and interacts with its environment, the SOP professors were generally dissatisfied with what their students get out of the PoE course. Several participants described what they had heard of the courses’ deficiencies. Only one dissenting participant described SOP students as being generally pleased with what they learned in PoE. The course was also characterized by SOP professors as being highly abstract, overly ideological, unresponsive to the needs of their students to understand the environment-economy nexus and showing a naïveté or lack of transparency about issues of paradigm or worldview. The integration of sustainability in PoE was seen as likely to bring to the fore problems with mainstream theory and the content of PoE courses; however, the SOP professors viewed this as an opportunity rather than as a problem.
The SOP professors suggested that by using more real-world examples, deemphasizing abstract theory and paying more attention to the environment, PoE could be improved, but generally they wanted more fundamental changes, such as abandoning or at least problematizing the mainstream paradigm. They said that they find that when SOP students who have taken PoE arrive in upper level SOP courses that have economics content, the students are ill-prepared. Most characterized the course as not giving their students much value-added in terms of learning new tools to attend to sustainability. However, there was little confidence in the economics department’s willingness or ability to adjust PoE to address such concerns. A couple of participants described unsuccessful efforts to get the economics department to be more responsive to SOP student needs. The result of their broad-based dissatisfaction with PoE is that SOP departments are exploring options for initiating their own economics courses. One such course has already been created at SFU.

Having added to the previous chapter’s analysis of PoE textbooks data on how PoE lecturers and SOP professors saw the relevance of their university’s sustainability commitments to curriculum, I now turn to document how the course was perceived by students.
Chapter 7: Student perspectives on principles of economics courses

It is true that we cannot, in the time available, teach everything we would like. But why do we pick out for treatment just that selection of topics that is least likely to raise any questions of fundamental importance?

Joan Robinson86

7.1 Chapter overview

Having analyzed how introductory economics textbooks address environment-economy linkages and sustainability in Chapter 4, and having explored in Chapter 5 what PoE lecturers and professors from SOPs whose students take PoE say about the course, I now review data generated from student interviews to provide a further perspective relevant to understanding PoE curriculum in the context of universities’ sustainability commitments.

As documented in Chapter 1, in North America, where many universities have signed sustainability declarations, about 40% of university students take a mainstream principles of economics course. To better understand how such courses prepare students to address sustainability, hour-long interviews were conducted over the period of June 2010 to March 2011 with 54 students who had taken such courses in the previous nine months from one of the three largest public universities in British Columbia, Canada.

The students interviewed represent three groups, the first two being prioritized in the study design and the last being opportunistic: economics and business students (ECON), students from sustainability-oriented programs (SOP) and students belonging to neither the ECON category nor the SOP (NES) category. Students were asked questions about their course and were asked to assess how well the course addressed the environment and sustainability (see interview guide in Appendix E). This data is reviewed first; it demonstrates that students found the course downplayed the environment and that they saw this as a situation to be remedied. Next, the results from the quote sorting exercise, whereby students sorted 17 quotes that were developed from the results of the textbook content analysis reported in

86 Cited in Hill and Myatt (2010,1).
Chapter 4, are discussed. This exercise was intended to identify the extent to which textbook material of interest for its sustainability content was encountered by students in their PoE courses. Most importantly, the quotes seeded student discussion of course content, generating thick descriptions of what students recalled being taught and how they felt about this content. Students were also tasked with evaluating the effects of a carbon tax on a firm that installs windmills and with providing economic arguments for and against the tax. Their responses to this exercise are assessed below to better understand how PoE performed in terms of preparing students to attend to sustainability; I argue that this data shows that the course performed poorly on this metric.

7.2 Characteristics of the student population

As explained in Chapter 4, I had sought to focus my interviews on two different populations of students who had recently taken PoE—the ECON and SOP students. In seeking to address the overarching research question of this study, the differences between what ECON and SOP students reported about PoE are not that critical. As a result, although I analyzed these differences I do not emphasize contrasts or similarities between the responses of these two categories of students. Exceptions include where clear differences are relevant to the overall research project, or to discuss the specific question of whether the particular educational needs of SOP students are being met. The rationale for preferentially recruiting these two types of students was to assemble a more comprehensive perspective on the course. This approach of generally proceeding without segregating the two groups in reporting results is also supported by the fact that as the interviews proceeded, it became clear that the boundaries between ECON and SOP students were somewhat blurred. At least two students who were categorized as ECON students mentioned during the interview that they were studying economics because they wanted to have knowledge and tools that would help them tackle environmental problems. And at least one SOP student had registered in his program because he thought it would help him succeed in the business world.
The breakdown of the interview population by institution, by program type,\(^{87}\) by course taken (derived from respondents’ answers to the pre-interview screening email) and by sex is given in Table 11.

**Table 11: Breakdown of the student population participating in the study**

<table>
<thead>
<tr>
<th>Category</th>
<th>University=&gt;</th>
<th>UBC</th>
<th>SFU</th>
<th>UVic</th>
<th>Line total</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td><strong>Program type</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECON</td>
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<td>10</td>
<td>5</td>
<td>23</td>
<td>43%</td>
<td></td>
</tr>
<tr>
<td>NES</td>
<td>9</td>
<td>2</td>
<td>1</td>
<td>12</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>SOP</td>
<td>11</td>
<td>3</td>
<td>5</td>
<td>19</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td><strong>Sex</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Male</td>
<td>14</td>
<td>6</td>
<td>6</td>
<td>26</td>
<td>48%</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>14</td>
<td>9</td>
<td>5</td>
<td>28</td>
<td>52%</td>
<td></td>
</tr>
<tr>
<td><strong>PoE course taken</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Micro</td>
<td>26</td>
<td>13</td>
<td>11</td>
<td>50</td>
<td>93%</td>
<td></td>
</tr>
<tr>
<td>Macro</td>
<td>22</td>
<td>11</td>
<td>8</td>
<td>41</td>
<td>76%</td>
<td></td>
</tr>
<tr>
<td>Both courses</td>
<td>20</td>
<td>9</td>
<td>8</td>
<td>37</td>
<td>69%</td>
<td></td>
</tr>
<tr>
<td><strong>University totals</strong></td>
<td># of students</td>
<td>28</td>
<td>12</td>
<td>11</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>52%</td>
<td>28%</td>
<td>20%</td>
<td></td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

As compared to the actual population of PoE students, both ECON and SOP students are deliberately overrepresented in this sample. Some students mentioned the names of their professors during the interview, and based on this information, at least 13 different lecturers/professors\(^{88}\) were involved in teaching this sample of students.

Until question 16 was reached in the interview, other than a mention of the two population types that were being targeted for recruitment on posters and in the consent form,\(^{89}\) students

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\(^{87}\) In the extracts from student transcripts in this dissertation, student interviewees are numbered from S01 to S54, with a letter appended to the number to identify the student type: E for ECON students, S for SOP students and N for NES students. The subsequent number indicates the paragraph number in the ATLAS.ti dataset.

\(^{88}\) Based on the available online course listings, the various sections of PoE at the study sites during the study time frame were taught by sessional instructors (with PhDs), tenure-track or tenured instructors and associate, assistant and full professors.

\(^{89}\) Posters included the text: “Two groups of students who completed an Intro Econ course are being interviewed: 1) students majoring or minoring in economics; 2) students majoring or minoring in a program that specifically addresses sustainability (e.g., Environmental Studies).” The consent form included the line, “Also, you are either majoring or minoring in economics or majoring or minoring in a program that specifically addresses sustainability (e.g., natural resource management, forestry, environmental sciences).” It seems from student reactions to questions in the study, such as expressing surprise that a study about an economics course would include questions about how it attended to environment-economy linkages, that most students had not taken particular note of this fact.
should not have discerned that the study was concerned with how PoE addresses sustainability. However, before this question, just shy of half of the interviewees, or 25 of 54 students (though only seven of them were ECON students, while 15 of them were SOP) were sufficiently aware of and interested in environmental issues that, without prompting, they had raised some aspect of environment-economy linkages or sustainability in their answers. This could range from including sustainability or a clean environment in their description of a healthy economy to recounting course content that they had found problematic in how it related to the environment.

7.3 A student portrait of PoE

7.3.1 Course characteristics

Before attending specifically to how the course addresses environment-economy linkages and sustainability, I highlight certain themes that emerged from student descriptions of PoE in order to better understand the context in which economic theory relevant to sustainability is or might be taught. This context provides insights into understanding the degree to which students feel that they can interrogate theory, the extent to which lecturers reiterate textbook content and the like.

It should be noted that many of the students described enjoying their PoE course and described how they had felt they had learned a lot from it; based on their experience of PoE, 28 out of 54 described themselves as more likely to take further courses in economics than they were before taking the course. In the pages that follow, I focus on the more critical comments, but this generally positive assessment of the course should be kept in mind throughout.

For most students, course content is largely defined by or even “absolutely dominated by the textbook” {S31-S 63}. Students are expected to buy and read the textbook, and almost everything that is taught in the classroom can be found in the textbook, though not all textbook chapters or sections will be covered (a couple of students reported that they did not buy the text and instead relied on course lecture slides). As such, a common complaint was
that the lectures mirrored textbook content. Various students mentioned that carefully reading the textbook was key to obtaining a good mark:

Oh yeah, after the midterm, I guess some of the people didn't do very well and then the teacher said, “read the textbook, read the textbook” because I guess some people didn't read it as in depth as they should have. So yeah, it was very much emphasized.... {S11-E 67}

Online resources associated with the textbook are sometimes used, mostly for practise drills, but do not seem to be emphasized. Students mentioned large class sizes (typically over 100), teaching via lectures and slides and student participation mostly taking the form of asking questions of clarification.

7.3.1.1 The learning environment and ethos of PoE

It seems some students were told by their lecturer that their learning process would go more smoothly if they let go of their resistance to assumptions and approaches used in PoE that they might find difficult to accept or that didn’t map to their existing beliefs:

He warned us that there are a lot of things that you’re going to go against, that ethically or morally you won’t agree to, but once you do that, once you relax that thing about yourself, I guess everything was much more acceptable. {S15-E 96}

Perhaps not surprisingly then, a student reported finding that turning off the critical part of one’s brain helps in learning PoE:

Definitely when I went to study economics at the 100 level I had to turn off my critical brain for a little bit and just learn how to work with the models that were presented to me. {S24-S 43}

Although a substantial minority of students indicated that PoE had raised in their minds substantive questions about economic theory or its implications that they wanted clarified, few students reported raising or recalled other students asking such questions in class. Much of class time is focused on defining and explaining concepts, drawing graphs, learning and exploring the implications of various models and the like. Students who had found some aspect of theory problematic often reported that they did not ask substantive questions for fear of aggravating their peers by slowing down the class, or for fear of being ridiculed by the lecturer. Students may be coming away with the impression that certain questions, such as
those that query the plausibility of theory and its relevance to informing public policy decisions, are not on the agenda in most first year economics courses:

...but there was another person questioning this: “are there situations in which trade is not good and should not be pursued?” And the answer was that, “at this point we're only in the first steps of the course, so no, at this point we're not going to discuss situations in which trade is not good.” That was the answer he gave. {S08-E 120}

It seems that some lecturers are teaching economics in a way that comes across to students as implying that the economic theory discussed in the course is authoritative, settled and an accurate representation of economic reality. Two students contrasted the certainty of theory as presented in the classroom to their lecturer’s more ambiguous stance when theory was discussed in person, as is seen in this ECON student’s account:

Although my professors would tell me in person that they took issue with some of the things that were promoted by the course, I wish that they would maybe bring up some of those ambiguities in class, rather than portraying those things as “this is the fact” when in person they’ll admit there’s a lot of problems with that. {S13-E 111}

7.3.1.2 The worldview and normative connotations of PoE

SOP students in particular tended to raise issues regarding the worldview and normative values connected to PoE that they felt they were being asked to accept or at least to work with. As the student comments reported in this subsection illustrate (see Table 12), it seems that many PoE students encounter content that is infused with normative positions, or that may be interpreted as having normative connotations, that is potentially problematic from a sustainability perspective. Specific reasons given as to why this content might be problematic is that the content seemed to normalize selfishness, consumption, economic growth and/or suggest that government intervention in the economy should be avoided; as discussed in earlier chapters, enhancing prospects for sustainability may require constraints on consumption, limits on growth and extensive government intervention. More broadly, one student characterized the course as being imbued with value judgements:

I would say it’s a very robotic course that has incredible implicit value judgments that aren't necessarily, that are kind of taken as truths. {S47-S 45}
At the same time, consistent with the textbook tendency to insist that normative and positive economics should be kept separate, several students described instances that suggest that lecturers also brought up the desirability of keeping economic theory separate from values or politics:

*I think in the course we discussed there is a lot of issues with that [redistribution of income], like, it'd be a political decision, not an economic decision, so we didn't really talk about it much.*  {S33-N 87}

In analyzing student descriptions of classroom lectures to assess the extent to which the students appeared to encounter potentially problematic normative content, a brief digression is warranted to clarify my basis for classifying content as having normative connotations. Given that normative positions are inherent in mainstream theorizing (Sen 1987; Hausman and McPherson 1996), my intent was not to identify all content that entails a normative stance, since this might capture all content that builds upon a utilitarian foundation or privileges individual preferences. A more selective filter was needed.

When a student reports that they were taught that government efforts to redistribute wealth “don’t really work out as well as they plan” {S11-E 177}, the lecturer may have based their lecture on empirical data or on an economic model that demonstrates that income transfers are partially dissipated or misappropriated. The lecturer might be speaking from a standpoint they view as strictly positivistic; they are not making a normative claim about what a government ought to do. The lecturer might even take pains to add that society may decide that transfers of wealth are desirable, even if it is known that some dissipation will occur or even if economic theory points to drawbacks to redistribution. However, the point here is that the interview data suggests that many students appear to leave the course with the impression that economists advance certain policy positions because they are supported by economic theory and that they often miss the normative stances inherently entailed by supporting a given policy stance.

This observation suggests that there may be an interesting disconnect occurring in PoE classrooms wherein some lecturers are insisting that values do not and should not enter economic theorizing, while accounts given by PoE students suggest that PoE reinforced
certain normative positions. Alternatively, lecturers appear to have different positions, with some taking great pains to avoid taking normative positions (though they may not recognize the course’s commitment to growth and enabling consumption as a normative position) while others may not.

Table 12: PoE content with normative connotations as seen from student comments

<table>
<thead>
<tr>
<th>Content with normative connotations</th>
<th>Example student quote</th>
<th>Potential sustainability implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Countenancing greed and selfishness</td>
<td>…I felt like mostly it helped me, it sort of made me a little bit more cynical [laughs] about the way people operate and the assumptions inherent to that [economics] course are just, made me feel like that was possibly responsible for more people’s mind frames and I thought that considering the number of students that take this course first year and then go on to take more of these courses, I thought that maybe that was, you know, helped to shape their worldview a little bit. …that everybody’s greedy that they can get absolutely what they can get, with no cause, no concern for anybody else or anything else and everybody’s primary objective is to …to get the most that they can out of everything {S53-S 77}.</td>
<td>Normalizing self-interested behaviour may undermine other-regarding behaviour and ethical stances that favour sustainability.</td>
</tr>
<tr>
<td>Altruism redefined as a form of greed</td>
<td>…the argument made in class was that potentially people are still greedy, they’re just greedy for altruism. Which I find kind of a difficult thing. I wouldn’t say that someone who’s doing charity work is greedy necessarily for altruism. Maybe they are. Maybe they’re greedy in the sense that they want people to look at them and think that they’re doing good things. But I find that very difficult to accept {S14-E, 88}.</td>
<td>Humans have diverse motivations, with self-interest being only one of them. Sustainability is likely to be favoured if motivations such as altruism can be fostered and harnessed.</td>
</tr>
<tr>
<td>Free market stance</td>
<td>…so the maximum benefit that could have gone for either of the producer, the consumer is diminished when prices are not set by a free market, so I feel this is pretty much, if it sums up his [the lecturer’s] economic philosophy, it’s this {S29-E 90}.</td>
<td>Extensive intervention in markets to correct market failures and to limit or prohibit unsustainable economic activities are likely to be required in order to achieve sustainability.</td>
</tr>
<tr>
<td>Consumption as supporting wellbeing</td>
<td>We were taught that… people are happier when they get more, so when the economy is doing better they will consume more and they’ll feel happier because they feel wealthier {S06-E 146}.</td>
<td>At the consumption levels prevailing in Western societies, increased per capital consumption does not map to increased happiness. Increasing consumption is problematic from a sustainability perspective. Pathways to wellbeing that are less dependent on consumption will be needed.</td>
</tr>
<tr>
<td><strong>Content with normative connotations</strong></td>
<td><strong>Example student quote</strong></td>
<td><strong>Potential sustainability implications</strong></td>
</tr>
<tr>
<td>----------------------------------------</td>
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<tr>
<td>Growth as desirable</td>
<td>…that’s basically the general principle that I found from both classes, was that you want the economy to grow, so that life improves {S05-S 222}.</td>
<td>Growth results in higher levels of throughputs and consequent environmental impacts, or an ever-increasing challenge to improve eco-efficiency. As growth is increasingly uneconomic, rising costs erode improvements in wellbeing.</td>
</tr>
<tr>
<td>Growth / prosperity improves environmental outcomes</td>
<td>What we learned was like that…when a company’s doing well they will care more about the environment {S45-E 153}.</td>
<td>Some companies, such as many in the oil sector, have posted healthy profits all the while resisting meaningful action to protect the environment.</td>
</tr>
<tr>
<td>Economy’s health dependent upon consumer spending</td>
<td>I remember learning that it’s better if people spend more {S16-E 216}.</td>
<td>Sustainability is likely to require less emphasis on consumer spending as a means to secure economic stability and opportunity.</td>
</tr>
<tr>
<td>Desirability of trade / exchange</td>
<td>…when there’s more things happening in the market then people have more opportunities and can make more money and people can trade things more often, and the more trading there is the better it is basically {S53-S 146}.</td>
<td>Expansion of markets / sphere of exchange is not necessarily an indicator of a healthy, sustainable economy.</td>
</tr>
<tr>
<td>Consumer choice / consumer sovereignty should be respected</td>
<td>I would say that there was more the attitude that the consumer will make a choice and it will be the right choice and the kind of products that they support are the best products for the marketplace and they are right {S37-S 66}.</td>
<td>Sustainability is likely to require some constraints on consumer choice.</td>
</tr>
<tr>
<td>Choice linked to human rights</td>
<td>…what I’ve learned in the course [is] it's all about a capital market economy where everyone has their freedom of choice so like government should not intervene, so it’s kind of concerned about human rights as well, so basically this is my argument for you. Because the main focus of economy, it says that the market economy is the best thing for the economy. As in a capitalist economy works best for most countries {S18-E 125}.</td>
<td>To date, allowing consumers to make choices through markets has not delivered sustainability. Sustainability is likely to require extensive government intervention to put in place constraints on resource use, production methods and consumer choice. The human right to survival may have to take precedence over the right to choose in market settings.</td>
</tr>
<tr>
<td>Government efforts to redistribute income are sometimes unsuccessful</td>
<td>I learned in the class, I think, I’m pretty sure, that although the government tries to distribute wealth it doesn't really work out as well as they plan, or something, so I’m not really sure how that happens. But, yeah, I think it was talked about, I guess welfare programs and they talked about how they should distribute money but then reality doesn't really work out as well as theory suggests, or something like that {S11-E 177}.</td>
<td>Given humanity’s limited endowment and the limited capacity of sinks to absorb wastes, achieving wellbeing amongst the poor, which is implicit in sustainability, is likely to require a more equitable distribution of income and wealth, even if some is dissipated in the process of redistribution.</td>
</tr>
</tbody>
</table>
It is difficult to discern from the interview data whether PoE acts to shift students’ beliefs and values, an issue that has been much debated in the literature (see Section 2.7.3). Though students were not asked directly if their beliefs and values had shifted as a result of PoE and no instrument was administered to detect such effects, the interview data does provide some insights. While some students described encountering values in PoE that they found problematic and that they rejected, a small number described how their values shifted as a result of the course. For instance, one student described how, after her professor used a pie chart to explain how redistribution can erode incentives to work and hence can affect the size of society’s economic pie, she came to accept that redistribution may not be wise:

*And this is what I believe [laughs]. After my prof convinced me to believe this. Because before that I was thinking that the society should be more fair, we should distribute wealth more evenly between rich and poor, but after he talked about the pie chart, we’re like, hmm, that makes sense.* [S01-E 169]

Of course, the degree to which such shifts might last over time cannot be determined from the interview data.

### 7.3.2 RQ9 and RQ10 – Student perspectives on how PoE addresses EELS

9) *How do students who are majoring in economics and who have taken Econ101 perceive the Econ101 course in terms of its relevance to addressing sustainability?*

10) *How do students who are registered in sustainability-oriented programs and who have taken Econ101 perceive the Econ101 course in terms of its relevance to addressing sustainability?*

The majority, or 34 of the 54 students, recalled that at least one of the courses they had taken addressed the environment or sustainability in some form or other, while for the other 20 students, the environment and sustainability had not been addressed. Of course, in the cases where students did not recall encountering environmental content, this does not necessarily mean that their courses did not include economic theory focused on the environment. The economic theory covered may have related or been applicable to the environment, but students may not have recognized it as such if it was framed using technical terms like externalities and public goods. For instance, a student who at first could not recall
encountering environmental content in his course recollected externalities being addressed in class when I prompted him with the term. However, he explained how he was unable to remember its applicability to the environment and how he was left with the impression that economics pays little attention to such issues:

Yeah we did talk about that [externalities], but I don't remember anything about environment. I feel like that's the way that, I don't think like economics is very environment focused. I feel it's very money focused and whether that is positive to the environment or not doesn't matter, they're just going to do what they want [laughs]. {S41-N 139}

The interview data is clear that only in a couple of exceptional cases did participating students frequently encounter content that addressed environment-economy linkages in their economics courses. Also worth noting is that even if a student recalled that the course addressed the environment, this does not necessarily mean that the content in question provided the student with knowledge or tools that would improve their ability to attend to sustainability.

From student reports, it seems that in most PoE courses, externalities and public goods were treated very briefly and were omitted entirely in some cases. As one student described it,

The only time we mentioned anything about the environment was when we talked about externalities. It was only mentioned about the negative externalities of having pollution and how, basically how that can be priced in order to internalize that into the market. And yeah, that was pretty much the only time we talked about the environment. {S34-S 55}

A few students had encountered the concept of social externalities without its environmental equivalent (or without realizing externality theory applies to the environment). The majority of non-SOP students did not seem to expect that PoE would address environment-economy linkages and sustainability, though some of these students appeared to have shifted their view by the end of the interview, possibly as a result of the various questions requiring them to reflect on how the environment and the economy are interlinked. A SOP student recalled his instructor saying that the economics department did not want the environment emphasized in PoE:
As a result of the course’s focus on individual self-interest, one student left PoE with the impression that economics is devoid of possibilities to help improve environmental outcomes:

_I can’t think of economics doing anything for the environment. I’m sure it can within the maximizing thing, it’s just so overpowering._

_Interviewer: Sorry, what’s so overpowering?_

_The maximizing principle, about everyone being a maximizer and just being greedy and everything… {S15-E 194}_

Student commentary on PoE suggests that in some cases the course may be, intentionally or not, suggesting that environmental problems are relatively minor, easily resolved with modest changes in policy or through technological progress, or even self-correcting thanks to existing market structures and incentives. Such framing may do little to help students comprehend the scale of the challenge that society faces if it desires to reduce the sustainability gap. For instance, one ECON student described how technological progress will benefit the environment:

_...that very short, brief session on the environment and that supports the theory that technology will eventually create the most efficient way to produce things and that will be efficient in terms of cost and as technology advances it does produce more environmentally-friendly ways to do things {S14-E 141}_

A possible explanation for the limited coverage of the environment in some PoE classes is that it is intended to reassure students that economic theorizing takes environmental issues into consideration:

_Well in my opinion, you know, the dialogue on the environment has been kind of tokenistic, you know, in that you would just bring it up, just acknowledge it. And I think that, you know, reflected, somewhat in the courses. You would acknowledge that there would be problems with say pollution, if you pursued capitalism, and that was about it… {S27-N 49}
An ECON student, whose thinking seemed to have been influenced by reading, on his own initiative, a book written by an ecological economist, described how the environment is conspicuous in its absence in the course by explaining how he saw the circular flow diagram as failing to include the environment and, more broadly, saw the course as proceeding by assuming that resources are fully substitutable:

First of all we’ve seen the circular flow model. So it assumes that there’s no waste, or every waste can be reintegrated freely into the flow. It’s a model, it’s a simplified version of reality, but still it’s quite a big detail that we’re omitting there in the model I think. But I think in general we see environment or natural resources as just a means of production that can be substituted with other means of production very easily. (S08-E 100)

In most cases, students described encountering environmental content through the lens of externalities. As one student described it, “if I had to draw an equation it would be environment equals externality” (S26-S 63). An economics student described how her professor, briefly discussed how the existence of externalities complicates the logic in support of markets, but then carried on, leaving her unsatisfied:

...he had two lines in the book, or in his notes and stuff, that some people disagree with this because they say that things like externalities or public goods are never factored into the price. So, like, the costs, they are borne by people who have no say in the matter and have no benefit from the thing and the—. He just kind of said that and then, but then we just moved on and I was like, “well that’s like a huge obstacle, right?” That when you’re setting prices and stuff and we just kind of like acknowledged the fact that they existed but then we didn’t go into it. We just moved on continuing with the whole like completely free market thing, and I was like, “Oh, well what about that one?” And then we just never really got into it, so I was kind of a little unsatisfied with that answer. (S29-E, 55)

This same student described being instructed to proceed in writing tests or assignments on the basis that externalities do not exist. As a result, she was left uncertain as to how externalities were to be addressed, and indeed if economists themselves know how to factor in externalities:

Whenever we had our assignments, or whenever we had our tests and stuff, it would always be under the assumption that externalities don’t exist. So it was difficult to apply that little corollary of information that we got with what we actually had to do. And I don’t know how much of it was his fault or how much of it was just people don’t know how to factor it in right now,
For many students, the time allotted to the coverage of externalities or the environment was brief, “not even one lecture” {S45-E 117}. In two cases, students explained how, thanks to a bit of student prodding, the lecturer allocated more time for discussion on environmental topics:

They were mentioned and luckily the prof did talk about them a bit more after a bit of prodding, or asking a few questions. But there wasn’t much. They say alright, yeah, the environment is important but we’re not going to think about it right now [laughs]. A lot of: “we’ll get to that later.” {S46-S 134}.

