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**50 YEARS OF ECONOMIC INSTRUCTION
IN THE *JOURNAL OF ECONOMIC EDUCATION***

Short title for running header: 50 Years of Economic Instruction

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With 2019 marking the fiftieth year of publication of the *Journal of Economic Education (JEE)*, it seems fitting to examine the evolution of economic instruction as portrayed in the *Journal*. Born of the American Economic Association (AEA), and first edited by members of the AEA's Committee on Economic Education (Saunders 2012), it is not surprising that the *Journal's* focus as chronicler, proponent, and outlet for economic education activity reflects the educational component of the American Economic Association's mission. The creation of the *Journal* signaled a self-awareness in the discipline that we needed to be more deliberate in thinking about how we teach economics and, as a discipline, take responsibility for the teaching enterprise at all levels in the United States. Further, it has "serve[d] as a journal of 'natural history' of the teaching of economics" and a resource designed to document successful "techniques and patterns" so that future generations do not face the pitfalls that "human knowledge [as] a very perishable commodity" generates (Boulding 1969, 9, 10).

We provide an overview of the evolution of economic pedagogy over the past five decades as conveyed by the *Journal of Economic Education*. In so doing, we consider pedagogical choice along with the underlying factors that potentially drive our activity. What is

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the purpose of such a review? Perhaps we bask in the notion that we have seen growth as a discipline and we have evolved as economic educators, making us more enlightened and more effective practitioners. Or perhaps this exercise serves to highlight our shortcomings as a profession and provides a point of comparison to other disciplines with the possibility that, as a discipline, we have fallen behind or in some way are lacking. But ultimately, an article that chronicles the past also points the way for the future and allows for more thoughtful choices as we, in our role as economic educators, continue to grow and adapt to the teaching climate in the United States in the coming decades.

A variety of factors have figured prominently in the economic education landscape, influencing pedagogical choice and direction over the last five decades. First and foremost is technological advance, both in the classroom and online. Broader trends in the discipline, such as fluctuating enrollment in the major and the rise of behavioral economics as a field also stand out as does economic activity related to transition, recession, and globalization. Increased pressure in the academy to prove effectiveness of teaching for assessment purposes and a growing awareness of alternative pedagogies also resonate. The publication of “Chalk and Talk” (Becker and Watts 1996), brought concern about the status quo in teaching techniques and the need to increase student engagement to the forefront in the economics discipline.

While we consider economic education by decade, beginning with the 1970s and ending with the current decade, this article is not intended to serve as an exhaustive tome on economic education, but rather a selective overview of highlights and transition points. We acknowledge the subjectivity inherent in such choices, and close with thoughts on the future direction of economic instruction, informed and fortified by this review of our history.

THE 1970s—A TIME FOR SELF-AWARENESS

A glance at the education-related activity and focus of the American Economic Association prior to 1970 is worthwhile as the environment in which the *JEE* emerged heavily influenced the first decade of articles with instructional emphasis. As early as 1944, the AEA created several ad hoc committees to explore potential improvements in teaching undergraduate economics. The emphasis coming out of these efforts included identifying economic knowledge necessary for high school students, cataloging resources for secondary schools, developing the *Test for Economic Understanding*, and studying graduate training in economics. However, the AEA continued to broaden its focus with respect to economic education and created an ad hoc Committee on Economics in Teacher Education in 1952, which eventually evolved into the Standing Committee on Economic Education (AEA-CEE) in 1955. Saunders (2012) provides a thorough description of the history, but most relevant for understanding the context in which the *Journal* was born (and thus the focus on economic instruction initially contained therein) was that the AEA-CEE served as the first editorial board of the *JEE*. As such, the first decade of *JEE* articles displays a strong emphasis on measuring and presenting the current state of economic education as reflected in the first editors' statement of purpose that included, "bringing together what we know about the major aspects of economic education..." (Villard 1969, 6).

