

Education, Research and Experiments in Economics

Professor Vernon L. Smith, Nobel Laureate (Economics), 2002
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Economic education, based on experimental methods, offers a way of thinking that arises from student experience in interactive markets and group decision-making. This methodology is a source of inspiration that encourages people to contribute to their own and others' understanding of the subject. The learning process becomes a growth path of discovery. Students at any level may become part of research teams composed of faculty, business practitioners and experienced entrepreneurs who want to explore using experiments in their search for innovation. The overall goal is to incubate creative, market-oriented projects that extend the boundaries of economic research and nurture thinking outside the traditional economics, education and policy boxes. Changing the way people think about economics is often the unanticipated surprise.

Research is about discovery and about recognising the importance of market-oriented solutions founded on property rights. Laboratory methods support work that asks: 'What kind of market?', 'How do we create and grow new markets?', 'How do we create property rights?', 'How do emergent orders form, evolve and survive?' and 'How can we assist these orders to advance human betterment?' Friedrich Hayek argued that "it is about studying that which is not" (Smith, 2007) — a task that necessarily involves imagining a world with different rules particular to an industry, issue or process.

Education and learning builds on acquiring new 'knowledge-how' in research and teaching, not only 'knowledge-that.' Education is about creating an environment in which students and researchers discover together and learn from each other. In this sense, the teacher who is not learning is not teaching.

Our joint efforts in research and teaching include the following topics:

- Specialisation, exchange and property rights
- Reciprocity, trust and trustworthiness in personal exchange
- Statistical methods and economic modelling for experiments
- Financial market bubbles: behaviour and modelling
- Regulations and subsidies in the healthcare industry
- Joint venture property rights

- Network markets: electricity, natural gas, gasoline and water
- Mechanisms in e-commerce
- Auction design: combinatorial, clock auctions
- Anti-trust: contestability and entry, bundling and pricing, competition policy
- Policy analysis: pollution emissions, spectrum policy, space resource policy.



Professor Smith (front row, third from the right) and his team with participants of the graduate student workshops

A unique feature of our vision in experimental economics has been the support of our participants for the following sponsored outreach programs:

- 323 participants from 13 week-long visiting graduate student workshops in experimental economics, beginning in 1995. Their fields included economics, psychology, philosophy, political science, science, computer science, engineering and anthropology.
- 450 participants from 19 week-long high school student workshops since 1997. As with the graduate students, their interests were broad-ranging; most are now enrolled at prominent universities.
- 60 participants from a recently inaugurated visiting undergraduate workshop.
- 400 participants in a series of 3-day seminars for the employees of Southern Power, the largest electric power producer in the US, where they learned about spot markets and financial hedges.
- 120 participants from the ranks of America's judiciary, who attended a series of 3-day seminars designed to elucidate basic property rights and competition principles.

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and 2) consistently show that majority of students think both the project and classroom lectures have ignited their interest and confidence in learning finance subjects. The students are also more likely to consider a career in finance as they feel increasingly knowledgeable and capable of analysing financial market issues.

One may argue that devoting so much effort into these strategies consumes too much energy. Based on my experience, I concur that it requires time and effort to be sensitive to students' needs and feelings. However,

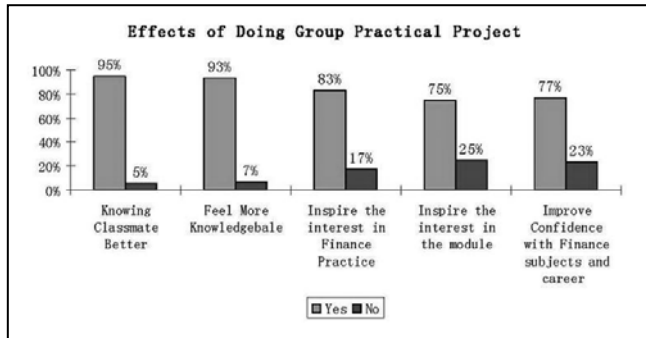


Figure 1: The learning effects of practical projects in terms of improving students' interests, confidence and analytical skills towards finance subjects