But not all students saw the environment being downplayed; as one student recalled, the environment was touched on “quite a few times in the textbook” {S49-E 106}.

Environmental and sustainability topics that students described coming up in class included:

- economic policies to decrease car use and increase transit use
- negative environmental impacts of economic development
- global warming and carbon taxes
- why buying local can be bad for developing countries
- deforestation
- businesses that green their operations will boom; dirty companies will face boycotts
- how government can foster innovation to help reduce pollution

7.3.3 Notions of sustainability in PoE

When asked how sustainability was addressed in PoE, three students responded by laughing spontaneously, with one of these adding, “Seriously?” {S48-E 104}. In general, it seems there is little or no mention of sustainability in PoE: 37 students reported sustainability never came up in their course.

Some of the students who did not recall sustainability arising in their course offered that as economics is often described as revolving around making choices when resources are scarce
and sustainability is related to scarcity, sustainability might be understood to be a topic that is covered implicitly:

...I don’t think sustainability was covered in the course, I really don't remember it. Well, he did say that the definition of economics is the management of scarce resources in society or somewhere along those lines, but he never really went into more about how those resources perhaps can be, I mean in terms of relating it to sustainability, it was just very textbook, just—. I would like to know more about that, because that’s what I’m interested in. {S22-N 139}

Nonetheless, 17 students saw sustainability as being part of the course content, or as a subject that arose at some point during their course, albeit typically very briefly (e.g., 15 minutes, one lecture, in the occasional example). The most commonly reported sustainability challenge covered in the course was the issue of population growth and its implications for resource availability.

In many cases, what students recalled with respect to coverage of sustainability suggests one or more of the following issues: the concept of sustainability they referred to is not related to sustainability as it is understood in this dissertation, their recollection of the sustainability-related content is unreliable or the material on sustainability they were presented with lacked depth:

They talk about consumer choice, right? How individual choices can be made on an individual level to help that, but—. A bit into policy I guess, obviously like the carbon tax, you know. I guess sustainability is brought up... {S46-S 121}

In one instance, the way sustainability was covered in the course—as investments whose present costs are too high to warrant the future benefits of avoiding damage—left an ECON student unimpressed:

Well, it was a little bit depressing actually in both of my classes to hear my professors say, “the benefits are so far off and the costs are right here and it’s so great that people probably just don’t care.” They definitely did talk a little about sustainability in that, I mean, they would talk about probability saying that it’s a probability calculation. What’s the probability that the oceans are going to rise this much and should we be trying to accommodate? What’s the probability that this is going to be worse than we thought, should we try to accommodate? I thought that was the wrong way of thinking about it. {S13-E 129}
In an atypical response, a student reported that the lecturer had referred to the Club of Rome’s *Limits to Growth* report and pointed out that it implied how current trends are likely to culminate in a disastrous outcome for humanity; this material apparently even made it onto a test. Interestingly, the student recalled the emphasis on the effects of population growth, but did not refer to economic growth:

*He said things like overpopulation and I think he emphasized overpopulation will decrease standards of living, and he showed us a graph or some sort that explained that, and we, that was a big part of the test. He also cited this book about how basically we’re all going to die in like 60 years or something if we run out of resources, so it’s kind of interesting.* {S33-N 57}

One SOP student’s description of how sustainability arose in the course contrasted markedly with the prevailing description. He recalled a lecture that focused on long-term sustainability and the challenge that finite resources imply for continued economic growth, a theme that the lecturer apparently continued to revisit thereafter:

*We got kind of like one lecture that was just on like long term-sustainability and talking about economic growth and you know, we kind of have always lived in economic growth, so we probably can’t you know, continue to grow infinitely on finite resources, and we need to find some way to come to terms with that. He definitely devoted a lecture to it around the middle of the course, and he would commonly refer back to things like that or that lecture and some of its content throughout the rest of the course afterwards.* {S37-S 47}

Thus, with a couple of exceptions, there is little indication that sustainability is a lens that is integrated into course content. A number of students stated that they were disappointed that the course did not attend to sustainability or did so only in passing mention.

7.4 **RQ 11 – Does PoE enable students to engage with sustainability?**

*What aspects of PoE do these two subpopulations of students perceive as providing concepts and tools that enable them to better engage in sustainability issues, what content do they feel should have been added to the course and what content do they feel was problematic from a sustainability perspective?*
A relatively high proportion, 32 of 54 students, described PoE as contributing to their understanding of the root causes of environmental problems and potential solutions. However, in many cases it was not clear that the root cause that the course had helped students appreciate was necessarily one that their lecturers were trying to teach them; one ECON student reported that a root cause that PoE had helped him to understand was how profit and self-interest trump environmental considerations:

Maybe the fact that sometimes economics and business play more important roles for people then future of the environment so they prefer to do something that will make money but will not be good for the environment. {S10-E 119}

After describing how profit-maximizing firms can ignore external costs because they do not impact their bottom line, a student tried to recall what insight her course offered in regards to a solution for this problem, but without much success:

Does the government pass a law on that? I only remember there are issues about environmental companies, but I don’t remember what the textbook says about how to solve this problem. {S30-E 127}

Some answers suggest that students had difficulty mobilizing content they learned in PoE to better understand what kind of societal responses to environmental problems might be effective. For instance, a SOP student reviewed course topics to consider which of them might have provided insights into environmental problems and solutions and struggled to shape her recollections of assorted economic concepts and curves into a coherent answer:

I wish I had my outline with me. I’m just going to quickly go in my head through things that we learned: opportunity costs, comparative advantages. [Pause] I guess, in two ways. In one, I look at the effect of the deadweight cost and how they apply, if you’re consuming a deadweight loss then it’s better to be in the equilibrium and I can see how that can create negative impacts on the environment. Also when we were talking about certain taxing, it’s kind of slipping out of my mind a bit. Certain taxing and why, ok we’re going to tax it here, like for carbon taxes or wherever you’re putting those, making those lines intersect. ... But of course they mentioned a little bit about the taxing, adding on, whether it was an excise tax or making quotas. But we didn’t really go into quota or price ceilings with regard to environmental issues. So the way I kind of grabbed it was, “yeah the tax, those taxes” and also looking at the use of public goods and where those lines would intersect. {S47-S 94}
A few students explained that while their PoE course paid little attention to environmental issues or sustainability, it was useful in helping them better understand how economists look at the world and the concepts they use:

The courses in economics didn't speak to environmental or sustainability issues at all, but I think that it was helpful to me to understand the ways in which economists think because at least I could have an understanding of their models that are often critiqued in other areas, for example environmental studies. So yeah, if only to provide a foundation in the language and ways of thinking of economists that was probably a benefit. {S24-S 101}

22 students indicated that the course had not provided them with insights into the root causes of environmental problems. Some were not disturbed by this, since they had not anticipated that an economics course would touch on the environment, but others seemed disappointed:

I don't know, I couldn't tell you. I honestly don't think it's the focus, I don't think they care about the environment, sorry, but like, for me I didn't hear anything about that. It was just about “oh money and what’s the right price?” {S41-N 147}

When students replied that PoE had not given them insights into root causes, they were asked if there was theory that they had learned in the course that though not explicitly related to the environment, they could apply to examine environmental issues to better understand such root causes. Student answers suggest that most had difficulty seeing how economic theory that had not been linked to the environment by the lecturer might be transferred to such issues. One ECON student offered that PoE helped give insight to “…what drives the economy is what drives the business decisions.” (S44-E 130). A second ECON student, when probed about theory learned in PoE not specifically tied to the environment that might be used to provide insights, offered the following thoughts on the relationship between productivity, output and environmental insult:

...when firms try to raise their productivity, raise their output, you can build as much factories as possible I guess and that would increase output, but at the same time if you have more factories it increases output, but it also damages the environment. It pollutes. Sometimes they dump stuff into water. {S48-E 112}
Despite the limited attention given to EELS in PoE and shortcomings in how it was covered, 32 students deemed that the course would be helpful for a student interested in sustainability, while 20 had negative assessments of the course’s potential to help such a student.

### 7.4.1 Environmental content students suggest adding to PoE

Further to the issue of how PoE prepares students to engage with sustainability are the suggestions students had for environmental content that could be added to PoE. Lumping together those who were neutral on the question and those who did not want to see environmental or sustainability content added to PoE, there were only 11 students who appeared to be satisfied with the status quo (six Econ students, two SOP students and three NES students). An overwhelming majority of students thought more content on the environment should be incorporated in PoE in order to enhance student understanding of the root causes of environmental problems. A common theme was that the course entirely omitted or barely touched on the environment, so just connecting the economy to the environment would be helpful:

> Well, I mean, they could have added a lot [laughs]. They could have actually mentioned the environment, especially since it’s such a big issue these days. {S05-S 183}

However, the lack of attention to the environment made it hard for some students to consider what could be added to the course or to know whether economics even has any insights to offer on the environment. One SOP student offered that if the economics discipline has nothing to say about the environment, lecturers should clearly state, “oh about the environment, we, our field and our science is limited in such and such ways.” {S40-S 84}. An ECON student (S08-E) reported that he was so dissatisfied with the lack of attention to externalities in PoE—environmental concern being his motivation to major in economics—that he was contemplating filing a formal complaint with the university. One theme that emerged is that in terms of how PoE addresses the environment, students would appreciate “a more integrated approach” {S22-N 147}. Also, students showed an interest in learning more about what economics has to offer in terms of finding solutions to environmental problems.
Students offered specific suggestions as to content they wanted added to PoE to enhance student understanding of the root causes of environmental problems and potential solutions, including:

- more emphasis on market failures, externalities and “how problematic it is to try and cost those social costs”  
  \{S25-S 68\}

- “industrial growth, how that could affect the environment, that could be useful”  
  \{S11-E 123\}

- negative economic growth “because we’ve definitely outstripped the carrying capacity of the various natural systems that we rely on as inputs for economics.”  \{S24-S 105\}

- companies moving to pollution havens to reduce costs, increasing costs to society \{S29-E\}

- “…I don’t know, change the perspective. It just seems it’s like a dying perspective.”  
  \{S26-S 71\}.

- “…more parallels to scarcity and sustainability. So have a more environmental approach and say, there’s having scarcity in the world means there’s only a limited amount of forest, we can log, and fish stocks too that we can’t just maximize on them, we have to respect the scarcity.”  \{S54-S 121\}.

One SOP student, who characterized environmental topics in PoE as something that students were not tested on but that “we would talk about every so often”  \{S43-S 112\}, suggested that lecturers should use more concrete examples to foster student learning. Another SOP student described her desire for PoE to spend a week on “those hard-hitting facts and numbers that make ES students cry,” explaining that students who go into business need to learn more about environmental impacts of economic activity:

> The people need, students in economics, in their first year, a lot of them are going to be business and if they don’t start thinking this way, I don’t know when they will. If they don’t start thinking about this right away. I think in the economic structure for the micro, they really just need to put an emphasis on the impact of some policies. Like an environmental impact, bring it, make it more alive. Show failures in the economic system. Don’t be afraid to. People need to be critical [laughs]. \{S47-S 99\}
For the minority who did not suggest additions, addressing sustainability and the environment is not “the purpose of the course” {S27-N 57}, there was already enough covered by the lecturer. Another viewpoint was that if such topics were not covered in class, the interested student could refer to their textbook.

7.5 Results from the card sorting exercise

As described in Section 4.6.2, students were asked to sort 17 quotes that paraphrased (and in some cases misrepresented) a number of claims of interest—or contradictory versions thereof—found in the typical introductory economics textbook. These quotes were worded based on findings from the content analysis of PoE textbooks described in Chapter 4. To recap the sorting process, students were asked to compare the quotes against what they learned in PoE and to sort the quotes into three piles: the first for those quotes that were “supported by or consistent with” PoE; the second for those that were “contradicted by or inconsistent with” PoE; and a third pile for those that were unrelated to PoE or that the student was uncertain about where to place. After the students had sorted the quotes into these three piles, they were asked to pick three quotes each from the first and second piles, to describe how the quote related to the course content and to give their personal opinion about each quote.

I report here on the results for those students who had taken both micro and macro courses. This involves a subset of 37 students of the original 54 students. I first performed a contingency table analysis to verify whether the responses were, overall, significantly different from what would be expected if the students were sorting the questions randomly. A random assignment would indicate that they were not putting thought into their answers, that the questions had no meaning to them or that they could not interpret the quotes. The highly significant result (Chi square 173, df 32, p<0.0001) indicates a high divergence from a

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90 Since students who missed either the macro or the micro course would miss content that would be related to some of the quotes, it seemed preferable to conduct the statistical analysis using only those students who took both courses. All students were retained in the qualitative analysis of how they described quotes relating to course content.
random assignment, meaning that the students had thought about the individual quotes and how to sort them.\textsuperscript{91} However, the design of the study, the relatively small number of students, and the degrees of freedom available do not make it possible to drill down to make statistically significant inferences with respect to how individual quotes were sorted. Of course, the results can still be examined at the level of individual quotes so long as claims of statistical significance are not made.

Results of the quote sorting exercise are reported in Table 13. The first column provides the letter by which quotes were identified. The second column is a paraphrased version of the quote (to make all the data fit in one table, the quotes have been distilled down to their essential claim). The third column, “Expected sort,” shows which way it was predicted that students would sort the quote given findings from the textbook content analysis (thus, I expected that quotes that deliberately misrepresented the textbook position would be sorted as “contradicted by or inconsistent with” course content and that those that reiterated the textbook position would be sorted as “supported by / consistent with” course content). The fourth column, “% sorted as predicted,” documents the percentage of students who sorted the quote as predicted, while the fifth column, “Unexpected sort,” shows the percentage of students who sorted a quote opposite to what was predicted, again, given the prevailing view in the texts. The last column, “% sorted unrelated / don’t know” reflects the percentage of students who deemed a quote to be unrelated to course content or who did not know how to sort the quote.

The quotes have been ordered in this table from the highest to lowest percentage, sorted as predicted. Only in the case of the top five quotes did the students clearly sort the quotes as predicted (at least 55% sorted as predicted; less than 20% sorted opposite to the way predicted).\textsuperscript{92} The opposite pattern is seen for the second to last quote, K, wherein 59% sorted

\textsuperscript{91} In some respects the statistical test reported here is redundant. Because the design of my study involved students speaking about three of the quotes they had sorted as consistent and three they had sorted as inconsistent and describing why they had selected a given sort for the quote in question, data was generated that further demonstrates that the sorting exercise was meaningful to them.

\textsuperscript{92} Given the fact that this analysis involves students sorting a set of 17 quotes into three piles, a fairly strong signal was needed to decrease the likelihood of picking up spurious results. Therefore, without claiming to draw statistically significant conclusions, before surmising that students were tending to sort
it opposite to what I predicted and 17% sorted it as predicted. A high proportion (a third or more) of the students put seven of the quotes in the third pile, the one reserved for quotes that were unrelated to course content or about which the student was uncertain. These seven quotes thus seem to reflect content that is not emphasized in PoE or they are quotes that students had difficulty interpreting / comparing against PoE content.

The quote sorting results suggest that the participants left PoE with the impression that PoE supports (or rejects) the following claims or policy stances:

1. Life for most Canadians improves when Canada's economy grows (quote A).
2. To address pollution, economists often recommend that governments apply a tax equivalent to external costs (quote I).
3. Governments should promote technological change and economic growth to improve environmental quality (quote L).
4. (Rejecting the claim) Because people are manipulated by advertisers and are not good at making rational decisions, governments should restrict the sale of products to those that are environmentally benign (quote H).
5. People in poor countries benefit from supplying the markets of rich countries (quote D).
6. Since firms face market pressure to minimize costs, without regulations the environment will be degraded (quote K).

Also, the fact that quote O was put in the unrelated / don’t know category by 70% of students suggests that students are not being taught in PoE that environmental conditions have improved since the 1960s and 1970s.  

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93 In retrospect, by referring to “the 1960s and 1970s” as the baseline against which the state of the environment was to be compared (a point of reference in one of the PoE textbooks), quote O was too specific; this specificity may be one of the reasons that so many students sorted the quote as unrelated to course content. Better wording for quote O would have been something to the effect of: “The state of the environment has generally been improving over the last few decades.”
Given findings from the analysis of textbook content, I was not surprised by the fact that such a high proportion of students leave PoE with the impression that the course puts forward the view that life improves with growth. The fact that an almost equivalent percentage of students leaves PoE with the impression that economists advocate for government rectifying of environmental problems via Pigovian taxes is encouraging from a sustainability perspective, but surprising given the fact that so many students said little and sometimes no course time was devoted to environmental content, a view that was corroborated by the PoE lecturers interviewed for this study. A high proportion rejected, as I expected given the privileging of consumer sovereignty, the notions that advertisers manipulate, that individuals are not good at making rational decisions and that governments should therefore restrict consumer goods to those that are environmentally benign. It is also unsurprising that students recalled learning in PoE that governments should support technological change and economic growth to improve the environment and that people in poor countries benefit from supplying the markets of rich countries.

I had not expected that students would sort quote K in a way that suggests that PoE supports the argument that competitive pressures result in firms degrading the environment unless regulations are put in place. Of course, the textbooks usually include a chapter where they explain the problem of externalities and how government action in the form of regulation, Pigovian taxes or other economic instruments can correct externalities and restore efficiency. However, given the broader context of how firms are portrayed in the texts—they are generally presented as wealth-generating and employment-providing entities—and the repeated emphasis on the efficiency advantages offered by allocation via the market and cautions about the inefficiencies caused by government intervention, I had not expected that students would link pressure firms face to reduce costs to the potential for environmental degradation without regulations. To put it in other terms, I had not expected that the students would recall this point of fine print in economic theory and interpret it so as to agree that PoE implies that free market arrangements should be constrained to avoid externality-inducing behaviour by firms. From a sustainability perspective, this result is encouraging as it suggests students leave PoE with the notion that economic reasoning supports the view that
regulations or other economic instruments are needed to ensure that profit-maximizing firms do not improve their bottom line at the expense of the environment. This view would be generally accepted by both mainstream and ecological economists.
Table 13: Comparison of predicted sort to how students actually sorted quotes

<table>
<thead>
<tr>
<th>Quote</th>
<th>Paraphrased quote</th>
<th>Predicted sort (per textbook analysis)</th>
<th>% students sorted quote as predicted</th>
<th>% students sorted quote opposite to predicted</th>
<th>% students sorted quote as unrelated / don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Life for most Canadians improves when Canada’s economy grows.</td>
<td>Consistent</td>
<td>84%</td>
<td>14%</td>
<td>3%</td>
</tr>
<tr>
<td>H</td>
<td>To address pollution, economists often recommend that government apply a tax equivalent to external costs.</td>
<td>Consistent</td>
<td>79%</td>
<td>9%</td>
<td>12%</td>
</tr>
<tr>
<td>L</td>
<td>Government should promote technological change to improve environmental quality.</td>
<td>Consistent</td>
<td>70%</td>
<td>8%</td>
<td>22%</td>
</tr>
<tr>
<td>J</td>
<td>Because people are not good at making rational decisions, only environmentally benign products should be sold.</td>
<td>Inconsistent</td>
<td>69%</td>
<td>11%</td>
<td>22%</td>
</tr>
<tr>
<td>D</td>
<td>People in poor countries benefit from supplying the markets of rich countries.</td>
<td>Consistent</td>
<td>62%</td>
<td>14%</td>
<td>24%</td>
</tr>
<tr>
<td>P</td>
<td>GDP is one of the most watched economic statistics.</td>
<td>Consistent</td>
<td>59%</td>
<td>35%</td>
<td>5%</td>
</tr>
<tr>
<td>J</td>
<td>Everyone benefits when the government avoids intervening in markets.</td>
<td>Consistent</td>
<td>49%</td>
<td>41%</td>
<td>11%</td>
</tr>
<tr>
<td>R**</td>
<td>To avoid the tragedy of the commons, natural resource stocks must be held either as private or government property.</td>
<td>Consistent</td>
<td>45%</td>
<td>26%</td>
<td>29%</td>
</tr>
<tr>
<td>N</td>
<td>Since rising income supports diminishing marginal utility, economic theory suggests equal distribution of wealth.</td>
<td>Inconsistent</td>
<td>38%</td>
<td>32%</td>
<td>30%</td>
</tr>
<tr>
<td>G</td>
<td>As our generation ensures economic growth, future generations will have more wealth for the environment.</td>
<td>Consistent</td>
<td>32%</td>
<td>22%</td>
<td>46%</td>
</tr>
<tr>
<td>Q</td>
<td>Growth is good for environment, it allows for reduced pollution, setting aside wilderness.</td>
<td>Consistent</td>
<td>32%</td>
<td>32%</td>
<td>35%</td>
</tr>
<tr>
<td>E</td>
<td>When rich economies grow, their demand for resources degrades the environment of poor countries.</td>
<td>Inconsistent</td>
<td>30%</td>
<td>30%</td>
<td>41%</td>
</tr>
<tr>
<td>E</td>
<td>Property rights can solve many environmental problems by giving owners the incentive to manage resources sustainably.</td>
<td>Consistent</td>
<td>24%</td>
<td>24%</td>
<td>51%</td>
</tr>
<tr>
<td>B</td>
<td>With growth more resources are used up and more wastes are emitted, leading to greater environmental harm.</td>
<td>Consistent</td>
<td>22%</td>
<td>38%</td>
<td>41%</td>
</tr>
<tr>
<td>M</td>
<td>Economic growth has to do with the application of human knowledge, so it is only limited by human imagination.</td>
<td>Consistent</td>
<td>22%</td>
<td>46%</td>
<td>32%</td>
</tr>
<tr>
<td>K</td>
<td>Since firms face pressure to minimize costs, without regulations the environment will be degraded.</td>
<td>Inconsistent</td>
<td>16%</td>
<td>62%</td>
<td>22%</td>
</tr>
<tr>
<td>O</td>
<td>Environmental conditions have improved since the 1950s and 1970s.</td>
<td>Consistent</td>
<td>14%</td>
<td>16%</td>
<td>70%</td>
</tr>
</tbody>
</table>

N=37, except *N=33, **N=31
7.6 Do students encounter the containment strategy?

In Chapter 4, I reported on the containment strategy, a pattern that I had noticed while conducting content analysis of economics textbooks. As explained earlier, various elements of this strategy appear in the mainstream textbooks, where they seem to act in such a way as to ensure that questions about the sustainability of indefinite economic growth are neutralized and do not leak into other sections of the textbook. The quote sorting data and student discussion of the quotes suggest that in PoE classrooms economic growth is argued to be desirable while GDP is claimed to be a good proxy of welfare, though with some provisions. However, in this subsection I document how the quote sorting data does not indicate that the containment strategy found in the textbooks is being deployed and emphasized in the classroom. The following analysis is based on how a subset of quotes that parallel the containment strategy were sorted by the 37 students who had taken both micro and macro.

Quote A, which claims that life improves with rising GDP, is considered the overarching claim and perspective taken in the textbooks and PoE courses; the limits to growth argument undermines this stance, and hence it is what the containment strategy is intended to defend. Quote A was sorted as consistent with classroom content by 84% (86%)\(^\text{94}\) of students. Quote P, which proposes that GDP is the best single measure of society’s welfare found 59% (63%) support. A student who discussed quote P explained that they sorted it as inconsistent with the course because they recalled “…there is one sentence that specifically says GDP doesn't exactly mean the quality of life in a country but it is an important way to measure” {S30-E 175}.

