Teaching Open-system Economics[1]

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Abstract

The different approaches to economics can be understood in terms of whether economics is understood in terms of a closed system or, if an open system, which type of open system. This paper considers what is implied for teaching, when an open-system approach is taken. The problems with open-system material are analysed in relation to the problem of uncertainty more generally. Focusing on issues of communication and persuasion, we consider the relative attractions of closed-system and open-system material for students as well as for teachers. The issues are addressed of how to build up an open-system programme and the respective roles of models, methodology, history of thought, history and contextual material.

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Introduction

The purpose of this contribution is to consider how we might approach the teaching of economics from an open-system perspective. Specific issues are addressed, such as how to build up the teaching of judgement skills as students progress through the programme, the place for teaching models within the programme and the integration of methodology and history of thought, as well as historical and institutional material, into the general curriculum.

It has become conventional to draw a distinction between closed-system thinking in economics and open-system thinking. Chick and Dow (2005) set out the conditions which must all be satisfied in a closed-system theoretical approach. These conditions are met by the formal discourse of mainstream economics. If any one of these conditions is not met, then the theoretical approach involves a system which is open in that sense. Since there is potentially a wide range of possibilities for not meeting one or more of the closed-system conditions and of possible ways of not meeting them, there is potentially a wide range of open-system theoretical approaches. In practice, since theoretical approaches require an intellectual community in which to develop, the range is somewhat limited (Dow 2004). The important point however is that closure and openness do not constitute a dual.

Nevertheless, whatever form is taken by an open-system approach, there are common implications of openness for the teaching of economics. A closed-system approach has been shown to require that the subject matter is so systematic as to yield law-like generalisations, while an open-system approach aims rather for conclusions as to tendencies which may vary (in potentiality and in actuality) between contexts (Lawson 2003). Closed-system economics is based on classical logic, which deduces propositions on the basis of a chain of reasoning starting from premises which are taken to be true. It is based on deductivist mathematics, with propositions tested against what are taken to be independent facts. Open systems of knowledge on the other hand, like the subject matter, evolve and are therefore provisional. Being permeable, they are open to inputs from other disciplines. Perhaps of greatest importance however is that they are subject to uncertainty and require the exercise of judgement.

Closed-system thinking has an aesthetic appeal, but also a psychological appeal because of the certainty (or certainty-equivalence) attached to conclusions. The uncertainty of open-system thinking prevents the building up of an aesthetically appealing closed system. The different strands of argument and types of evidence are inevitably incommensurate, since otherwise they could be reformulated into a closed system. But the consideration of these different arguments and evidence together in order to form a view requires the exercise of judgement. Inevitably any view will still be partial, starting from some understanding of the economy or another and employing some range of methods or another. There is no basis for a single best conclusion, but we can argue for the merits of the conclusions which follow from our own approach relative to alternative approaches. The decision as to how best to establish a policy proposal, for example, must be based on persuasion. By comparison with closed-system thinking, an open-system approach is conditioned by uncertainty and this is uncomfortable.

Each open-system approach has developed a methodology on the basis of a particular understanding of the economy, so that each methodology draws on a particular range of methods. Part of a pluralist strategy which seeks some structure may thus include formal models, which are small closed systems. But this closure within an open theoretical system is very different from the fixed, universal closure of mainstream economics. It is the provisional, partial closure involved in segmenting the subject matter for purposes of analysis. The process of segmentation and then of application of its results by unwinding segmentation was best put by Keynes (1936: 297–8):

> The object of our analysis is, not to provide a machine, or method of blind manipulation, which will furnish an infallible answer, but to provide ourselves with an organised and orderly method of thinking out particular problems; and, after we have reached a provisional conclusion by isolating the complicating factors one by one, we than have to go back on ourselves and allow, as well as we can, for the probable interactions of the factors amongst themselves. This is the nature of economic thinking. Any other way of applying our formal principles of thought (without which we would be lost in the wood) will lead us into error. It is a great fault of symbolic pseudo-mathematical methods of formalising a system of economic analysis . . . that they expressly assume strict independence between the factors involved and lose all their cogency and authority if this hypothesis is disallowed; whereas, in ordinary discourse, where we are not blindly manipulating but know all the time what we are doing and what the words mean, we can keep 'at the back of our heads' the necessary reserves and qualifications and the adjustments which we shall have to make later on, in a way in which we cannot keep complicated partial differentials 'at the back' of several pages of algebra which assume they all vanish

In order to pursue this open-system approach, economists require a range of skills, background knowledge, methodological awareness and the capacity for judgement to put together a plurality of analyses in order to formulate opinions and policy recommendations. Keynes (1924: 173-4) put it as follows, in his essay on Marshall:

> [T]he master-economist must possess a rare *combination* of gifts. He must reach a high standard in several different directions and must combine talents not often found together. He must be mathematician, historian, statesman, philosopher–in some degree. He must understand symbols and speak in words. He must contemplate the particular in terms of the general, and touch abstract and concrete in the same flight of thought. He must study the present in the light of the past for the purposes of the future. No part of man's nature or his institutions must lie entirely outside his regard.

