Journal of Economic Perspectives—Volume 14, Number 1—Winter 2000—Pages 109–119

Teaching Economics in the 21st Century

William E. Becker

The primary goal of undergraduate courses in economics is to enable students to think like economists (Siegfried et al., 1991, p. 199). But even college-educated high school teachers of economics have beliefs about economics that are more highly correlated with those of journalists than with those of economists (Becker, Walstad and Watts, 1994). What changes in the way we teach economics in our colleges and universities will enhance the use and appreciation of economic analysis?

Practical answers to this question are advanced in this article. I do not provide elaborate plans to restructure the principles program, and thus will not address issues like a one- versus a two-semester introductory course, the ordering of micro and macro, appropriate prerequisites for intermediate courses, or other schemes that require difficult-to-obtain departmental and administration consensus (Evensky and Wells, 1998). Instead, attention is restricted to what we teach, how we teach, and the assessment of the educational outcomes at the baccalaureate level.

What We Teach

Media headlines scream the need to understand macroeconomics. At a minimum, courses in macroeconomics should enable students to have a greater understanding of the economic news as it appears in the *Economist*, *Business Week*, and the *Wall Street Journal* than those without an education in economics. Conversely, instructors can use the headlines to set a context for the study of economics; for

■ *William Becker is Professor of Economics, Indiana University, Bloomington, Indiana, and Adjunct Professor, School of International Business, University of South Australia, Adelaide, Australia.*

example, Becker (1998) provides examples of how the news media can be incorporated into the teaching of statistics and econometrics.

Textbooks do a good job on many topics in macroeconomics. However, Peter Kennedy (1992) identified some macroeconomic concepts that frequently appear in the media but are not given adequate attention in textbooks. Three of his several relationships that have met the test of time, yet continue to be neglected, are: 1) nominal versus real interest rates in a variety of guises; 2) inflation rate differences and exchange rate changes (purchasing power parity); and 3) the loose tendency for real, but not nominal interest rates, to be equal across countries (interest rate parity). Recent events suggest a fourth neglected topic: technological change and economic growth.

The difficulties in teaching macroeconomics go deeper than which topics to emphasize; they include questions about what analytical framework should be used to teach those concepts. Thirty years ago, I had it easy as a student in Boris Pesek's and Martin Bronfenbrenner's macroeconomics classes. They were masters of the IS-LM-AS framework and taught it with confidence. Today, there is greater agreement among economists on micro than macro issues (Alston, Kearl and Vaughan, 1992). Entering the new century, students and their teachers of macroeconomics are somewhat uncertain of the preferred method of analysis.

IS-LM-AS remained the workhorse model of macroeconomics well into the 1970s, but the model came under continued criticism on many grounds and by the mid-1980s, rational expectations approaches were evident in textbook presentations. In the late 1990s, there was a swing away from rational expectations. For example, Thomas Sargent (1993) defected from the rational expectations camp to argue that people behave in accordance with bounded rationality. Although this view has not yet made it into many textbooks, past behavior among academic macroeconomists suggests that it will.[1] A version of the IS-LM-AS model, however, perhaps updated in various ways or drastically revised to include such things as a version of John Taylor's rule for the conduct of monetary policy (D. Romer, forthcoming), will likely remain the starting point for considering macroeconomics issues. But at present, Mankiw's (1990, pp. 1645–46) conclusion continues to hold: "The IS-LM model, augmented by the Phillips curve, continues to provide the best way to interpret discussions of economic policy in the press and among policymakers."[2]

The level of disagreement over macroeconomic approaches can be frustrating

[1] With the notable exception of Baumol and Benhabib (1989) in this journal, the complex dynamics of chaos theory for economics have not been presented with clarity even though students are aware of the idea from movies such as the schizophrenic thriller II, where Max says: "If you graph the numbers of any system, patterns emerge; therefore, there are patterns everywhere in nature . . . So what about the stock market? A universe of numbers that represents the global economy . . .".