Quotes G, L, M, O and Q were included in the quote sorting exercise so as to represent elements of the containment strategy. These quotes contribute to defending the claim that growth is beneficial for society. Reverse-coded quote B proposes that more growth will imply more harm to the environment and thus is a subcomponent of the limits to growth.

\(^{94}\) In this section, the second percentage figure indicates the proportion of students sorting in a given category if students who put the card in sort three (quotes neither supported nor contradicted by course content / quotes about which the student is uncertain) are removed from the denominator.
argument. As was anticipated, it found little support, with only 22% (36%) of students deeming it to be consistent with course content and 38% (64%) sorting it as inconsistent with course content. This lack of support for quote B, and the fact that 41% of students put it in the third unrelated / uncertain sort, seems to indicate that arguments that there are limits to growth are not generally aired in PoE, but if they are aired, it may well be to argue that the limits to growth thesis is flawed. However, there is the intriguing result that quote B is one of four quotes where there was a clear difference in how the quote was sorted by student type, with 53% of ECON students sorting it opposite to what I predicted (i.e., as consistent with course content), while only 33% of SOP students sorted it as opposite to predicted; 63% of SOP students put the quote in the uncertain sort. I do not have an explanation as to why ECON students but not SOP students recall being taught that growth implies higher rates of resource use and hence harm to the environment.

Quote L, which proposes that economic growth and technological change help improve the environment, was sorted as consistent with course content by 70% (90%), a level that suggests either that this portion of the containment strategy was being deployed or that it is a side effect of how PoE courses tend to presume that both continued economic growth and technological progress are desirable. Quote M, which synthesizes cornucopian Julian Simon’s belief that growth is only limited by the human imagination and shows up in the Parkin and McConnell textbooks, was sorted as consistent by a mere 22% (32%) of students while 46% (68%) sorted it as inconsistent. Students who discussed quote M and had sorted it as inconsistent explained that they had learned that growth requires capital, labour and in some cases resources and thus imagination on its own will not suffice.

Quotes G, O and Q were put in sort three, which was intended for quotes that students deemed neither supported by nor contradicted by course content or were uncertain of how to sort, by 35% to 70% of students (an average of 50%). Quote Q, which posits that growth is good for the environment, ended up equally distributed between sorts, which may indicate

95 The others were quote E, Q and R. See discussion of Q below. Compared to ECON students, on average SOP students ended up sorting an extra 10% of the quotes into the uncertain/unrelated category, which may indicate they had greater difficulty learning or recalling economic theory.
that students are not hearing much about linkages between growth and the environment. Alternatively, the various sections of PoE offered by different lecturers had differing perspectives on how growth affects the environment, likely depending on the professor (since textbooks generally take the position that growth improves the environment). While the relatively small number of students participating in the exercise does not permit statistical inferences to be made with smaller subdivisions of students, there is an intriguing result if one drills down into how quote Q was sorted by university; 67% of SFU students recalled being taught that growth benefits the environment, 63% of UVic students recalled being taught content that was inconsistent with viewing economic growth as beneficial to the environment and 50% of UBC students either deemed that their course did not address the relationship between growth and the environment or did not know whether the quote was consistent or inconsistent with their course. The remaining UBC students were evenly split between consistent and inconsistent. Quote Q was the only quote that showed a clear difference in how it was sorted when students were grouped by university. Also, there is a considerable divergence between how the ECON students and the SOP students sorted quote Q. While 47% of ECON students sorted the quote as consistent and 35% as inconsistent with course content, only 17% of SOP students sorted it as consistent and 33% sorted it inconsistent.

The lack of support for the idea that the containment strategy is deployed in the classroom is emphasized by the analysis of student commentaries on quotes G, L, M, O, Q and the reverse-coded quote B. For instance, in the case of quote M, wherein growth is described as limited only by human imagination, one student recalled learning content that fits with the containment strategy while a second recalled learning content that reinforces the notion that growth is influenced by the availability of resources:

>This growth has some to do with the expansion of technology, like last time we are living in the knowledge economy, we are buying something that is not visible, something that’s very small, those small stuff like a pen drive up so the growth is only limited by human imagination because humans come up with the idea of pen drive computer, these technologies that—. [S18-E 117]

...it definitely was implied that economic growth is not limited by human imagination, because the condition of the environment and the levels of
resources and stuff like that definitely influence the economic growth of every country. So, definitely it was implied in the class, and I also would agree with that, the way it was implied. {S38-S 71}

There is a similar pattern in responses to quote Q in that students’ recollections of course content suggest different classes offered opposing perspectives about the relationship between growth and the environment:

*Allow the economies to reduce pollution, if there’s more money then we have more money to budget into technological improvements...* {S16-E 224}

*We learned a little bit about the fact that the more we grow, the more we pollute, the more we take out of the environment and we don’t give back. In a sense some companies focus more on making a profit than having considerations for the environment.* {S44-E 176}

There is some evidence from the student commentaries on the quotes that where lecturers sought to assuage student concerns about limits to growth arguments, students were open to persuasion:

*Vaguely there was some discussion again, it wasn’t a big discussion. It was fairly short and it was discussing that the professor’s view was that there wouldn’t actually be shortages of natural resources in the future because economics teaches us that eventually pricing will equalize the market. Demand will go up and up and so will pricing. And that will eventually equalize the market and we will substitute or technology will force us to substitute out when demand gets, when prices get too high.*

*Interviewer: And what did you think of that?*

*Before I’d taken the class I probably would have said, “I don’t necessarily agree with that,” but I concede now that after having taken the class that yeah, we probably will force ourselves into situations where we will find alternative fuels, alternative material that we need for things. The other one that will be difficult to argue would be water actually. I’m not so sure we will find an alternative to that, so.* {S14-E 108}

The fact that there is limited evidence that the containment strategy is being mobilized in the classroom is perhaps to be anticipated given that both lecturers and students reported that so little time is spent on environmental topics and that sections on externalities and public goods are often omitted. This lack of evidence also suggests that despite the fact that continued
signs of environmental decline regularly make it onto the evening news, PoE lecturers do not feel they need to defend the presumed desirability of growth from limits to growth arguments.

### 7.7 Carbon tax exercise

This section describes some results from the carbon tax exercise section of the student interviews. The rationale for this exercise was to go beyond students’ perceptions of how PoE addresses EELS to explore the degree to which PoE currently prepares students to understand economic measures that might be taken on a contemporary environmental policy issue to improve prospects for sustainability.

Although PoE offers a mainstream version of economic thought that tends to downplay EELS and ecological limits, the fact that textbooks and sometimes lectures address externalities suggests that the course could help improve students’ understanding of market-oriented policies that can be implemented to foster sustainability. This exercise, which required that students evaluate the impact of a carbon tax and provide a basic economic rationale in support of such a policy, was thus designed to help understand PoE’s usefulness in preparing students to attend to sustainability in a way that might be considered amenable to the mainstream paradigm. These tasks are relevant since if students who took PoE are better able to provide a plausible economic rationale in support of a carbon tax to their friends or colleagues, prospects for informed public deliberation on such a tax might be improved.

Students were given a backgrounder on carbon taxes (see interview guide in Appendix E), to read over and refer to when answering questions 24 a) to f). To better understand their reasoning process, they were asked to answer the questions by thinking aloud. In the following pages, students’ answers to questions a, b and c are analyzed and categorized in order to assess how well PoE prepares students to understand the economic theory behind economic instruments intended to enhance environmental protection.
I report here on how well students performed on questions a-c. Although using a multiple choice format with appropriate distracters would have generated data that would require less interpretation, my intent was not to gain a precise measure of student performance; instead, I wanted to generate insights into how students mobilize PoE content in their reasoning and how they deal with potential sources of confusion. Hence the think-aloud format and the focus here on going beyond categorizing students’ responses.

Four students had taken macroeconomics but no microeconomics, where the relevant theory on externalities would normally be covered (S03-S, S07-E, S37-S, S48-E). They were therefore excluded from this analysis. The digital recorder malfunctioned during the carbon tax exercise for one student and the interviewer’s notes were not sufficiently detailed to report on the student’s reasoning (S02-N). Thus, a total of five of the 54 students are excluded from this analysis, leaving a population of 49 students.

7.7.1 Effect of a carbon tax

Q24 a) What effect would a carbon tax tend to have on a company that installs windmills that generate electricity?

Student answers to question 24 a) were tabulated according to whether they successfully addressed the following two elements:

- Effect: noting that a carbon tax would tend to have a positive effect on a company that installs windmills (e.g., increased sales, increased demand for its product);
- Mechanism: describing a plausible mechanism for the predicted effect (i.e., because the carbon tax makes electricity generated from fossil fuels more expensive, it improves the relative competitiveness of electricity generated from windmills).

The rationale for this question was to see whether students, having taken PoE, would see beyond the direct impact of the carbon tax on the windmill company (having to pay more for consumed inputs involving carbon emissions) to see how the tax would improve the company’s competitive position vis-à-vis firms that generate electricity using fossil fuels, thus improving its business prospects.
The answer sought in this case was that the carbon tax would tend to improve the competitiveness of a company that installs windmills that generate electricity since the relative cost of electricity generated through fossil fuel use (e.g., coal-fired generation) would increase with a carbon tax. Hence, even though this company might face increased costs in some aspects of its operations due to a carbon tax (e.g., the carbon tax increases the cost of fuel burned by the vehicles the company uses to install windmills), overall a carbon tax would likely lead to increased orders for windmills. Given that the policy proposal described in the backgrounder to the question also specified that the carbon tax would be revenue neutral so other taxes would decline accordingly, the windmill company’s costs on other line items might actually decline. Since students could come to the correct answer with respect to the tax’s effect by guessing (e.g., the feasible set of answers is that the tax will positively / negatively / have no effect on the windmill company), I was looking to see if they were able to both describe the effect and provide a plausible mechanism for the effect.

31 of 49 students were able to give an answer that indicated that there would be a positive effect on the windmill company’s business. 25 of 49 students were able to describe how a carbon tax would increase the relative competitiveness of wind-generated electricity over that generated with fossil fuels, as exemplified in the following answer:

...And the companies that burn fuel to make electricity, their price will go up, their price will go high because they need to pay tax to the government and so we [the windmill company owners] will have competitive advantage because we provide lower prices, relatively maybe, not real price because the cost of installing a windmill is probably more than traditional companies... {S30-E 203}

Many students saw that a carbon tax would have cost implications for the windmill company, but did not see how a tax penalizing carbon-intensive sources of energy generation would help improve the windmill company’s competitive position. Students sometimes reasoned that the carbon tax would be unfair because it would penalize companies attempting to do the right thing for the environment:

The carbon tax, I guess it kinda contradicts their purpose because windmills are generating electricity in an environmentally-friendly way ... Let’s say if they didn’t have the tax they’d be spending, say $5 to build one windmill but
With respect to the mechanism by which the carbon tax improves prospects for the windmill company, a few students offered answers that were not based on economic reasoning. For instance, a student suggested that the government’s implementation of a carbon tax might send a message to society with respect to expected ethical behaviour, so other economic actors would follow the government’s lead and make decisions accordingly, such that the windmill company would benefit from rising interest in green business (rather than more sustainable decisions resulting from changes in relative prices induced by the carbon tax). Such answers are interesting in that the students who gave them did not seem to understand or place much importance on how the carbon tax would change relative incentives.

### 7.7.2 Arguments in favour of a carbon tax

*Q24b) What economic arguments could you give in favour of a carbon tax as described in the passage you just read?*

This question was asked to see if students could draw on PoE to provide a basic economic rationale for a carbon tax. If students who have taken PoE are able to provide a plausible rationale to their neighbours or to others, the political prospects for implementing (or strengthening) a carbon tax might be improved.

Student answers to question b) were tabulated on the basis of three elements:

- **Internalization of externalities**: explaining that the carbon tax would help internalize the externality of climate change or that it would ensure that the price of fossil fuels better reflects its marginal social costs.

- **Incentive effects**: explaining that a carbon tax would create an incentive for economic actors to reduce their carbon emissions by shifting consumption towards goods and services with fewer carbon-intensive products or by investing in technologies with lower carbon footprints.
Other valid economic arguments: in those cases where a student’s response had missed either the internalization of externalities or the creation of incentives, student responses were tabulated if they offered other valid economic arguments in favour of a carbon tax.

Student competence in answering this question varied widely. Many students gave answers that suggested they had at least partially understood and could apply course content to provide an economic argument in favour of the carbon tax. Few students were able to cogently mobilize mainstream economics theory to argue in support of such a tax. The following answer, which is atypically elaborated and grounded in PoE theory, shows that the student understood and was able to explain the logic behind internalizing externalities and Pigovian taxes and how they work to adjust market prices so as to create an incentive to reduce fossil fuel use and emissions:

I think part of the economic arguments would say it sounds very much like a Pigovian tax in that you’re putting in a carbon tax specifically to discourage and compensate for damage being done to the environment. The reasoning in terms of adjusting the tax so that the tax burden is relatively the same is sounds fairly like a reasonable solution. And the relative pricing—[reads passage from exercise backgrounder]—I think it would encourage businesses to develop cleaner technologies and renewable incentives by making obviously the relative price of production be reduced if they’re using environmentally-friendly methods, ‘cause the tax would actually be a cost of production if they were using carbon-based methods, or carbon-producing based methods for production. {S14-E 181}

Many answers provided simple economic arguments that focused on the incentive effect of the tax, but omitted the issue of redressing externalities:

In economics we understand that actors respond to incentives. The carbon tax creates an incentive to reduce C02 emission; by reducing C02 emission,

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96 I classified arguments that were aligned with one or more elements of the following rubric as valid arguments: externalities imply that prices are distorted so that private incentives do not reflect social costs; the carbon tax helps correct the distortion and restore efficiency; firms and consumers react to the change in prices induced by the carbon tax and substitute away from carbon-intensive products and activities; the increased cost of carbon emissions fosters innovation in energy conservation and alternative sources of energy; revenue from the carbon tax allows governments to reduce other taxes that tend to have distortionary effects, whereas the carbon tax corrects for distortions. However, if an answer combined one or more elements with a clearly incorrect statement, it was not classified as a valid argument.
the actor increases their overall wealth and reduces how much taxes they have to pay. \{S33-N 98\}

Table 14: Student responses to the carbon tax exercise

<table>
<thead>
<tr>
<th>Question</th>
<th>Student response</th>
<th>Positive effect</th>
<th>Plausible mechanism offered to support predicted effect</th>
<th>Internalize externalities</th>
<th>Create incentives</th>
<th>Described other plausible economic arguments*</th>
<th>Offered implausible economic argument against carbon tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) What effect would a carbon tax tend to have on a company that installs windmills that generate electricity?</td>
<td>Student Type</td>
<td>Positive effect</td>
<td>Plausible mechanism offered to support predicted effect</td>
<td>Internalize externalities</td>
<td>Create incentives</td>
<td>Described other plausible economic arguments*</td>
<td>Offered implausible economic argument against carbon tax</td>
</tr>
<tr>
<td></td>
<td>Econ</td>
<td>14 (67%)</td>
<td>9 (43%)</td>
<td>4 (19%)</td>
<td>17 (81%)</td>
<td>2 (10%)</td>
<td>10 (48%)</td>
</tr>
<tr>
<td></td>
<td>NES</td>
<td>5 (45%)</td>
<td>4 (36%)</td>
<td>0 (0%)</td>
<td>8 (73%)</td>
<td>1 (9%)</td>
<td>9 (82%)</td>
</tr>
<tr>
<td></td>
<td>SOP</td>
<td>12 (71%)</td>
<td>12 (71%)</td>
<td>2 (12%)</td>
<td>14 (82%)</td>
<td>0 (0%)</td>
<td>10 (59%)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>31 (63%)</td>
<td>25 (51%)</td>
<td>6 (8%)</td>
<td>39 (80%)</td>
<td>3 (6%)</td>
<td>29 (59%)</td>
</tr>
</tbody>
</table>

Percentage figures indicate the percentage of students falling within a given category.

*For question b, if a student’s response included sound economic arguments in support of a carbon tax that covered the key categories of internalizing externalities and creating incentives, additional plausible economic arguments offered by the student were not tabulated.

...if you increase the price the demand will decrease. So as it’s stated, yes, I think that a carbon tax would definitely reduce the emission of carbon. Prices get passed on to the consumers, and the marginal consumers would substitute or reduce consumption or what have you. \{S52-S 230\}

Of interest is an answer where the student was able to mention the concept of internalizing externalities, but expressed the view that he would be surprised if economists supported a carbon tax, despite the fact that the consensus view in the profession (Pigou 1912; Pearce and Turner 1990; Cropper and Oates 1992) and the view prevailing in textbooks is that externalities should be internalized to correct for market failure and to enhance economic efficiency:

In my experience I’d be surprised to see them [economists] arguing for a carbon tax, but in the event that they were arguing for a carbon tax I’d see that they were, it was essentially internalizing an external cost, to an extent. \{S25-S 109\}
I now turn to the students whose performance on this question was less than would be desirable. Some students admitted that they could not give an economic argument in favour of a carbon tax. One student’s ability to give an economic rationale for the carbon tax seemed to have been hampered by wanting to “divorce myself” from “the way they [economists] think” [S26-S 111]. Another student had learned that economics has a negative view of all taxes, so could not think of an argument in favour of a carbon tax:

Well, what I’ve learned so far in economy is that taxes don’t tend to, don’t tend to increase efficiency of society and that it tends to decrease efficiency instead, because of the dead weight loss for society which leads to—. But then again, that leads to more equity and I don’t really know how I can answer this. So far what I’ve learned in economics is that taxes are bad for efficiency, but not for equity. So that’s pretty much all I can say about that, you can’t really give too much in favour of it because what I have learned so far is a negative, a more negative view of taxes. {S22-N 255}

In another case, a student who believed the carbon tax would be an effective means of reducing emissions could not think of an economic argument in favour of the tax:

Well if global warming is going to be catastrophic, as the IPCC has predicted, I feel like the only way to make a quick and effective change in carbon output is probably to put the tax on. As far as economic arguments, I don’t really know if I can argue it economically, but I feel like that might be something we’d have to do... {S39-S 95}

The following answer suggests that despite taking PoE, the student had yet to appreciate the way in which the internalization of externalities via Pigovian taxes adjusts relative incentives so that consumers take into account the taxable CO$_2$ emissions associated with each product, and thus how markets make use of information (in this case, information on the carbon content of goods). Instead, the student suggested that a company that sought to reduce carbon emissions would look good from a corporate social responsibility perspective in comparison to its competitors and hence might attract more customers, all the while confiding that the customers would have difficultly assessing the reliability of the company’s claims with respect to the carbon content of goods:

...people tend to buy products that’s good for environment... if there were two companies and one company is emitting less carbon dioxide, then people might get more products from the company that’s emitting less. But maybe it’s hard to know, unless they [the company] say it on their own, like,
‘we are producing...’ Because you go into a store and you have a choice between two products, but you can’t really say which company is emitting less... {S32-N 124}

Similarly, the following answer shows a student who took a perspective that is inconsistent with mainstream theory by suggesting that a subset of firms would not seek to reduce the amount of the carbon tax they had to pay (in mainstream theory, all actors respond to incentives, so given a new set of relative prices brought about by a carbon tax, economic agents would seek to optimize their consumption of inputs, thereby taking into account carbon intensity):

...I guess if they don’t want to be heavily taxed they would try to find a better way. If I was running a company, I would try and find a better alternative, but I guess some of them wouldn’t. I don’t know. {S03-S 237}.

Below is an example where a student reviewed various concepts that are discussed in PoE but was unable to pull them together into a cogent argument in favour of the tax:

I can’t remember, I learned this one theory, I think it might have been GDP, I’m not really sure it’s like C+I+ Net Exports, all that one, [hesitant voice] I think it’s GDP. But I think if there’s businesses, if taxes are higher, I guess, they reduce what they generate, but since here although the taxes for carbon is going up, the taxes for other things are going down, so it shouldn’t really affect GDP as much as it would if they didn’t lower the other taxes. So I guess in that way it shouldn’t really lower the GDP as much, so I guess that's an argument for the tax. {S11-E 193}

Despite the fact that the backgrounder explained that the tax would be revenue neutral, a frequent answer provided as an economic argument in favour of the tax was that the proceeds would flow to the government:97

Oh well, they could say you could make a lot of money from this carbon tax because everyone is using so much carbon, but it’s... I don’t know; I’m not that great at Econ. {S05-S 288}

97 Beyond the issue of revenue neutrality, the fact that a tax raises revenue for the government would be a weak economic argument for a tax, since this argument would apply to all taxes that generate government revenue. A stronger argument would be to point out that a carbon tax helps correct a price that fails to account for externalities, while at the same time generates revenue that the government can use to reduce other taxes that involve deadweight loses, thereby improving efficiency.
As an example of valid economic arguments for the carbon tax that are unrelated to incentive effects or internalizing externalities, one student (S36-E) argued that by implementing a carbon tax, more greenhouse gas emissions would be abated, which would reduce the level of coastal flooding and hence save society from having to spend money on mitigation. Another noted that unless carbon taxes were implemented in all countries, producers in the country where carbon taxes were put in place would be at a competitive disadvantage compared to those in countries without a carbon tax.

7.7.3 Economic arguments against the carbon tax

Q24c) What economic arguments could you give against a carbon tax?

One of the main reasons for including a question asking for arguments against the carbon tax was to present both pro and con alternatives in order to avoid creating the impression that the study was slanted in any given way or to signal to the student that economic theory speaks strongly in any one direction. Seeking arguments both for and against carbon taxes increased the likelihood of surfacing student confusion on the economics of externalities.

In order to detect errors in comprehension of the economics of externalities, student answers to question c) were tabulated solely on the basis of whether an implausible economic argument against the carbon tax was offered. While there are some plausible economic arguments that can be made against a carbon tax (for instance, that unless applied internationally, a carbon tax can put domestic manufacturers at a disadvantage), it was not anticipated that such arguments would be covered in PoE; as it would not make sense to expect students to provide such arguments, they were not tabulated. Non-economic arguments against the tax were also ignored since they were not of research interest.

The most common source of confusion detected in students’ arguments against the carbon tax was that adjusting prices via a carbon tax so as to internalize an externality involves distorting prices or reducing efficiency. In fact, carbon taxes are intended to bring prices that are already distorted due to the externalities involved in climate change more into alignment with marginal social costs so as to improve efficiency. A second common error was the
argument that the tax would put dirty industries at a competitive disadvantage when in reality redressing the fact that dirty firms are at an unfair competitive advantage (since they externalize the costs of their carbon emissions) is one of the tax’s desired effects. In some instances, it seems that students missed the fine print on the conditions that must be met for markets to allocate resources efficiently. Students seem to be leaving some PoE courses with the impression that economists give near blanket endorsement to the market and frown upon government intervention. A breakdown of erroneous arguments made by students is provided in Table 15 along with a mainstream economics explanation of the nature of each error.

Table 15: Erroneous arguments students offered against a carbon tax

<table>
<thead>
<tr>
<th>Type of erroneous argument</th>
<th>Example</th>
<th>Flaw in argument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon tax makes polluting activities more expensive / increases costs for carbon-intensive goods and services and reduces their consumption.</td>
<td>“Well arguments against would be that certain companies are unfairly targeted… some of them have to rely on emissions-based activities, something like, you know, if you were an industry that relied on trucking, for example, it’s extremely difficult based on your infrastructure, based on everything that you have set up already to go shift from a carbon-based system to something else.” {S27-N 92}</td>
<td>Pigovian taxes are intended to ensure that market price reflects the marginal social cost and to discourage production and consumption where marginal social costs exceed marginal social benefits. A reduction in the level of uneconomic activities is a desired outcome of implementing a carbon tax.</td>
</tr>
<tr>
<td>Tax results in deadweight loss.</td>
<td>“The tax would be argued against on the basis that it removes some of the either producer / consumer surplus present.” {S25-S 111}</td>
<td>Since a carbon tax corrects for an externality, there is no deadweight loss. In addition, since the tax was defined to be revenue neutral, taxes that do impose deadweight losses may be scaled back.</td>
</tr>
</tbody>
</table>

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98 This table shows categories where two or more students made similar errors. Some students included more than one erroneous argument.
<table>
<thead>
<tr>
<th>Type of erroneous argument</th>
<th>Example</th>
<th>Flaw in argument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon tax involves</td>
<td>“…tax is always done by the government, it's not by the invisible hand, and as we talked about in class, it's always better, in terms of making profits, it’s always better to only use the invisible hand. So when government interferes, it creates some sort of problems.” {S30-E 221}</td>
<td>In the case of market failures government interference to restore efficiency is warranted.</td>
</tr>
<tr>
<td>government interference in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the economy. (3 students / 49)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbon tax penalizes small</td>
<td>“… if I was a large company I could afford the tax; if I was a small company doing something that could be potentially useful I need to pollute for the time being and I'm just going to go out of business really quickly.” {S23-N 175}.</td>
<td>The size of a company is not necessarily related to its ability to pay a carbon tax since the tax depends on emissions; both large companies and small companies will have an incentive to abate in order to maximize profits.</td>
</tr>
<tr>
<td>companies while large</td>
<td></td>
<td></td>
</tr>
<tr>
<td>companies can afford the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tax and will pay it rather</td>
<td></td>
<td></td>
</tr>
<tr>
<td>than abate emissions. (3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>students / 49)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Since the tax is revenue</td>
<td>“… if you use the revenue from the carbon tax to lower the price of other things overall, we would still, the incentive [to emit less] would still go down… because you would still have that money.” {S20-S 231}</td>
<td>Revenue neutrality is at the economy-wide scale, there is no tax rebated on a given individual’s CO$_2$ emissions. Each individual / firm would have an incentive to abate emissions.</td>
</tr>
<tr>
<td>neutral, people still have</td>
<td></td>
<td></td>
</tr>
<tr>
<td>money so there is little</td>
<td></td>
<td></td>
</tr>
<tr>
<td>incentive to reduce</td>
<td></td>
<td></td>
</tr>
<tr>
<td>emissions. (2 students / 49)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Companies will just pay</td>
<td>“…companies might just say, well, ok, we’ll just pay the tax, instead of trying to change their procedures or operations to decrease emissions” {S40-S 118}</td>
<td>If the marginal cost of abatement exceeds the tax, then paying the tax is rational and efficient, so this position is not an economic argument against the tax. If the tax exceeds the marginal cost of abatement, profit-maximizing companies will invest in abatement technology to the level where the marginal cost of abatement equals the carbon tax.</td>
</tr>
<tr>
<td>the tax rather than abate.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2 students / 49)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Answers to questions d and e of the carbon tax exercise are not analyzed here because the wording of the questions invites personal opinions that are less helpful for assessing the usefulness of PoE in preparing students to participate in deliberations over carbon taxes.
7.8 Student opinions on taxes versus regulations

f) If society decided to reduce carbon emissions, would you prefer that government introduce a carbon tax, or that government put in place regulations that require all polluters to reduce their carbon emissions?