We begin our discussion of the 1970s with a look at instructional articles involving emerging technologies, then we consider games and experiments in the classroom, and finally objective-driven instruction. It is perhaps not surprising that in its first decade, we find *JEE* authors questioning the standard lecture format for content delivery as we see the potential in other structures made possible by changes in technology, resource availability, and educational mindset. Luker et al. (1975) compare four systems of content delivery including the use of

closed-circuit TV, games and simulations, programmed learning, and conventional lecture. Also, McConnell and Lamphear (1969) question the traditional lecture format in the advent of television and in response to the “new” widespread availability of textbooks and other course materials.

The Promise of Technology

A great deal of scholarly work in the 1970s related to the use of television in teaching economics. This is not surprising, as it was likely a direct offshoot of previous efforts of the AEA including the AEA’s co-sponsorship of “The American Economy” Television Course. With TV use in full swing, articles abound with focus on how TV can be used as a substitute for live introductory economics lectures (for complete courses or segments of a course), sometimes accompanied with brief discussion periods or capacities for students to replay the lecture at their own convenience. The use of closed-circuit television is one of the first fundamental shifts in course structure and content delivery that dominates the 1960s and the early 1970s.

Despite the fact that computer access was not widespread at this time, computer use is introduced as a supplement to lecture, primarily in the form of games and simulations. Arguments for computer-assisted instruction (CAI) include enhancing learning, working with real-world data, giving students an opportunity to engage with computers when they might not have an opportunity elsewhere, and making economics fun. However, the argument is also made to move beyond canned simulations and interactive programs to developing projects in which students write their own programs to enhance the understanding of the models and mechanisms that generate outcomes (Vrooman 1974). Although primarily focused on describing research outcomes supporting learning enhancements associated with CAI, a survey conducted by Soper (1974) demonstrates the wide-ranging applications of (batch and interactive format) CAI across

differing environments (course levels and class size). Despite the heavy representation of the use of computers for simulations and games, papers of this decade also describe how the computer can be used as a tool for the student (and instructor) for formative assessment such as with the Teaching Information Processing System (TIPS) (Kelley 1973) and PLATO (Paden, Dalgaard, and Barr 1977). Each provides real-time evaluation and interactive materials with PLATO putting the control of material navigation in the hands of the student whereas TIPS surveys student knowledge and then assigns student work based on demonstrated capabilities.

The Games People Play

The economist's natural affinity for game theory and outcome demonstration, combined with these computer-enhanced technological capabilities, leads to a proliferation of games, simulations, demonstrations and experiments. In some cases, these techniques are considered a complement to the standard lecture, but in other instances, they are presented as yet another structural approach to content delivery that might replace the standard lecture format. As economists begin to think of ways to make economic instruction more "hands on" and "experiential" these pedagogical approaches seem to be the natural extension of the type of work we do in the discipline. The official educational lingo regarding "active" learning and "cooperative" and "collaborative" learning have yet to come into use, but a basic understanding that student engagement with the content and the ability to demonstrate the relevance of economics seems to propel the use of games throughout the decade.

Lumsden (1970) provides an overview of games and simulations in use by economic instructors. He describes some of the earliest games used without the aid of technology, such as games where students act as buyers and sellers to drive market outcomes or simulations in which students play the role of policy maker and the instructor records and calculates outcomes. He

then goes on to identify and discuss some of the earliest computer applications used for economic simulations that were developed beginning around 1965. They were cumbersome by today's standards, but path-breaking at the time. An instructor might gather student decisions and data during class, enter data after class in a computer, run the job at a computing center, collect hard copy output and share results with students in the following class period. He also discusses some of the earliest attempts to develop computer programs for use in the economics course such as the Economics Laboratory project at the University of California, Santa Barbara.