[2] Robert Solow, John Taylor, Martin Eichenbaum, Alan Blinder and Oliver Blanchard provide an exchange of views on "a core of practical macroeconomics that we should all believe" (*American Economic Review,* May 1997, pp. 230–246). Blinder and Blanchard explicitly identify the IS-LM framework as particularly useful for macro analysis, although they, as well as the other three, call into question various aspects of the assumed relationships based on both theoretical and empirical considerations.

for academic economists, but it also offers an opportunity to teach about the way in which economists think. A few years ago, for example, Marilyn vos Savant (1997) was asked in her advice column how economists working with the same data reach different conclusions. Her answer is instructive: economists are like chefs who amaze us with the variety of stuff they cook up when given exactly the same ingredients, equipment and staff. Students need to learn how economists working with the same data may still find it impossible to identify a unique explanation and how differences in interpretation can arise. This message is not restricted to macroeconomics.

Perhaps the main concern over what is taught in microeconomics is that for many students, textbook discussions of markets are too often hypothetical and do not involve current events and observable phenomena. Textbook-style competitive markets may work for agricultural commodities, at least in an idealized world, but they do not work for many items of interest to students. When imperfect information leads to the use of price as a measure of quality—as in used car markets, insurance, and labor markets—then equilibrium may be characterized by inequality between quantities demanded and supplied and a neat separation of demand and supply curves may not be appropriate. Traditional discussions of supply curves are problematic when marginal costs are approximately zero, as is the case for many information-based goods today. Even when students can regurgitate demand and supply analysis in fairytale situations, they have trouble applying this framework to the world they know (Strober, Cook and Fuller, 1997).

Shapiro and Varian (1999) assert that our neighbors in backyard conversations and business friends at parties are in part correct when they assert that the microeconomics they learned in college is of little use in many current decision-making situations. To an executive marketing a new piece of software or selling an innovative computer component, to a publisher introducing a new online magazine, to a government lawyer applying antitrust regulations to the purveyor of an operating system, or to a satirist like P.J. O'Rourke (1998) writing about markets, textbook supply and demand graphs may not appear to help much.

Shapiro and Varian (1999, p. *x*) argue that as decisionmakers, "you do not need a brand new economics. You just need to see the really cool stuff, the material they didn't get to when you studied economics."[3] Some of those concepts and principles not emphasized in principles and intermediate textbooks include: 1) bundling and complementarity; 2) experience goods and property rights; 3) signaling, screening and selection; 4) expectations and risk; 5) switching costs and lock-ins; 6) cost- versus value-based pricing; 7) innovation- versus price-based competition; 8) competition within and between standards; 9) network economies and externalities.

[3] As a matter of exposition, Shapiro and Varian (1999) demonstrate that serious analysis can be presented without burdening the reader with mathematics, which they could have employed had they deemed it necessary. Their style is reminiscent of Irving Fisher: say it in words, demonstrate it in graphs and tables, and if technical details are needed, place them in appendices or provide references.

To show the power of economics in the 21st century, instructors of economics at both the principles and intermediate levels need to adopt these analytical techniques and change the focus of examples. To do this, the intermediate courses need not be turned into lessons on business strategy. More headline-grabbing material, however, needs to be in prominent places. It would be useful to think about restructuring the sequence in which economics is taught to arrive earlier at some of the issues that most interest students.

The Importance of Teaching

The field of economics has placed too little value on the importance of teaching in recent decades (Becker, 1997). However, there is at least circumstantial evidence that economists are now devoting more attention to teaching.