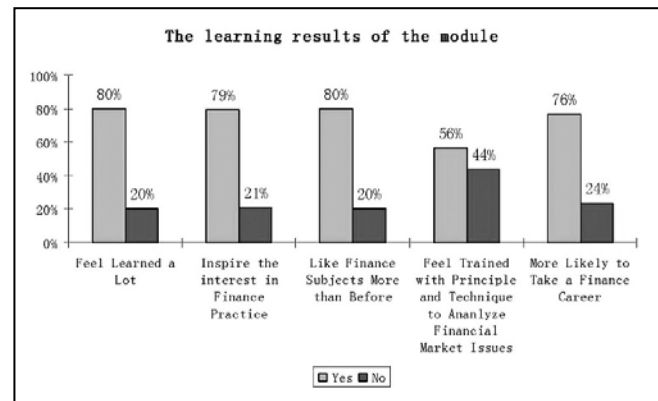


Figure 2: The learning effects of FNA3103 in terms of improving students' interests, confidence and analytical skills towards finance subjects

I think the effort is worthwhile as teaching the subject becomes easier over the semester. In addition, more students improve and become 'good' ones who know how to learn and take the initiative rather than wait to be fed with information. Overall, the experience reinforces the belief that students' potential can be nurtured when we encourage and help them look into their own strengths. Thus, we should teach such learning skills when imparting knowledge to our students. ■

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Instruction in these workshops draw on the expertise of 21 faculty members from 12 universities, many of whom are alumni of our graduate workshops and were at one time pre- or post-doctoral visitors. For alumni of the high school workshops, a small new summer internship programme allows them to pursue new research and education experiences in an environment where they are not only mentored but also regularly interact and mentor each other.

There are critical characteristic principles of fact and value that underlie our use of the experimental methodology. They are, in brief:

- Decentralised knowledge and efficient coordination that require free choice among individuals, governed by rules respecting limited resources, and is constrained by the freedom of choice of others.
- 'Know-how' in society is dispersed across individuals in all social systems.
- Diversity of knowledge, preferences and skills are the hallmarks of all markets and social systems.
- Free choice allows human social systems to explore and discover opportunities through which all can achieve increasing gains from exchange through the specialisation enabled by exchange.
- Personal and impersonal exchange systems that have co-evolved with knowledge and skills specialisation are the only known engines of wealth creation.

- Market experiments enable us to better understand how institutions matter because the rules matter, and how rules matter because incentives matter.
- Personal social exchange systems are an important complement to market exchange systems. Both share the ancient principle of mutual giving and receiving, but are expressed differently as reciprocity in social exchange and property rights supported by the rule of law in market exchange.
- Markets can be structured so that they are self-regulating and self-ordering to create new long-term value, but the structure of (property) rights to act must honour technical features that vary across different industries and physical environments. This requires 'test bedding' (i.e. try it before you fly it) in both the laboratory and field to understand new applications. The important research question is: 'How should the rules vary with circumstances?'

What we have learnt, after years of discovery and innovation, is that experimental economics makes it possible to do the following:

- Test the limits of existing economic principles using motivated human subjects interacting in laboratory or field environments.
- Test assumptions about human behaviour in personal social and impersonal market exchange systems.
- Test the predictive power of traditional models

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of exchange and decision-making, and explore the form and meaning of rationality in new and changing circumstances.

- ‘Test bed’ new self-regulating and self-ordering market and resource management systems both in the laboratory and in field applications, recognising that their technical and institutional features must be adapted to different industries and physical environments.



Enthusiastic participation during the workshops for high school students

- Study the means whereby the inherent decentralisation of information, knowledge and skills can be coordinated for improved performance and human betterment.
- Study ‘what is not’ (i.e. arrangements that currently do not exist) to better understand those that exist, and ask if and how what exists can be made more effective.
- Explore and understand counterfactuals — the ‘what if’, ‘what might have been’ or ‘what might be’ questions — which cannot be observed in life. Experiments can help us to investigate and enable us to better understand ‘what is not.’
- Engage with those close to real-world problems, where markets have not previously existed, to define the problems that need attention, then design and ‘test bed’ solutions before they are implemented to avoid costly mistakes.
- Seek more effective decisions or property rights arrangements within working systems, such as the Internet and other forms of shared goods and services.
- Build electronic exchange mechanisms, (i.e. rule systems) for markets in industries such as electric power, water supply and transportation networks, healthcare delivery, financial instruments and resource management within firms.
- Explore alternative ways in which markets can be structured for self-regulation.
- Establish better integration between field and experimental studies so that each can inform and enhance the other.
- Work to understand both the seen and unseen elements that affect the behavior of markets and other social systems.



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In summary, the experimental methodology we use to acquire new knowledge of economic systems underpins our use of apprenticeship-based, hands-on learning in interactive markets and group decision-making for students of all levels of education, from high school through to graduate studies, and even into the workplace. ■

Reference

Smith, Vernon L. (2007). *Rationality in Economics: Constructivist & Ecological Forms*. New York: Cambridge University Press.