Joseph (1970, 92) also makes the case for the use of games and simulations in the economics classroom as the appropriate future direction for economic instruction, claiming that the time has come for economists to be accountable for the teaching product they provide, for the degree of engagement in the classroom, and for moving students beyond the abstract to reality. He too describes early market experiments in which students act as buyers and sellers, but also claims that it turns what students view as dull, academic principles into living and dynamic markets. He identifies the first oligopoly and production games that students play with the computer. While no one at the time tried to measure the effectiveness of these games and simulations, there seemed to be anecdotal consensus among the authors of game-related articles that this technique and technology was transforming the learning experience of economics students and had enormous future potential.

Objective-Driven Instruction

It is easy to argue that desired learning outcomes are grounded in disciplinary-specific objectives. However, the use of objectives without a measurable behavioral component are ineffectual. Learning goal statements "should include (a) the situation in which the learning behavior is to occur, (b) a precise description of the behavior expected, (c) the object or goal

of the behavior, and (d) a specified criterion performance level. Indeed, high claims are made for learning improvement via the use of instructional objectives, regardless of instructional area” (Phillips 1972, 112). The use of student learning contracts is described as a method of operationalizing the use of behavioral objectives, providing students with a guide to progress successfully through course lessons (*JEE* 1972). Van Metre (1976, 96–97) uses behavioral objectives as the first step in a model of instructional development. However, he takes this step even further by describing and providing examples of a “taxonomic structure of learning outcomes” based on five domains: motor skills, attitudes, verbal information, intellectual skills, and cognitive strategies. He argues that identifying the domain most relevant to the objective can enhance the efficiency of methods of instruction.

A natural outcropping of advances toward an objective-driven course is the emergence of “programmed instruction” and “self-paced learning” as new structural models for content delivery, once again challenging the conventional lecture format. Several articles describe different experiences with these instructional models, but two stand out. Soper (1973) describes the use of “programmed learning” in economics, which appears to be a precursor of the “inverted” or “flipped” classroom concept, made possible by increased accessibility to course materials. Allison (1975) describes “self-paced,” objective-driven learning models in which instructional progress is based on learner responses. The learner proceeds from one topic to the next at their own speed with some elements resembling a precursor to modern online learning models. There were different permutations in employing these models and some overlap as self-pacing was often a component of a programmed learning structure.

THE 1980s—THE SKY'S THE LIMIT

As economic educators enter the 1980s, computer capability and accessibility permeate higher education and economists struggle to keep pace, searching for the best ways to harness and develop technology for teaching purposes. After reconsidering the basic lecture model and course structure in the 1970s, we begin to realize that learning might also be enhanced by better identifying and adapting to the composition of our student audience and this perspective is now added to the reconsideration of course structure. Based on the varied array of articles emphasizing ways to engage students, it is also evident that in addition to games and simulations, there is no limit to the ways we can increase engagement and convey relevance. As we consider more complex and sensitive ways to connect with students it appears that we have entered an age of enlightened engagement.

The Proliferation of the Computer

The consensus that appears to arise at the start of this decade is that the use of computers for computer managed instruction (CMI, described in the 1970s as self-paced instruction) was largely ineffective. However, closer empirical investigation suggests that the aggregation across students may be masking the differential gains across students, with lower-performing students demonstrating the most positive gains (Swartz, Davisson, and Bonello 1980; Marlin and Niss 1982).

Perhaps the lack of a strong evidence for the efficacy of CMI is one reason for the domination of computer-aided instruction (CAI) during this decade, primarily in the form of supplements to instruction such as macroeconomic policy simulations. However, the growing availability of microcomputers is accompanied by a recognition that rigidly programmed simulations and games are limited as pedagogical enhancements. It is in the second half of this

decade that examples of the use of CAI move beyond demonstrations or convenient methods for testing what students have learned to approaches in which students are active participants in the learning process. Miller and Weil (1986, 62) present a guided inquiry approach, arguing that such “lessons provide much more complex and thorough branching to remedial questions than is possible in a programmed textbook. As a result, they are more responsive to the student and keep the student more actively involved with the material....” Examples appear that focus on the student “simulating the programming and model-building process” (Scheraga 1986, 130), “developing a computer simulation model in the classroom and then us[ing] it to solve macroeconomic problems” (Day 1987, 351), and using spreadsheets to allow students to actively manipulate outcomes and unveil the hidden equations that drive the calculations that are common in passively oriented preprogrammed simulations (Adams and Kroch 1989).