PoE textbooks commonly argue for the advantages of Pigovian taxes over regulations since imposing regulations is both complex (reflecting the diversity of industries, products and the like) and does not harness the market in search of efficiency gains. This question was thought to be a useful means of gaining insight into how well students had understood the economic rationale for using economic instruments to protect the environment. Without some basic economic theory, or starting with a naïve understanding of the economy, it would be easy to reason that since a carbon tax is intended to increase the cost of certain inputs, and since a portion of these added costs will likely be passed on to consumers, regulations are preferable to taxes because they do not act directly on prices. However, economic theory helps clarify that firms may face higher costs with regulations compared to a carbon tax as regulations generally provide less flexibility for firms to innovate and find the most cost-effective means of reducing emissions. The costs of regulatory compliance may therefore ultimately increase consumer prices more than a carbon tax. The question asked for the students’ preferences, rather than their view of what economic theory would suggest is more efficient, in order to explore how they drew on what they learned in the course when formulating a personal opinion. In the following pages, a few results in this section are highlighted.

Some students had clearly understood mainstream arguments for why a carbon tax would be more efficient than regulations:

... a carbon tax is sort of something that, you know, it runs itself very much. It's less work, it's more fair as well because it's just based off carbon emissions, and you know, any company that seeks to increase its profits would want to reduce their carbon emissions in order to reduce their operational costs. I would definitely be leaning towards government introducing carbon tax, or possibly a combination of both. {S38-S 87}

The carbon tax was also preferred because its impact on prices would be more predictable in comparison to regulations {S10-E 199}. It was also seen as more effective since everyone would feel the effects of a tax, whereas regulations could be broken, and the government
“can’t be watching every single company” [S22-N 301]. It would also generate funds that could be used to support health care or education [S23-N 192], though this does not necessarily avail if the tax is revenue neutral (the general principle that a carbon tax has the advantage over regulations in terms of generating government revenue in a non-distortionary manner is sound). Students also provided ethical rationales for preferring regulations to a carbon tax; such reasoning does not suggest that economic theory may have been misapprehended since some students may prioritize moral principles over economic goals.

Table 16: Weaknesses in student reasoning with respect to tax versus regulations

<table>
<thead>
<tr>
<th>Type of weakness in student reasoning</th>
<th>Example</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulations as a more direct way of reducing emissions.</td>
<td>… I would prefer that regulations require that they reduce their carbon emissions, I think that’s a more direct way of doing it [reducing emissions] rather than letting the market sort it out through a Pigovian tax. [S13-E 257]</td>
<td>A carbon tax, if sufficiently high, can be an effective way to reduce carbon emissions. Regulations are not necessarily more direct or effective.</td>
</tr>
<tr>
<td>Failing to consider how demand is more elastic in the long run than in the short run.</td>
<td>… Some things you just need to buy. If you have a car you can’t really go out and buy a car that uses less gas because you’re already stuck with what you have. And you don’t really get to choose whether you use less gas or not. If you have to drive a certain amount to work then you can’t really change that. [S44-E 224]</td>
<td>Fails to see that though demand for some goods can be inelastic in the short term, it can be elastic in the longer term. Also, over the long term producers can reduce their use of carbon-intensive inputs by substituting them with goods that are less carbon intensive; they can also make products that make more efficient use of fossil fuels.</td>
</tr>
<tr>
<td>Assuming that regulations are costless and would not affect prices.</td>
<td>I would definitely try the regulations first because it doesn't really cost a lot of money … [S09-E 197]</td>
<td>Regulations can be costly to implement and enforce; a carbon tax creates an incentive to reduce emissions efficiently, while regulations may impose costly compliance costs. Both a carbon tax and regulations will tend to affect consumer prices.</td>
</tr>
<tr>
<td>Type of weakness in student reasoning</td>
<td>Example</td>
<td>Explanation</td>
</tr>
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<td>--------------------------------------</td>
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</tr>
<tr>
<td>No difference seen between taxes and regulations.</td>
<td>But if they can have like a regulation that, like, will stop people from driving, without the carbon tax, than wouldn’t that be the same thing? What’s the difference? {S16-E 369}</td>
<td>There are many differences between a carbon tax and regulations. While regulations often specify a required level of performance, carbon taxes create an ongoing incentive to develop technologies that reduce emissions and concentrate abatement efforts where they are most cost effective.</td>
</tr>
<tr>
<td>Regulations will foster improvements in eco-efficiency, but a carbon tax will not.</td>
<td>…Like it seems like the carbon tax is like a giant cannon that they’re aiming at the whole car, and they’re trying to solve the problem by blowing up the whole car. … I think if there were requirements that polluters reduce their carbon emissions they [manufacturers] would design cars differently {S24-S 206}</td>
<td>Both a carbon tax and regulations can foster eco-efficiency improvements.</td>
</tr>
<tr>
<td>If society has made a decision to reduce emissions, a carbon tax is unnecessary.</td>
<td>“Well the society has already decided to reduce carbon. The tax would then be unnecessary if they’re really serious about it, the society themselves…” {S35-N 115}</td>
<td>Fails to consider free riding and other collective action dilemmas that are avoided through the imposition of a carbon tax.</td>
</tr>
<tr>
<td>A carbon tax would increase all prices so consumer decisions would be unaffected.</td>
<td>I guess it [the carbon tax] is going to increase everything’s price… People are not going to be like ‘oh the price just increased or just doubled or anything.’ This is kind of a little bit of increase in everything; I don't think that can be that evident to consumers… {S15-E 212}</td>
<td>A carbon tax would increase the price of carbon-intensive goods and services relative to goods and services with low carbon intensity.</td>
</tr>
<tr>
<td>Regulations stop pollution at its source; a carbon tax stops pollution at the consumer level.</td>
<td>“I would prefer that government put in place regulations that require all polluters to reduce their carbon emissions because that way because overall we could stop it from the source instead of stopping it from the consumer.” {S21-S 205}</td>
<td>Regulations still leave many decisions around the level of emissions in consumers’ hands. For instance, while a regulation can require that vehicles meet certain minimum fuel-efficiency standards, consumers decide how far to drive their cars and thus still make decisions that affect their total emissions.</td>
</tr>
</tbody>
</table>
However, despite their PoE courses, many students expressed viewpoints that suggested they had not understood or bought into the mainstream reasoning that Pigovian taxes are more efficient than regulations. Some instances of student confusion are shown in Table 16; explanations of the weaknesses in students’ reasoning from a mainstream economics perspective are also included.

Some caution should be used when drawing on the results of this exercise to evaluate the usefulness of PoE in helping students comprehend the carbon tax as an economic measure to enhance sustainability. (On the other hand, one would hope that after having taken PoE students would have some ability to think through some of the impacts of a tax beyond its direct impact on prices).

7.9 Chapter conclusions

A number of findings emerge from the student data. While many students were satisfied with what they had learned in PoE and reported that they would encourage a friend to take the course, a large number of students, especially SOP students, reported being frustrated with the course. Some rejected much of the course’s content and instead focused on playing within the permitted economics rulebook in order to pass the course.

The students’ descriptions of PoE seem to confirm that PoE is infused with normative positions that favour economic growth and consumption, a standpoint that is potentially problematic from a sustainability perspective. From the students’ descriptions, limited (and sometimes no) time is spent on the environment. When the environment is addressed in PoE, it usually makes its appearance as a separate topic via the theory of externalities and discussions of the commons. Students described learning core theory in a way that suggests the economy can be considered separately from the environment. Rather than opening up questions of sustainability for students (e.g., are there limits to growth, are current economic arrangements sustainable?) or calling into question the limitations of mainstream theory, student interview data shows that the course tends to set aside such questions; it also tends to reject these questions without due consideration for contemporary scholarship (there are no limits, current economic arrangements taken as given; limitations of mainstream theory are
not raised) and presents contestable claims relevant to sustainability as truths (e.g., richer societies take better care of the environment). An inadvertent effect of downplaying the environment in current incarnations of PoE is that some students leave the classroom uncertain as to whether the economics discipline or economic theory can attend to the environment.

Students who have taken PoE have limited ability to work through the effects of a carbon tax or to provide economic arguments in favour of the tax. Many offered flawed economic arguments against the tax. These results suggest that principles of economics courses perform poorly with regard to preparing students to take sustainability into account, even when the courses are assessed within a mainstream economics framework. It seems reasonable to expect that at universities that have made sustainability commitments, students who have taken PoE should show a stronger performance at mobilizing the economic theory they have learned to reason through a contemporary public policy issue of such critical import to sustainability.

From student descriptions of their PoE experience and their perceptions of how well PoE addressed environment-economy linkages and sustainability, there is thus little or no indication that universities’ sustainability commitments have influenced principles of economics curriculum. The sustainability challenge and environmental problems are downplayed; a clear majority of students advocated for a greater emphasis on sustainability. Instead, curriculum seems designed to replicate in students the mainstream commitment to economic growth and consumption, and to take current economic arrangements as given. Students learn of an economy that at most times seems to exist independently of its natural environment and that can be theorized about in this way. At the same time, based on how students sorted quotes and how they described lectures, there is little indication that lecturers are putting much emphasis on seeking to undermine limits to growth arguments.
Chapter 8: Summary, discussion and conclusions

It is because our wellbeing is about what we can do and be that the future matters for how well our own lives go. There are good reasons to do with our own well-being that we both care about future generations and that we consume now in ways that provide the conditions for a life worth living for them. O’Neill (2006, 171)

8.1 Chapter overview

I begin this chapter by providing a summary of the study. The results presented in Chapters 5-7 are reviewed in the context of relevant literature. I argue from these results that PoE courses are not assisting universities with meeting their sustainability commitments since sustainability has not been integrated into curriculum; these courses present naïve understandings of environment-economy linkages and they promote certain public policy stances that appear likely to exacerbate environmental trends. I then describe what these findings imply for practise, concentrating on the question of how sustainability can be integrated into principles of economics (PoE) curriculum and textbooks. I follow up with implications for economics departments, sustainability-oriented programs (SOPs) and other departments from across the academy. I then consider implications for university sustainability policies and strategies and the sustainability in higher education literature. Lastly, I review the limitations of the study and close by offering recommendations for further research.

8.2 Summary of the study

This study was focused on exploring the implications of universities’ sustainability commitments for PoE curriculum. Introductory economics courses were selected given the fact that so much environmental change is the result of economic drivers (Dietz et al. 2007) and because a growing body of literature suggests that if prospects for sustainability are to be improved, society will have to be governed by new economic goals and models (Speth 2008, 2009; Hueting 2009). Introductory economics courses were also of interest because in North America students from across the academy are required to take them—by one estimate, about 40% of undergrads. Most of these students take few or no other courses in economics, such
that it is the one occasion for many students to learn mainstream economic theory in a concentrated manner at the university level. I have proceeded on the basis that, over time, this course may be an important influence on the economic beliefs and values that circulate through society and as a result on the types of economic policies that get implemented and the economic decisions that are made (see Section 2.7.2). These ideas imply that what is taught in PoE has implications for sustainability.

To examine how universities’ sustainability commitments are being played out in the introductory economics classroom, this study drew on qualitative research methods and a case study approach and included several components. The first component involved content analysis of leading PoE textbooks used in BC university classrooms, as well as texts selected because they are market leaders. To provide a point of comparison, the same methodology was applied to a pair of textbooks that explicitly seek to address issues of sustainability. The second component was based on interviews with three distinct populations of participants at the three universities selected for the case study. The first population was made up of lecturers who teach PoE, the second involved professors in SOP departments whose students are encouraged or required to take PoE and the third involved students who had taken PoE in the previous nine months.

By focusing interview efforts on two distinct populations of students—those in economics or business versus those in sustainability-oriented programs—this study was designed to bring to the surface student perspectives on PoE courses, and in particular how these courses address environment-economy linkages and sustainability (EELS). Students were required to sort a set of 17 quotes according to whether a given quote was consistent or inconsistent with the content of their PoE course. They then discussed a subset of these quotes. This exercise provided valuable data on what students recall being taught and how they perceived this content. To move beyond student perceptions of their course, an exercise that required them to consider the effect of a carbon tax was included to see if students could harness the economic theory that is taught in PoE to analyze a public policy issue of contemporary significance.
The theoretical framework for this study was developed by integrating several disparate literatures. First, since this research was focused on sustainability, to assemble the tools required to analyze PoE textbooks and to understand content in PoE curriculum related to environment-economy linkages, I turned to ecological economics, focusing on theoretical contributions that might be useful in understanding deficiencies in how the environment is conceptualized in mainstream economics. This approach also helped identify the concepts and tools students should be introduced to at the introductory economics level if they are to understand the economy’s relation to the environment and the challenge of sustainability. Ecological economics points to the need to examine material and energy flows through the economy and to take into consideration the risks involved in allowing human demands to exceed ecological thresholds. It provides a starkly different perspective on economic policies that are likely to enhance the common good over the long term.

A second major component of my theoretical framework was assembled by reviewing a number of studies on curriculum in higher education that share commonalities with the current research project. This review suggested that Basil Bernstein’s pedagogic device, Pierre Bourdieu’s theory of cultural production, Margaret Archer’s Critical Realism and Bruno Latour’s Actor-Network Theory (ANT) were literatures that merited further consideration. In undertaking such a synthesis, I was clear that as an interdisciplinary scholar who could not possibly achieve the depth that scholars who specialize in these literatures could, my reading was provisional. I recognize that these literatures diverge in important respects and that there are certain incompatibilities; I make no pretense of reconciling divergences. For instance, Archer critiques Bernstein, while Bourdieu and Latour’s ANT suggest very different ways of looking at higher education. Having qualified my interpretation of these literatures in this way, I argue that nevertheless, disparate elements can be drawn upon to provide theoretical support for the current research project.

Bernstein draws attention to the field of recontextualization, whereby knowledge typically produced by others is assembled into curriculum before it is reproduced in the lecture hall and in textbooks. Bourdieu offers a plausible explanation as to why academics may avoid perturbing curriculum as well as the knowledge that it privileges to avoid undermining the
very intellectual capital in which they are invested. Another plausible explanation for why academics may have ingrained dispositions that limit the possibility that they will question curriculum that has stabilized is provided by Bourdieu's concepts of doxa and habitus. At the same time, I do not interpret habitus as denying PoE lecturers all possibility of agency or reflexivity.

Margaret Archer's framework draws attention to the logical relationships between ideas and the implications of such relationships for those who work in the world of ideas. When certain ideas are mobilized in PoE lecture halls and textbooks, they inadvertently drag along with them other ideas that stand in logical relation to them. This raises questions about how various agents, including textbook authors, PoE lecturers, students, and SOP professors, engage with ideas that stand in logical contradiction to those mobilized in PoE. Archer also provides a framework for understanding cultural maintenance and cultural elaboration. In a PoE setting, this information suggests avenues wherein research may help further explain the stability of PoE curriculum as well as how other agents may seek to foster curriculum change.

Latour's Actor-Network Theory invites researchers to go beyond human actors and to pay attention to the material elements that are mobilized in the network involved in delivering PoE courses. While my research cannot be said to fit within an ANT approach—I make no pretence of tracing out the key actants mobilized in the delivery of PoE, nor am I interested in examining the materiality of the course beyond the textbook—it does provide some theoretical justification for my emphasis on analyzing the content of introductory economics textbooks, as they are obligatory passage points that PoE students must go through and that have a marked influence on the shape of PoE courses.

8.3 Discussion of the findings

8.3.1 A context of deepening crisis and sustainability commitments

As this research project wrapped up, the decade of education on sustainable development promulgated by the UN was more than half over. Both existing sustainability commitments
and the sustainability in higher education literature point to the desirability of integrating sustainability across the curriculum (Wright 2002; Shriberg 2004; Haigh 2005; McMillin and Dyball 2009). Universities have made considerable progress in meeting their sustainability commitments through the greening of campus infrastructure and operations. Indeed, what some are calling the greenest building in North America recently opened at UBC, one of the three case study universities. Yet when it comes to addressing sustainability in the curriculum, scholars working in diverse disciplines report that there has been inadequate progress (Bosselmann 2001; Sterling and Scott 2008).

Four decades of critique of mainstream economics by ecological economists (Georgescu-Roegen 1971; Daly 1992a; Daly and Cobb 1994) has had little effect on mainstream theorizing (Ma and Stern 2006). Past experience plus insights derived from considering the sociology of the economics profession (Fourcade-Gourinchas 2001; Fourcade 2006, 2009) and literature on theory choice in economics (e.g., Mackie 1998) suggest that curriculum will evolve slowly. During the time frame that this study was carried out (2007-2011), the world was rocked by a global economic crisis that is having grave implications for human welfare and the stability of the international economic order. As a result, the limitations of standard theory and the economic order to which it is most relevant have been debated by a broader public than the economics profession is accustomed to. The Inside Job, a recent documentary and winner of the 2010 Academy Award for Best Documentary Feature, subjected academic economists to public scrutiny for the role some of them may have played in enabling the financial crisis. Prompted by the economic profession’s failure to anticipate the 2008 financial crisis, financier George Soros donated $50 million to set up the Institute for New Economic Thinking. This institute challenges, in a high-profile manner, “deficiencies in our out-dated current economic theories” and seeks to foster innovative scholarship. In 2011 the Occupy Wall Street movement spread rapidly across North America, suggesting that there is a broad public that is deeply concerned about the injustices perpetuated by the existing economic order. As I was writing this section, 70 students staged a walkout of

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99 cir.s.ubc.ca accessed December 13, 2011.
100 Ineteconomics.org/about (accessed December 20, 2011).
textbook author Gregory Mankiw’s introductory economics class at Harvard,\textsuperscript{101} complaining that his course is imbued with an ideology that lends support to the types of public policies that have institutionalized a grossly inequitable socioeconomic order.

Although the 2008 economic crisis has tended to push concerns about sustainability off the front page of newspapers, scientific reports that picture a worrisome trend of escalating rates of ecological deterioration continue to accumulate. The International Energy Agency, not known for its radicalism, recently warned that there are but five years left to act before humanity locks itself into an energy pathway that commits humanity to a dangerous climate change of 3.5°C to 6°C (International Energy Agency 2011). Such news on the environmental front has also contributed to public deliberation regarding the long-term viability of conventional economic prescriptions and has helped foster the slow but steady expansion of a network of scholars and activists who are challenging the economic growth paradigm implicit in mainstream economic theorizing (Villano 2011).

The context reviewed above suggests that there may be atypical pressures accumulating that have the potential to culminate in a period of more rapid change in the theories mainstream economists subscribe to and engage with, and in the pace of change for PoE curriculum.

### 8.3.2 Textbooks

Textbooks are seen as obligatory passage points into a profession (Latour 1987; Barnes 2002). PoE courses are largely shaped by the textbook. The mainstream textbooks have much in common, although they differ in the degree to which they emphasize imparting technical skills and display varying levels of enthusiasm for “free” markets versus government involvement in the economy. However, these differences notwithstanding, with respect to how environment-economy linkages are addressed, the textbooks show much commonality.

Research question one

*What proportion of PoE textbooks in use in BC, as well as the leading North American textbooks, addresses environment-economy linkages and sustainability, and how does this compare to a pair of textbooks written expressly to attend to sustainability?*

The standard textbooks give little space to content that touches on environment-economy linkages or that is significant to sustainability—on average, only about 3.2% of the text. None of the mainstream textbooks included sustainability as one of the pivotal issues facing society. The standard textbooks were found to compartmentalize material that relates to the environment in chapters on externalities and public goods. Such compartmentalization has the effect of suggesting that linkages between the economy and the environment are weak. At least one textbook author explicitly suggests to the lecturer that the chapters that address the environment are not core chapters and may be omitted in the face of time constraints (Parkin, xxii). If chapters specifically devoted to externalities and public goods are excluded, content that touches on environment-economy linkages drops to an average of 1%. In one of the texts examined, a student could read up to 289 consecutive pages without encountering environmentally-related content.

The pair of textbooks that Goodwin and her co-authors wrote explicitly to address sustainability outperformed the mainstream texts, with 4.4% of content in the microeconomics volume and 9.6% in the macroeconomics volume addressing environment-economy linkages. While the mainstream texts concentrate environment-economy linkages in one or two chapters, they are woven throughout the Goodwin text.

These findings are consistent with the PoE textbook analysis conducted by Daly (1995), Northrop (2000) and Reardon (2007), who examined PoE textbooks from an ecological economics standpoint. The present analysis adds to this earlier work by developing a replicable methodology for assessing what proportion of the textbooks addresses environment-economy linkages, how this content is distributed and providing a more in-depth analysis. It is also applied to more recent editions of PoE textbooks. However, measures of proportion and distribution give a limited sense of the textbooks; the next section addresses the ideas that the textbooks seek to convey.
Research question two

What does content analysis of such PoE textbooks indicate with respect to how environment-economy linkages and sustainability are conceptualized?

The standard textbooks treat the environmental implications of economic activity in a highly stylized manner, with little grounding in factual data or environmental science literature. This approach misses an opportunity to make the text more relevant and to add to student knowledge of contemporary environmental issues. The texts presume that increased output and rising per capita consumption levels are desirable, that they enhance wellbeing and that they imply that richer countries have less impact on the environment than poorer countries. However, there are theoretical reasons and empirical data that suggest that richer countries do not in fact have less impact on the environment (see Section 3.2) (Wackernagel and Rees 1996; Rees 2003a). Compartmentalization of environmental content allows for the ecological viability of status quo economic policies to be left largely unexamined in other chapters.

In large part, the inadequate treatment in mainstream texts of the role that resources and energy play in enabling economic activity identified through content analysis is consistent with concerns about mainstream theorizing that are raised in ecological economics literature. For instance, Ayres complains that the standard economic model has “…no role for physical materials, energy or the laws of thermodynamics. Energy and materials exist in the theory as outputs—products and services—but not as inputs or drivers” (Ayres 2008b, 294). For the textbooks to include more sophisticated coverage of environment-economy linkages, including greater consistency with the first and second laws of thermodynamics and a shift from presuming the desirability of growth to presenting growth as having both desirable and undesirable characteristics—and in particular presenting the ways in which further growth in rich countries is likely to be creating ever-greater challenges for achieving sustainability—would require a much more fundamental rewrite (Daly 1995).

The textbooks advocate for growth as society’s primary macroeconomic policy objective despite the fact that beyond modest levels of income, economic growth and wellbeing are poorly linked (Easterlin 1995, 2010; Layard 2005; Costanza et al. 2007; Konow and Earley
While the mainstream textbooks present the “limits to growth” debate, their presentation of it is unreliable and is based on selective mobilization of relevant evidence, with little attention accorded to more recent theoretical arguments on why further economic growth is likely to compound the difficulties in moving towards greater sustainability (Huesemann 2003, 2004; Ayres and van den Bergh 2005; Victor 2008). The textbooks seem likely to confound rather than advance student understanding of the nature of humanity’s sustainability predicament and its potential remedies. This situation is particularly disconcerting when one considers that textbooks are given a privileged position by professors while students tend to accept what their textbooks tell them (Richardson 2004; Paxton 2007).

