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School voor Educatieve Studies

Educatieve master in de economie

Masterthesis

Keeping minds open. Proposals on how to begin a first-year university economics course in the 21st century

Andrew Lancaster

Scriptie ingediend tot het behalen van de graad van Educatieve master in de economie

PROMOTOR :

Prof. dr. Tom KUPPENS

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Abstract

This study proposes improvements to the first part of an introductory economics course unit at the University of Hasselt. The primary aim of this project is to help students keep an open mind and understand economics accurately as a contested field. They should therefore learn how to criticize, contextualize, and compare paradigms. A design-based research (DBR) methodology was used. Concrete innovations are proposed based upon the objectives of the university, and the following three design principles guide the philosophy behind the proposals: (a) *Methodological pluralism* rejects the anti-pluralist tradition of economic science needing to follow specific methodological rules; (b) *Transformative learning* is a constructivist paradigm which informs us about learning situations where students need to reassess their fundamental assumptions; (c) *Economics as a toolbox* is an older economics teaching metaphor emphasizing that many of the difficulties in this field involve special problem-solving methods that students must be able adapt to different problems. Insight into the characteristics of these "threshold concepts" is also drawn from more recent literature. Supplementary materials have been created in the form of short online modules about groups of concepts. The modules can be used flexibly but a suitable learning path is suggested. In addition, this study lays out a framework of background information that can be used to develop and trial further improvements in an incremental process going into the future. It is foreseen that the results of modules should be easy to assess because responses can be collected when students use them.

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> a subject so 'immersed in matter' (to use the fine expression of Lord Bacon) as a nation's prosperity, must be looked at on many sides, in order to be seen rightly even on one.
>
> —John Stuart Mill, *Obituary for Jean-Baptiste Say, 25 November 1832*

1. Problem definition and relevant literature

This study proposes answers to the important question of how to improve the way foundational principles are taught in the first part of an introductory university-level economics course. The simple proposed answer is "pluralism", because from the beginning of this study there was a clear vision of economics students need a broader foundation early in their course, which can support open-minded engagement with the world's changing economic challenges. However, the devil is in the details.

The first part of the introductory macroeconomics course unit at the University of Hasselt (UH) is a typical general introduction to the field of economics. It begins with some core ideas, and to use the wording made popular by Siegfried et al. (1991; cf. Siegfried 2009), it aims to help students to start "thinking like economists".

The aim of this project is that the minds of students should be kept more open to competing ideas, and not trapped by the dominant neoclassical paradigm which they must learn. This does not mean that the students will be confronted with complex debate at this early stage. They can however already be exposed to the idea that there are debates, and they can be given a rough road map of where some of the forks in the road ahead will be.

Learning modules will be proposed for testing, but perhaps more importantly this document collects justifications and explanations which can be used to go further. This is important because major changes to such courses are not an easy sell. There is a strong tradition of explaining economic core concepts in a way that actively closes doors to alternative ideas and critical thinking. It does not help that this has been going on for generations now, and while the textbook narratives have become less pragmatic, and increasingly narrow, the training of economists has come to include less discussion of the historical, political, and philosophical debates which formed the only real context in which the textbook assumptions can be properly understood (Blaug, 2001; Bowles & Carlin, 2020). Because the influence of this history is likely to be underestimated or misunderstood, one important aim of this document is therefore to lay out some of the

controversies connected to introductory economics courses. The aim is that instructors and course designers will then find it easier to judge the possibilities and priorities.

It should be kept in mind that although this study proposes that students should be given more contextual and critical information, it is not the intention that an introductory course should cover the amount of context discussed below. It is assumed that course designers can best consider much more information than they eventually use in their courses.

To begin setting up this framework of background thinking, we will first consider some of the concerns which exist about the introductory teaching of the core concepts in economics. This will need to include some discussion of the historical background of those courses.

1.1. A remarkable tradition

Introductory economics courses represent a remarkable example of academic standardization and tradition-building in teaching that can be best understood in terms of twentieth-century history. New American-style university economics courses and textbooks developed after the second world war, and they soon spread around the world. The content and style were new, and strongly influenced by the advent of a completely new type of economics-based government in America, the so-called welfare state.

The start of the corresponding textbook and course-design revolution, led originally by Paul Samuelson at MIT, can be defended as an intelligent and pragmatic reaction to the post-war situation (Bowles & Carlin, 2020). MIT, which was not a traditional academic university at the time, aimed to quickly train a new generation to work in this new situation. Samuelson (1948, as cited in Bowles & Carlin, 2020) found pragmatic ways to shoehorn a simplified mechanical model of the new welfare-state, "macroeconomics", based roughly on the new models of John Maynard Keynes (1936/1978b), into the neoclassical mechanical models which correspond to what we now call "microeconomics". The neoclassical models had found their most influential form in the work of Keynes's teacher at Cambridge, Alfred Marshall (1920/1986), and he was in turn inspired by 18th and 19th-century "classical" analyses of early capitalism. Samuelson was therefore being innovative and traditional at the same time. He called the overall theoretical construct in his course a "neoclassical synthesis" (Bowles and Carlin, 2020, p. 180).

One of the most important results of the compromises and design decisions made in Samuelson's synthesis is that economics teaching is now divided into two incompatible parts, which we now call microeconomics and macroeconomics. This fact on its own can be somewhat bewildering to students. What is less obvious is that as the textbooks evolved, many of them were influenced by positivist philosophy. Economics was strongly

influenced by prescriptivist attempts to define science in terms of fixed rules. By the late 20th-century, most textbooks had quietly moved to a completely new methodology-based definition of economics, and topics deemed unscientific began to be de-emphasized or omitted in mainstream textbooks (Backhouse & Medema, 2008; 2009a; 2009b). Lionel Robbins (1938, p. 348), the most important early promoter of this movement, insisted that all economists accepted the same core assumptions about the logic of human decision making, and treated them "as if they were certain". Robbins saw deductive research using such assumptions as the scientific core of economics and questioned the scientific value of other approaches.

The new type of definition was therefore a Trojan horse, with controversial methodological ideas hiding inside. This trend had wide-ranging, significant effects. By excluding "unscientific" ideas, according to a controversial conception of science, introductory economics courses became more abstract, less connected to empirical or policy topics, and less pluralist. This had a particularly big impact on the way introductory courses explain economics.

In short, the methodological debates of past generations have created some insidious challenges for this project and all projects with similar aims. Instructors need to recognize topics where such influences have played an important role, and to find ways to stop them from blocking critical thinking and pragmatism.

The problematic simplifications of the neoclassical models taught in these courses, and the way in which students are shepherded away from many topics, arguably made some sense in the 1950s, but criticisms started early. Economists have long been uncomfortable with the lack of perspective and critical thinking in these courses. Despite their emphasis on neutral-seeming maths and mechanisms, they have been accused of defending a specific political status quo, by avoiding certain topics and emphasizing others (Galbraith, 1973). The rationales for its approach to science have on the other hand been compared to astrology and cargo cults, and even called an "intellectual crime" (Fullbrook, 2009, p. 22). The writing style of the more recent successors of Samuelson, such as Gregory Mankiw (Mankiw, 2007, as cited in Fullbrook, 2009), have been described, for example by Fullbrook, as a kind of "bullying" (p. 19).

Unfortunately, there is very little financial incentive for major textbook suppliers to break the self-perpetuating circle (Colander, 2015). Something will have to change within that system or else change will have to come from outside the textbook-producing network.

In the post-COVID world one important prediction which we can safely make is that new media will play a major role in the evolution of economics education. Publishers of educational texts will of course increasingly provide electronic versions of their products,

but new media now gives educators more power to create and distribute alternative teaching materials and force change. This change can be incremental and flexible, and this project can be seen as a conscious attempt to contribute to a bigger movement. Various organizations have already established websites and other media to help students and educators go beyond the standard textbooks. Some examples are listed in an appendix.

It is a guiding assumption and hope of this study that economics educators will increasingly be taking matters into their own hands and building course materials according to their best understanding of what is needed. As has already been indicated, the approach here will therefore be not only to give concrete proposals, but also to inspire and inform further work by the international economics-teaching community.

1.2. An increased priority

While the history of economics explains the textbook tradition's problematic evolution, there are also practical priorities outside of academia that make it particularly important for introductory economics to become more pluralist in the 21st century.

With the end of the Cold War, this style of introductory course, often referred to with the American-style course name "Economics 101", has become even more important — although it no longer fits so well with the real-world situation. It has spread all over the now more globalized world, as has capitalism and the modern welfare state. It is an important part of the education of many young university students doing many types of course (Jones et al., 2009). Many will become business leaders, public servants, teachers, journalists, or political leaders. Outside of academia, the introductory version of economics influences how the real world is managed. Economics 101 courses can even be blamed for having a real negative effect upon global economic and environmental problems (Raworth, 2017).