The American Economic Association, through its Committee on Economic Education, has been working with the National Council on Economic Education since the 1950s to advance the teaching of economics at all educational levels, with significant activity at the K-12 levels (Siegfried and Meszaros, 1998). The AEA efforts with regard to undergraduate teaching have a new intensity in recent years. For example, at the 1999 ASSA meetings in New York, 12 sessions focused on the teaching of economics, ranging from Nobel laureate Paul Samuelson's principles textbook to faculty advisors dealing with student apprehensiveness about economics. At the 1998 Allied Social Science Association meetings in Chicago, 14 sessions were devoted to teaching economics, including one headed by Nobel laureate Ronald Coase on teaching business economics. As recently as 1996, the San Francisco meetings listed only six such sessions, and the January 1994 Boston meetings showed a meager four sessions on economic education, with similar small numbers back into the 1980s. In 1999 the AEA Executive Committee made a $26,000 grant to the AEA committee on economic education for a conference aimed at exploring ways to advance the teaching of economics. Also for the first time, this committee added a member representing community college teachers of economics, a group previously ignored by the AEA (Becker, 1997).

Another example of increasing interest in the teaching of economics is the exponential growth in the number accessing the *Journal of Economic Education* website at ⟨http://www.indiana.edu/~econed/index.html⟩. The number of hits on the *JEE* website increased from 553 per month in April 1995 to over 34,000 per month in March 1999; even taking the growth of the Internet into account, this rise is substantial. The number of well-known economists submitting articles to the *JEE* has increased, with articles from John Bishop, David Colander, William Greene, Alan Krueger, Cecilia Rouse, and W. Kip Viscusi to name a few published in the last couple of years.

There is evidence that top-ranked universities and prestigious colleges are now requiring documentation of teaching scholarship (Becker and Watts, 1999). At the Carnegie Foundation-classified baccalaureate institutions, for example, teaching

has a 50 to 60 percent weight in personnel decisions. In economics departments at the Carnegie Foundation-classified research universities, teaching enters annual salary raise, tenure, and promotion decisions with an average weight of only 25 to 30 percent; yet even at these institutions, there are now instances of researchers not getting tenure or promotion because of unacceptable teaching.

In the opening decades of the 21st century, it will be interesting to see whether an increased emphasis on teaching leads to a change in how economics is taught and increasing student interest in economics. As of the late 1990s, however, the lecture was the dominant teaching method in economics (Becker and Watts, 1996, 1998), while class discussion, rather than extensive lecturing, is the most prominent form of instruction in higher education as a whole (Sax et al., 1996).

To get or keep in step with the rest of higher education, there are at least two types of pedagogy that seem especially well-suited to the teaching of economics. One involves the idea of getting students actively involved in the learning process. The *Journal of Economic Education* is filled with such activities; many are similar in tone to the "classroom games" featured in this journal over the last few years. Some of the best of these activities are summarized in articles (Becker and Watts, 1995) and elaborated in books (Becker and Watts, 1998; Walstad and Saunders, 1998; Keenan and Maier, 1995). In selecting these activities, it is important to keep in mind the amount of time required for their use versus the potential benefits to students.

A second and emerging pedagogy involves the use of the Internet. Many economists are making use of the Internet in their teaching and departments of economics are exploring ways to offer courses (or perhaps even entire degree programs) via the Internet (Katz and Becker, 1999). Unlike the introduction of technologies of the past (the printing press, radio, television) the Internet has the potential to involve distant learners interactively in the educational process. Internet developments are featured in the new "Online" section of the *Journal of Economic Education.*

The speed with which economists embrace new approaches to teaching will obviously depend to some extent on the reward structures for doing so. But ultimately, teaching practices within departments of economics will likely move beyond the chalk-and-talk preaching mode that characterizes the 20th century style of economics teaching. Students now expect to be engaged in the learning process and appear unwilling to sit passively through lectures.

Assessment of Teachers

Economics departments have relied almost exclusively on end-of-term student evaluations of teaching as the measure of the instructional product (Becker and Watts, 1999). "[T]he primary purpose of the common end-of-course evaluation form," write Walstad and Saunders (1998, p. 339) "is to provide comparative data

for administrators . . .". This heavy reliance on student evaluations is troubling, for several reasons.[4]

First, there is little reason to believe that student evaluations of teaching capture most of the elements of good teaching. As measured by correlation coefficients that are often far less than 0.7, student evaluation scores explain less than 50 percent of the variability in other teaching outcomes, such as test scores, scores from trained classroom observers, alumni surveys, and so on.