The textbooks promote the creation of property rights in natural capital as a means of creating the appropriate set of incentives to solve environmental problems, but show little recognition of how private property can allow other environmental insults to occur and can contribute to habitat fragmentation and incentives to deplete resources. They downplay or ignore instances where common property regimes or state action have worked to sustain the productivity of natural ecosystems. In addition, the textbooks include little or no content that might enhance student understanding of the role that the redistribution of wealth and less consumerist lifestyles in rich countries could play in moving towards sustainability.

Goodwin uses a sustainability lens to examine a number of important economic issues, presents students with recent empirical data on environmental indicators and grounds the discussion with references to specific articles from the environmental sciences. She is transparent regarding mainstream theory’s limitations in attending to the environment and the fact that considering sustainability may cause problems of coherence. For instance, Goodwin acknowledges that addressing unemployment via the Keynesian policy of stimulating aggregate demand may have the undesirable side effect of undermining society’s environmental goals.

In summary, the analysis in this study shows that the introductory economics textbooks in use in BC during the study period, as well as three leading US textbooks, one of which includes a Nobel laureate who has written with great concern about the environmental crisis
as its lead author, appear poorly suited for PoE courses at institutions committed to sustainability. In contrast, the Goodwin texts would appear to be a suitable choice as a PoE textbook at institutions that have made a commitment to sustainability and are seeking to improve the environmental literacy of their students, all the while ensuring that students are being trained in the basics of mainstream economic theory.102

Students would likely be better served if authors of mainstream economics textbooks were to improve the sophistication with which their texts address environment-economy interactions. Textbook authors, already under pressure to add various topics to their texts, may well object that a fuller and more sophisticated treatment of environment-economy interactions would expand the total page count well beyond the amount that can be managed by first year students. There are two rejoinders to this argument. The first is that integrating sustainability into the text—the key word is integration—does not so much mean adding more topics and hence pages, but rather means rewriting existing content such that it more realistically addresses environment-economy linkages and keeps in view the sustainability implications of theory and policy. For instance, some of the examples used could be replaced with examples that both illustrate economic principles and are environmentally relevant, a tactic adopted by Goodwin. The second rejoinder is that if one goes back to one of the commonly agreed desirable outcomes of taking introductory economics—a better understanding of the economy (Boulding 1988)—much of the existing content (some which no longer reflects current theorizing) could be omitted, a point that even scholars in the mainstream tradition have made (Becker 2004, 2007; Ferguson 2011). For example, few PoE students in North America major in economics, fewer still will go on to get a PhD, and but a handful will ever be appointed governor or chairperson of a central bank. As such, it may be possible for authors to allocate less space to currently favoured topics such as the mechanism whereby central banks influence interest rates. Furthermore, most textbooks have superfluous content that could be deleted, such as the page McConnell devotes to considering whether a robot could replace the Chair of the US Federal Reserve (p. 333).

102 I have not systematically assessed how competently Goodwin covers mainstream theory. However, the authors’ credentials and peer review have given me reason to believe that they are satisfactory in this regard.
Authors of the standard texts should consider opportunities to better optimize the limited number of pages allotted to sustainability-relevant issues. Textbook authors would likely write more relevant textbooks if they spent fewer of their scarce pages exploring the efficiency properties of tradable permit schemes and spilled more ink exploring the basics of how the biosphere and the economy are linked and what such linkages imply for the sustainability of economic activity. After all, most students are not going to spend their working hours setting up tradable permit schemes or comparing pollution charges to cap and trade systems (and the few who do will take higher-level courses in economics). They will, however, be working at workplaces that place demands on the environment, voting as citizens in elections where environmental issues will be important and, as consumers, making decisions that influence their ecological footprints.

8.3.2.1 The textbook containment strategy

In Chapter 4, I described a pattern detected in the textbooks whereby they seem to be written as if to contain contemporary concerns that prevailing economic arrangements are implicated in the environmental crisis and that growth may not be feasible or desirable in the long run; I named this a containment strategy. The main elements of the containment strategy involve: acknowledging the limitations of GDP as an indicator, introducing Malthusian concerns, explaining why Malthus’ prediction was wrong, referring to contemporary concerns regarding limits to growth, explaining how technological progress and the market mechanism can forestall resource exhaustion such that growth can proceed apace and explaining that richer societies have more wealth to devote to protecting the environment.

Where most of the elements of the containment strategy have been mobilized, I contend that the textbook’s overarching normative position regarding the desirability of economic growth, the viability of consumer society and the desirability of economic development are insulated from potentially disturbing questions about the state of the environment and the potential for resource depletion and degradation. It also serves to contain questions that issues of environmental concern might surface about the materiality of the economic process from
undermining the plausibility and coherence of mainstream theory. The remainder of the text can plausibly proceed on the basis that exponentially increasing consumption and economic growth are desirable and attainable for the indefinite future. This approach much simplifies the author’s (and the lecturer’s) task, because otherwise, at each juncture where increased consumption or output is presumed as a desirable outcome (e.g., when explaining how a free trade regime allows both trading partners to increase aggregate consumption levels), or at each juncture where textbook content implies inputs from the environment will be needed and wastes will be emitted (e.g., references to production and consumption), the author (or instructor) might have to defend underlying assumptions about environment-economy linkages, resource availability, ecological limits and the desirability of growth. In bringing together these various arguments, mainstream textbook authors appear to acknowledge and then neutralize concerns that students might have about the sustainability of growth and the wisdom of policies intended to further increase standards of living amongst the well off. The various elements of the containment strategy are built around what at first appear to be reasonable claims. However, when each element is subjected to critical scrutiny, weaknesses emerge that undermine the overarching argument that limits are to no avail. Yet most first year students are not likely to be sufficiently motivated or intellectually prepared to probe such arguments. They are unlikely to be familiar with the substantial scholarly literature that is relevant to assessing the underlying claims.

While I argue that the textbooks incorporate the containment strategy, I did not assess its effectiveness at diminishing students’ propensity to become concerned about the ecological viability of ongoing economic growth; this is an issue that merits further investigation. The effect may well be modest, since university students are exposed to a wide range of intellectual ideas and other influences. Furthermore, the prevailing public discourse, advertising, government policy and many economic institutions and practices presume that growth is viable and desirable. Analysis of the student data generated by the quote sorting exercise, focusing on the quotes that paralleled the elements of the containment strategy, is reported in Chapter 6. This data suggests that the containment strategy was not being consistently deployed and / or that the elements were not being emphasized in PoE at the case study universities. However, if instead of deploying this containment strategy, PoE
textbooks and courses treated the issue of ecological limits as warranting careful attention (as is the case in the Goodwin textbooks) and incorporated recent scholarship on limits, students might well leave PoE more sceptical of the long-term ecological viability of contemporary economic policies. Textbooks that incorporate such a perspective would better enable lecturers to reflect their university’s sustainability commitments in the classroom.

Bernstein’s pedagogic device suggests that there is much to be learned from investigating the recontextualizing rules that textbook authors and curriculum developers use to sort through knowledge and decide what to repackage for use by lecturers. He argues that the recontextualization process invites the insertion of ideology, as it involves “appropriating discourses from the field of production, and subordinating them to a different principle of organisation and relation. In this process, the original discourse passes through ideological screens…” (Bernstein 2000, 115). As such, in arriving at present day PoE curriculum as it is represented in the textbook, critical decisions have been made about how the economy is positioned in relation to the environment, the extent to which environmental problems are allowed to appear and the types of problems that are considered.

This recontextualization is seen by Bernstein as influenced by broader societal interests and power structures; space allocation within PoE textbooks seems to fit this model, as it reflects broader societal privileging of markets and consumerism as paths to wellbeing. There are distributive rules about who has licence to produce new knowledge that is considered legitimate within a field (Bernstein 2000, 114) and about vetting knowledge produced by others who have not qualified themselves as bona fide producers. Thus, content must be produced by practitioners working from a mainstream perspective in order to merit space in the textbooks. For instance, feminist ecological economists have argued that the subject matter of economics should be recast in PoE from choice to provisioning (Nelson 1993; Nelson and Goodwin 2005) to no apparent effect. Further, in Bernstein’s view, investigating the knowledge claims considered legitimate within a discipline is also relevant to understanding curriculum.
ANT theorists working in higher education describe how networks often stabilize after establishment, with the comment “…the network can settle into a stable process or object that maintains itself. Like a black box, it appears naturalized, purified, immutable and inevitable, while concealing all the negotiations that brought it into existence” (Fenwick and Edwards 2011, 4). This description is apt for PoE textbooks; based on information from their textbook, many students will not become aware that other understandings of the economy and other variants of economic theory exist.

8.3.3 Economists delivering and defining PoE curriculum

Research question three

How do economists in standard economics departments who teach or are involved in setting PoE curriculum perceive the existing PoE course in terms of its relevance to sustainability and the adequacy of its treatment of sustainability?

The participants from economics departments tended to be unaware of their university’s sustainability commitment and were sceptical of whether universities should make such commitments. Sustainability was not salient to this population; indeed, two of the informants were hostile to the concept, while others expressed concerns about the possibility of defining sustainability. None of the lecturers reported teaching PoE in a way that explicitly addresses sustainability.

A couple of the interviewees conceded that until the interview, they had given little thought to the relevance of the environment-economy linkages in PoE. All 11 participants acknowledged that PoE downplays environment-economy linkages and omits sustainability, but only four participants described this situation as unsatisfactory. In large part, PoE was seen as a course that must focus on the core theory, and EELS are not considered to be part of the core. However, two lecturers who are also involved in teaching upper year economics courses were dissatisfied with the fact that students taught PoE by their colleagues often arrive in upper year courses without appearing to have learned about market failures and externalities. At the same time, while acknowledging that EELS are not emphasized, lecturers characterized PoE as offering students tools and insights relevant to addressing
sustainability, such as the concept of opportunity costs. There was some frustration that when taking PoE courses SOP students do not appear to appreciate that economics offers solutions to environmental problems. Two lecturers offered that PoE could help clear up misconceptions held by students in programs that focus on sustainability.

The state of the environment or the possibility of shortages emerging in natural resources that are necessary to support human wellbeing did not appear to be a focus of concern for most PoE lecturers. Participants saw the market mechanism as solving problems of resource scarcity through higher prices, which foster greater efforts at both extraction and conservation; this position parallels that set out by leading mainstream economists when they first responded to the limits to growth report (Samuelson 1973; Solow 1974). A couple of PoE lecturers described devoting course time to setting out why the Club of Rome report was wrong or why concerns about limits to growth are misplaced. Environmentalists were sometimes described as putting forth extreme positions or as lacking a balanced perspective on economic matters. Although the participants acknowledged that there are a number of environmental problems, these were seen as amenable to being rectified through policy prescriptions congruent with mainstream theory (e.g., establishing property rights, implementing Pigovian taxes, issuing tradable emission permits).

**Research question four**

*From the perspective of these economists, does the PoE curriculum require revising to address sustainability? If so, what are the nature and the extent of revisions that they deem desirable?*

PoE was described as a course that has changed little over the decades, a view confirmed in the scholarly literature (Watts and Schaur 2011). In general, though participants saw scope for making pedagogical improvements to PoE, they displayed little enthusiasm for modifying curriculum to put more emphasis on environment-economy linkages and in particular were guarded about the desirability and possibility of explicitly addressing sustainability. Their hesitance was in part explained by concerns about how sustainability might be qualified but also because PoE is a course that all participants deemed to be problematic. They perceived that too much material must be presented in too little time to students who often already find
the course difficult. The course is challenging to teach satisfactorily in part due to its split mandate of serving those students who will major in economics and those for whom it will be their only economics course. If change in PoE curriculum is to address sustainability, these challenges and constraints, which are also well-documented in the literature (Colander 2000c, 2005a; Becker and Watts 2001; Becker 2003), will need to be taken into consideration.

Seven of the participants initially offered that sustainability should have no place in the PoE curriculum, though most softened their stance over the course of the interview. Three thought sustainability deserves coverage in PoE. A couple of participants acknowledged that until the interview they had given little thought to addressing EELS in PoE, but in considering the issue over the course of the interview, they saw that there were sound reasons for giving it more attention and would consider how it might be addressed in future iterations of the course. The main change participants contemplated to integrate sustainability into the curriculum was to ensure that the theory of externalities and market failures which is already covered in the textbooks is addressed during lectures. Participants were concerned that addressing sustainability in the curriculum could put them in the position of promoting student adoption of a given set of values when they perceive that their mandate as professional economists is to provide an objective presentation of economic theory and clearly differentiate between normative and positive economics.

One reason offered for not addressing sustainability in PoE was that students need to understand the core economic theory before they have the tools to understand environmental problems and potential solutions. In this view, EELS are better addressed in upper level economics courses in environmental and resource economics, even though the lecturers acknowledged that many students will never take such courses. Also, given the already full agenda in PoE, lecturers feared that adding EELS would mean that other content—typically content that is considered to be part of the core—would have to be dropped. This perspective suggests that for these participants, the economic theory that directly deals with the environment and sustainability is not core theory; attending to EELS is does not mean that core economic theory itself may require updating.
Lecturers seek to foster student acceptance of the mainstream framework and formal models of economics, a finding that is consistent with how others have characterized disciplinary norms (McCloskey 1998, 143–144; Reay 2010, 103) and with the profession’s tendency to write off research undertaken by heterodox economists (Harley and Lee 1997; Mackie 1998). Similar to Colander and Klamer’s research (1987; Colander 2005b), as well as that of Davis (2007), there was no sign that the economics department participants entertained the possibility of a “fundamental change in the direction of thinking” (Heilbroner and Milberg 1995, 100) that would facilitate the incorporation of the concepts, theories and methodologies used by ecological economists or other heterodox economists. Rather, the norms that emerged during the interviews seemed consistent with Becher and Trowler’s finding that for economists, raising questions regarding disciplinary ideology is unacceptable and “…those who question the basic axioms of the subject are liable to find themselves cast into a wilderness of their own…” (Becher and Trowler 2001, 59).

In Bourdieu’s terms, PoE lecturers could be viewed as enmeshed in their field’s doxa, shared implicit beliefs that do not require discussion (Bourdieu 1992, 168). They have mutual beliefs over what counts as valid economic theory and what does not and generally agree on the core principles that are to be taught in PoE. They explain the importance of teaching the core theory and are sceptical about diverting time to discuss sustainability; these characteristics suggest that they share the profession’s reluctance to reorient teaching to enable students to ask the “big think” questions advocated for in the Teagle commission report on the economics major (Colander and McGoldrick 2009). Bourdieu’s (1998) argument that disciplinary struggles tend to mirror struggles in society at large plays out in the case study. Two PoE lecturers were dissatisfied with the small amount of time their colleagues spend discussing market failures and externalities; this discontent suggests that parallel to the broader environment-economy conflict taking place in society, faculty in economics departments struggle with how much attention to give to environmental issues.

**Research question five**

*From the perspective of these economists, does integrating sustainability*
Ecological economists have suggested that addressing EELS in a foundational way creates problems of plausibility and coherence for mainstream economics (though not necessarily using this terminology) (Georgescu-Roegen 1971; Daly 1995). Though concerns raised by scholars critical of mainstream theory were discussed during the interviews, in contrast to the explicit identification of such issues by SOP professors, the interviews did not bring to the surface instances where PoE lecturers acknowledged or struggled with issues of plausibility and coherence.\textsuperscript{103} There are several possible explanations for this occurrence. It may be that the interview guide and the questions posed were not suitable for surfacing such problems. Alternatively, participants may not have been aware of such problems, or if they became aware of them during the interview, did not acknowledge them.

In considering why issues of plausibility and coherence did not seem to arise, responses that touched on participants’ initiation into the discipline and their views on mainstream economics point towards plausible explanations. The participants appeared to be committed to working within the mainstream paradigm.\textsuperscript{104} As one participant described the process of training, if a young scholar wants to land an academic position in a mainstream economics department under prevailing conditions of intense competition for academic postings, singular focus is needed, and there is little time to engage in learning from other disciplines or schools of economic thought.

There was little indication from the interview data that the participants in my study had sought out literature, data or arguments that challenge mainstream economics’ view of how environment-economy linkages are conceptualized, how modern industrial economies impact

\textsuperscript{103} One possibility of course is that mainstream theory already does or could in theory address EELS without creating problems of plausibility or coherence; I set out the arguments made by ecological economists against this position in Section 3.2.

\textsuperscript{104} At least two of the lecturers saw themselves as belonging to schools of thought that have less currency within the mainstream. However, using Lee’s (Lee 2009, 4–11) criteria, heterodox economists would likely nevertheless classify them as mainstream.
the environment or how environmental degradation and resource depletion may constrain future economic activity. For the most part, it seemed as though participants had not invested much effort in considering arguments or literature that focus on the ways in which mainstream theory may have weaknesses in addressing EELS. As a result they were only superficially aware of the relevant debates. In part, this is not surprising. Articles published in mainstream journals tend to cite other mainstream journals; they rarely cite articles published in heterodox journals such as *Ecological Economics* (Ma and Stern 2006; Dobusch and Kapeller 2009; Lee 2009).

The literature confirms that the specialized training and socialization into the economics discipline does little to prepare aspiring economists to value, engage with or incorporate insights or findings from other disciplines (Colander and Klamer 1987; Colander 2005b; Davis 2007), including those such as the environmental sciences that are relevant to sustainability. More generally, the fact that PoE lecturers were not engaged with findings from the environmental sciences is consistent with literature on academic disciplines that suggests that cross-disciplinary borrowings that might impinge on the value of a discipline’s existing stock of knowledge are generally limited (Bourdieu 1988; Becher and Trowler 2001, 97–100). These considerations and the fact that issues of plausibility and coherence did not arise for PoE lecturers suggest that economics departments are unlikely on their own initiative to make substantive change to curriculum to address sustainability.

The theories of Bourdieu and Archer seem to offer the most insight as to why issues of plausibility and coherence did not emerge during the interviews. Questions regarding concerns about PoE drawn from the ecological economics literature did not perturb the lecturers. Nor did discussing the issue of integrating sustainability result in them showing signs that they detected any need to revisit their profession’s received view. They could be described, per Bourdieu, as having a habitus that enables them to deal with such issues, a habitus shaped by growing up in a society that endorses growth and the market economy, cemented by taking PoE, honed during graduate school training and reinforced as they adopt the field’s illusio, playing the approved games as they seek to secure an academic position and the economic and symbolic capital that go with it.
The PoE textbook provides the lecturer with a succinct restatement of the profession’s position on limits and on the environmental impacts of economic activity. Situations in which lecturers must deal with students who ask inconvenient questions that must be answered or neutralized provide the opportunity to rehearse the standard arguments. Such situations of course fit with Archer’s analysis regarding how material interest groups and individuals who want to maintain privileges (such as ensuring that jobs within the department go to mainstream rather than heterodox economists) need to be able to censor or disarm ideas that stand in logical contradiction to the ones they themselves mobilize.

These ideas raise the broader question of why PoE lecturers teach economic theory that is packaged in a way that seems unlikely to spark student interest in carefully examining the viability and desirability of industrial market economies. In a Marxist interpretation by Cronin (1996,12), Bourdieu’s theorizing is seen to help explain how the interests of rich elites end up being promoted by social scientists who help shape the public’s view of the world. The scientists share with the elites certain affinities since they aspire to achieve similar levels of status, such that they come to embody a habitus that leads them to engage in theorizing that, at least in its aggregated form, shies away from a more fundamental critique of the status quo.

I do not go so far as Cronin as his interpretation does not help explain the fact that the ivory tower tolerates a certain proportion of academics who, like Bourdieu himself, construct profound critiques of contemporary society that call into question the privileges enjoyed by elites. Theorizing about the relationship between elite interests and the social sciences must account for the fact that the academy’s ranks support a number of theorists whose research and teaching challenges the ways in which the economy serves elite interests. Yet, given that issues of plausibility and coherence did not arise during the interviews, and that the participants showed little sign of engaging with how taking into consideration sustainability might problematize aspects of mainstream theory, there is a basis for finding that, as
Bourdieu’s analysis suggests, PoE lecturers are confining their students to theory that reinforces status quo economic arrangements rather than calling them into question.\textsuperscript{105}

In this way, the interview data muddies mainstream economists’ portrayal of themselves as objective scientists engaged in seeking to discover and describe economic laws and attributes (Gross 2011) and then sharing this knowledge with their students. Instead, the data would seem to be more consistent with understanding PoE as a course that prepares students to accept the economy and take a place within it rather than preparing them to assess the implications of current economic arrangements and to consider other imaginaries for the economy. Neither was there much indication that lecturers had gone beyond disciplinary boundaries to engage with theory or empirical evidence on the state of the environment that might raise questions about mainstream theory. Yet such initiatives would better fit with the ideals of scientific practise surrounding the value of peer review and open deliberation, especially given the growing literature that the contests the methods, analysis and policy implications derived from mainstream economics.

ANT (Latour 2005), and more specifically the performativity of economics literature (MacKenzie et al. 2007), suggests that the economy is produced by a variety of human and non-human actors. Some of those human actors include economists themselves, whose theorizing helps favour certain approaches to economic policy over others, and thus contributes to sculpting economic interactions, human behaviour and ultimately society. PoE courses are described in course catalogues in a way that suggests students will learn about the immutable economic laws that economists have uncovered, a framing that suggests the courses are objective and disinterested. But the disinterested framing of PoE is difficult to reconcile with the course’s focus on humans as self-interested to the exclusion of other-regarding motivations, competition to the exclusion of collaboration and cooperation and the

\textsuperscript{105} There is one obvious counterexample of theory that is taught in PoE that has revolutionary potential, namely the law of diminishing marginal utility. Applied to wealth and income, it can be used to argue that radical redistribution of wealth is in order, since it implies that the rich receive little benefit from an increment of income, while the poor greatly benefit. However, its revolutionary impact is neutralized by various means, such as explaining how high levels of taxation would reduce the incentive to work and thus reduce the size of the total economic pie available for redistribution.
portrayal of the market as a mechanism that sums self-interested behaviour into socially desirable outcomes while ignoring the ways in which well-functioning markets, even without market failures, can create socially undesired outcomes (Colander 2003). Using the lens of ANT, PoE courses might be understood as one part of a system that enlists students into an actor-network that promotes the organization of society according to free market ideals. This interpretation does not imply that this outcome is the intent of individual lecturers, or even of the economics departments; ANT theorists do not see the network as being controlled by any one actor, so no motives need be assigned.

I now turn to examining the results from the interviews with professors in sustainability-oriented programs whose students take PoE. It is important to remember that four of these participants were recruited on the basis of their role as a current or former senior administrator of a SOP, while five were recruited on the basis of their expertise in economics, broadly defined.

As overall context, in contrast with their economics colleagues, sustainability was salient for SOP professors and it made sense to them that universities had made sustainability commitments. They were receptive to the academy working towards students understanding the issue of sustainability and having the tools to participate in its promotion. There was some scepticism that universities would be able to deliver on sustainability commitments due to the fact that universities themselves are seen to be dependent on prevailing economic arrangements.

Research questions six and seven

*How do senior administrators, economists and faculty members who have economics expertise and are affiliated with sustainability-oriented programs perceive the relevance of the PoE course to sustainability and its suitability as a principles course for students who are majoring in sustainability-oriented programs?*

*From the perspective of these individuals, does the PoE curriculum require revising to address sustainability. If so, what is the nature and the extent of revisions that they deem desirable?*
Research question six was intended to shed light on how SOP professors perceive the relevance of PoE to sustainability and its suitability as a course for their students. Research question seven was intended to shed light on the extent to which SOP professors think revisions in PoE curriculum are necessary to attend to sustainability. Since the answers to the two research questions were found to be closely interlinked, they are considered jointly here.

While SOP professors believe that it is important for their students to gain a basic level of competence in economic theory, literacy and an understanding of the economy, most are dissatisfied with the current incarnation of PoE offered by the economics department. There was consensus that, in theory at least, PoE courses should be relevant to sustainability since for the SOP professors the economy and the environment are inextricably linked, some of the environmental trends being observed were seen to have their roots in economic policies and economic instruments are seen as important tools for ameliorating environmental conditions. However, based on feedback from students, their own observations with respect to the level of preparedness of SOP students returning from PoE courses and discussions a few SOP faculty had had with members of the economics department, SOP professors listed a variety of concerns about PoE.

PoE was described by SOP professors as being naïve and out of date with regard to environment-economy linkages, and as doing little to address the need for SOP students to understand the environment-economy nexus and to learn tools that can help attend to sustainability. The PoE courses were deemed to be overly abstract, poorly linked to the types of real world issues that would be salient to SOP students and overly focused on the needs of economics majors. SOP professors also described PoE as doing little to prepare their students for upper level SOP courses that have economics content or draw upon economic theory.

For SOP professors, revisions to the PoE curriculum were seen as essential if the course is to attend to sustainability and meet the needs of SOP students. However, the SOP professors expressed little confidence in the economics department’s willingness or ability to address their concerns in a way that would address EELS and would better meet the needs of SOP students. In part, this scepticism derives from the fact that of the nine SOP professors
interviewed, four of the five who had expertise in economics raised issues of paradigm, ideology and worldviews. These concerns showed that the professors were critical of mainstream theorizing, or were looking for space within the PoE curriculum for alternative schools of economic thought that are more attentive to environmental issues and broader questions about market societies. The interviews with SOP professors uncovered the fact that there may be increasing external pressures to amend PoE to better attend to sustainability. One of the programs has already dropped the PoE requirement and is offering its own economics course that adopts an ecological economics perspective. Others described how they are exploring options to ensure that they can offer their students an introductory level economics course that better addresses environment-economy linkages and focuses on the specific needs of SOP students. They described unsuccessful efforts to get the economics department to be more responsive to SOP student needs.