The economic concerns we face today are quite different from those of the period after the second world war, which is when our current teaching traditions were established. Today more than ever then, teachers and students of economics must be made aware of what was always true — that economics is not about learning one true model. Properly understood, economics is and was about learning to continuously design and criticize a wide range of new and old models, which provide different perspectives. John Maynard Keynes (1971, p. 297) made this point already in 1938, in a comment criticizing the first phase of the scientific methodology push of Lionel Robbins (1935/1945, 1938), which he objected to, and which will be discussed further below:

> Economics is a science of thinking in terms of models joined to the art of choosing models which are relevant to the contemporary world. It is compelled to be this, because, unlike the typical natural science, the material to which it is applied is, in too many respects, not homogeneous through time.

Bowles and Carlin (2020) propose that while Samuelson can be seen as helping a generation to face the urgent practical problems of his time, we are now facing new problems which are ignored in his type of textbook. These include "climate change, inequality, wealth creation, and innovation together with its effect on the future of jobs, and financial instability". They suggest (p. 192) that we are at a new "Samuelsonian moment". However, moving new concerns to the centre of attention will not be easy. None of these problems can easily be discussed within the framework of pure neoclassical thinking, which dominates the Economics 101 worldview.

Finally, it is worth stating that despite the urgency, the aim of making economics pluralist is more than just a reaction to some problems. All economics including neoclassical economics can be better taught and understood from a more pluralist and pragmatic point of view. Ultimately, it is hoped that the project can also help reintroduce some more positive emotions to introductory economics courses. The neoclassical models are not known for promoting emotions such as wonder, awe, and optimism. That economics can inspire such emotions is perhaps not widely appreciated, but it can be better appreciated by sometimes stepping outside of the neoclassical echo chamber and looking at economics from more points of view.

2. Methodology

2.1. Basic parameters

A starting point for designing the methodology of this study was to analyse the practical parameters and limits of the task.

- The lectures consulted were from the 2021/22 and 2022/23 academic years. For the most part they follow the orthodox Economics 101 tradition. This study will focus more upon that tradition than upon specific variations of it. This has the benefit of making the proposals relevant to similar courses.
- One of the specific concerns raised about the present course, and courses like it, is that they do not help students prepare to think critically about topics such as sustainability as the course unfolds. Such topics are not well-suited to the neoclassical paradigm, and so students need to understand its limitations.

- As mentioned, in the UH economics course the introductory topics are followed not by a microeconomics unit, but by macroeconomics. In some cases, this has guided ideas about which types of topics to spend most time on. For example, there is a case for including more discussion of specific neoclassical assumptions if they are potentially relevant to macroeconomics.
- There was no possibility to test the developed materials properly with groups of students, as the course is only organized in the first term and the development took place mainly in the second term of the year. (One recent student, my own son, was shown the modules for the first time just before completion of the project.) The lectures were studied based upon PowerPoint presentations, Blackboard course information, the assigned reading materials, and discussions with Professor Kuppens who both supervised this paper and gave lectures. As will be discussed, rather than presenting a single closed research loop, the hope is that paper set-up an on-going iterative process of improvement which colleagues can trial in both Hasselt and other learning institutions. It was therefore important to design thoughtful proposals for future interventions by others which have a high chance of creating both success, and insights for further improvements.
- The assigned textbook is by Lipsey and Chrystal (2020). This 14th edition book has evolved from one of the most popular British Economics 101 textbooks, *An Introduction to Positive Economics*, published by Lipsey in 1963 (Lipsey, 1963, as cited in Lipsey, 2001; Backhouse & Medema, 2008, 2009a, 2009b). Lipsey has been consistently sceptical of the methodological approach to economic science propagated by Lionel Robbins (1935/1945, 1938, 1981). For better or worse, Lipsey was among the generation of economists who turned from Robbins to the philosopher Karl Popper, for an alternative prescriptivist approach to economics, emphasizing falsification. As Lipsey wrote decades later (2001, p. 170): "Whatever the current evaluation of him, Popper provided us with a way to escape from the methodology that we had been taught". In practice, Lipsey textbooks tend to avoid methodological questions (cf. p. 16) and try to take a practical and empirical perspective. The book therefore contains many useful discussions of the real economy, at least in Britain. These are undoubtedly useful for some parts of the course, but there is very little which can help us break free from prescriptivism's influence upon the way core concepts are initially set-up. As will become clear, a didactic concern with economics textbooks of this type is that large numbers of introductory concepts are given very quickly, which is unsuitable for some of the difficult foundation concepts.

Based upon consideration of the objectives and these practical considerations, it was decided to proceed based upon a "design-based research" (DBR) methodology in order

to develop supplementary teaching materials and background information for instructors and course designers.

2.2. Design-based research (DBR)

A notable aspect of this project is that it involves a type of lesson which has a long tradition of iterative evolution. It is not a controlled experiment with a beginning and end, but a pragmatic study which aims to contribute well-designed proposals for interventions with a chance of improved results and useful feedback. These proposals are specifically designed with the idea that if they are not used in their present form, they will still be useful contributions to the on-going conversation which is inevitably necessary in a complex field like this. The "design-based research" paradigm fits this context well.

DBR became an identifiable methodology after the publications of Brown (1992) and Collins (1992; see also Collins et al., 2004). As in the present project their concern was to achieve progress in education using a pragmatic experimental approach that goes beyond controlled "laboratory" environments, and involves real, complex, teaching environments. It is a paradigm for researchers working with educators. They already foresaw that new media would increasingly assist in this process, partly because it can help record the practical results.

Another aspect of reality which guides this study, is that its starting point is a significant practical problem. Similarly, McKenney and Reeves (2013) emphasize that it is central to the DBR approach that it is "initiated to address problems that are both scientifically and practically significant".

Anderson and Shattuck (2012) have listed several characteristics which distinguish DBR, and which match the present study. Remarks in quotation marks are from their article:

- **Situated in real educational contexts.** "Being situated in a real educational context provides a sense of validity to the research and ensures that the results can be effectively used to assess, inform, and improve practice in at least this one (and likely other) contexts."
- **Focussed on the design and testing of interventions.** "The creation begins with an accurate assessment of the local context; is informed by relevant literature, theory, and practice from other contexts; and is designed specifically to overcome some problem or create an improvement in local practice."
- **Using mixed methods.** "DBR is largely agnostic when it comes to epistemological challenges to the choice of methodologies used and typically involves mixed methods using a variety of research tools and techniques."

- **Involving multiple iterations.** Shattuck and Anderson compare the approach to design practice in industry, such as "the manufacture of cars or of fashions", which "usually evolves through the creation and testing of prototypes, iterative refinement, and continuous evolution of the design".
- **Stemming from partnership between researchers and practitioners.** Shattuck and Anderson describe such projects as involving partnership development, negotiating "from initial problem identification, through literature review, to intervention design and construction, implementation, assessment, and to the creation and publication of theoretical and design principles."
- **Yielding design principles.** "Designs evolve from and lead to the development of practical design principles, patterns, and/or grounded theorizing." DBR develops and utilizes pragmatic working generalizations, rather than grand theories.

Anderson and Shattuck also differentiate DBR from the similar "action research" paradigm. Both approaches follow the "meta-paradigm" of philosophical pragmatism which also influences many proponents of pluralism in economics. In contrast to action research, they describe DBR as more concerned with developing useful theories, in the sense of practical design principles. It also emphasizes dialogue, while action research is generally performed by educators working alone.

A useful insight of Anderson and Shattuck is that DBR projects must be concerned with the question of how they can have a real impact on practice. In the present study, the decision to work in separable modules, which can be used in multiple ways or else adapted, is a response to this priority.

As has already been noted, the present study was not able to go as far as actual real-life trials and feedback. In terms of the DBR process model proposed by Hoadley and Campos (2022) the aim is to propose a first round of interventions which can be tested, leading to new conjectures, new tests, and further reflection aimed at new generalizations. In terms of their model, the proposed interventions in this project represent initial "grounding" and "conjecturing" phases. These resulted in the framework of background thinking contained in the present document. Grounding has therefore involved the identification, in discussion with the involved educators, of the objectives and parameters. Conjecturing has meant the creation of generalizations which will be used as working theories to guide the process of supporting learning.

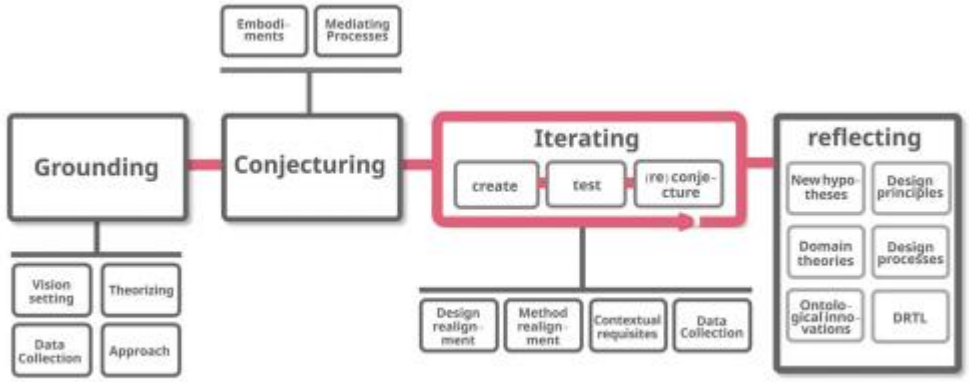
Using the terminology of Sandoval (2014), the results of conjecturing are on the one hand the "embodiments", such as the e-learning modules themselves and their key

components, and the "mediating processes", which are the effective causes of better learning outcomes. Mediating processes can be looked at as either "observable interactions between participants and the designed environment", or else by analysing "artifacts that participants produce from their activity". In practice it is proposed that one convenient way of doing this will be to use online modules that can collect student responses to carefully chosen questions, which they must respond to in order to progress. Sandoval describes mediating processes as "proxies for learning processes", which "indicate the extent to which learners are engaged in the sort of activity and thinking hypothesized to matter".