Second, departments often misuse these scores by comparing each instructor with numerical means or medians for all instructors of the course or of like courses, which results in treating the scores as if they have far more precision than they actually do and by implication damns the half below the average regardless of its level. As psychologist Wilbert McKeachie (1997, p. 1223), a long-time provider of college teaching tips, puts it: "Presentation of numerical means or medians (often to two decimal places) leads to making decisions based on small numerical differences—differences that are unlikely to distinguish between competent and incompetent teachers." Instead, McKeachie advocates the use of broad categories in salary decisions like "deserves merit increase," "deserves average increase," or "needs help to improve," with assessment based on student ratings of the attainment of education goals.

Third, if administrators treat student evaluations of teaching as important, then teachers can be expected to react to them in ways that may be inappropriate. To instructors, generating positive student answers to questions about overall effectiveness and communication skills may smack of entertainment and dumbing down. To raise scores on the end-of-term entertainment quotient, teachers can be expected to modify student activities and grading; they can manipulate timing and procedures for student evaluations of teaching data collection; they can drive the unhappy out of the class, with no trace showing on end-of-semester student evaluations of teaching. To raise their scores on organizational questions, instructors may attempt to gain class sympathy by alleging that snafus are out of their control.[5] Instructors facing the judgment of student evaluators may also avoid innovation. As McKeachie (1997, p. 1219) points out: "Many students prefer teaching that enables

[4] End-of-term student evaluations of teaching may be widely used simply because they are inexpensive to administer, especially when done by a student in the class, with paid staff involved only in the processing of results, which is the typical routine followed by departments of economics (Becker and Watts, 1999). Less-than-scrupulous administrators and faculty committees may also use them because (for the reasons given in the text) they can be dismissed or finessed as needed to achieve desired personnel ends while still mollifying students and giving them a sense of involvement in personnel matters.

[5] Economics departments often use their large enrollment classes to justify overall department budgets. Especially in large public research universities, there may be little assurance that general department funding flows back to the large enrollment courses, which provides instructors and course coordinators with the "outside of their control" excuse. The department of economics at Stanford University works on a different model, in which funding from the dean's office is allocated directly to a center responsible for the economics principles course, which ensures that funding and internal resources flow to where the students are.

them to listen passively—teaching that organizes the subject matter for them and that prepares them well for tests . . . research, however, points to better retention, thinking, and motivational effects when students are more actively involved in talking, writing, and doing . . . Thus, some teachers get high ratings for teaching in less than ideal ways."

A fourth concern with the student evaluations forms used in economics courses is that they usually ask few questions that deal with what education specialists say is important: active student learning and group (or collaborative) learning. Furthermore, although academic economists call for the use of better applications and examples in teaching, these items are among the least often asked questions on student evaluations of teaching. Although there is lip service about implementing new technology in teaching economics, questions about the use of technology are rare on student evaluations of teaching forms (Becker and Watts, 1999). Little attention is given to students' perception of what they believe they learned.

A fifth concern is the converse of the fourth: what the student evaluations do ask about is often in areas where the students have little ability to judge. The top four items on which student opinion is typically sought include the teacher's overall effectiveness, communication skills, organization and planning, and knowledge of material (Becker and Watts, 1999). Students have little basis for judging an instructor's knowledge of the material, and students cannot know what goes into organizing a course (or what might have gone into organizing the course) if they have never taught it.

Finally, an end-of-term student evaluation offers no feedback to the instructor on what might be done to improve teaching during that actual course. An instructor interested in improving the learning of current students needs feedback before a term is nearly over. Questions asked of students must elicit responses that suggest a desirable change in instructor behavior.