It is a challenge for practising economists to meet Keynes's requirements. But fostering such skills as the focus of economics teaching poses particular challenges. In many ways the challenges for the practising open-system economist in a discipline dominated by closed-system thinking carry forward into teaching, since they relate specifically to issues

of communication and persuasion. But the challenges take on a particular form when considering how to design an open-system economics programme whereby students gradually improve their capacity to cope with uncertain knowledge.

The Challenge for Teaching

How we approach the challenges of teaching economics depends on our approach to economics. Teaching conveys knowledge not just about models and theories but also about understandings of the real world and about ways of building knowledge. Education was something which Kuhn (1962) emphasised, focusing on the role of exemplars in propagating a particular paradigm. A closed-system approach conveys knowledge about a bounded set of models, built deductively from axioms taken to be true, yielding propositions which can be demonstrated with certainty to be true. There may be competing models and theories, but the expectation is that it is feasible to arrive at a conclusion as to which is best. Econometrics courses teach students how to reach such conclusions by empirical testing. Applied courses apply the chosen models to policy questions, again with the expectation that one policy solution can be demonstrated to be best. This approach to teaching puts bounds on what students need to know and puts the emphasis on the acquisition of technical skills which for many students pose the greatest challenge.

An open-system approach in contrast leaves the subject matter open-ended, not least since it is expected to evolve over time but also because it includes contextual detail and does not raise the prospect of demonstrable proof with respect either to theory or policy. The challenge for students then is to learn not only a large body of material but also the art of judgement. Open-system learning thus develops different skills than closed-system learning. Students perceived to be weaker (in technical capacities) tend to be recommended to take non-technical courses as being easier for them. But generally, in my experience, they have found such courses much more difficult.

Which is the more challenging depends on the interests of the students, as well as on their prior training and psychological make-up. Both approaches purport to address real world problems and offer some guidance as to how to address them. But, in practice, closed-system economics prioritises teaching technical skills over applicability, something which was found to cause concern among US graduate students, for example (Colander and Klamer 1987). If students are interested in real world applicability of theory then they will be more motivated to take on the challenges of open-system thinking than the technical challenges of the closed-system approach. Further, just like practicing economists, some students come to the subject with prior psychological leanings towards closed-system thinking or open-system thinking. Chick (2013) develops this line of thought by applying Rokeach's (1960) notion of open minds and closed minds to economics and economics education.

But the education process itself influences students' capacities for open-system thinking. Chick draws on Earl's (2000) application to economics education of the framework developed by the psychologist Perry (1970). Perry argued that disposition evolves with education through a series of levels, ranging from the dualism of closed systems up to the

level at which students are able and willing to commit to one of the many approaches on offer. To this framework Chick adds Maslow's (1968) hierarchy of needs, with the first need being the need for security; closed-system thinking, with its clear bounds and demonstrable conclusions provides just such security. We would therefore expect a progression of increasing capabilities for open-system thinking as education proceeds.

There are particular difficulties however in effectively starting with a closed-system view of the world in order to provide students with a sense of security on the one hand and a methodology to match on the other hand if the goal is to educate within an open-system approach. To this is added the complication of some members of teaching staff continuing with a closed-system approach as students progress through the programme. Earl (2000) and Chick (2013) offer a range of useful ideas as to how to address these difficulties. In what follows, I will draw some provisional conclusions from my own experience of teaching economics.

First I would argue for consistency in the broad approach taken to economics. The need for security in the early stages of economics education, combined with the need to take things one step at a time, means that it is useful to employ simple models at this stage. This is controversial among open systems economists who embrace higher degrees of openness. Models do entail some closure (even if the closure is permeable and provisional), by abstracting from other factors. But their use is a compatible method within some open system, pluralist methodologies (Chick and Dow 2005). But in any case economists have to be able to operate within a discipline which most economists identify exclusively with models and therefore they have to be able to engage on the subject of models, even if to argue against their use. What is important is that it be made clear to students that all models are only partial contributors to any discussion and assume away a lot of important factors which will be discussed elsewhere. It is in my view damaging to students' confidence in their education to present models at the start as if they produce demonstrably true conclusions, only later on to reject them as false, replacing them with more complex models as the ones which are really the best, again to be replaced at the graduate level.