Based on Bernstein’s (2000) framework, the SOP professors could be seen as challenging the recontextualization decisions that have been made regarding what knowledge is translated into PoE curriculum and reproduced in the classroom. They ask questions about available knowledge in the economics of sustainability that are being ignored and about normative positions that favour growth and consumerism being woven unreflexively into the curriculum.

The SOP professors with expertise in economics could be seen through the lens of Bourdieu’s framework as seeking to challenge the mainstream discipline’s illusio. However, the SOP professors did not show much interest in undermining the capital held by their economics department colleagues. The SOP professors seemed focused on the collective good that they thought would could come from the economics department offering instruction in what they characterized as more realistic and relevant economic theory.

**Research question eight**

*From the perspective of these individuals, does integrating sustainability into the PoE curriculum result in a course that has the potential to undermine the plausibility or coherence of standard economic theory as it is presented at the principles level? If so, how do they resolve this dilemma?*
Research question eight was intended to probe the extent to which SOP professors, especially those with economic expertise, see the incorporation of sustainability as raising issues of plausibility and coherence. Again, unlike their colleagues in the economics department, this group of professors spoke of certain aspects of mainstream economics being called into question by explicit attention to sustainability. As noted above, they saw contemporary economic theorizing as being enmeshed with the dominant social paradigm that is itself viewed as a major cause of unsustainability. Thus, for SOP professors, addressing EELS in PoE raises problems of coherence and plausibility, but unlike their economics department colleagues, they embrace these problems and see them as a means of leveraging curriculum change.

From an ANT perspective, SOP professors appear to be assembling or enlisting in new actor-networks that decentre PoE as an obligatory passage point for SOP students, advocating for either an overhaul of PoE or a course that provides an alternative perspective on economic theory. They have sought but have not found allies within economics departments and have written off convincing their mainstream peers to make the desired retrofit. For them, the easiest path is to develop an in-house sustainability and economics course; their ambitions have not extended to providing an alternative to PoE for students across the academy.

8.3.4 PoE students

The student interviews provided important context on PoE courses that is relevant to this study’s research questions. PoE is seen as a course that is often poorly taught, and focuses on lectures rather than student engagement, a finding that is consistent with the economics education literature (Becker and Watts 2001; Johnston 2001; Watts and Becker 2008; Ongeri 2009). From the experience of most students, the course and the textbook are largely equivalent. Classroom discussion does not foster consideration of substantive issues with respect to the plausibility of economic theory. Some students reported that economic theory had been presented as if it is authoritative and settled. Students also reported being directed to accept and work with assumptions; questions about the plausibility of these assumptions was deferred to upper year courses. A small number of exceptional cases aside, they did not
appear to encounter heterodox economic content. The student interviews surfaced content with normative connotations that was encountered during lectures or in textbooks; SOP students were most likely to describe this content as problematic. Concerns raised included how PoE portrays free market consumption and economic growth as desirable, maps marketplace choice to freedom and validates self-interested behaviour. With this context, I now turn to what the interview data shows with respect to the research questions.

**Research questions nine and ten**

*How do students who are majoring in economics and have taken PoE perceive the PoE course in terms of its relevance to addressing sustainability?*

*How do students who are registered in sustainability-oriented programs and have taken PoE perceive the PoE course in terms of its relevance to addressing sustainability?*

Research questions nine and 10 were intended to explore ECON and SOP student perceptions of the relevance of PoE to addressing sustainability. SOP students were sought out for this study because I reasoned they would be uniquely positioned to evaluate how well PoE contributes to students’ understanding of the sustainability challenge. Students in these programs, such as Environmental Science at SFU or Environmental Studies at UVic, tended to be frustrated with the course and the worldview it promotes.

A majority of students agreed that the course would be helpful to a student interested in sustainability, though it was categorized as being unhelpful by a substantial number; the SOP students in particular categorized it as unhelpful. There was near unanimity that the environment receives little emphasis in PoE, with one lecture on the topic or passing references sprinkled through the lectures being common. Indeed, a couple of students described having to prod the lecturer to attend to the environment. In exercises and exams environment-economy linkages were most often set aside. Sustainability in the sense used in this dissertation was rarely encountered. When limits to growth arguments were aired in the classroom, except in a couple of exceptional cases, students recalled learning that concerns about limits were unwarranted. Rather than opening up questions of sustainability for
students or engaging in an open exploration of the limitations of mainstream theory and the offerings of contending perspectives (an approach that would seem consistent with the ideals of liberal education), student interview data shows that PoE tends to set such issues aside.

One of the most important benefits PoE delivered for a number of the SOP students was to better understand the mainstream economist’s worldview, a view they perceived as having much influence on modern society. A number of SOP students reported being turned off economics, though it should be noted that some of these described an interest in taking heterodox economics courses such as ecological economics. At the same time, however, other SOP students professed an interest in studying upper year mainstream economics courses, often in spite of their PoE experience.

Though many of the students, especially students majoring in economics, did not have problems with the content of PoE, some found it initially difficult to adjust to the assumptions required by mainstream theory, such as seeing human behaviour as motivated by self-interest. The students’ descriptions of this adjustment period fit well with James’ account of how Bourdieu’s framework is helpful in understanding students’ daily experiences and how their early reactions against new demands on their knowledge give “… way to an acceptance of its terms, as students become socialized, and their habitus reconfigures within the new field” (James 1998, 120). The students are in a new course and must focus on learning how to succeed in this new game; the habitus inculcated through years of schooling tells them that to do so, they need to accept the new discipline-specific set of rules that their lecturer sets before them.

It seems that a few of the students, mostly from SOPs, could be described using Bernstein’s pedagogy of practise as raising questions about the recontextualization of knowledge. They wanted to know why alternative theories and perspectives were not being aired in class, they resisted taking aspects of the theory being reproduced in the classroom as valid knowledge and a few of them suspected that there was ideology in the theory they were being taught. In parallel with Bernstein (2000), the questions they asked carried an implicit concern about
whether certain interests were being favoured at the expense of future generations and the non-human world.

**Research question eleven**

*What aspects of PoE do these two subpopulations of students perceive as providing concepts and tools that enable them to better engage in sustainability issues? What content do they feel should have been added to the course and what content do they feel was problematic from a sustainability perspective?*

Research question 11 was intended to explore what PoE content students found enabled them to engage with sustainability, what content they thought should have been added and what content they found problematic. Student reports of how environment-economy linkages and sustainability are addressed, and of the insights PoE offers into the root causes of environmental problems and potential solutions, do not give much reason for confidence that these courses are substantively increasing students’ understanding on this front. For a sizeable minority, the course was characterized as lacking any insights into EELS, with students sometimes describing the course as being focused on the world of business. I had initially reasoned that in cases when a student’s PoE course did not directly address the environment, students might be able to apply PoE concepts or analytical approaches to the analysis of environmental issues or sustainability. However, there were few instances where students described being able to make such connections, suggesting that it is unreasonable to expect a first year student to be able to transfer knowledge in such a manner without guidance. The examples of insights provided by the majority who stated that the course had given them insights into environmental problems tended to lack much by way of substance.

Research question 11 was also intended to explore what students think should be added to PoE to address EELS. A clear majority of students proposed that more emphasis on EELS would enhance PoE. Students wanted the environment and the economy to be better integrated in the course, an approach well-supported in the sustainability in higher education literature. A number of specific suggestions were offered for environmental topics to be incorporated into PoE, including introducing concepts which are anathema to mainstream theory such as economic degrowth (Latouche 2009; Kallis 2011). SOP students were the
strongest advocates for placing more attention on EELS; one interesting rationale offered for this perspective was a desire for peers from other faculties to be exposed to theory that explains the environmental impacts of economic activity. A small minority were satisfied with the existing treatment of EELS (in an exceptional case because it was described as being heavily emphasized).

It proved difficult for the students, whom are still early in their undergraduate education and may only recently have learned about sustainability, to evaluate what content should have been added to the course. In retrospect, this should not have been surprising. Since most students reported that little emphasis was placed on the environment in PoE, and that even less—or none—was placed on sustainability, they had little to go on in terms of understanding how mainstream economists theorize about the environment and thus they were at a disadvantage in terms of identifying content that might be incorporated into the course. Few students would have had the opportunity to learn about non-mainstream theories that might be incorporated into PoE. For this reason, the carbon tax exercise proved useful in answering research question 11. It provided a useful complement to the interview questions that focused on eliciting student perceptions in that it generated data on how well students who had taken PoE were able to think through a contemporary public policy intended to favour sustainability. Analysis of student performance on the carbon tax exercise suggests that PoE shows limited effectiveness at contributing to students’ understanding of how a carbon tax would help mitigate carbon emissions. Thus, even when evaluated by mainstream criteria, PoE shows room for improvement in terms of helping students understand the economic implications of, and the economic rationale behind, a contemporary public policy of considerable significance to sustainability.

8.4 Synthesis of textbook, PoE lecturers, SOP professors and student data

When the textbook content analysis is considered together with the results from PoE lecturer interviews, SOP professor interviews and student interviews, a number of findings emerge. Based on this case study, there is little or no indication that universities’ commitments to address sustainability have resulted in integration of sustainability into principles of economics curriculum, despite the fact that economic activity depends upon and impacts the
environment and that human wellbeing is influenced by environmental conditions. The content analysis documented how the textbooks used in PoE classrooms take a normative stance toward embracing growth and the desirability of increased per capita consumption, treat the environment as separable from the economy, downplay environmental concerns and critique and contain the limits to growth literature. The economists who deliver PoE courses were generally not aware of their universities’ sustainability commitment, did not find the concept of sustainability as it is understood in this dissertation to have saliency and generally did not see PoE as an appropriate place to address this topic. Professors in SOPs are frustrated by what their students learn in PoE. These SOPs have taken or are planning measures to develop an introductory level economics course that is more suitable for their students. Student interview data shows that students who are motivated by concern for the natural world and are inadequately served by the course tend to be dissatisfied with the course’s treatment of environment-economy linkages. While PoE should help students understand the impact of a carbon tax, their performance in an exercise that required them to reason through the implications of a carbon tax was lacklustre. In this sense, even when assessed in the context of adding to student capacity to understand market phenomena and the implications of economic policies PoE performed poorly.

I argue my findings support the conclusion that PoE courses delivered by mainstream economics departments are not likely to evolve in a manner that will contribute to universities meeting their sustainability commitments without external pressure or the direct intervention of senior administrators. First, the literature reviewed in Section 2.5 showed that large gaps can persist for long periods of time between theory as it is mobilized in PoE textbooks and classrooms, and theory as it is conceptualized by leading practitioners. The content analysis showed that while textbooks allocate some room to environmental topics, they do so in a manner that is not reflective of current knowledge in the natural sciences. SOP professors recognized that their peers in the economics department face a dilemma: embracing sustainability and committing to addressing environment-economy linkages in a sophisticated manner may undermine the intellectual capital in which economists have invested as it would call into question the mainstream model’s coherence, plausibility and saliency.
Students sitting down in a PoE classroom at a major public university in British Columbia circa 2010 would have an experience similar to their peers educated pre-Brundtland with respect to the treatment of environment-economy linkages. This despite a quarter century during which rates of resource extraction have continued to grow, a global GDP that has doubled, significant advances in the environmental sciences and the fact that the universities in question signed sustainability commitments over a decade ago.

Insights from ecological economics have yet to influence the North American variant of PoE and PoE lecturers were not interested in drawing on this literature. While these results may not surprise critics of orthodoxy, one would hope that well over two decades since ecological economics was formalized as an area of inquiry (Martinez-Alier and Schlüpmann 1990; Spash 1999), greater signs of influence might be detected. However, in PoE courses, little attention is being given to economic drivers of environmental degradation or to how the changing state of the environment is likely to influence future economic activity. Though PoE is often introduced with a definition of economics that refers to resources and scarcity, the course proceeds as though resource scarcities are easily handled, or even automatically corrected by the market mechanism, while scarcity of absorptive capacity for the by-products of economic processes is downplayed. Indeed, PoE courses have a hidden curriculum (Apple 2004) of suggesting the correctness of a social order where markets are privileged, corporations generate wealth, consumption is desirable, growth is to be fostered and governments should have a limited role in the economy.

For those students whose formal, university-level economics training is limited to PoE, the course seems to be a natural forum to delve into issues about how the economy affects and is affected by the state of the environment. Since higher-level economics courses tend to mirror the PoE content, albeit using more formal methods and with the broadening of applications (Goodwin 2008), how PoE courses attend to EELS is also important for students majoring in economics.
One of the themes that I drew upon in this study arises in Marglin’s (2008) work and deals with how mainstream economic theory is qualified with fine print. The lecturers interviewed provided examples of how they set out the qualifications and delimitations of the theory that they teach. Student interviews confirmed that various theories, claims and normative positions were often qualified by their lecturers (though some students felt such qualifications and their implications were not sufficiently emphasized). The content analysis found that the textbooks similarly point out such fine print. However, it is not clear that students appreciated the implications of the fine print they encountered. For instance, some students seemed to think their lecturers had endorsed the free market and disapproved of government intervention. From the students’ descriptions of PoE’s perspective on the rationality of the human actor, consumer sovereignty and the desirability of choice, it seems that PoE does little to prepare students to evaluate arguments in favour of constricting the choice set of goods and services that consumers can choose from in support of sustainability (Menzel and Green Forthcoming). Instead, it tends to provide them with arguments that restrictions on choice should be rigorously avoided.

Relevant to the question of whether economics departments are likely to embrace a version of PoE that incorporates EELS in a meaningful manner is PoE lecturers’ receptivity to alternative visions of economic theory, since, for instance, ecological economics might offer insights into how EELS can be incorporated into economic theory. The mainstream economics profession has been documented as having little interest in or respect for heterodox schools of economic thought (Dow 2000, 2011; Schiffman 2004; Lee 2009; Mata 2009); views expressed by the PoE lecturers were consistent with this literature. For instance, informants reported that there would be no value for a department to replace a retiring Marxist economist and most participants were unfamiliar with ecological economics. The participant who demonstrated the most familiarity with this body of thought saw it as offering few insights beyond those already provided by mainstream economics, but feared that teaching ecological economics content could expose students to weak or erroneous theory. Other disciplines in the social sciences were sometimes denigrated, as when an informant reacted to one approach to integrating sustainability by dismissing it as likely to lead to a course that would be as weak as a sociology course. Such beliefs and attitudes
suggest that as long as PoE is taught within economics departments, it is unlikely to incorporate a more pluralistic approach.

By way of contrast, where the PoE lecturers portrayed growth as increasing society’s wealth and offering the possibility of a healthier environment, the SOP professors expressed concerns that growth entails greater use of resources and increased emission of wastes, and hence greater environmental impact.

From Archer’s critical realism and morphogenetic approach, PoE can be described as being built upon the foundation of a necessary contradiction. Robbins’ (1935) influential definition of mainstream economics involves harnessing the concept of scarcity in a context of purportedly insatiable human desires wherein trade-offs need to be made. With this definition of economics in place, growth becomes the logical solution to scarcity, yet in the version of growth offered in PoE, the economy expands into an unbounded space. In other words, what the economy grows into—and that may therefore become scarce as it is displaced by an accumulating stock of manufactured capital—is neither specified nor incorporated into the analysis; growth comes without trade-offs or costs.

Some of the SOP professors, a few of their students, and even a small minority of environmentally-minded ECON students brought this contradiction to the fore. They took the idea that scarcity underlines the definition of economics and applied it in a new way by linking it to the environment, highlighting that there is scarcity of renewable resources or ecosystem services and scarcity of sinks to absorb the wastes. They also reached into the cultural system for the concept of limits, which stands in logical relation to the idea of scarcity. Given the emphasis on growth and its myriad benefits, they took the core ideas of trade-offs and costs and asked about the trade-offs and costs of growth. The PoE lecturers might be characterized as seeking to diffuse or deny the relevance of limits, delimiting discussion of the costs to microeconomic contexts and avoiding discussion of costs and

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106 I set aside the argument that if people are insatiable, no matter how much the economy grows, people will still want more, so growth does not actually solve the problem of scarcity—it merely ensures that the desires that remain unsatisfied are ever less urgent.
trade-offs in relation to economic growth. The challenges this endeavour creates for PoE lecturers may well mount as various sources are increasingly depleted and more and more sinks are overwhelmed.

8.5 Implications for current practice

8.5.1 Integrating sustainability into PoE curriculum

In this section, I consider changes that could be made to the prevailing PoE curriculum while still operating within the framework of mainstream economics. Rather than setting out a long list of learning outcomes that a sustainability-oriented PoE should achieve, I focus here on a number of relatively simple changes that would enhance student understanding of environment-economy linkages and provide them with tools and concepts for engaging with sustainability:

1. Make explicit at an early stage in the course that the economic process involves material flows and energy use. This change would include attending to both the sources for raw materials and the sinks for by-products, and conceding that economic models have tended to neglect materials and energy. This approach implies that materials and energy should be represented in production functions and the circular flow diagram.

2. Put into question the subject matter of economics. Is it, per Robbins, centred around the study of choice given insatiable wants, scarce means and ends that are not discussed? Or is it, per the feminist economics perspective, about provisioning, and hence also inextricably tied to the ends that economic activity is intended to satisfy? Such a shift in how the subject matter of economics is understood would also entail a discussion about human wellbeing.

3. Abandon the containment strategy and instead seriously engage with the limits to growth debate in order to probe the mainstream economics profession’s response to concerns about limits and to consider the extent to which trends in key environmental indicators over the last 40 years might indicate that limits are being breached. This alteration would provide an appropriate base for discussing the extent to which modern economies are dependent on, and might be weaned off of, growth.
4. Discuss how societal interest in sustainability has arisen and what varieties of economic policies have been proposed, such as carbon taxes, to foster sustainability.

5. Problematize consumption and consumer sovereignty and acknowledge that traditional policy solutions linked to consumption, such as stimulating aggregate demand to address unemployment, may have the result of exacerbating environmental problems. Allow for endogenous preferences (e.g., influence of marketing on consumer preferences).

6. Explore how the law of decreasing marginal utility might inform policies on the distribution of wealth and the allocation of resources in a context where resources are finite, over a billion people live in extreme poverty and sustainability is a societal concern.

7. Be transparent about the normative foundations entailed in the criteria of economic efficiency and explore alternative criteria for evaluating economic policies and outcomes.

8. Explore the importance of natural capital, especially that which supplies desired ecosystem services, and set out the reasons that free markets may erode natural capital and flows of ecosystem services.

9. Ensure private goods, public goods and common-pool resources are differentiated and explore why markets oversupply the first type but undersupply the other two.

10. Replace homo economicus with a model that is better supported both theoretically and hypothetically by expanding the human motivations in the model from pure self-interest to allow for altruistic and cooperative behaviours and abandon the assumption that individuals are rational.

Others might amend the above list, substituting one change for another, or otherwise vary the above recommendations. I do not pretend to have a definitive list; rather this list is offered based on my analysis of the data from the present study. My intent is to initiate a critical reassessment of PoE curriculum in a typical course that queries how sustainability can be incorporated at a more fundamental level. The above changes would still allow the core of mainstream economics to be taught, albeit in a more nuanced manner that would foreground
the limitations of the paradigm and make clear that economic theory is very much a work in progress.

8.5.2 Improving the textbooks

Given factors that tend to favour relative homogeneity amongst PoE textbooks and inertia in modifications, it could easily be another decade or more before the top-selling textbooks begin to break with the Samuelson mould and thoroughly integrate consideration of environment-economy linkages. This is not a satisfactory situation for universities that have made sustainability commitments. At the same time, it has to be recognized that addressing environment-economy linkages and sustainability at a foundational level would likely result in an end product that deviates substantially from the prevailing texts (Daly 1995) and thus would no longer be considered mainstream (Colander 2004). Textbook authors could nevertheless address the recommendations set forth in the previous section in future editions of their textbooks.

One option for the interim, which also finds support in Ongeri’s (2009, 7) investigation of student dissatisfaction with the teaching of economics, would be for departments or individual lecturers to rely less heavily on economic textbooks. This would allow lecturers to put more emphasis on a greater diversity of sources and would create the opportunity to openly discuss controversies with respect to how mainstream theory addresses the environmental implications of economic activity and the economy’s dependence on the environment. Of course, relying less heavily on the textbooks increases the lecturer’s teaching burden, particularly in the context of large class sizes, and the reward structure that PoE lecturers work within is not likely to foster such innovation. The second option would be to use textbooks—like Goodwin’s—that do not incorporate the containment strategy and explicitly attend to environment-economy linkages and sustainability while still covering mainstream topics, in a way that explicitly acknowledges the disjunctures thereby created and embraces critical thinking about the models used. However, it seems that for the short- to mid-term, unless there is sufficient pressure from higher levels of university administration, few departments will be willing to switch from using textbooks that depart more than modestly from the currently prevailing descendants of Samuelson’s classic text.
In the interim, measures to foster incremental changes to better address EELS in the leading texts are worth contemplating. The fact that weaknesses in how the mainstream texts conceptualize the linkages between the environment and the economy have been documented suggests that the textbook peer review process undergone by standard textbooks ought to be revisited. The issue is not one of an insufficient number of reviewers. Colander (2004) explains that a new textbook faces about 60 reviewers (most of whom are front line teachers rather than researchers involved in producing new economic knowledge), and that this peer review process tends to cause textbooks to evolve towards the norm. Parkin and Bade acknowledge their debt to 30 reviewers, representing 22 Canadian universities and three colleges. Rather, the issue is that all the reviewers are from within the same discipline and are closely aligned to the same worldview. To better address EELS, reviewers should include individuals trained in other disciplines, such as the environmental sciences, as well as economists less committed to mainstream economics. Further to Paxton’s (2007) observation that the tendency of textbook authors to forgo citations of original literature provides a poor role model for students, authors should also draw upon and cite recent literature in sustainability and the environmental sciences. This would help ensure that content is more up to date on the key debates around sustainability and how the economy and the environment interact.

8.5.3 Implications for economics departments

The following recommendations are offered despite my assessment that they are unlikely to resonate with or be seen as legitimate by economics departments or the economics discipline (the critique is from outside the paradigm, by a researcher without mainstream credentials, using data generated from research methods that are not accorded much weight by the discipline). Furthermore, for these recommendations to be implemented, lecturers would have to invest significant effort in rewriting lecture notes and revising problem sets and exams; given that the incentive structure that currently prevails in academia downplays teaching, they would be unlikely to gain much in return. Accordingly, the recommendations here are based on the premise that substantive change in the teaching of economics at the introductory level will be initiated from beyond the economics department, be it by senior
administrators, other departments, or as a result of students no longer accepting the status quo.

Since so few PoE students go on to major in economics and even fewer become research economists, the relevant criteria for selecting the content to emphasize in PoE curriculum should not be that which prepares students for advanced study in economics, but rather that which will most aid students’ understanding of the economy (Boulding 1988; Colander 2000c, 2005a; Ormerod 2003). Given humanity’s ecological predicament, the imperative to work towards sustainability and commitments made by universities that imply the integration of sustainability across the curriculum, it seems reasonable to expect that in the 21st century achieving a basic “understanding the economy” would incorporate a basic understanding of how economies interact with their broader ecological contexts. Economics departments should consider this a criterion for assessing PoE courses.

8.5.4 Implications for sustainability-oriented programs

SOPs at the case study sites appear to have reached a threshold where they are no longer willing to accept that PoE in its current form meets students’ needs for instruction in the foundations of economic theory. This is an interesting junction, because in ANT terms, SOPs are part of the network that has been mobilized across the academy to give PoE courses their status as an obligatory passage point for such a high proportion of undergraduate students. By resisting continued enrolment in the network, SOP programs may contribute to a destabilization of an actor-network that has proven remarkably durable.107

107 I have mostly relied on ANT to provide a rationale for undertaking the content analysis of PoE textbooks. My interpretation of the ANT literature suggests that a fruitful analysis of the network involved in the promotion and production of PoE could be undertaken. Such research could investigate what role these courses play in the broader societal project of sustaining and elaborating the structure of modern economies. In other words, the research could evaluate the extent to which PoE plays a role in providing theoretical and moral justification for the present economic order. I also have not investigated the process by which PoE became an obligatory passage point for so many students, or how this requirement has been stabilized and maintained over several decades. Nor have I followed up on the intriguing work by Kreplin (1979) to examine the extent to which players beyond academia and beyond the textbook industry, such as industry associations and the US Council for Economics Education, may be involved in promoting the inclusion of economics education at the public school and university levels and in influencing the packaging of economic theory for educational contexts.
The data here suggests that SOPs have good reason to seek an alternative to PoE and to conclude that this alternative is not likely to come from the economics department. By initiating their own course to replace PoE, or by exploiting opportunities to partner with other departments to develop a course that breaks out of the mainstream mould, they are contributing to better addressing university sustainability commitments.

