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Experimental Economics and Economic Education

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There is a longstanding relationship between experimental economics and economic education, dating back to the beginning of experimental economics as a distinct field of economic methodology. As a doctoral student at Harvard, Vernon Smith attended only two classes in Edward Chamberlain's seminar on monopolistic competition. In the first class of the seminar every year, Chamberlain conducted a classroom demonstration/experiment on a competitive market, with students making trades in just a few rounds and not calling out their offers to buy or sell. Chamberlin used the results to show that there was no price convergence in this setting, and to argue that the assumptions for competitive markets in economic models were unrealistic. That led to Smith's 1962 article in the *Journal of Political Economy* – delayed for a time by sceptical referees and an initial rejection – written while Smith was in his first faculty appointment at Purdue University.

Smith (1981) has written about the key role his teaching had on his work in experimental economics. The standard teaching load at Purdue then, as at most other state doctoral universities in the US at the time, was four courses a semester. His first year's (1955–56) teaching assignment for both semesters was four sections of a principles class. Even with only one preparation, Smith calls that assignment 'the hardest job I ever had' (1981, p 369). After bouts of frustration and insomnia during the first semester, he thought about Chamberlin's classroom experiment and decided to adapt and use it in the first class he taught in the second semester. To let students 'experience' a market, he made some important institutional changes in how the trading was done, reflecting the way securities and commodities were actually traded. Most important, he had students call out offers to buy and sell, and had the trading go on for several more rounds than Chamberlin did. When Smith ran the experiments he found, to his 'amazement,' that the price quickly converged in classes of just over 40 students – with roughly 20 buyers and sellers. In later semesters he repeated the experiment with further modifications to test for robustness in the convergence result, thereby developing more aspects of the experimental methodology as an alternative to 'the prison of conventional patterns of economic thought'. His own interests and frustrations with the state of economic knowledge were clearly key parts of this work; but just as clearly his experience in teaching principles classes, and his concern with student learning and interest in economics, were also important in launching his research agenda in experimental economics.

Because experiments allow students to experience and actively participate in different kinds of market settings, while generating data on the effects of various institutional structures and alternative policy measures that can be used in classroom discussions and debriefing sessions, many experimental economists have followed Chamberlin and Smith's example in using experiments and simulations in their teaching. Some economists who do not use experiments in their research have also adapted experiments to use in their teaching. In fact, there is now a fairly extensive literature of articles, book chapters, books and websites promoting and supporting pedagogical used of experimental economics – for example see Holt 2007, Hazlett 2006, Bergstrom and Miller 1999, Noussair and Walker 1998, Holt and McDaniel 1998, the Summer 1993 special issue of the *Journal of Economic Education*, and http://veconlab.econ.virginia.edu/admin.htm.

Given that and how popular experimental and behavioural economics have become as research methods/fields in recent decades – in part because experiments are used across virtually all content subfields in economics – the surprising thing may be that the classroom use of experiments has not increased far more. But see Watts and Becker (2008) for US survey data indicating that the growth in the use of classroom experiments across undergraduate courses from 1995 to 2005 was at best modest. That may only reflect the fact that most economists currently teaching were trained before experimental economics was recognised and offered as a specialisation in most graduate training programmes, and that economists without that kind of training are not likely to pay the costs of learning how to use experiments in their teaching. Or it may just reflect substantial general inertia in teaching methods, including weak incentives to change how economics courses are taught. But it is important to note that there has been some growth in the use of classroom experiments, and there will probably be more in the future. There is also some recent research (e.g. Emerson and Taylor 2004) – though not yet a lot – suggesting that students learn more economics in classes that use experiments to supplement standard lecture formats.

Against that background, we decided it was time to sponsor a new special issue on classroom uses of experimental economics. Special issues focused on particular topics seem to draw more interest (and citations) than individual articles on the same topic scattered across different issues, and it certainly makes it easier for readers to get a sense of common features, issues and problems that have to be addressed in starting to use experiments – or any other new teaching and/or assessment method. So we posted a call for papers for the special issue in 2008, with help from many of the experimental economics associations and leaders in the field. We were gratified by the quantity and especially with the quality of the articles that we received, which is best represented by the articles that appear here. The range of topics covered is itself a noteworthy point, as is the variety in the kind and structure of experiments featured in the different articles.

The articles discuss experiments in the fields of public policy (Diduch), labour markets (Esplin and Garces-Ozanne), environmental economics (Holt *et al*.), and game theory, international trade and market equilibrium (Jaworski *et al*.). Apart from guidance on how to conduct the experiments, evidence is provided on the effects of experiments on learning and on student engagement. In terms of student learning, the evidence in Esplin and Garces-Ozanne is inconclusive. They compared test results for a control and treatment group – the treatment group being the group who had conducted the experiment – and were unable to conclude that the treatment group achieved better results. Although this sits somewhat at odds with prior empirical work suggesting that experiments do improve learning in economics (Emerson and Taylor, 2004; Dickey, 2006), more work needs to be done in evaluating experiments.

But perhaps a narrow measure of student achievement according to test results ought not be the only indicator of the value of experiments. Esplin and Garces-Ozane find that students enjoyed the experience very much, and Emerson and Taylor found some evidence that certain groups of students were more likely to take higher level economics courses having participated in experiments. Similarly, Egbert and Mertins note that students reported a positive learning experience with experiments – in this case students were asked to take the experimental methodology a step further by designing their own experiments.

The final article in this issue, by Kaplan and Balkenborg, provides a succinct overview of the why, which and where questions: that is, why use experiments, which ones are best and where to go for resources.

Further work on the effects of experiments on learning might usefully take a longitudinal view. What really matters is how well students can apply their learning over time, years after they have graduated. Tests of student achievement at the immediate conclusion of a course cannot reliably pick up long-term effects. The evidence strongly indicates that students enjoy experiments and actively engage with them, which augers well for deep learning and therefore long-term understanding. It would be interesting to test this hypothesis.

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