As shown in Figure 1, Hoadley and Campos also emphasize the importance of visualizing a loop of iterative testing, re-conjecturing, and reflecting. As already mentioned, this current project aims to facilitate and inspire future work by modelling steps which can be adapted and repeated.

Figure 1

The process model of Hoadley and Campos (2002)



A process model for DBR.

2.3. Design principles

The starting point for the grounding of this project is the question of how we can keep minds open in a typical introductory economics course. After confirmation of the situation and the priorities, suitable working principles have been selected, and these are used to guide the overall approach to each of the economics topics.

The following three principles are proposed as answers to three sub-questions, each involves a different type of challenge and takes its frame of reference from a different type of literature.

- **Methodological pluralism.** This answers an economics question, about what should be taught. How should we explain what economics is, and how the field

works? In answer, we take a systematically pluralistic approach. But because of its importance to this field, we must also address the question of how a pluralist approach can be extended to address traditional concerns about scientific methodology. Even for instructors who prioritize simplification in introductory courses, they should understand the problems which lie behind the subject matter they are simplifying. This first topic draws upon high level debates among economists about their own field, because the question of how to explain the core topics of an introductory course is deeply connected to how economics sees itself.

- **Transformative learning**. This concept helps us address a didactic question. How should we conceptualize the implications of pluralist learning objectives for lesson design? The aim is to kick-off a learning career which can, and hopefully will contain open-minded discourse and critical thinking. Economics, it is proposed, is a grown-up topic, and students need to develop grown-up learning skills. They therefore need to start considering facts that come from outside their everyday experience. The didactic paradigm of transformative learning already has some history in economics contexts. It has for example been proposed as a way of changing the minds of students concerning topics like climate change and sustainability, and that is relevant to this study. Another branch of literature has proposed that the concept is specifically useful for understanding difficult "threshold concepts" that are important during introductory courses.
- **Economics as a toolbox.** This older paradigm is used to approach the teaching challenges specific to the economics topics to be handled in the lessons. How can we help students learn about the basic principles of economics without oversimplifying? Each such question will be handled case by case, having its own literature, but as an overall approach this study will be guided by the idea that introductory economics necessarily requires students to assimilate a difficult set of threshold concepts before they can proceed. In particular this includes several powerful procedural concepts that provide a model for further learning. Concerns have been raised that these concepts are often taught too superficially (Frank, 2006).

Each of these will be discussed in more detail below. It is worth noting that these are compatible methodologies. For example, like social constructivism, they are all influenced by philosophical pragmatism. The aim of avoiding subservience to methodology "rules" will perhaps be the most notable innovation for readers familiar with methodology discussions in economics, and in that respect methodological pluralism, which addresses this point, represents a philosophical thread which ties these principles together into an integrated whole.

2.3.1. Methodological pluralism

Pluralism is one of the pre-agreed objectives of this study. In a broad sense this means a situation is targeted wherein different principles and traditions co-exist, and can be treated seriously, within one community. Calls for more pluralism in economics became common long ago, and they have become more intense today. A notable early example is the call for action posted by Hodgson, Mäki & McCloskey (1992), in the *American Economic Review* (see appendices), which included Samuelson and three more Nobel-prize winners among the signatories.

While pluralism is a relatively straightforward concept, methodological pluralism represents a more specific idea that is especially relevant to the approach taken in this project. It is a type of pluralism used to understand a science such as economics, that is strongly influenced by its internal methodological norms. The case for methodological pluralism in economics was initiated most famously by Caldwell (1982; 1988; see also Dow, 1997; 2021).

To understand the importance of pluralism for the designer of an introductory economics course we can start with what seems relatively straightforward. One straightforward argument for pluralism is that students graduating from this course will be better prepared to fairly evaluate the trade-off between economic growth and sustainability. This is a topic in direct conflict with the narrative of standard introductory textbooks, which tend to treat ever-increasing production and consumption as an unquestionable aim of humanity. It is self-evident that the designers of introductory courses ultimately hope that their students will one day be able to use their knowledge to grapple with real-world economic dilemmas. Clearly this means that they need to learn about reality and not just practice models. The reality of economics is that beyond the introductory textbooks there is a dynamic universe of debates and controversies, not only about economic theory, and practice, but also about associated ethical, political, and philosophical concerns. If there is a plurality of opposed perspectives, then it is logical that an introductory course must aim to develop the ability of students to compare and evaluate different positions. This on its own seems a good reason to consciously design lessons which help students see that economics is not a field with one monolithic consensus, which is unfortunately the way that many introductory textbooks present it.

Garnett and Reardon (2011, pp. 244–245) have listed three basic methods by which economics teaching can be made more pluralistic:

- A "contending perspectives" model where the core concepts and methods of several different paradigms are taught.

- A “big toolbox” approach where core concepts are presented in a problem-centred way, rather than being filtered based on method or paradigm.
- Complementary courses and learning experiences outside the standard curriculum.

The third option is outside the parameters of this specific project, but the other two are relevant, and guide the approach throughout. The toolbox conceptualization is designated as one of the guiding design principles which is discussed separately.

As will be explained in more detail below, another strategy for facilitating pluralist learning is that students should be given contextual information, to help them understand the thinking behind specific ideas. Discussion of context helps both educators and learners to avoid the dangers of oversimplification, which can close minds. In a core concepts course, teaching without context is especially problematic, because it makes it difficult for students to integrate what they learn into a useful framework, and this would represent a failure.

It might seem difficult for anyone to be against pluralism in the broad sense described so far. Nevertheless, economics has traditionally been very resistant to pluralism in introductory courses, and this has continued to be the case even while working economists have arguably tended to become more open-minded (Colander, 2004; Davis, 2006; Salanti, 2020). To understand why, we need to consider the special role which ideas about scientific methodology have played in the history of economic theory teaching.

The main reason that economists have been suspicious of pluralism is concern with maintaining scientific standards and avoiding “anything goes” relativism (Dow, 2021). As already indicated, during the twentieth century influential proponents of this priority, such as Lionel Robbins (1935/1945, 1938), argued in effect that economics is defined by a very specific method, and for him this meant strictly limiting the types of working assumptions economists may make. This influential proposal has tended to make some economics courses pro-actively anti-pluralist, because any idea which did not come from the standard set of working assumptions can be rejected and ignored as unscientific or inappropriate for discussion within economics (Gräbner & Strunk, 2020).

A particularly important example of a set of assumptions connected to methodology is associated with “methodological individualism”, which is characteristic of neoclassical microeconomics and prescribed by both Robbins and the Popperians. Whether they are conscious of it or not, all economists are trained to think using this method. Broadly speaking this approach demands that social phenomena be explained in terms of the behaviour of individuals, because only individuals make decisions. As a method for

analysing society in an abstract way it is older than economics, going back to the atomism of Thomas Hobbes in the 17th century (Udehn, 2002), although the term itself was coined by Joseph Schumpeter in 1909 (Basu, 2008). As Hodgson (2007) has pointed out, this term has been used inconsistently and problematically in economics. A very specific and problematic type of methodological individualism is central to the familiar models of neoclassical economics such as demand and supply curves. These models require that certain remarkable assumptions about atomistic human behaviour need to be treated as proven. For example, if people make buying and selling decisions based on what they see others do, which they obviously do, then the logic of methodological individualism is not valid (Basu, 2008). Despite its importance to mainstream economics, and its known logical problems, the real-world implications for economics are not necessarily something which most economists think carefully about. In practice it means that theorists must assume that relationships and institutions are not part of what economists can or should explain. This is clearly not satisfactory for any economics student who wants to hear what advice economists can give about the institutional oversight of environmental damage, financial institutions or systems of taxation and subsidy. Clearly however, these are topics which economists should have something to say about.

Among its various effects, this history has even created confusion and disagreement about the definition of economics itself, as will be discussed below. Anyone designing a pluralist course should be aware of the dilemmas this embedded anti-pluralism creates. One of the first challenges of this study is to make proposals about how to handle the definition of economics, and the assumption of methodological individualism, in an open-minded manner. The proposed approach is that it is possible and desirable to take this complication as a positive and use it to give new students a broader and deeper perspective.

Although it still influences introductory economics courses, the "prescriptivist" idea that scientific knowledge can be demarcated by specific rules is no longer tenable. While it would be impractical to examine this issue in depth here, authors such as the historian of science Thomas Kuhn (1970), and the pragmatist philosopher Richard Rorty (1979) demonstrated that this conception of science is inadequate. Economists such as Caldwell (1982; 1988) and McCloskey (1986; 1994) have long ago demonstrated the critical relevance of this to economics. However, whether or not this has influenced how professional economists think and work, it has not yet had much effect upon economics teaching.