This decade closes with a cautionary note. The growth of textbook supplements that employ the use of microcomputers may fall into the same trap as initial CAI attempts if they are not carefully constructed as a “learning tool.” Walbert (1989, 283) argues for an interactive design in which the computer acts as a dedicated tutor, a drill sergeant, a presenter of “what if” strategies for problem solving, and a tracker of progress in order to direct resources to help students overcome deficiencies.

Attention to Audience

There is a rising awareness of the diverse audience enrolled in (primarily) the introductory course and how a better understanding of differences across students might inform pedagogic approaches. Diversity in this context is categorized by gender and race/ethnicity, learning styles, and differences in student aptitude.

Ferber (1984) summarizes the U.S. Department of Education's work, "Sex and Gender in the Social Sciences: Reassessing the Introductory Course," identifying sources of gender bias in education (across a variety of levels and disciplines) that are argued to be a source of the underrepresentation of women in economics. Changing course content is presented as one method for overcoming this imbalance and Ferber describes specific topics appropriate for the introductory course that might be of greater interest to women. This work was not an isolated case for concern, as the work of Feiner and Morgan (1987) demonstrates that leading introductory textbooks of the time were nearly devoid of discussions of women (or minorities). Even within topics that might arguably be of special relevance for women (and minorities) such as poverty, income distribution, unemployment, and labor markets, there is little to no explicit mention (p. 382). At the same time, one cannot make the argument that this material was not course-worthy, given the "burst of published scholarship on women and the economy" and the existence of textbooks specifically dedicated to women and work courses (Krynski 1987, 443).

The rise of self-paced instruction of the 1970s is re-evaluated in terms of potential pitfalls, suggesting that it might not be the one-size fits all solution to learning enhancement. Yates (1981) argues that emphasis on creating flexibility in the pace of instruction/learning without careful consideration to cognitive style differences has the potential for generating self-paced processes that are biased in favor of one style. He further argues that because cognitive styles vary across students and time, varying instructional methods to complement a range of styles will improve student cognitive deficiencies and enhance strengths (p. 31). Caution in allowing too much flexibility in terms of student choice of learning strategies is further stressed by Hall (1982), who finds that students choose strategies correlated with their existing skill strengths rather than skills in need of further development.

Disparities in performance outcomes are shown to be associated with differences in pedagogic and assessment approaches. For example, students with greater pre-course knowledge of economics and high aptitude (SAT/ACT) performed better in lecture courses as opposed to those that incorporated simulations and games (Fraas 1982). Further, when differences in assessment tools are explored as a potential source of documented sex difference in performance, it is shown that male students perform better on multiple choice assessments whereas females demonstrate greater performance on essay tests (Lumsden and Scott 1987).

Enlightened Engagement

Authors introduce a variety of innovations in this decade intended to enhance (primarily) the introductory course. Two recurrent themes underscoring the development of such enhancements are the desire of instructors to make the economics they are teaching more “real” and to capture student interest in the subject matter.

While internships add a level of realism by moving the student out into the world to explore how economists use their knowledge (Sternberg 1982), instructors also describe examples of bringing the world into the classroom through the use of newspaper clippings (Kelley 1983). Providing concrete connections between abstract theory and examples is demonstrated through the development of econometric laboratory lessons that demonstrate techniques using topic-specific applications (McNown and Hunt 1984). Hansen (1984) makes use of a unique notetaking market facilitated by a student association on his campus to demonstrate demand theory.