In my view, therefore, the teaching of any models should be embedded in a broader discussion of the factors left out by the model in order to teach how models can be useful, but also to demonstrate their limitations. While models should not be the centrepiece of economics education, inevitably safety-seeking early learners will tend to concentrate on them. Further, early teaching limits how much can be addressed. The simplest way to conduct pluralist analysis at a basic level is to address a topical issue which inevitably applies to a particular context, thus limiting the extent of relevant detail. Since students will be aware (or can be encouraged to become aware) of different views on topical questions, they can learn how to go about assessing the relative merits of different views.

This type of discussion also gradually introduces students to the fact of differing perspectives within economics and to the skills required to address them. A closed-system approach involves teaching theories or models as 'correct' or 'best', even if

alternatives are taught first in order then to be rejected.[2] This dualistic practice of rejection is one which has invaded much of the general economics discourse. But it is not the only option: Chick (1995) explains three other possible reactions to difference: containment, paradox and synthesis. Closed-system thinking leads to the familiar 'I'm right – you're wrong' way of handling difference, such that argument is confused with hostility. It turns out that 'argument' is yet another word whose meaning depends on whether a closed-system approach is being taken or an open-system approach. Within an open-system approach critical argument is simply the normal way for social scientists to proceed in debate over different approaches which draws on reason and evidence. There is no need for it to be hostile. Rather argument is how constructive exchange proceeds, including the exchange between researcher and journal referee just as between teacher and student (Earl 2000). Indeed the post-autistic movement made an early contribution by advocating teaching by means of debates (see further Dow 2003).

What is being advocated here is an open-system approach to teaching which incorporates methodological material in an integrated way. While there is certainly room for specialist courses in methodology, and indeed in history of economic thought, simple methodology and reference to some history of thought should be embedded in teaching of theory from an early stage (Dow 2007, 2009). Otherwise there is a risk of incoherence between courses taught from different perspectives without these differences being addressed within each course. The same argument could be made for embedding material from history particularly, but also from sociology and psychology, in economics teaching. But this proposal poses the further challenge for economics educators whose earlier training was of the mainstream, closed-system variety, without embedded input from other disciplines. Separate specialist courses, in economic history for example, might be advocated on pragmatic grounds.

It was the Scottish tradition in higher education for all students to start with philosophy as a grounding for all subjects, and for all subjects to be taught with reference to their history. Further economics was understood as political economy, with scope for input from sociology and psychology. This educational approach was grounded in the Scottish enlightenment approach to epistemology which we would now classify as an open-system approach. This was the tradition in which I was educated, so it comes naturally to me to teach in this way, though taking account of the fact that most students have not had any prior philosophical training.

In order to tie down this general discussion, let me explain how I approached teaching in money and banking. Most students, both Honours undergraduates and Master's students on a Money and Banking programme, were motivated to take the relevant courses by their wish to pursue a career in the financial sector. A closed-system mainstream course would not do, not least because mainstream monetary theory neither explained money nor included banks. Instead I included historical material, history of thought and material on modern institutional developments. I also included material on the mainstream

[2] This is a rhetorical technique used more generally in academic discourse (Klamer 1995).

approach because it is an important influence on policy. But more importantly mainstream theory lies behind the design of institutions within which policy must be framed, notably independent central banks with inflation targets and the architecture of the euro zone. In any case students understood better both the meaning and significance of the Post Keynesian theory I was teaching them by counterposing it with mainstream theory and by being encouraged to form their own opinions about the different approaches.

I used a range of methods, including some formal methods, to convey ideas. For example a useful tool to convey difference of approach was one I picked up from Brian Loasby; this illustrates the power of diagrams to convey particular ideas. The students were encouraged to watch carefully as I drew what, *ex post*, were two identical diagrams with time and the rate of growth of output on the axes, and say which was mainstream and which Post Keynesian. It all depended on which of two lines was drawn first: the trend rate of growth with (incidental) fluctuations round it (the mainstream presumption of stability as the norm) or the fluctuations with a trend superimposed upon them (the Post Keynesian presumption of instability as the norm). The finished diagram was insufficient on its own to convey a conceptual – indeed an ontological - difference.

Of course a financial and economic crisis has the silver lining of being a wonderful case study for teaching Post Keynesian economics. At other times it can be difficult for students to engage with the nature and causes of instability. But even in relatively stable times, the Post Keynesian theory of money and banking and monetary policy all provide wonderful material by which to convey methodological and theoretical issues as being of topical importance. As a realist approach, Post Keynesian economics can more easily engage in real issues than approaches which assume the economy to be a closed system. Students who are motivated to understand real processes better respond favourably, if open-system economics is exposed to them carefully so as not to be psychologically uncomfortable.