While McCloskey thinks it best to give up on methodology entirely and analyse science as debate and discussion, Caldwell's proposed response is methodological pluralism. To

avoid terminological confusion, proponents of methodological pluralism don't accept that any specific methodology can define what makes a belief scientific, and so their own "methodology" is not what McCloskey (1986, pp. 24–26; 1994, p. 265) calls big-m "Methodology" or "Method". As Dow writes, "methodological pluralism can be interpreted as non-methodology because it does not establish standards". Instead, she describes it as "a meta-methodological position" which "advocates that methodologists study a range of methodologies" (Dow, 2012, pp. 138–139). In short, as she explains it: "The argument for methodological pluralism is that, if certain knowledge about reality is not in general possible, that is, knowledge is in general held with uncertainty, then there is no basis for identifying one best way of building knowledge." Caldwell's methodological pluralism provides us with a useful framework for this project, even if we accept the anti-methodology argumentation of McCloskey, because the aim here is to design an economics course which explains not only the economy, but also the field of economics.

In short, what limits open-minded thinking in economics is its traditional anti-pluralist use of big-M Methodology, and that is why methodological pluralism, and not just any type of open-mindedness, needs to guide the course design. Anti-pluralism cannot be justified on the basis of any consensus among economists, except in the unscientific sense that it has been accepted for a long time. The next step is to consider how a more pluralist approach can also be justified and put into effect from an educational perspective.

2.3.2. Transformative learning

Development of working theories is a first step in the design-based research approach. The first part of this was confirming the suitability of pluralism as a goal from the point of view of economics, and the philosophy of economics. It is now necessary to consider how students can best learn in these lessons.

In crude terms, the proposal so far is that simplification distorts economics. This implies that economics students in a university course should learn in a relatively adult way, in order to have a good open-minded starting point from the beginning. However, pluralism potentially presents learners with a cognitive challenge. It means that some types of simplification will be avoided, and instead pluralism requires higher order, critical thinking. In comparison to traditional approaches, students will be given more context, and will be helped to see connections and conflicts between themes. There should also be a contrary effect. For many students the neoclassical models are likely to be simpler, not more difficult to understand, if more explanatory context is given.

What can didactic literature tell us about the practical implications of introducing more critical thinking into an introductory course? Transformative learning is a theoretical

paradigm which is very influential in the field of adult education. The original version was formulated by Jack Mezirow (Kitchenham, 2008; Cranton & Taylor, 2012). According to his vision, an important challenge which distinguishes adult education is that adults often undergo a seriously disorienting learning phase because they need to critically reassess the basic assumptions they have been building up. Mezirow's discursive approach to this type of transformative learning process was influenced by Jürgen Habermas and Thomas Kuhn, both of whom focussed upon the social context in which knowledge is constructed. He was drawing upon the similar philosophical trends to those which have transformed understandings of methodology in economics and other fields. Mezirow, like McCloskey, did not believe in the discoverable existence of absolute truths that are independent of human perceptions of them, and he understood this to be relevant to the practical question of how learners should learn difficult topics. Just as schools of scientists sometimes need to reassess their paradigms, so do individuals and indeed instructors. Mezirow's vision therefore dovetails well with the pluralistic approach which is needed from an economics perspective.

In Mezirow's work the focus was upon adult learners. He believed that adults, or at least some of them, are best equipped to critically reflect upon, and adjust, paradigms which they have committed to previously. In contrast he felt that although adolescents can criticize the assumptions of others, even "well into their adulthood" they are less able to criticize their own assumptions (Mezirow 2000, p.26). Nevertheless, aspects of Mezirow's work have influenced thinking about education more generally, including university economics courses.

One example which is relevant to the aims of this project is the proposal to use this approach to help tertiary students confront the reality of sustainability concerns (Boström et al., 2018; Rodriguez Aboytes & Barth, 2020; Singer-Brodowski et al., 2022). Mezirow's original vision has inspired a wide range of visions which all tend to use the term "transformative learning" (Hoggan & Finnegan, 2023). Such research often deviates from Mezirow's original vision because it is not restricted to adult students.

It is logical that Mezirow's ideas have been so inspirational in a wide range of learning situations. His approach starts from social constructivism (Cranton & Taylor, 2012), which is a broad mainstream paradigm of educational thinking, but it focusses upon situations where past learning experiences have closed people's minds. I propose that transformative learning is relevant in two ways to this project. Firstly, as we will see, economics already has a long and positive tradition of questioning misunderstandings which are often part of common sense, for example concerning sunk costs, or relative comparative advantage. Secondly, the aim of this project is to proactively confront the

danger of students closing their minds to non-neoclassical ideas, by demonstrating a pluralist approach to economics from an early stage.

A detailed account of all major aspects of transformative learning theory would not be practical in this document, but Mezirow's advice about practical implications will be summarized. To start with, Mezirow (1997, pp. 9–10) emphasizes that "educators must help learners become aware and critical of their own and others' assumptions. Learners need practice in recognizing frames of reference and using their imaginations to redefine problems from a different perspective." Furthermore, he listed the following "ideal" conditions which the educator must strive to create if they wish to create "effective discourse".

1. Those participating should have full information.
2. There should be no coercion. (Consider Fullbrook's remark about bullying textbooks, cited above.)
3. Participants should have equal opportunities "to assume the various roles of discourse (to advance beliefs, challenge, defend, explain, assess evidence, and judge arguments)".
4. Participants should "become critically reflective of assumptions".
5. Participants should be "empathic and open to other perspectives".
6. Students should be "willing to listen and to search for common ground or a synthesis of different points of view".
7. Participants "can make a tentative best judgment to guide action".

Some of these, such as 1, 2, 4, 5, and 6, are more relevant to a lecture setting than others. Small group work forms, envisioned in point 3, will not be a focus of this paper, although proposals are presented as modules that can be used in different learning environments. An important implication for this project is that when students are processing fundamentally new approaches to questions, important contextual information should not be hidden from them. For example, instructors should look for opportunities to encourage students to see the assumptions being made, and to compare different perspectives.

Is Mezirow's approach to transformative learning appropriate for young adults starting a university lecture course? The proposed answer is yes, but a longer answer with some debating points seems appropriate here, because Mezirow's position was carefully developed, and it raises several issues which deserve critical reflection. After all, this study aims to provide some provocative background thinking which can help colleagues not only to think about the proposals made below, but also to make better proposals.

First, it may be that many of the students will have little knowledge of economic theory, but many already have strong opinions about socioeconomic and political reality, often coming from internet sources. The world's recent experiences with fake news and pseudoscience must surely remind us that we longer have much control about when young adults start learning about adult topics and going outside of their everyday comfort zones and life experiences, whether their teachers help them or not.

Secondly, there is no sharp dividing line between young adults and older adults. Singer-Brodowski et al. (2022) note that many university economics students face discomforting transformative learning experiences at a young age, because of their concerns about sustainability. More generally, promoters of pluralist economics education have pointed to other concerns, such as income disparity and financial crashes, which many young university students want their economics courses to help them process (Bowles & Carlin, 2020).

In short, the practical reality is that students beginning with this "grown up" topic at university must surely expect and even hope that they will be engaging with it in a serious and undistorted form. And as economics instructors we must surely be aiming to help them handle this reality. The young age of first year students is certainly an issue which deserves consideration. But students need the mental tools to be able to compare opinions, and this means they need practice. Critical thinking competencies are in fact always needed to understand economics properly as a field with many perspectives. When it comes to topics like economics, the simplification of explanations can be very counter-productive, and occasionally even irresponsible.

It is also important not to over-dramatize the likely levels of discomfort which will be faced by the economics students considered by this project. From a practical point of view, this study aims to make limited proposals for introductory courses which are forward-looking, in the sense that they prepare students better for later phases of learning. Ideally, it is hoped that young students can start developing a truly critical understanding of economics without deep discomfort or confusion.

On the other hand, one of the deepest insights from Mezirow is that a lack of discomfort cannot be the main aim of a conceptually difficult course. Some discomfort may be unavoidable. If students simply learn to recite assumptions during an exam, then this project will have failed to achieve its objectives.

2.3.3. Introductory economics as a toolbox

To adapt methodological pluralism and Mezirow's philosophy of transformative learning to the objectives of this study requires a consideration of the typical problems faced when

teaching the special types of topics which encompass “thinking like an economist”, both as a traditional bundle of topics, and as individual topics.

This project does not propose substantial changes to the standard core theoretical concepts, but having a list of core concepts is not enough. For example, the project aims to avoid students being “bullied” into treating the working assumptions and methodologies used by neoclassical models as unquestionable. This creates another challenge. If the students will be helped to see models as questionable, then how can instructors and students explain the value of those imperfect models they must learn?

On the one hand, simply listing problems with models might create misunderstandings and negativity among the students. On the other hand, attempting to give full explanations could become inappropriately complex for an introductory course. It is clearly important to find a way of giving students a balanced and pragmatic understanding of the value of what they are learning in the introductory course. The students need help to develop some metacognitive insight.