In the 21st century, sole reliance on traditional end-of-term student evaluations of teaching should not be tolerated. For starters, student evaluations should focus on what students know; that is, what they learned. Feedback should be gathered by a variety of methods throughout the term. On resident campuses with ample computer facilities and programming staff, electronic technology makes periodic assessment easy. In this case, students need not complete assessment instruments in a classroom; instead, they can be required to complete periodic questionnaires as part of a course requirement, with an option for anonymous response available to students who desire it.

It is also important to move beyond student evaluations to other methods of assessing teachers, including classroom observation, peer review of teaching materials, drop rates, and patterns of subsequent student behavior (like grades in future classes). Russell Edgerton, past president of the American Association of Higher Education said (as quoted by Wilson, 1998, A14): "[I]f teaching were to be seen as scholarship, intellectual work, it would not be enough to evaluate teaching simply by looking at student ratings . . . Teaching, like research, should be peer reviewed." The American Association of Higher Education has instituted a program called

"From Idea to Prototype: The Peer Review of Teaching" that it is conducting at 16 research-oriented universities. This prototype program looks beyond student evaluations for the assessment and improvement of specific pedagogical skills.

Assessment of Students

Multiple-choice tests are a staple of assessment in economics classes, especially in large enrollment introductory classes, where they are nearly mandated by cost considerations. Multiple-choice tests are crude instruments for assessing student learning, and as such, should not be the sole method of assessment in any course. They can be used, however, in educationally sound ways.[6]

In the early 1970s, Allen Kelley (1973) created an innovative program of frequent multiple-choice testing in large classrooms with immediate detailed feedback—an approach which can be used by anyone with access to machine scoring. It is especially attractive to anyone teaching in a lab where assessment material can be delivered directly and uniquely to each student in the class, as I have done in my teaching of business and economics statistics. In a large high-tech auditorium, where the instructor can monitor each student's response on a key pad, software programs enable rapid display of responses and their distribution, offering instructor and students immediate checks on learning.

From Harvard seminars on college teaching, Light (1990, 1992) reports on the courses students respect and from which they learn most. The crucial features are: immediate and detailed feedback, with frequent points of assessment, and high demands and standards but with ample opportunity to revise and improve work as part of the grading process (that is, learning from mistakes). Students also claim to learn from the reinforcement of their peers.

With these elements of learning in mind, even in a low-tech classroom, multiple-choice questions can be used creatively to get students involved and interacting with each other. Consider this approach: After a midterm exam is machine or hand scored, it can be returned for a new choice of answers. Let the students interact with those sitting around them to determine the correct answers—a frenzy of activity will ensue. After several minutes, quiet the room and have each student resubmit a new answer sheet for partial credit.

As another example, a single multiple-choice question can be projected in a traditional large lecture hall. Each student answers the question on a sheet they received entering the hall. For a second question, each student marks the answer from "A. Certain" to "E. Doubtful" to indicate confidence. Students then discuss

[6] Interestingly, there is no teaching method that is superior to the others as measured by multiple-choice tests. This is not to say that one teaching method may not be preferable to another; it may simply reflect the fact that multiple-choice tests measure only lower rather than higher aptitudes, or any of the many other problems with the value-added = postcourse test − precourse test study designs typically employed in educational research (Becker, 1997).

their answers with neighbors—the lecture hall is abuzz. After a few minutes, students continue the process with question three (a repeat of question one) and final confidence given in question four (a repeat of question two). Student attendance and participation will increase with the use of this activity, if they get some credit for attempting answers, as well as for the correct answer to number three, when responses are scanned and machined scored. The instructor also gets feedback on student confidence in what they are doing.

The "one-minute paper" is touted in the education literature as an important pedagogical innovation for improving teaching (Cross and Angelo, 1993, p. 148). It is invoked in the final minute or two of class. Students are asked to write and hand in their individual responses to the following two questions:

1) What is the most important thing you learned today?
2) What is the least clear issue you still have?