Conclusion

Here we have explored what is involved in open-system thinking in economics, relative to the dominant closed-system approach. The first point to emphasise is that there is a range of possibilities for open-system approaches. But all hold in common the idea that a range of approaches is not only possible but also both inevitable and desirable; the idea that theories and, in particular, models are partial and provisional; and that ideas from other disciplines should be embedded in economics (rather than tacked on *ex post*). Open-system thinking can be uncomfortable in its uncertainty but satisfying in its efforts to engage with real world problems.

Many of the challenges facing open-system economists in a predominantly closed-system discipline carry over into economics teaching. From an open-system perspective, communication and persuasion are critical. So is argument as a constructive exercise rather than an exercise in hostile rejection. Economists need to develop skills in the judgement required to navigate a pluralist analysis of a complex open economic system. Just as open-system economists have to function among closed-system economists, so

they must also devise effective means of communicating ideas to students who are also taking closed-system economics courses.

But in an ideal world of teaching, where economics programmes are designed along open-system lines, the emphasis on technical skills would be substantially reduced in order to make way for the philosophical, historical and institutional material required to equip students for building up their capacity for judgement. Even where such a programme included some closed-system economics, the students would become equipped to form their own views about it. But, given the psychological appeal for many of closed systems, particularly in the early stages of learning, great care must be taken in building up to open-systems thinking. Here I have argued, however, for consistency in explaining the provisionality of a starting point which might include some simple models.

References

Chick, V (1995) '"Order out of Chaos" in economics?', in S C Dow and J Hillard (eds), *Keynes, Knowledge and Uncertainty*. Aldershot: Edward Elgar, pp. 25-42

Chick, V and Dow, S C (2005) 'The Meaning of Open Systems', *Journal of Economic Methodology*, 12 (3): 363-81.

Colander, D and Klamer, A (1987) 'The making of an economist', *Journal of Economic Perspectives*, 1 (2): 95-112

Dow, S C (2003) 'The Relevance of Controversies for Practice as well as Teaching', in E Fullbrook (ed.), *The Crisis in Economics: The Post-Autistic Economics Movement: The first 600 days*. London: Routledge, pp. 132-4.

Dow, S C (2004) 'Structured Pluralism', *Journal of Economic Methodology*, 11 (3): 275-90. Reprinted in W Olsen (ed.), *Realist Methodology*, Sage, 2010 and S C Dow, *Foundations for New Economic Thinking*, Palgrave, 2012.

Dow, S C (2007) 'Pluralism in Economics', in J Groenewegen (ed.), *Teaching Pluralism in Economics*. Cheltenham: Edward Elgar, pp. 22-39.

Dow, S C (2009) 'History of Thought and Methodology in Pluralist Economics Education', *International Review of Economics Education* 8 (2): 41-57.

Earl, P E ([2000] 2008) 'Indeterminacy in the Economics Classroom', in P E Earl and S F Frowen (eds), *Economics as an Art of Thought: Essays in Memory of G. L. S. Shackle*. London: Routledge, pp. 25-50. Reissued in revised form in E Fullbrook (ed.), *Pluralist Economics*. London: Zed Books, pp. 193-214.

Keynes, J M ([1924] 1972) 'Alfred Marshall', reprinted in *Essays in Biography. Collected Writings of John Maynard Keynes*, vol. X. London: Macmillan for the Royal Economic Society.

Keynes, J M ([1936] 1973) *The General Theory of Employment, Interest and Money. Collected Writings*, vol. VII. London, Macmillan, for the Royal Economic Society.

Klamer, A (1995) 'The conception of modernism in economics: Samuelson, Keynes and Harrod', in S C Dow and J Hillard (eds), *Keynes, Knowledge and Uncertainty*. Aldershot: Edward Elgar, pp. 318-33.

Kuhn, T S ([1962] 1970) *The Structure of Scientific Revolutions*. Chicago: Chicago University Press.

Lawson, T (2003) *Economics and Reality*. London: Routledge.

Maslow, A H (1968) *Toward a Psychology of Being*, 2nd edition. New York: van Nostrand Reinholt.

Perry, W G, Jr (1970) *Forms of Intellectual and Ethical Development in the College Years: A Scheme*. New York: Holt, Rinehart and Winston.

Rokeach, M (1960) *The Open and Closed Mind*. New York: Basic Books.