Helpfully, economics teaching already has a long tradition of conceptualizing and explaining these introductory models in a pragmatic way as a mental “toolbox” that should be used flexibly and selectively. For example, in the 1920s John Maynard Keynes (1978c) famously opened his introduction to a series of Cambridge economics handbooks with the following remark:

> The Theory of Economics does not furnish a body of settled conclusions immediately applicable to policy. It is a method rather than a doctrine, an apparatus of the mind, a technique of thinking which helps its possessor to draw correct conclusions.

The toolbox metaphor itself was popularized and expounded by his Cambridge colleagues, Arthur Pigou (1929), and Joan Robinson (1933/1969). It is notable that they emphasized that good economists weren’t just tool users, but also tool makers. According to Pigou the “principal tools in the economic workshop are ranged about the central idea of demand and supply" (p. 8), which is one of the opening topics in Hasselt. Pigou also noticed that his famous teacher Marshall, who buried the difficulties of his “tool making” in “platitudinous” language, could cause misunderstandings among students (p. 5). “In Edgeworth's work [in contrast] the student knew what he was up against; he might not understand it, but, if he did not, there was little danger of his imagining that he did (p. 4).”

Explaining the working models of economics pragmatically, as an adaptable tool kit for analysing socio-economic problems, might be a way to avoid dogmatism, but the remarks of Pigou, Robinson and Keynes alert us to the fact that students don't just need some tools, but actually need to learn how to adapt those tools in new contexts, and even make new tools. Cohn (2007) complains that the toolbox approach, as it is used today, has not been pluralist.

> Some textbooks offer an engineering-oriented definition of economics that portrays the discipline as a "tool kit". This approach muddies the waters. […] The textbooks imply that neoclassical tools can operate on all economic topics. To do this textbooks have to define economic topics and economic questions in a narrow way. (Cohn, 2007, p. 42)

Cohn (pp. 44–45) suggests that while there is "nothing inherently objectionable" with introducing these important concepts early in courses, the textbooks tend to use static models, and distorted accounts of economic history. In this way the students are made aware of some simplistic arguments for the benefits of economic growth and free trade. Students are then left in this state because complications are not addressed later in the course. This raises the question of whether it is worth starting on some complex topics, which we will not be able to explain in a pluralistic and complete way.

The situation is that most "students who take introductory economics seem to leave the course without really having learned even the most important basic economic principles" (Frank, 2006, p. 58). Frank argued (p. 59) for spending more time on a smaller number of topics, because "a relatively small number of basic principles do most of the heavy lifting in economics". He believed most economists would agree on a list something like the following:

1. "The scarcity principle: Having more of one good thing usually means having less of another."
2. "The cost-benefit principle: Take no action unless its marginal benefit is at least as great as its marginal cost."
3. "The not-all-costs-matter-equally principle: When making decisions, some costs (e.g., opportunity and marginal costs) matter much more than others (e.g., sunk and average costs)."
4. "The principle of comparative advantage: Everyone does best when each concentrates on the activity for which he or she is relatively most productive."
5. "The principle of increasing opportunity cost: Use the resources with the lowest opportunity cost before turning to those with higher opportunity costs."

6. “The equilibrium principle: A market in equilibrium leaves no unexploited opportunities for individuals, but may not exploit all gains achievable through collective action.”
7. “The efficiency principle: Efficiency is an important social goal because when the economic pie grows larger, everyone can have a larger slice.”

The first five of these constitute a single bundle of inter-connected supply-side concepts used to analyse questions of economic cost and scarcity. The level is pitched significantly higher than our introductory course. They are linked by the concept of marginal comparison which can better be handled in a subsequent microeconomics course. But several of these are at least touched upon among the opening topics in UH. Opportunity costs provide a good example of the challenges faced. Although there is an apparent widespread consensus among economists that this topic is essential to understanding how economists think, researchers consistently find that it is taught quickly at the beginnings of courses, and not integrated into later insights (Frank, 2006). Consequently, even professional economists and postgraduate students are frequently unable to answer some types of questions about this topic in the same ways (Ferraro and Taylor, 2005; cf. Potter & Sanders, 2012). Opportunity costs will be discussed in more detail below.

Shanahan (2016) criticizes the current approach in university economics teaching because textbooks list key concepts which need to be learned, but do not consider how students need to learn them. In recent decades the specific educational and cognitive challenges connected to core concepts in many introductory university courses have become the focus of a new paradigm partly influenced by Mezirow’s concept of transformative learning. Meyer and Land (2003, 2005) introduced the term “threshold concepts” as a way of identifying the critical concepts which tend to become bottlenecks in university courses because they are both important to the course, and difficult to process. These need special attention when courses are designed. Their proposals about how to identify these concepts has been criticized (O’Donnell, 2009a), but it nevertheless gives a good insight into what types of learning challenges we can expect (2003 pp. 5–6):

1. They are "transformative". As we’ve seen, this means these concepts cause a "significant shift" in how a topic is perceived. This can even have an emotional impact, and it can affect people's personal identity.
2. They are "probably irreversible". These are the types of ideas you can’t unlearn. Whatever new things you learn later, you won't return to your previous beliefs.
3. They are "integrative". They expose "previously hidden interconnections". As an example, Meyer and Land suggest that opportunity costs might not be highly

integrated within economics courses, while general equilibrium thinking is an example of a concept which economists link to many types of question.

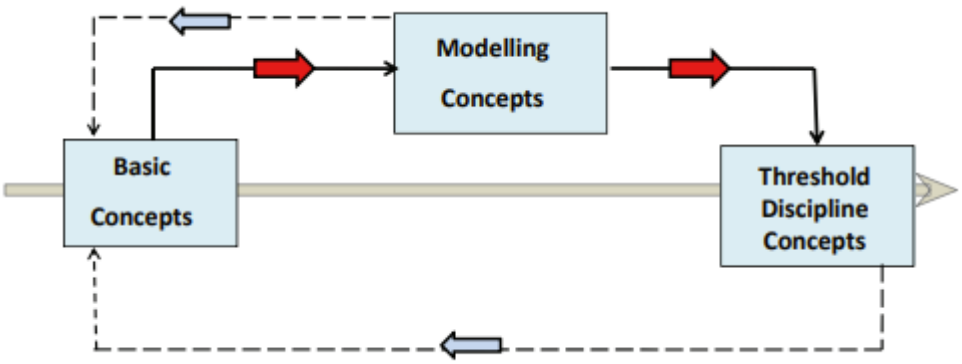
4. "Possibly often (though not necessarily always) bounded." This refers to the way in which some threshold concepts define the boundaries of a field or paradigm.
5. "Potentially (and possibly inherently) troublesome". Concepts can be troublesome in different ways. Students may find them counterintuitive, or alien, or incoherent.

The first three criteria are related to the types of adjustment problems learners have because of the interconnectedness of concepts, and the last two can be seen as effects caused by the first three (Davies & Mangan, 2007). Three and four are related to the importance of concepts within a field. Such highly integrated and boundary-defining topics are clearly very important for course design, especially for introductory courses. These are obvious potential bottlenecks to further learning.

Davies and Mangan (2007) have pursued the threshold concepts paradigm further with a specific focus upon economics. They propose that a useful distinction can be made in economics between (a) *basic concepts* which can be understood by building upon previous learning; (b) *discipline threshold concepts* which require a building up of economic concepts first; and (c) *discipline procedural concepts* which are important because, reminiscent of Keynes, Pigou and Robinson cited above, they argue that learning "how to select, amend and test economic models is a central part of undergraduate education in economics" (p. 715). Examples which they give of procedural threshold concepts used to select and improve models in economics include "comparative statics", which is a typical neoclassical modelling approach that involves quite specific assumptions such as ceteris paribus assumptions and market equilibrium assumptions.

Figure 2

Integrating linked concepts (Davies and Mangan, 2008; 2010)



Davies and Mangan (2008; 2010) give a useful graphic representation of the ways in which the three types of concepts affect each other (Figure 2) as the student progresses along the grey line. They propose that this can be used to assist not only the course design, but also to plan effective evaluations. The threshold concepts are like "portals", while the modelling concepts are needed to build those portals.

Davies (2011, p. 255) list the following practical implications for lesson design:

1. "Do not try to introduce 'simplified versions' of profound ideas to students in the early stages of their learning."
2. "Do be explicit about the modelling process in economics – illustrating how, as an economist, you set about framing problems."
3. "Do encourage students to expect to reconfigure their understanding of the subject: it is not that they or their teachers 'got it wrong' earlier – the process of learning should involve some major re-working."

This threshold concepts framework is still relatively new, but these categorizations give a useful framework for course designers to connect different terminologies relevant to the challenges of teaching introductory economics. It is interesting that the didactic term "modelling", emphasized by Davies and Magan, fits so well with the tool metaphor of the pre-Samuelson Cambridge economists in the 1920s, emphasizing once again that they were not really talking about a collection of ready-to-use tools, but about learning to adapt to new situation based on the models provided by previous experiences.

3. Results: analysis and proposals

In this section more specific rationales and background thinking will be given for the online modules, especially where the proposals are significantly different from traditional approaches and/or the present lectures.