The first question gives the instructor insight into what is being learned and the second gives information on what is still needed. Periodic use of the one-minute paper, short in-class quizzes, and similar classroom checks on student understanding provide a proven framework to assess what students are and are not learning during the course (Chizmar and Ostrosky, 1998).

Ultimately, however, no matter how they are delivered, multiple-choice or even open-ended test questions do not involve students in what economists do. To get students to think like economists, we need to find ways to move beyond highly structured tests that typically do not challenge students beyond a recall cognitive level.

Conclusion

Departments of economics have two powerful reasons to care about improving the quality of their teaching. First, the contest for resources within institutions of higher education implies that the number of majors and enrollments matter. Following several consecutive years of decline in the number of economics majors in the early 1990s, data collected by John Siegfried (1999) suggests that the trend in majors may have turned up modestly in 1996–97 and 1997–98.[7] The driving force behind those numbers is debatable. Whether students will take more courses in economics or choose to major in the field because of improved teaching is hard to say, but, at least, improved teaching is unlikely to hurt enrollments!

More broadly, a few courses in undergraduate economics, and perhaps only an introductory course, are often the only interaction that the college graduates of tomorrow will have with the economics profession. Because they are the only

[7] Siegfried's AEA sample of 120 colleges and universities may not be representative of the U.S. census of approximately 1,400 institutions offering bachelor's degrees. For example, Siegfried's AEA sample shows majors peaking in 1991–92 but the census data shows the high point in 1989–90.

opportunities that academic economists will have to educate the citizens and voters of tomorrow, they deserve our best efforts.

■ *The author thanks William Baumol, Robin Bartlett, Suzanne Becker, Stephen Buckles, George Bredon, Brad De Long, W. Lee Hansen, Masanori Hashimoto, Hirschel Kasper, Arnold Katz, Peter Kennedy, Alan Krueger, Mark Maier, Julie Marker, Michael Salemi, John Siegfried, Kim Sosin, Craig Swan, John Taylor, Timothy Taylor, Hal Varian, William Walstad, and Michael Watts for their help and constructive criticism on earlier draft material.*

References

Alston, Richard M., J.R. Kearl and Michael B. Vaughan. 1992. "Is There a Consensus Among Economists in the 1990s?" *American Economic Review.* May, 82:2, pp. 203–09.

Baumol, William J. and Jess Benhabib. 1989. "Chaos: Significance, Mechanism, and Economic Applications." *Journal of Economic Perspectives.* Winter, 3:1, pp. 77–105.

Becker, William E. 1997. "Teaching Economics to Undergraduates." *Journal of Economic Literature.* September, 35:3, pp. 1347–73.

Becker, William E. 1998. "Engaging Students in Quantitative Analysis with Short Case Examples from the Academic and Popular Press." *American Economic Review.* May, 88:2, pp. 480–86.

Becker, William E. and Michael Watts. 1996. "Chalk and Talk: A National Survey on Teaching Undergraduate Economics." *American Economic Review.* May, 86:2, pp. 448–53.

Becker, William E. and Michael Watts. 1999. "How Departments of Economics Evaluate Teaching." *American Economic Review.* May, 89:2, pp. 344–49.

Becker, William E. and Michael Watts, eds. 1998. *Teaching Economics to Undergraduates: Alternatives to Chalk and Talk.* Cheltenham UK: Edward Elgar.

Becker, William E. and Michael Watts. 1995. "Teaching Methods in Undergraduate Economics." *Economic Inquiry.* October, 33:4, pp. 692–700.

Becker, William E., William B. Walstad and Michael Watts. 1994. "A Comparison of Views of Economists, Educators, and Journalists on Economic Issues," in *An International Perspective on Economics Education.* Walstad, W., ed. The Netherlands: Kluwer Press, pp. 65–87.

Chizmar, John and Anthony Ostrosky. 1998. "The One-Minute Paper: Some Empirical Findings." *Journal of Economic Education.* Winter, 29:1, pp. 3–10.