8.5.5 Implications of the study for other departments across the academy

This study is relevant to non-economics programs of study that make PoE a required course. Other disciplines should be aware that if what their students are learning in the PoE course conforms with the norm, it is likely to add little to, and may actually impede, student understanding of sustainability.

Looking beyond PoE to the sustainability in higher education literature, the broader implications of this study are that in integrating sustainability across the curriculum, some departments or disciplines may have to re-examine the theory that they are teaching in order to assess whether the theory requires updating to account for the fact that only recently have various disciplines come to recognize human dependence on the natural world.

8.5.6 Implications for university sustainability policy and strategy

Universities have tended to focus their assessment of sustainability in the curriculum on identifying courses that promote sustainability. They do so in part to meet the reporting requirements of sustainability assessment and performance systems that have yet to settle upon a satisfactory way of measuring the integration of sustainability into the curriculum (Yarime and Tanaka 2012). They have not tended to identify courses that may be teaching problematic content from a sustainability perspective. If universities intend to take their sustainability commitments seriously, they should also consider implementing processes and

108 For instance, UBC reports on its sustainability website that it has “more than 450 sustainability courses across campus that range in scope from the highly specialized to the multidisciplinary...” (http://www.sustain.ubc.ca/teaching-learning/curriculum; accessed April 27, 2012). The University of Victoria reports, “Currently over 200 courses are offered on campus that include triple bottom line sustainability in a number of different disciplines.” (http://web.uvic.ca/sustainability/teaching.php; accessed April 27, 2012).
incentives that encourage the review of curriculum through the lens of sustainability. Such a review might be carried out by subjecting existing curriculum in priority subject areas to review by an interdisciplinary group of scholars, including some with expertise in the environmental sciences and sustainability literatures. This would have the advantage of ensuring that paradigms taken as given within a discipline would be scrutinized. In the case of economics, given the legacy resulting from departments failing to hire candidates from heterodox schools of economic thought (Lee 2009; Mata 2009), university administrators might also wish to encourage paradigmatic competition by allowing interdisciplinary courses in economics and sustainability, or by encouraging SOP departments to offer their own courses in ecological economics. However, the prospects for such an outcome may be limited given reductions in state support for higher education; increasing collaboration between universities and the private sector means that the “space for public discussion, debate, commentary and critique ” tends to be diminished (Slaughter and Rhoades 2004, 333).

8.6 Implications for theory

8.6.1 Implications for sustainability in higher education literature

This study contributes to the sustainability in higher education literature by analyzing how the sustainability commitments of public universities have influenced, and might influence, curriculum in a subject where there is a strong case to be made for the integration of sustainability. Furthermore, it has helped shed light on the ways in which researchers and advocates of sustainability in higher education should incorporate into their research an examination of how integrating sustainability across the curriculum could bring to the fore contesting paradigms, worldviews and values, and could challenge theory offered by disciplines—such as economics, business and marketing—that minister to the existing social economic order (Heilbroner and Milberg 1995; Springett 2010). It has also helped address a lacuna in the sustainability in higher education literature by documenting an instance where integration of sustainability into curriculum may require that the theory being taught be revisited.
I argue that my findings suggest that PoE courses in their present incarnation at the case study sites perform poorly and perhaps impede universities in meeting their sustainability commitments. Rather than contributing to the environmental literacy of students, providing them with tools to analyze sustainability challenges and enhancing the likelihood that students will become ecologically responsible citizens, these courses perpetuate an unrealistic view of the economy as existing in isolation from the environment. They present consumerism as an unproblematic aspect of modern economies and economic growth as a desideratum while being structured so as to contain limits to growth arguments and prevent them from eroding the credibility of the normative positions advanced in the courses. For these reasons, PoE courses may be serving to reduce the likelihood that students will be prepared to or interested in engaging meaningfully with these issues.

8.6.2 Ecological economics

Unlike mainstream economics, which has its own journals in economics education, there is little by way of a literature in ecological economics education (Clark 1991; Polimeni 2004); ecological economists should consider putting greater emphasis in this direction. The theoretical framework used in this dissertation was partly built with ecological economics theory. The end result provides a more detailed example of how this growing body of literature can be used to critique mainstream economics education and to suggest both incremental and more foundational revisions.

8.6.3 Curriculum and the university

It is unfortunate that the institutional design of the university does not appear to create much of an opportunity for a meta-critique of the teaching that, per Becher and Trowler’s (2001) metaphor, a tribe carries out within its own territory. In part, this situation emerges from one of the strengths of the university in that competing views of the world exist within a campus, and professors enjoy a degree of academic freedom. It entails accepting the reasoning that if different disciplines offer diverging perspectives of the world, students can sort them out, and the effort this requires will strengthen their reasoning abilities. There is value to this approach. Yet it is also known that many students focused on meeting extensive course
requirements for specialized degrees do not sample from multiple disciplines. Without meta-
critique or interdisciplinary peer review, this case study suggests that a discipline can end up
reproducing an isolated form of knowledge that may short change students and limit the
university from achieving its full potential. Barnett (2000, 2012, 152–163) has argued that in
an era of supercomplexity, new approaches to curriculum and pedagogy are needed, wherein
the disciplinary field recedes in importance. I argue that the university should value the
ability to develop and deploy diverse ways of knowing about the world, yet at the same time
should build into its DNA arrangements that foster critical engagement between knowledge
structures, both to benefit from cross fertilization and to avoid localized stagnation.

Barnett (2011a, 141–151, 2011b), argues for the ecological university and declares it to be a
feasible utopia. However, when he assesses feasibility, he does not appear to address whether
the ecological university is practically feasible in the sense of whether it can recruit and
retain enough students and secure sufficient funding. As Silva and Slaughter (1984) and
Bourdieu (1988) have documented, since the social sciences were formalized within the
academy, they have offered limited scope for an effective critique of existing power
structures and privileges. More recently, as the university has shifted towards academic
capitalism, the possibility of a searching critique of existing economic arrangements has been
further constrained (Slaughter and Rhoades 2004). Students would likely come away from
their years at an ecological university with knowledge that could be a liability for securing
employment in corporate North America, as graduates who ask deep questions about how
operations impact future generations may interfere with achieving quarterly revenue targets.
If society remains committed to the growth paradigm, there may be little interest in allocating
funds towards ecological universities that raise inconvenient questions about the feasibility
and desirability of society’s path. As a result, the resourcing of the ecological university by
the government, the corporate sector or by students would be tenuous.

Thus, the topic of this dissertation is embedded in a broader question about the feasibility of
implementing the academy’s sustainability commitments through curriculum in a meaningful
way when society itself remains on a path that seems likely to erode prospects for future
generations. Can the university embrace the integration of sustainability across the
curriculum in a way that does not shy away from preparing students to encounter, or even to seek out, what may be deeply inconvenient questions about the viability of modern industrial societies (Orr 2004; M’Gonigle and Starke 2006b)? Or to avoid cutting off its supply line, must the university be timid as it reforms curriculum? Will theorizing that implies that modern lifestyles and economies require radical redesign be kept out of curriculum in favour of less threatening but overly optimistic thinking that requires little by way of course correction?

There are indications in the data presented here that the long period of stability in PoE core curriculum that began when the template was first set by Samuelson (Samuelson 1948; Colander and Rothschild 2010) may be coming towards an end. Some of those delivering the courses are dissatisfied with the status quo and, though not necessarily motivated by sustainability, seek to shake up PoE curriculum. SOP departments are working on eliminating PoE as an obligatory passage point for their students. A small number of students have protested against the curriculum and the remnants of the Occupy movement continue to point to the injustices created by the current economic order. External critique of the mainstream model has reached high levels due to the 2008 crisis, which has also prompted internal self-reflection about the discipline’s failures, generating new possibilities for revisiting disciplinary commitments (Colander 2010; Shiller 2010) and offering a broader curriculum (Thornton 2012). Heterodox schools of thought have managed to attract resources and to become better organized through societies, journals and a growing body of scholarly literature (Goodwin 2008; Dow 2011). There have also been some recent successes at creating space for heterodox thinkers in the academy (Stilwell 2006). What light can the theories of Bernstein, Bourdieu, Archer and ANT shed on the question of whether a discontinuity in PoE that would realign curriculum in a way that better accounts for the environment is likely to take place within the next decade or so? Bourdieu and Archer seem to offer the most promise and I consider their implications.

Bourdieu offers plausible accounts of power that consider the possibility of resistance and discontinuous change; indeed Bourdieu’s Homo Academicus is in part about explaining how the May 1968 crisis in France escalated from a small student protest into a general strike that
paralyzed the French economy (Bourdieu and Wacquant 1992, 89). In Bourdieu’s analysis, when crises in different fields become synchronized, a localized crisis can quickly evolve into a general crisis. Might the world currently be in such a situation considering the continued fallout of the 2008 financial crisis, new resources being allocated to probing existing theory and continued concern about the environment? Previous analysis of sustainability policies at one of the case study universities found “a serious lack of direction and visioning for university teachers… when it comes to incorporating sustainability directly into courses and curricula” (Timmerman and Metcalfe 2009, 54). Might an innovative university president, recognizing how existing capitals at stake in the economics field maintain the status quo in PoE curriculum, leverage the university’s sustainability commitment to initiate a process for renewing the PoE curriculum, sparking similar processes at other universities? Alternatively, in a scenario that echoes the unrest in France in May 1968, should the current economic crisis continue to deepen, social dislocation might reach such an intolerable level that the broader public may begin to scrutinize the economic instruction that is carried out within the ivory tower.

Archer points to a tendency for processes of morphogenesis to accelerate via reinforcement. As more ideas pointing in a new direction emerge (e.g., limits, sustainability, ecological economic theory) and as more agents align with them, eventually, the increasing contradictions result in system behaviour change from negative to positive feedback. The interaction of structure and culture that formerly generated stasis changes to interaction where differences enlarge, and each cycle generates new possibilities for change as agents adjust to new ideas and build on gains from the previous cycle. Of course, the picture is more complex, since advances made by oppositional groups may result in redoubled efforts by dominant ideational groups to undercut the rising influence of ideas used by their opponents (Archer 2000, 276–280).

Thus, initial successes in creating space in the academy for the teaching of heterodox economics, beyond those that can harmlessly be contained (such as a SOP offering its own variant of PoE to a small number of students), are likely to be resisted. This resistance is likely to come most strongly from within mainstream economics departments, but parties
external to the university that benefit from existing economic arrangements may also have an interest in stymieing reform. Furthermore, given its reputation as the most rigorous of the social sciences, and the necessity of having impeccable mainstream credentials to get into leading economics departments, business schools and bodies like the IMF and the World Bank (Fourcade 2006, 2009), some students may want to continue learning time-honoured mainstream theory.

While the theories of Bourdieu and Archer offer some insights on how a substantively new variant of PoE might come to be offered more widely at North American campuses, they do not make clear what factors will prove critical to its creation or when such changes might come to pass. Past advocacy for greater pluralism in economics, even when led by scholars with mainstream credentials (e.g., Hodgson et al. 1992), has had little effect. Nonetheless, I argue that those who believe that there is value in revisiting PoE curriculum can draw on the above insights to seek to leverage change.

### 8.6.4 Limitations of the study

Since qualitative methods were deemed most appropriate for this study, the populations sampled and the data generated were not intended to be representative of the actual student body of students who take PoE in British Columbia or at North American universities. The results were thus not intended to be generalizable and readers should take this consideration into account. Despite the fact that PoE courses have been found to be highly standardized, there is likely to be variability in content at different universities and even within universities. The literature suggests little variation in PoE courses across North America, and the interview data confirms that there is both a desire and pressure for PoE lecturers to conform to continent-wide norms. However, this study may have limited bearing in instances where either a department or an individual instructor stets curriculum that substantially departs from the norm.

The sample size of 54 students is not atypical for studies using qualitative research methods. With respect to SOP professors and PoE lecturers, a high proportion of each of these two populations was represented at the three case study universities, and thus there is reduced
likelihood that some phenomena or perspective of interest was missed. The semi-structured interview format generated dense, detailed descriptions of respondents’ views of PoE. It is important to interpret the students’ data cautiously since the interview was of limited length and students had limited incentive to try their best to give detailed and well-thought-out answers. One also needs to take into account that students who have just completed their first year are young adults who are still at an early point in their undergraduate studies and have had limited instruction and practise in thinking critically. For instance, the fact that a given student performed poorly on the carbon tax exercise may be due in part to shortcomings in the broader educational enterprise and the fact that the student’s reasoning skills are still maturing. The responses give an indication of what students experienced in PoE, what they are thinking and what they have and have not learned, but only to a limited degree.

The student interview guide would benefit from further refinement. For instance, the sentence construction in some of the quotes could be simplified, and the number of quotes students were asked to sort should probably have been reduced from 17 to between 10-12. The selection of quotes could have been further fine-tuned to focus more sharply on course content of interest. Further, three sample quotes could have been created so that the interviewer could illustrate the sorting process in front of student (with one quote being obviously consistent, a second being obviously inconsistent and a third being obviously unrelated to PoE course content). The carbon tax exercise would also benefit from further refinement. The wording used in the background and in the questions could be amended to make the questions more concrete. The exercise itself could be converted into multiple choice format with realistic distracters taken from student responses to the current study. With the above changes, the student interview guide could then be sent out for peer review amongst PoE lecturers and professors with economic expertise in order to better ensure that the results generated with the final instrument would be acceptance by lecturers who teach PoE courses.

As explained in 1.7, this study was focused on ecological aspects of sustainability and downplayed social aspects such as issues of inter and intragenerational equity. Adding a
more robust equity frame to the analysis might well highlight other aspects of PoE that deserve attention.

### 8.7 Recommendations for further research

The purpose of this study was to better understand how universities’ sustainability commitments play out in the introductory economics classroom. It has helped address a lacuna in sustainability in higher education literature by documenting an instance in which the theory being taught may need to be revisited if sustainability is to be integrated into curriculum. It has also contributed to the ecological economics literature by documenting how mainstream economics textbooks and lecturers are addressing environment-economy linkages and sustainability and how students perceive their PoE courses on this account. It portrays an instance where normal science in the Kuhnian sense (Kuhn 1962) is under increasing pressure as result of increasing tensions between mainstream theory and the real world of unmet human needs and accelerating environmental degradation.

Since so much of what happens worldwide in economic education is affected by the theories and teaching practices favoured in the US, to guard against the possibility that aspects of the results reported here are idiosyncratic to BC and to Canada, this research should be expanded to include American universities.

This dissertation also generated results that could further support research on the questions addressed in this study using quantitative research methods. For instance, the range of responses from students or PoE lecturers could provide a foundation for developing closed-ended questions for survey instruments that could be administered across a range of North American universities. Such a quantitative approach might generate results that would have a greater likelihood of influencing the economics education literature and actual practises within economics departments.

Since textbooks are so influential in shaping course curriculum, an ideal complement to the current study would be to interview PoE textbook authors to better understand how they see future editions of their textbooks being affected by societal concern about sustainability and
university efforts to integrate sustainability across the curriculum. This would allow investigation of issues such as why Stiglitz chose to include the containment strategy and put so little emphasis on environment-economy content in his textbook when in other contexts (Stiglitz 2006, 2010) he has written with great concern about environmental matters.

While the results presented here provide some insight into how members of the economics profession respond to normative positions, external events and competing theories that are potentially disruptive to the plausibility and coherence of mainstream theory, the interview process and interview guide were of limited effectiveness in surfacing such issues. Further research into factors that might affect the extent to which mainstream economists might be willing to revisit their theoretical commitments would nicely complement scholarship by Moore (2005b) and others on how changes to encourage a focus on sustainability at the institutional level can be encouraged. The results reported here could also inform the development of research undertaken using action research methods (Winter 1996). Such research would allow PoE lecturers who want to explicitly integrate sustainability into the PoE curriculum to be supported, through a research process, in collaborating to explore the implications of such integration for the plausibility and coherence of mainstream theory as well as what theoretical constructs might require revision.
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Appendix A  Textbook measurement protocol

1. Any environmental content is identified, recorded and annotated. Environmental content includes:
   
   - Occurrence of key words (e.g., biodiversity, environment, etc.), discussion of environmental topics such as global warming, economic analysis of environmental issues and policy responses (e.g., tradable permit schemes).

   Environmental content excludes:
   
   - Occurrence of the words “land”, “resources” or “natural resources” in an abstract sense (e.g., “Capital, labour and land/natural resources are the factors of production” would not merit inclusion; while “Concerns about the depletion of natural resources…” would be included).

   Content considered on a case by case basis:
   
   - Discussion invoking two economic terms in particular, “externalities” and “public goods” may or may not be related to environment. For instance, biodiversity and a healthy atmosphere are public goods, but so is national defence and building a lighthouse. Externalities include both those with environmental content (e.g., a factory emitting wastewater into a stream) and those that do not (e.g., one person getting vaccinated reduces likelihood of disease transmission to others). Where the passage in question related to the natural environment, they were recorded; otherwise, they were not recorded. Petty instances of externalities unlikely to impact ecosystems – most often, disturbances of stereo noise or cigarette smoke – were also excluded from the scoring.

   - Population growth was not recorded unless it was discussed in an environmental context.

2. Also recorded was any reference to a publication that drew on an environmental sciences / natural science literature.

3. Also recorded were images or graphics with an environmental focus (e.g., picture of billowing smokestacks).

4. For each page with environmental content, an estimate was made of the proportion of the page that is devoted to environmental content. The following convention was used:
   
   - if one or two words occurred in a sentence, but the sentence is not specifically related to the environment, 1% (e.g., “the government budget must cover expenditures for defence, health care and environmental protection”)

   - a single sentence, focused on environmental content, 5%

   - otherwise, the available proportion of the page covered by environmental content was estimated, providing a value from 0 to 100%.

5. In calculating statistics, any pages that were blank or that contained no substantive content were deducted.

   Note that the omission of web-based chapters will affect the environmental content tally of the textbooks that use them (i.e., McConnell). The rationale for excluding such chapters is that if the authors present them as so clearly optional that they must be downloaded then students are unlikely to read them.
Appendix B  Invitations to faculty to participate in the study

Two versions of the following letter were used, the first below was sent to economists who deliver principles of economics lectures in economics departments. The second version, for professors in sustainability-oriented programs, involves substituting the first three paragraphs below; the amended wording is included below the letter.

Principal Investigator:  Co-Investigator:
Dr. Ron Trosper, PhD  Tom Green
Associate Professor  Doctoral Student
Department of Forest Resources  Interdisciplinary Studies Graduate Program
Management
University of British Columbia  University of British Columbia
Phone (604) 822-8089  Phone:

__________, 2011

Dr. _________
Professor
Economics Department

Dear Dr.______________.

Study: Perspectives on Introductory Economics Courses at BC Universities

I am a doctoral student in the Interdisciplinary Studies Graduate Program at the University of British Columbia. I am working with Dr. Ronald Trosper, an economist in the UBC Faculty of Forestry to examine the potential implications of recent sustainability commitments by BC universities to the introductory economics curriculum. In support of this research, 51 students from UBC, SFU and UVic who have taken introductory economics have already been interviewed.

The perspectives of faculty and instructors such as yourself who are involved in shaping or delivering economics curriculum at BC universities is an important component of our work. This work, part of a study entitled “Perspectives on introductory economics curriculum in a changing world” will be used in my PhD dissertation. Accordingly, I am writing to request an interview.

You are being invited to participate in this study because of your participation in shaping or delivering undergraduate economics curriculum.

This research will help contribute to the general understanding of how introductory economics curriculum in BC attends to sustainability.
Study Procedures
This study is taking place in British Columbia. The investigator (Tom Green) is contacting individuals who are involved in shaping or delivering undergraduate economics curriculum at BC universities. Participants will be asked to participate in an interview that should take between 30-60 minutes. The interviews will be in person or, if necessary, by telephone, depending on the location and availability of participants. In both instances, interviews will be taped.

If after reviewing the consent provisions as attached you agree to take part in this study, please contact me and to set up a time for an interview.

Consent and confidentiality
Information on consent provisions and confidentiality are provided in the attached document. Consent will be requested orally at the start of the interview and this consent, like the rest of the interview, will be taped.

Sponsor
This research is funded in part through a Social Sciences and Humanities Research Council scholarship which supports Tom Green’s doctoral studies.

Contact for information about the study
If you have any questions or desire further information with respect to this study, you may contact Tom Green by email at:_________________.

Contact for concerns about the rights of research subjects
If you have any concerns or questions about your treatment or rights as a research subject, you may contact the Research Subject Information Line in the UBC Office of Research Services at 604-822-8598.

I can be reached at ______________. If you are able to participate, the interview can be scheduled at your convenience. Thanks for considering this request and I hope to hear from you.

Yours sincerely,

Tom Green
PhD Candidate
Amended wording for SOP professor letters:

I am a doctoral student in the Interdisciplinary Studies Graduate Program at the University of British Columbia. I am working with Dr. Ronald Trosper, an economist in the UBC Faculty of Forestry to examine the potential implications of recent sustainability commitments by BC universities to the introductory economics curriculum. In support of this research, 51 students from UBC, SFU and UVic who have taken introductory economics, have already been interviewed. Learning about the perspectives of faculty from sustainability-oriented programs (e.g., Environmental Science) who teach undergraduates or are involved in shaping curriculum and program requirements is an important component of our work. This work, part of a study entitled “Perspectives on introductory economics curriculum in a changing world” will be used in my PhD dissertation. Accordingly, I am writing to request an interview.

You are being invited to participate in this study because we understand three or more of the following apply:

- your department/program is considered to pay explicit attention to sustainability
- your department/program requires or encourages at least some of its students to complete one or more introductory economics courses
- because you have some or considerable expertise in economics or environment-economy linkages
- because you teach at the undergraduate level and/or are involved in setting graduation requirements for undergraduates in your program
Appendix C  Interview guide for economics lecturers

Interview Guide

Study: Perspectives on introductory economics curriculum in a changing world
For economics faculty involved in delivering or shaping Econ101 curriculum

1. First, I would like to confirm that you received the consent information and that you consent to this interview, which is being taped?
   [If participant withholds consent, abort interview]

2. Note subject’s gender: __________

Section 1 Background information

3. In what ways have you been involved in introductory economics curriculum, either teaching or shaping curriculum?
   **Probe:** For how long?

Section 2 Purpose and characteristics of Econ101

4. To what extent does the department define or specify the introductory economics curriculum, versus curriculum being defined by individual instructors?

5. What purpose should taking introductory economics courses fulfill for those students from other departments who complete the course but who are not required to take more advanced courses in economics?

6. From what you have observed, what are the changes in the way students think or in what they believe that commonly result from taking introductory economics?
   [If yes] **Probe:**
   - How have these changes manifested themselves?
   - Can you give a specific example of a change that you have noticed?
   - Are any of these changes problematic?

Section 3 sustainability and the introductory economics curriculum

7. The Talloires Declaration of 1990, which most universities in BC and many universities across North America have signed on to, requires that universities: “ensure that all university graduates are environmentally literate and have the awareness and understanding to be ecologically responsible citizens.” Many universities are seeking to integrate sustainability across the curriculum. What should integration of sustainability into the curriculum look like for introductory economics?
8. How much emphasis does your department place on teaching content in the introductory economics course that addresses environment-economy interactions and sustainability? 
   [If high level of emphasis] **Probe:** What has the department done to emphasize sustainability and environment-economy interactions? 
   [If little or no emphasis] **Probe:** Why does the department not put more emphasis on sustainability and environment-economy interactions?

9. Are there pivotal insights from economic theory that students should master by studying introductory economics, so as to help them understand sustainability and environment-economy interactions? 
   **Probe:** What would be an example of a pivotal insight?

10. How satisfied are you with the introductory economics curriculum, in terms of it being an introduction to the discipline that reflects current knowledge, especially with respect to environment-economy linkages and sustainability? 
    [If dissatisfied] **Probe:** What content from the introductory economics curriculum stands out as being out of touch with current knowledge?

11. [Omit if covered in previous answer] What is your assessment of the textbooks used in introductory economics courses, with respect to their treatment of environment-economy linkages and sustainability?

12. To your knowledge, have any students expressed concerns about content covered in introductory economics courses because of how it dealt with the environment-economy interactions or sustainability? 
    [If yes] **Probe:** what was the nature of their concern? 
    [If no] **Probe:** Programs like natural resource management, forestry or environmental studies often require their students to take introductory economics. There are indications that some of these students find that introductory economics courses do not feel that environment-economy linkages and sustainability are addressed adequately and they feel that some of the policies that are endorsed in these courses would cause further environmental degradation. How would you respond to a student who raised these concerns?

13. What should be done, if anything, with respect to how the introductory economics curriculum addresses environment-economy interactions and sustainability?

14. To your knowledge, have there been instances of collaboration between the economics department and other departments to develop undergraduate courses that address environment-economy interactions and sustainability?