These modules are intended to complement existing materials and are therefore deliberately different from the typical style of lectures and textbooks. They are intended to be a first trial, which can be improved upon further. They can be adapted and used flexibly, and it is hope that they will inspire more innovation. The aim is to give instructors the possibility to help students gain a deeper understanding of selected topics. The modules can be used most simply in a logical sequence fitting before, after or during the lectures. A more specific proposal will be given below. They could also simply be made available as extra reading for students.

As an overall guiding principle, all the proposals aim to keep the minds of students open and create a broader and deeper base of economic understanding to build upon, based

on the guiding principles described above. In practice, one way of doing this is often by encouraging students to see how topics in these first lectures are linked to each other and to bigger discussions, in ways which are not always simple and clear.

As a practical strategy, several "food for thought" documents are incorporated which can be used to inspire deeper critical thinking and discussion in lectures, small group activities, or small assignments.

Cognitive load may be a concern, because students are exposed to extra procedural concepts, critical thinking, and metacognitive thinking. However, extra information has been carefully selected, looking at the usefulness of the terms for multiple topics. Each small cognitive investment should have a positive payback. My only test subject, my son, noted that it was enjoyable and helpful to see the practical thinking behind the introductory models. The hope is that some students will be motivated to feel more connection to economics if the background of its foundational concepts are less mysterious.

Concerning software, many different options were examined, including Book Widgets, ClassPoint, Pear Deck, Google Forms, and others. However, the more attractive and user-friendly options require subscriptions, and it was decided not to spend money on this. The main requirements are (a) the possibility of asynchronous slideshows including interactive slides such as quizzes, so that responses can be collected, and students can be kept actively engaged, and (b) the possibility of collecting results automatically, for example in a SCORM compatible system. Nearpod was eventually selected as good enough to demonstrate the principle.

3.1. The present course in a nutshell

In the current course, the first lecture is broken into two parts. Since 2022/23 the opening PowerPoint also gives learning objectives, which are a useful reference point. Beginning with the first part, H1:

1. **H1. Introduction to economics.** (*Inleiding tot de economische wetenschap*.)
   Learning objectives:

- You can describe the **subject matter** of economic science.
- You can explain **some important basic economic concepts**.

The first lecture breaks discussion into the following themes. These are core neoclassical topics, where students learn to look at economic problems in a specific way.

1.1. A **definition of economics**, which connects to the concept of **scarcity**. (*Kiezen is verliezen*. "Choosing is losing.") This section currently also includes a discussion of the **factors of production**, and **opportunity cost**. In the

modules these four topics are treated separately. Only scarcity and opportunity cost remain together.

1.2. Adam Smith and the "**invisible hand**". (*De onzichtbare hand*.) This section also includes mention of the concepts "***homo oeconomicus***", **rationality**, and the **price mechanism**. In the modules, *homo oeconomicus* and rationality are discussed in the definitions module and other places, because these have no real connection to Smith.

1.3. The **role of the government**. (*Rol van de overheid*.) This is a quick presentation of the differences between centralized and decentralized economies, which mentions that all real economies are a mixture. This topic is now discussed within the modules about the definitions of economics, and Adam Smith.

2. **H2. The market mechanism.** (*Marktwerking*.) Learning objectives:
   - You can explain how the quantity demanded and offered is determined.
   - You can identify the difference between a movement along and a shift of the supply and demand curve.
   - You can estimate the impact of market events on the equilibrium price and quantity.

The lecture PowerPoint breaks H2 discussion into (a) Demand, *Vraag*; (b) Supply, *Aanbod*; (c) Price theory, *Prijsvorming.* This collectively represents the familiar neoclassical "demand and supply" model known to all economists. Although this is the core of the mainstream, an attempt has also been made to create a module which demonstrates ways to enrich discussion of this topic.

3.2. Learning activity 1. Definitions of economics, macroeconomics, and microeconomics

As discussed, the definition of economics has become an important concept in economics, which limits the possibilities for pluralism and open-mindedness. This topic is a positive opportunity to help students see that economics is a contested field. The most obvious innovation in this proposal is that two definitions will be given, instead of one. This is clearly a more pluralistic approach, but it is also more technically accurate. Some important facts:

- There is no consensus definition of economics. This is demonstrated for example by Backhouse and Medema (2008) in their *New Palgrave* entry for the definition of economics.
- The lectures and assigned reading in Hasselt have already been using two opposed definitions. The presentation uses the methodology-based definition

of Robbins (1935/1945). The textbook (Lipsey & Chrystal, 2020, p. 20) uses a subject matter definition, written by a known critic of the Robbins approach to economics (Lipsey, 2001; Backhouse & Medema, 2008; 2009a; 2009b).

- Subject matter definitions go back at least as far as Jean-Baptiste Say (1861). They are strongly preferred among pluralist economists (Cohn, 2006, p. 42; Chang, 2014, pp. 17–27; de Muijnck & Tieleman, 2021, pp. 51–52; Raworth, 2017, p. 34).
- The Robbins definition is particularly difficult to reconcile with macroeconomics, the subject of this course unit, because unemployment and inflation cannot be explained in terms of optimal decisions about scarce resources.

A second significant innovation is that the concepts of neoclassical economics and methodological individualism are introduced to students. Students are therefore exposed to metacognitive information describing economics as a field, and a way of modelling how neoclassical economists think.

A third innovation is that the definitions discussion is linked to powerful real world politic debating points, using Bill Clinton (Michael Alvarez & Nagler, 1995) and Margaret Thatcher (Margaret Thatcher Foundation, 1987). Convenient short Youtube clips are also used (Marshall, 2007; bedri birdirbir, 2021). It may be argued that these examples are far from the "lifeworld" of first year university students, but on the other the slogans and everyday examples should help students see a link not only with current political debates, but with emotionally charged topics that impact normal families today. These two politicians are selected because they are influential explainers, who are still imitated and cited in many countries.

The food for thought reading focuses upon the problematic importance of voluntary exchange in the economy, and how this makes the idea of central planning problematic. One innovation here is that instead of simply dismissing the impracticality of central planning totally, Galbraith's famous concept of technocracy is also introduced as a proposed type of central planning which is more compatible with a certain level of free exchange and capitalism. As a central planning example to show the practical problems, Venezuela is chosen as a recent example, and students are asked to google the situation there.

3.3. Learning activity 2. Demand, supply, and partial equilibrium

The concepts connected to demand and supply, represent the core of neoclassical economics and this topic plays a central role in the teaching of neoclassical procedural

concepts. Many young university students will already be familiar with aspects of this topic. As a neoclassical microeconomics topic, the assigned textbook already goes into more detail than the UH macroeconomics course (Lipsey and Chrystal 2020, pp. 23–27). Its English terminology has been followed to some extent, for example the "law of price adjustment". Because this is a mainstream topic, the module may seem less necessary. In fact, because this paradigm is so dominant, students especially need more contextual information to help them see the model as a practical tool rather than an absolute truth.

The basic approach of the lectures and textbook provided the main parameters, more than in some of the other modules. For example, based upon discussion with Professor Kuppens, the difference between curve shifts and movements along the curves is a model for discussion later in the macroeconomic course. However, the aim is to complement the detailed discussions in the book, not go significantly beyond them. In the module, assumptions and procedural concepts are discussed in a non-mathematical way, showing that the models are clever, useful, but imperfect. Students are helped to see the ideas which connect the neoclassical models, including procedural concepts. The concepts methodological individualism and neoclassical economics, which already appeared in the definitions module, now become more concrete and useful. The module introduces more neoclassical procedural concepts, comparative statics and partial equilibrium. The law of supply, will be discussed further in the scarcity and costs module.

In later chapters Lipsey and Chrystal (2020) give a useful discussion about the difficulty of observing demand and supply curves using real-world data (pp. 62–63). I propose that this is useful for instructors to remind themselves that demand and supply curves are purely deductive proposals, and virtually impossible to measure empirically (cf. p. 16). Because this project concerns a macroeconomics course, this is not emphasized in the proposed learning modules, but it could be a good food for thought topic.

More generally this model has no shortage of potential food for thought topics because this is an well-known model with some well-known weak points, which I hardly need to list. For example, students studying this topic are sometimes invited to think about the problems this model has with it competition assumptions, or its assumptions about perfect information. However, because this project concerns a macroeconomics course the problems of time and equilibrium have been selected for extra consideration.

3.4. Learning activity 3. Costs, scarcity, and supply curves

After considering various approaches the difficult topic of opportunity costs, the concept which economists use to define cost in a way which links to scarcity, was integrated into a short module which also aims to finish off discussion of the supply curve. Because of the way Lipsey and Chrystal handle it, the human decision-making model behind the

demand curve was already integrated with discussion of demand and supply generally. As usual, a decision was therefore made to emphasize connections and to show the background thinking of neoclassical theory as a complex integrated whole. Not only the demand curve, but also the supply curve, is derived from an analysis of the logic of individual decisions. In other words, opportunity costs are integrated, and not kept isolated. Often, as in Lipsey & Chrystal, the link between the law of supply and opportunity costs is not explained directly, and the supply curve's justification is instead discussed in terms of production curves (e.g. Lipsey & Chrystal, pp. 114). The module's approach is in answer to published concerns about the way in which opportunity costs are taught.