Cross, K. P. and T. A. Angelo. 1993. *Classroom Assessment Techniques: A Handbook for College Teachers.* San Francisco: Josey-Bass.

Evensky, Jerry and Michael Wells. 1998. "Making a Series of Courses into a Program." *Journal of Economic Education.* Winter, 29:1, pp. 72–80.

Katz, Arnold and William E. Becker. 1999. "Technology and the Teaching of Economics to Undergraduates." *Journal of Economic Education.* Summer, 30:3, pp. 194–99.

Keenan, Dianne and Mark H. Maier. 1995. *Economics Live: Learning Economics the Collaborative Way.* New York: McGraw-Hill, 1995.

Kelley, Allen C. 1973. "Individualizing Education through the Use of Technology in Higher Education." *Journal of Economic Education.* Spring, 4:2, pp. 77–89.

Kennedy, Peter. 1992. "On Journalists' Use of Macroeconomic Concepts." *Economic Inquiry.* January, 30:1, pp. 194–201.

Light, Richard J. 1990. *The Harvard Assessment Seminars.* Cambridge, MA: Harvard University Graduate School of Education and Kennedy School of Government, First Report.

Light, Richard J. 1992. *The Harvard Assessment Seminars.* Cambridge, MA: Harvard University Graduate School of Education and Kennedy School of Government, Second Report.

Mankiw, N. Gregory. 1990. "A Quick Refresher Course in Macroeconomics." *Journal of*

Economic Literature. December, 28:4, pp. 1645–60.

McKeachie, Wilbert. 1997. "Student Ratings: The Validity of Use." *American Psychologist.* November, 52:11, pp. 1218–25.

O'Rourke, P. J. 1998. *Eat the Rich: A Treatise on Economics.* New York: Atlantic Monthly Press.

Romer, David. 2000, forthcoming. "Keynesian Macroeconomics Without the LM Curve." *Journal of Economic Perspectives.*

Sargent, Thomas. 1993. *Bounded Rationality in Macroeconomics.* Oxford: Clarendon Press.

Sax, Linda J., et al. 1996. *The American College Teacher: National Norms for the 1995-96 HERI Faculty Survey.* Los Angeles: Higher Education Research Institute, UCLA.

Shapiro, Carl and Hal Varian. 1999. *Information Rules: A Strategic Guide to the Network Economy.* Boston: Harvard Business School Press.

Siegfried, John J. 1999. "Trends in Undergraduate Economics Degrees, 1997–98." *Journal of Economic Education.* Summer, 30:3, pp. 325–28.

Siegfried, John J. and Bonnie T. Meszaros. 1998. "Voluntary Economic Content Standards for America's Schools: Rationale and Development." *Journal of Economic Education.* Spring, 29:2, pp. 139–50.

Siegfried, John J., et al. 1991. "The Status and Prospects of the Economics Major." *Journal of Economic Education.* Summer, 22:3, pp. 197–224.

Strober, Myra, Allen Cook and Kasi Allen Fuller. 1997. "Making and Correcting Errors in Student Economic Analysis: An Examination of Videotapes." *Journal of Economic Education.* Summer, 28:3, pp. 255–71.

vos Savant, Marilyn. 1997. "Ask Marilyn." *Parade Magazine.* September 5, p. 22.

Walstad, William and Phillip Saunders, eds. 1998. *Teaching Undergraduate Economics: A Handbook for Instructors.* New York: McGraw-Hill.

Walstad, William and Phillip Saunders. 1998. "Using Student and Faculty Evaluations of Teaching to Improve Economics Instruction," in *Teaching Undergraduate Economics: A Handbook for Instructors.* Walstad, W. and P. Saunders, eds. New York: McGraw-Hill, pp. 337–55.

Wilson, Robin. 1998. "Project Seeks to Help Colleges Use Peer Review to Evaluate Teaching." *Chronicle of Higher Education.* January 16, p. A14.