**Section 4 Curriculum change** 
[Skip this section if subject is pressed for time or shows waning interest]

15. What is the process by which the introductory curriculum is revised?
16. At the present time, how much interest is there within the economics department in revising the introductory economics curriculum?

Section 5 Constraints on curriculum change

17. How constrained is your department in terms of its ability to revise the introductory economics curriculum by the need to ensure that students are adequately prepared for more advanced courses in economics?

18. How constrained is your department in terms of its ability to revise the introductory economics curriculum by the shared expectations of the economics profession with respect to what should be covered off at the principles level?

19. Would your department’s prestige amongst departments of economics at other universities be affected if your department’s curriculum was revised to place more emphasis on sustainability?

20. Are you aware of any textbooks suitable for use in introductory economics courses that emphasize environment-economy linkages and sustainability?

Section 4 Content questions

[Note: if there is sufficient time, proceed with question below. Otherwise, explain the desire for follow-up: “I see that it is time to wrap up our interview. However, I’m hoping that you can help me with one more activity that we can follow-up through a second interview, or via email. In order to better understand the implications of integrating sustainability in the introductory economics curriculum, I have selected a number of quotes that seem relevant to introductory economics and sustainability from critics who advocate change in what is taught in introductory economics courses. Each quote comes with an associated question. The questions are intended to help me understand your expert opinion on the merit of the criticism and its potential implications for curriculum. I’d appreciate it if you could read through the quotes and questions and select a couple that you would like to offer your expert opinion on. I will leave you with this sheet that contains the quotes and questions. Please contact me via email or telephone if you are willing to provide your commentary.”]

21. In order to better understand the implications of integrating sustainability in the introductory economics curriculum, I have selected a number of quotes that seem relevant to introductory economics and sustainability from critics who advocate change in what is taught in introductory economics courses. Each quote comes with an associated question. The questions are intended to help me understand your expert opinion on the merit of the criticism and its potential implications for curriculum. I’d appreciate it if you could read through the quotes and questions and select a couple that you would like to offer your expert opinion on. Here are the quotes and questions; let me know when you have selected those you want to comment on and are ready to provide your thoughts.
i. Quote: “These basic insights [regarding the economy’s dependence on the natural world and its environmental impacts] could certainly be included in an elementary text. But the rub is that their inclusion has so many implications that are so upsetting to the standard viewpoint that extensive revisions throughout the text could not be avoided.” (Daly, 1995, p. 150).

Question: If sustainability and environment-economy linkages were integrated into introductory textbooks, what changes, if any, would be required in the text to avoid presenting students with incoherent theory?

ii. Topic: Circular flow diagram & perpetual motion “…the fact that natural resources can be used up or polluted is not portrayed [in the circular flow diagram]. Because of this, the circular flow diagram is a little like a ‘perpetual motion machine’; the economy it portrays can apparently keep on generating products forever without any inputs of materials or energy. The necessity of resource maintenance activities is ignored.” (Goodwin, Nelson, Ackerman, & Weisskopf, 2009, p. 49)

Question: What benefit would there be to including stocks and flows of energy, resources and wastes in the circular flow diagram commonly included in introductory economics textbooks?

iii. Topic: Production functions “Standard textbooks include such curious illustrations as the theoretical bakery that employs capital … and labor to produce bread, without either flour or fuel.” (Ayres, Turton, & Casten, 2007, p. 634).

Question: To what extent do introductory economics textbooks have the potential to mislead students with respect to the economy’s dependence on natural resource inputs and the environment, when they omit resources in production functions or in discussions of the marginal productivity of capital or labour?

iv. Topic: Ethical judgments in textbooks “…the implicitly espoused ethical judgments and value-based positions [prevailing in the 19 introductory economics texts reviewed are]:

- All goods are equally meritorious.
- Economic growth is desirable.
- By assuming insatiability, texts legitimize and promote consumerism.
- Promoting well functioning markets as facilitators of voluntary exchange is to promote ignoring their sometimes coercive nature.” (Northrop 2000, p. 59)

Question: To what extent are the implicit normative positions that this scholar identified in introductory textbooks problematic from a sustainability perspective?

v. Topic: expanding the scope of economics: “A good way to reframe the principles course is to think of economics as defined by the concern of economic provisioning,
or how societies organize themselves to sustain life and enhance its quality. Such a definition is much broader than definitions of economics that focus on individual rational decision-making, markets, or GDP growth. ... Because it points directly to questions of survival and the quality of life, it invites questions about whether current patterns of wealth and income distribution, consumerist attitudes, and the use and abuse of the natural environment serve valuable ends.”
(Nelson 2009, p. 61)

Question: The above quote from the feminist economics literature suggests that in introductory economics courses, students would benefit from the subject matter of economics being expanded beyond being the science of choice under scarcity to being about provisioning to sustain life. What is the most important point you would raise in support or in opposition to this suggestion?

vi. **Topic: Econ101 promotes self-interest** “[Since Adam Smith] ordinary people have bought into the virtue of self-interest, though as I have indicated, Economics 101 helps to drive the lessons home” (Marglin, 2008, p. 114).

Question: In what ways, if any, might the emphasis on self-interest in introductory economics be problematic?

vii. **Topic: Portrayal of common-pool resources:** “Despite [Nobel Prize winner in economics] Lin Ostrom’s pathbreaking contributions that put institutions evolving from below, and the corresponding incentives provided, into the center, economics textbooks and many theoretical treatises still focus on the Samuelsonian conception of the necessity that public goods should be supplied by government, and private goods by the market. The type of institutional economics advanced by Ostrom is still largely disregarded…” (Frey, 2010, p. 304).

Question: To what extent does the treatment of the commons in contemporary introductory economics textbooks require revision to reflect the scholarship on the management of common-pool resource that earned Elinor Ostrom the 2009 Nobel Prize in economics?

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**Section 7 Wrap-up**

22. This concludes the interview. If there are any other comments you’d like to make with respect to introductory economics courses and sustainability, feel free to tell them to me now, or email them to me in the next few days.

Thank you for participating in this study. Your assistance is very much appreciated.
Appendix D Interview guide for professors in sustainability-oriented programs

Interview Guide

Study: Perspectives on introductory economics curriculum in a changing world
For faculty in sustainability-oriented programs with expertise in economics

1. First, I would like to confirm that you received the consent information and that you consent to this interview, which is being taped?
[If participant withholds consent, abort interview]

2. Note subject’s gender: __________

Section 1 Background information

3. In what ways, if any, does your work intersect with the introductory economics curriculum?

Section 2 Rationale for SOP students to take Econ101

4. What was the departmental rationale for having students from _[department/program]_ take introductory economics?

5. From your own perspective, what purpose should taking introductory economics courses fulfill for students in _[department/program]_ who will not go on to take more advanced courses from the economics department?

6. Do you consider that the introductory economics course now taken by your students in the economics department suits the purposes of _[department/program]_?
   [If no] Probe fully:
   i. What are the key deficiencies?
   ii. In what ways would it need to change to suit your _[department/program]_'s needs?
   iii. Why does _[department/program]_ not offer its own equivalent of the introductory economics course, specifically tailored to address the needs of your students?
   [If yes] Probe:
   iv. What attributes of the introductory economics courses stand out as suiting the _[department/program]_'s needs?

7. From what you have observed, what are the changes in the way students think or in what they believe that commonly result from taking introductory economics?
   [If yes] Probe:
   i. How have these changes manifested themselves?
   ii. Can you give a specific example of a change that you have noticed?
   iii. Are any of these changes problematic?
Section 3 sustainability and the introductory economics curriculum

8. The Talloires Declaration of 1990, which most universities in BC and many universities in the US have signed on to, requires that universities: “ensure that all university graduates are environmentally literate and have the awareness and understanding to be ecologically responsible citizens.” Many universities are seeking to integrate sustainability across the curriculum. What should integration of sustainability look like for introductory economics?

9. What are the pivotal insights from economic theory that students in [department/program] should master by studying introductory economics, so as to help them understand sustainability and environment-economy interactions?

10. How satisfied are you with the introductory economics curriculum, in terms of it being an introduction that reflects the current state of knowledge, especially with respect to environment-economy linkages and sustainability?
   [If dissatisfied] Probe: What content from the introductory economics curriculum stands out as being out of touch with current knowledge?

11. [Omit if covered in previous answer] What is your assessment of the textbooks used in introductory economics courses, with respect to their treatment of environment-economy linkages and sustainability?

12. To your knowledge, have any students expressed concerns about content covered in introductory economics courses because of how it dealt with the environment-economy interactions or sustainability?
   [If yes] Probe: what was the nature of their concern?
   [If no] Probe: Programs like natural resource management, forestry or environmental studies often require their students to take introductory economics. There are indications that some of these students find that introductory economics courses do not feel that environment-economy linkages and sustainability are addressed adequately and they feel that some of the policies that are endorsed in these courses would cause further environmental degradation. How would you respond to a student who raised these concerns?

13. What should be done, if anything, with respect to how the introductory economics curriculum addresses environment-economy interactions and sustainability?

14. To your knowledge, have there been instances of collaboration between the economics department and other departments to develop undergraduate courses that address environment-economy interactions and sustainability?
Section 4 Curriculum change

15. At the present time, how much interest is there within your [department/program] to encourage the economics department to revise the introductory economics curriculum to better address sustainability and environment-economy linkages?

Section 6 Wrap-up

16. This concludes the interview. If there are any other comments you’d like to make with respect to introductory economics courses and sustainability, feel free to tell them to me now, or email them to me in the next few days.

Thank you for participating in this study. Your assistance is very much appreciated.
Appendix E  Interview guide for students

Interview Guide, Students
Study: Perspectives on introductory economics curriculum in a changing world

Preamble
[Only begin once consent form has been signed; if consent form has not been signed, do not proceed]

We’ll be talking today about your perspectives on a number of issues and then more specifically about your perspective on the introductory economics course[s] which you recently completed at your university. I just want to repeat again that you can stop the interview at any time and you can let me know if there is any question you don’t want to answer.

There is no right or wrong answer to the questions that follow; what we are interested in hearing is your opinion or perspective. Once again, we’d like to emphasize that your identity will be kept strictly confidential.

Section 1 – Background information and educational/career objectives
[These initial questions are warm up questions and serve to put their studies in economics in a broader context; it should not take > 5-7 minutes] Let’s start with some background information and your opinions on some broad topics.

1) [Record subject’s gender: _________]

2) I understand you are registered in __________ program\textsuperscript{109}. Can you explain to me why you decided to study in this area?

3) What kind of job or career do you see yourself holding when you have finished your studies?

4) What subjects or areas of expertise [disciplinary knowledge] do you think will be important to succeed in your chosen career?

5) How would you describe your political views?
   **Probe:** For instance, if there was an election held in Canada today, which party would you prefer to win?

\textsuperscript{109} Because of the recruitment process, the interviewer will be aware of the interviewee's program of study.
Section 2 General perspectives on economics
Now we’ll shift to your thoughts on economics.

6) What comes to mind when you think of economics, as in the field or discipline of economics?

7) Other than through classes in economics at school or university, who or what sources of information have helped you develop your understanding of economics and of economic phenomena?

8) In your view, what are some key characteristics of a healthy economy?
   [If respondent has difficulty answering] Probe: “For instance, if someone was asked ‘what are the key characteristics of a healthy community’, their answer might be ‘it’s a community where people trust their neighbours, where there is little crime, where there are playgrounds for kids,’ things like that. So what would you list as the key characteristics of a healthy economy?”

Section 3 – The economics courses – [Core research questions]
Now I would like to get your perspective on a number of matters that are related to the economics course(s) that you recently completed at __[university]__.

9) How would you describe the content of your most recent intro economics course to a fellow student who was curious about the course?
   [If student focuses on teaching methods rather than content, or if simple answer given (e.g., “useful”)] Probe: How would you summarize for a friend the kind of theories and information that you were taught?

10) How much emphasis was placed on reading the textbook your most-recent economics course?

11) How much emphasis was placed on using online materials associated with the textbook used in this same course?

12) In what ways did your first year economics course help you better understand the world around you?
    Probe: For instance, how might you complete the blanks in the following sentence: “As a result of studying economics, where before I was perplexed about ____________, I can now see that it happens because ____________. ”

13) If applicable, please give me a specific example of theory taught in your university-level economics course[s] that you found to be particularly insightful or that you found particularly useful?
[If a specific example is provided without explanation as to why it was insightful or useful] **Probe:** In what way did you find _______ to be insightful or useful?

14) If applicable, please give me a specific example of theory taught in your university-level economics course[s] that you found to be problematic or that you had difficulty accepting as being valid or relevant?
[If specific example provided without explanation as to why it was problematic] **Probe:** what was it about _______ that you found problematic / had difficulty accepting?

15) How did the theories you learned in your university-level economics course[s] support or conflict with what you have learned in courses in other subjects or disciplines?
[If student focuses on corroboration] **Probe:** Can you give me an example of content taught in your economics course[s] that stands out as supporting or confirming what you have learned in courses in other subjects or disciplines?
[If student focuses on contradictions] **Probe:** Can you give me an example of content taught in your economics course[s] that stands out as contradicting or conflicting with what you have learned in courses in other subjects or disciplines?

Section 4: The economics courses and the environment

Now we will talk about how your economics course covered the environment\(^{110}\).

16) How were environmental issues and the interactions between the economy and the environment covered in your economics course?
   **Probe** fully

17) How was the issue of sustainability, or ensuring that the needs of future generations of humans can be met, covered in your course?
   **Probe** fully

18) What were the most important contributions made by your economics courses into improving understanding of the root causes of environmental problems and potential solutions?
   [If only one contribution mentioned] **Probe:** do any other contributions come to mind?

19) Is there any content or topics you feel should have been added to your introductory economics course in order to improve students’ understanding of the root causes of environmental problems and measures that society could put in place to improve sustainability?

\(^{110}\) Where the word environment is used, there is a small chance that some students will interpret the term differently than intended, e.g., as business environment vs. relating to the natural environment. Adding the word "natural" has problems of its own. A standardized clarification will be made when necessary to clear up confusion. "There is something I should clarify, in these interview questions, where the word environment is used it refers to "the air, water and land in or on which people, animals and plants live." (Source: Cambridge online dictionary).
19B) How do you think the environment as in the air, land, water and plants and animals, will change between now and the year 2050?

20) On each of the cards I am going to hand you, there is a quote. Please consider each quote and sort it according to how the quote relates to the content taught in your first year economics courses. On top of the envelope labeled #1 [label on envelope states in large print: “Quotes supported by or consistent with the content of your Introductory Economics course(s), whether or not you personally agree with the quote.”] place quotes that are supported by or consistent with content taught in your economics course(s), whether or not you personally agree with the quote. On top of envelope #2 [label on envelope states in large print: “Quotes contradicted by or inconsistent with the content of your Introductory Economics course(s), whether or not you personally agree with the quote.”] place quotes that are contradicted by or are inconsistent with the content of your economics course(s), whether or not you personally agree with the quote. On top of envelope #3 [label on envelope states in large print: “Quotes that don’t belong in envelopes 1) (supported by / consistent with) or 2 (contradicted by / inconsistent with) / Quotes for which you are uncertain”]

[Interviewer to put down envelopes on table.]

<table>
<thead>
<tr>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>A “Life for most Canadians improves when Canada’s economy grows.”</td>
</tr>
<tr>
<td>B “If the economies of rich countries grow, more resources will be used up and more wastes will be generated; as a result, there will be greater harm done to the environment.”</td>
</tr>
<tr>
<td>D “People in poor countries generally benefit from the opportunities that arise to supply the markets of rich countries.”</td>
</tr>
<tr>
<td>E “A majority of environmental problems would be solved if property rights were extended to cover most natural resources since it would then be in the owners’ interests to manage the resources they owned sustainably.”</td>
</tr>
<tr>
<td>F “When the economies of rich countries grow, they typically require more natural resources. Since many of these resources are extracted from poor countries, the end result of growth in rich countries is that the environment in poor countries is degraded.”</td>
</tr>
<tr>
<td>G “If our generation ensures the global economy grows, we will create more wealth that future generations can use to solve environmental problems.”</td>
</tr>
<tr>
<td>H “Because people’s preferences are manipulated by advertising and because individuals are not good at making rational decisions, governments should restrict what products can be sold in the marketplace to those that are environmentally benign.”</td>
</tr>
<tr>
<td>Quote</td>
</tr>
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</table>

21) Now I’d like you to look over the quotes on top of envelope #1, those that you identified as being supported by or consistent with the content of your first year economics courses. Please pick three of the cards that you feel comfortable explaining how they related to the
content of your introductory economics course[s]. [Once student has selected 3 of the quotes, ask the following for each of the three quotes] How does Quote [letter reference] relate to the content of your economics course[s]? [After student explains] Now how do you personally feel about that quote? [Move on to 2nd and 3rd quotes selected by the student].

22) Please look over the quotes on top of envelope 2, those that you identified as being contradicted by or inconsistent with the content of your first year economics courses. Please pick three of the cards that you feel comfortable explaining how they related to the content of your introductory economics course[s]. [Once student has selected 3 of the quotes, ask the following for each of the three quotes] How does Quote [letter reference] relate to the content of your economics course[s]? [After student explains] Now how do you personally feel about that quote? [Move on to 2nd and 3rd quotes selected by the student].

Section 5) Sample problem
[If interview so far is already close to the 60 minutes mark, if student is tiring or having difficulty, this section may be omitted]
In this next section of the interview, I will be asking you to answer a question that is based on the kind of questions that sometimes appear in introductory economics textbooks or that might have been used in an exam. What I would like is for you to answer the assignment by “thinking aloud”, in other words, explain your reasoning aloud as you think through the question.

I am going to hand you a card with a practice question to help you get used to answering a question while thinking aloud. We won’t be using your answer to this practice question in the study.

23) Imagine you will have to survive one week on a deserted island. You can pick any two of the following three items to bring with you. Explain aloud as you go along your reasoning process for which of the items you would choose to leave behind:
   - a fishing rod
   - 20 litres of fresh water
   - a flashlight
   [Give feedback as appropriate on their following of the thinking aloud protocol.]

24) Please read the following text written on the piece of paper that I am handing you. It provides background information for some questions that I will hand you. After you have read it over, I will hand you the questions that relate to this backgrounder, one question at a time.

[Background text follows in italic] In recent years scientific consensus has emerged that human activity, particularly the burning of fossil fuels, leads to higher greenhouse gas concentrations in the atmosphere which in turn result in global warming (also known as climate change). Many economists have suggested that to reduce the threat of global
warming, a tax should be imposed on greenhouse gas emissions. Such a tax is commonly called a carbon tax.

As an example of how a carbon tax would work, if government set the carbon tax at $80 dollars per tonne of CO$_2$ emitted:

- a company that emitted 100 tonnes of CO$_2$ a year would have to pay a carbon tax of $8,000 (100 x 80)
- a company that emitted 2 tonnes of CO$_2$ a year would have to pay a carbon tax of $160 (2 x 80).
- if a company reduced its CO$_2$ emissions in half by conserving energy, it would reduce the amount of carbon tax that it paid by half.

Economists recommend that if a carbon tax is put in place, other taxes should be reduced to avoid increasing the overall tax burden. A carbon tax would increase the price of goods or activities which resulted in the emission of greenhouse gases into the atmosphere; environmentally benign goods and activities would be largely unaffected, or might even be cheaper.

Economists reason that the change in relative prices resulting from a carbon tax would encourage consumers and businesses to make less polluting choices and it would give industry incentives to develop clean technologies or renewable energy. As a result, if the carbon tax was high enough, carbon emissions would start to decline. At the same time, provisions such as rebates could be put in place to ensure that the carbon tax did not create undue hardship for people with low incomes. By using the revenues from the carbon tax to reduce other taxes, government could ensure that the amount of taxes paid by the average person would stay about the same.

Please remember that as you answer the questions that I am now going to give you on these cards [one by one], the idea is to think aloud just as you did in the practice question about the deserted island.

a) What effect would a carbon tax tend to have on a company that installs windmills that generate electricity?

b) What economic arguments could you give in favour of a carbon tax as described in the passage you just read?

c) What economic arguments could you give against a carbon tax?

d) Would you be for or against government putting in place a carbon tax, knowing that a carbon tax would have the effect of increasing the costs of goods and activities that emit greenhouse gases into the atmosphere?

e) Besides a carbon tax, are there other economic measures you believe should be used to reduce society’s greenhouse gas emissions?
f) If society decided to reduce carbon emissions, would you prefer that government introduce a carbon tax, or that government put in place regulations that require all polluters to reduce their carbon emissions?

[After this section completed] Thanks for answering those questions while thinking aloud. That is the end of the think aloud questions.

Section 6: Closing
We are almost at the end of the interview and I’d like to get final reflections on your economics courses.

25) [Question 25 no longer used]

26) [for SOP students only, not economics majors] Would you say that based on your experience of first year economics courses, you would be more likely or less likely or just as likely to take more advanced courses in economics?
   •  Probe: why would you be more likely / less likely?

27) Please complete the sentence that is printed on this card in a way that reflects your experience [interviewer to hand card to subject]: “For those individuals who want skills and knowledge that will help them contribute to making the world more sustainable, they would have found the introductory economics courses I took to be…”

28) That was my last question. If there is anything else you would like to add about the issues that have come up so far in this interview, please feel free to tell me now. You can also email any thoughts that come up in the next few days if you would like to share them.

Thanks for participating in this study. This has been very helpful and I appreciate your time.
Appendix F  Student consent form

Consent Form

Study: Perspectives on introductory economics curriculum in a changing world

Principal Investigator:  Co-Investigator:
Dr. Ron Trosper, PhD         Tom Green
Associate Professor         Doctoral Student
Department of Forest Resources
Management
University of British Columbia
Phone (604) 822-8089

Date:____________

Purpose: The purpose of this study is to learn more about student experiences taking first year economics courses at BC universities. This study is being undertaken as part of Tom Green’s doctoral studies and the results may be published as part of his dissertation, as well as in one or more articles to be published in academic journals.

The study involves an interview that will take approximately 1 hour. This study is intended to identify ways to improve the relevance of introductory economics for students. Ethics approval has been obtained through the UBC Behavioural Research Ethics Board.

You are being asked to participate because you are a student who completed a first year economics course at a BC university within the last 9 months and you have not yet completed any 2nd, 3rd or 4th year economics courses. Also, you are either majoring or minoring in economics or majoring or minoring in a program that specifically addresses sustainability (e.g., natural resource management, forestry, environmental sciences).

Study Procedures: The interview will take about 60 minutes. It will involve a conversation between you and the interviewer about your experiences taking one or more introductory economics courses at a BC university. During the interview, you will also be asked to complete a small number of simple exercises and to reflect aloud on your reasoning in these exercises. The interview will be taped to record the details accurately. The questions asked will differ slightly if you are a student majoring in economics or a student majoring in other disciplines. The interviewer or the Principal Investigator will be happy to answer any questions you have about the procedures.

Potential risks: There is no risk to you in participating in this study. If you don’t feel comfortable answering any of the questions, you can simply tell the interviewer and you don’t have to answer.
**Potential benefits:** There are no specific benefits for you of participating in the study, other than having an opportunity to share your experiences of a course you recently completed. You may also find the questions interesting and enjoy talking about them.

A potential benefit to society at large of your participation is that the results of this study may help inform revisions to introductory economics curriculum.

**Confidentiality:** Your identity will be kept strictly confidential. Recordings, documents or transcripts will be identified only by code number and kept in a locked filing cabinet or in password-protected digital files on the Principal Investigator’s computer. After the study is completed, transcripts identified only by an ID number will be placed in a data archive where they will be kept for 5 years. Only the Principal Investigator will have access to the identities of study participants. You will not be identified by name in any reports of the completed study.

**Remuneration/Compensation:** In order to defray the inconvenience of participation, you will receive an honorarium in the amount of $15. If you choose to end the interview before it is completed, you may still receive the honorarium.

Contact for information about the study: If you have any questions about the study procedures or would like further information about this study, you may contact the Principal Investigator, Ron Trosper, at (604) 822-8089 or the Co-Investigator Tom Green, at 778-847-7665.

Contact for concerns about the rights of research subjects: If you have any concerns or questions about your treatment or rights as a research subject, you may contact the Research Subject Information Line in the UBC Office of Research Services at (604) 822-8598.

**Consent:** Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time without penalty.

Your signature below indicates that you have received a copy of this consent form for your own records. Your signature indicates that you consent to participate in this study.

_______________________        _______________________ __________
Subject Name  (please print)               Subject Signature      Date
Appendix G  Sample advertisement for recruiting students

The following advertisement was placed in The Peak student newspaper at Simon Fraser University. Similar advertisements were placed in The Martlet at University of Victoria and The Ubyssey at the University of British Columbia.

Share your experiences of ECON 103 / 105  
...and earn $15

UBC researchers are conducting a study to learn about student experiences taking first year economics courses at BC universities. If you are a student who completed a first year economics course within the last 9 months we invite you to participate in our study.

The study involves a 1 hour interview. This study is to explore students’ perceptions of introductory economics courses.

Further information: _______________