Opportunity cost is one of the archetypical examples of a threshold concept in economics. Meyer and Land (2003; 2005) already mentioned it in the articles which launched the threshold concepts paradigm more generally. It has already been noted that economics graduates have been judged as showing a poor ability to apply this concept in a consistent way to real examples (Ferraro & Taylor, 2005). The awkward relationship which economics has with this core concept is elegantly illustrated by the fact that critics of Ferraro and Taylor could demonstrate that the "wrong" answers can in fact also be justified using standard economic assumptions (Potter & Sanders, 2012). Potter and Sanders (p. 255) argue that Ferraro and Taylor's findings actually "suggests difficulties in framing an opportunity cost accounting question" because the correct answers are context-dependent in the real world. They suggest that teachers should teach this introductory subject in a way which is more like "advanced economics training", where students are helped to see how opportunity costs can be calculated in different ways.

Based on this background, O'Donnell (2009b) argued that opportunity cost is a "difficult" concept but "not a fundamental concept in economics", and that "a deep understanding of the concept is not necessary for a successful career in economics". We have instead accepted the argument of Tang (2019), that opportunity costs are being taught wrongly, and they deserve to be seen as a threshold concept. Citing the threshold concepts literature discussed above, he argues that the acquisition of threshold concepts "has to be integrative for these concepts to be transformative", and "to become powerful tools to transform our way of looking at real life events, they must be assimilated beyond the level of 'ritual knowledge'".

The food for thought exercise for this module asks students to see if they can link opportunity costs to the shape of the supply curve, and there are also exercises concerning the logic of sunk costs. The sunk costs topic was also seen as a positive opportunity to show how economic logic can be useful for everyday spending decisions.

Other themes which could have been connected to opportunity costs include comparative advantage and production possibilities frontiers (see Lipsey & Chrystal, 2020, pp. 11–12). However, these are topics connected to the theory of trade and development rather than macroeconomics. Furthermore, to go much further along this path the students will have to become familiar with marginal analysis, and this major procedural concept is best handled in a specialized microeconomics course.

It would be outside the parameters of the current project to give development and trade theory a higher priority, but it is worth noting that the CORE project (Bowles et al., 2017) does effectively start its course with such "classical" topics.

3.5. Learning activity 4. Smith and the invisible hand

Adam Smith's 18th-century invisible hand is a controversial and confusing metaphor, that some proponents of pluralism in economics suggest avoiding altogether in introductory courses (Fullbrook, 2009, p. 23). They have a good point. To put it simple terms, the current handling of the concept in the PowerPoint presentations explains the metaphor wrongly, but then again, so do many publications. Smith (1759/1979; 1776/1979) is wrongly associated with the neoclassical concepts of "*homo oeconomicus*", and the "price mechanism" which did not exist in his time. It is true that Smith's descriptions of competitive markets are an inspiration to modern economists, but he did not use his invisible hand metaphor to describe free markets. This misunderstanding became common in the 20th-century. One of the main sources of error, it seems, was Samuelson himself, and his original 1948 textbook which other authors, "without checking for themselves by reading *Wealth of Nations*, simply copied into their own new textbooks", so that it is now "believed to be true by the majority of faculty and their graduate students" (Kennedy, 2017, pp. 86–87).

> According to 'Google Alerts', the 'Invisible Hand' is mentioned somewhere, ten or twenty times a day in the world's media outlets in hosts of different contexts, from the proverbial sublime to the utterly pretentious. (Kennedy, 2017, p. 88)

In contrast, the assigned textbook (Lipsey & Chrystal, 2020) mentions Smith several times but avoids this famous misunderstood metaphor.

Smith used the metaphor in an economic context only twice (1759/1979, p. 184; 1776/1979, p. 456). In both cases, he described how specific situations could sometimes, but specifically not always, incentivise bad people to do what good people would want them to do. That's all. Instructors and students are of course free to

poetically compare those two invisible hand examples to what happens in competitive markets, but Smith only used the term in examples involving particularly worrying types of individual decision makers, who were not being pushed by any market forces. There are many proposed ways of reinterpreting Smith's metaphor, but he probably didn't see it as important at all (Grampp, 2000; Kennedy, 2017). It is even quite likely that Smith's choice of words was 18th-century sarcasm (Rothschild, 1994).

Because the danger of oversimplification was already recognized, the students are currently also given a 27-minute podcast to listen to which contains a discussion about Adam Smith's less-known philosophical book, the *Theory of Moral Sentiments* (Smith, 1759/1979). This is a relatively long exercise which strays quite far from economics. It is recommended that students can use this time differently, by using the proposed module.

As in the case of opportunity costs, this is an example of a core principle that is frequently handled too quickly, and not being integrated into the knowledge which students know well enough to use. Once we accept that Smith has very little to do with neoclassical economics, should the course commit time to him? I propose that a careful explanation about Smith can give real insight into economics as a field, in a way which most neoclassical sources fail to do. Some students will find Smith, the founder of economics, a genuinely interesting topic (Dupont & Durham, 2021). It has also been argued that Adam Smith's perspective is a particularly relevant one for students and instructors to spend time on in the wake of the financial crisis (Wight, 2019). Unlike the neoclassical model-builders who he influenced; Smith was directly engaged with real-world concerns like unethical people with increasing economic power.

The proposed module is relatively short for such a big topic, focussing upon threads which link with the other modules, including methodological individualism and market equilibrium. Because the role of the government appears in the present list of learning objectives Smith's famous 3 rules have also been added. This should give students perspective and context.

The food for thought materials provided for this activity take the opportunity to raise questions about two concerns about Smith's approach, both which raise important concerns about economics today, which is still under his influence. One of these is concerning income distribution, and the other is about growth as an economic target. These are certainly topics relevant to the concerns of many young people today, but the neoclassical theory essentially ignores them. A third food for thought slide raises the question of whether individual desires are now sometimes guided, for example towards new technologies or fashions. This is a thought-provoking claim associated with the

American Institutionalists such as Galbraith, who was already discussed in the definitions module.

This module is intended to be relevant to current concerns, and not historical interests. For topics like the ones selected, Smith is far more relevant than neoclassical theory.

1.1. Learning activity 5. Factors of production

Sticking to the parameters of the project, a relatively simple module is offered, which aims to help students look "behind the scenes" at the links, and background thinking. As usual the aim is to keep minds open, and to build a good foundation that integrates with other topics. This module is however difficult to link with modern neoclassical economics. Instead, it is proposed that it can be handled after the Adam Smith module, because it supports that module by further investigating the concept of capital goods as a factor of production, and the Smithian explanation of economic growth.

Like opportunity costs, the factors of production, or "agents of production" (Edgeworth, 1898, Marshall, 1920/1986), are an old core concept that developed in 19th-century classical economics. Like opportunity costs they are often mentioned only in the beginning of first-year micro- and macroeconomics, but students are not given many opportunities to integrate this knowledge and "see the point" of the concept. Unlike opportunity costs, the idea of distinguishing some fundamental types of input has been replaced in today's neoclassical models. Instead, they prefer a mathematically abstract conceptualisation of an unspecified number of "resources". It is therefore particularly difficult to link this topic to the other modules, without distorting it to equate the classical factors of production with neoclassical "resources" and making it almost meaningless. This is what Lipsey and Chrystal essentially do (2020, p. 10).

The main dilemma with this module is therefore whether to take the discussion any further. The original point of the factors of production was to categorize the inputs used to create goods and services. Discussion about the differences between factors was important in discussion about economic growth and income distribution, which are not central topics in the dominant neoclassical paradigm today. These topics are certainly still important in the 21st-century, as demonstrated by the popularity and interest surrounding Thomas Piketty's book (2014), *Capital in the twenty-first century*, but this project concerns the beginning of an introductory macroeconomics course.

In classical economics there were three factors of production. The two primary "non produced" sources of value were called "labour" and "land" ("human action and external nature" as Edgeworth described them). "Capital" covers all means of production which were themselves produced (Edgeworth, 1898; Lipsey & Chrystal, 2020, p. 10). The basic

logic of these three is relatively easy to explain in a meaningful simple form, and so this has been laid out in the module.

Starting in the 1980s in the United States, high school courses also added a fourth factor, called "entrepreneurship". The aim of this educational decision was to make sure students were educated about the importance of entrepreneurs (Kent, 1989). There was no corresponding new consensus in economic theory about a fourth factor of production. Nevertheless, this new factor can be usefully explained to students together with the thinking behind it. In reality, entrepreneurship is one proposal among many, and it has been argued for in different ways (Blaug, 1997). In the end it was decided not to discuss more proposals or debates, because these would not link back to the concepts in the other modules. The aim of this project is to support teaching of the topics already being covered, and so a proper discussion of the factors of production would need to be done in another part of the course. In the same way, several food for thought topics were considered, such as human capital, but they all involve further investment into topics which probably won't be integrated into the course later on.

This topic is a good example of the pragmatically experimental nature of this project. It is probable that experience with this module and the others can lead to further insights about how it can best be expanded, and how it fits with the course more generally.

1.2. Learning path suggestions

As already noted, instructors can use these modules flexibly and do not need to use all the materials or even entire modules. However, a suggested structure would be as follows. This gives a logical build-up of inter-connected topics and it also aims to support the sequence of learning objectives in both the book and lecture PowerPoint.

Before first lecture:
1. What is economics?

After first lecture:
2. Demand, supply, and equilibrium. (Should come after 1, and before 3.)
3. Costs, scarcity, and supply curves. (Should come after 2.)

Flexible, but after 1:
4. Smith and the invisible hand.
5. Factors of production. (Short. Should come after 4.)

The two modules which are most different to normal approaches are 1 and 4, because they add new information and correct potential misunderstandings.

The whole topic of Adam Smith may seem to be the expendable, especially given that the modules now distinguish Smith's thinking from the neoclassical models. However, I propose that this topic complements the other modules precisely because it can help students escape the neoclassical matrix and see more of the big picture.

2. Conclusions

It was possible to make an integrated and logical proposal about how to teach the topics of this introductory course in a more pluralist and effective way. A first set of proposed teaching modules has been produced using freely available software, showing how the guiding principles can be put into effect with specific economics topics. This is a first step in a process which can now hopefully continue.

One of the most important challenges was to identify the nature of specific anti-pluralist influences within the economics teaching tradition. The principle of methodological pluralism supplied a superior way of conceptualizing how a science like economics can be pluralistic without becoming "unscientific". On the didactic side, several different types of literature gave insight into the challenges represented by the special type of core concepts which are important in this type of course. Some of the most important introductory topics are procedural concepts or mental "tools" which need to be integrated with other knowledge in order to be useful. It has been argued that a more pluralist approach, involving more critical thinking, will therefore also improve learning outcomes for mainstream neoclassical topics.

2.1. Further research

As has been noted, the DBR methodology which has been used in this study can and should be taken further. A cycle of practical trials and reconsiderations is envisioned. That is why it has been a priority to develop proposals that are ready for testing, and frameworks which make it easy to reconsider and adapt. One of the benefits of proposing online modules is that the answers to questions can be easily collected and used as feedback to guide further development. It would also be relatively easy to add separate questionnaires into the learning path, for example as google forms. Future researchers may also find it particularly useful to use "food for thought" materials to collect more complex insight into the learning results.

2.2. Bigger changes

The proposals made for this project were incremental and cautious, and further incremental work is hoped for. However, in the longer run instructors should be using these experiences to look for opportunities to design larger changes to their courses.

The CORE project (Bowles et al., 2017), for example, makes a much more radical change to the structure of its introductory economics course, daring to begin with economic history, not micro- or macroeconomics, addressing the question of "how the global economy came to look as it does today". Such an approach would allow threshold concepts such as division of labour, international trade, and comparative advantage to become the entrance into economics, before being introduced to neoclassical

abstractions. For now, such topics tend to have a low priority in the standard micro/macro textbooks, because they do not fit easily into either of those two main branches. We have seen that economists are concerned that both students and instructors have trouble integrating the concept of opportunity cost to their overall studies and careers. Some researchers have even questioned whether this traditional core concept should continue to be given priority. If it is to be retained, then the most obvious link students should be able to make to other parts of typical economic courses, is with trade and development theory, including such concepts as the production possibility frontier.

2.3. Closing remarks

Whether it be from the point of view of economics or education there are many good reasons to aim at more pluralism, realism, and critical thinking in introductory economics courses. Debate about over-simplification in economics courses is not new, but it has an increased importance today. 21st-century economists need to address a wide range of changing economic priorities. More than ever, old assumptions need to be questioned, and new approaches will need to be encouraged. The narrowing down of such courses in the late 20th century has made economics less useful and less inspiring.

Traditionally these courses have tended to downplay the complications which are essential characteristics of the core topics of economics. From a teaching point of view, this is an obvious temptation. While learning a specific model, should students be constantly reminded that the model is not an accurate representation of economic reality? That could indeed be demotivating. This paper has argued that pluralism and critical thinking can be a positive experience. Indeed, critical thinking is a competence of the highest importance in its own right. If one result of the present proposals is to help students improve their ability to identify and discuss assumptions, not only in economics, but also in life generally, then this would already be a very positive achievement.

It must also be emphasized that action is needed from instructors willing to try new things. The textbook industry is unlikely to take the initiative, and we may not for example presume that the so-called “internet generation” will find the extra information they need online. They certainly will find information, but not necessarily the type which instructors would like them to have. The internet makes information easily available, but students need the mental tools to help them judge it critically. Training students to think critically is something tertiary education should surely aim to provide.

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Appendices

The learning modules

Nearpod sessions can be accessed at https://app.nearpod.com using the below PIN codes. QR codes have also been made for convenience.

<table>
<tr><td colspan="2">Definitions of economics, macroeconomics, and microeconomics
Nearpod session code: YDLJ3</td></tr>
<tr><td>Demand, supply, and equilibrium
Nearpod session code: MVEXH</td><td>Cost, scarcity, and supply curves
Nearpod session code: 5TD3M</td></tr>
<tr><td>Adam Smith and the invisible hand
Nearpod session code: DQERA</td><td>Factors of production
Nearpod session code: Y2LXH</td></tr>
</table>

Organizations and online resources supporting pluralism in economics

The following notes are added without much elaboration because they may be useful for teachers, instructors and course designers. While calls for new approaches are not new within economics itself, they have gained popular momentum in the context of the global financial crisis of 2007/8 and increasing climate change concerns. Notably, global protest movements such as “Occupy”, and “Extinction Rebellion”, have focussed increased attention upon criticisms of the neoclassical paradigm in economics.

Some useful international media:

Occupy:

- https://www.economist.com/graphic-detail/2011/10/17/cross-continents ;
- https://www.theguardian.com/world/occupy ;
- https://www.theguardian.com/world/2021/sep/15/occupy-wall-street-10-year-anniversary-lessons

Extinction Rebellion:

- https://www.theguardian.com/environment/2020/aug/04/evolution-of-extinction-rebellion-climate-emergency-protest-coronavirus-pandemic ;
- https://extinctionrebellion.uk/declaration/ ;
- https://www.economist.com/britain/2019/04/17/could-extinction-rebellion-be-the-next-occupy-movement

These movements helped make it clear to a broader public that not only students, but also teachers of economics, have long been concerned about the shortcomings of that dominant paradigm.

Some of the overlapping movements which have published work most relevant to this study include the following.

- The *mouvement des étudiants pour une réforme de l'enseignement de l'économie* originated with the publication of a letter by economics students sent to *Le Mond*e in 2000. Their newsletter has developed into an online journal, *Real World Economics Review* (http://www.paecon.net/PAEReview). The original student group also maintains its old website under its original name (http://www.autisme-economie.org).
- The Institute for New Economic Thinking (INET, https://www.ineteconomics.org) which also supports the Young Scholars Initiative (YSI, https://ysi.ineteconomics.org).

- Rethinking Economics (https://www.rethinkeconomics.org) includes many of the student organizations within the International Student Initiative for Pluralism in Economics (http://isipe.net), such as the Cambridge Society for Economic Pluralism (http://www.cambridgepluralism.org), and is also associated with an educational news website "Our economy" (https://www.ecnmy.org).
- The CORE project (Curriculum Open-access Resources in Economics, https://www.core-econ.org) which has created e-books and other online resources that are now starting to be used in university courses.
- The Network for Pluralist Economics (Netzwerk Plurale Ökonomik e.V., https://www.plurale-oekonomik.de), which has created the Exploring Economics website (https://www.exploring-economics.org) which is useful resource for helping students compare different schools of economics.

Topics of shared and urgent concern to most of these authors and movements correspond partly to the concerns of the protest movements. Examples include income distribution, financial regulation, and the negative side-effects of targeting short-term economic growth, such as environmental damage, energy crises, and global warming.

Naturally the present study does not aim to be a survey of all economic debates. Instead, the literature described above indicates that there are identifiable issues which can helps us set priorities when planning introductory economics courses. These in turn have a direct causal connection to areas of government policy and public debate which create justified feelings of frustration, fear, and cynicism in our time.

The appeal of 1992

The appeal of Hodgson, Mäki & McCloskey (1992) was a single page announcement, which registered the agreement of a long list of economists including four Nobel prize winners:

> “A PLEA FOR A PLURALISTIC AND RIGOROUS ECONOMICS”
>
> "We the undersigned are concerned with the threat to economic science posed by intellectual monopoly. Economists today enforce a monopoly of method or core assumptions, often defended on no better ground that it constitutes the 'mainstream'. Economists will advocate free competition, but will not practice it in the marketplace of ideas."
>
> "Consequently, we call for a new spirit of pluralism in economics, involving critical conversation and tolerant communication between different approaches. Such pluralism should not undermine the standards of rigor; an economics that requires itself to face all the arguments will be a more, not a less, rigorous science."
>
> "We believe that the new pluralism should be reflected in the character of scientific debate, in the range of contributions in its journals, and in the training and hiring of economists."