A wide range of documented classroom interventions promote interactive learning. Some are modest methods for engaging students such as participation in games, experiments or simulations, while others require a complete overhaul of course practices. For example, Karpoff

(1984) describes an apple and candy bar barter trading exercise conducted outside of class that lasted over an entire semester. Weekly changes to the parameters of the market allow the instructor to cover introductory microeconomic topics including equilibrium, price controls, monopoly privileges, and taxation. Alternatively, Hansen (1983) describes a complete shift away from the lecture format to one that is entirely based on discussion. He carefully describes the intricate planning that must go into preparing for successful discussion including course goal definition, appropriate material choice, discussion question and mechanics development, and well-defined discussion leader responsibilities (p. 41).

It is within this decade that we also observe the growing interest in writing, both that which is student-generated, and the use of existing published works other than traditional textbooks. Motivations for these activities are based in applying learning theory, enhancing literacy, or generating interest. Crowe and Youga (1986, 218–19) argue that writing can generate connections that enhance cognitive development, serve to document thought processing activity, and act as a monitoring device for progress as students digest content, apply analytical and critical thinking skills, and become independent thinkers. Others describe specific examples of how to engage students in the writing process, including the use of position papers and a journalistic approach (Fels 1984; Grunin and Lindauer 1986). Watts and Smith (1989, 291) argue that literature and drama are key factors in “shaping public opinion” and economics of the time “shape and direct literature, drama, and language.” Their summary provides both breadth and depth for those who might wish to enhance student interest in economics by incorporating literary works into their courses.

A Re-evaluation of Content and Structure

Critical reflections of (primarily) the introductory course dominate this time period, although the lens through which this is conducted varies. Hurst, Lesage, and Weiss (1980, 55) begin the decade with an attempt to frame the “lack of acceptance of proposals in economic education” as a disconnect between educational and economic framing. They demonstrate the structural approach of grounding curriculum in learning theory using two recently published articles describing behavioral objectives as the universal frame for the introductory course and correlate this approach with functionalist theory (with a focus on the holistic goal). They contrast this with a description of economics as based in mechanistic theory (one that explores relationships across components of a larger structure). They suggest that reform would require a synthesis of the two frameworks and present their view of what conditions might need to be satisfied for this to be successful (p. 58). In light of this perspective, perhaps it should not be surprising that despite the documented learning gains for programmed instruction demonstrated in the previous decade, it appears that the efficiencies of this technique have not been sufficient to gain it a foothold as a common approach for introductory economics (Vredeveld 1982).

Reform of the content and structuring of introductory economics continues to garner attention. The principles of macroeconomics course receives a great deal of attention in terms of both course structure and supporting textbooks as authors raise issues of how to frame an introductory course given the unsettled nature of the subject matter; some arguing for a structure that is grounded in discussing relevant institutions, others providing examples with empirical emphasis. Hallagan and Donnelly (1985) describe an experimental approach that allows student content choice through a modular course structure. Introductory courses at their institution were redesigned to have a common nine-week (micro or macro) core followed by two, three-week,

topic-specific modules that students were allowed to choose. They argue that the approach generated a more consistent coverage of core concepts and allowed for enhanced interest by both students and faculty due to the topical component of the course.

Textbook evaluations surface, focusing on characteristics that drive their adoption beyond the content contained therein. For example, leading textbooks are evaluated for their “readability” and thus the degree to which they might be accessible for target audiences. While considerable variability across texts is documented, the choice of readability measure is shown to be an important determinant of accessibility ratings. Yet as McConnell (1983, 71) concludes, rather than continuing to analyze characteristics of the textbook as an input into the learning process, perhaps the more important and yet unanswered question is the degree to which the choice of textbook contributes to student learning outcomes.

THE 1990s—OUR MAJORS ARE DECLINING

It is in the 1990s that as a discipline, we come to the realization that enrollment in the economics major is declining at most institutions across the United States, as we see in figure 1 (Siegfried 2002). Perhaps in part as a response to this trend, the majority of pedagogical publishing in economics in the 1990s seems to ultimately be influenced by the twin notions that, as teaching economists, we have failed to convey relevance in the classroom, and we have failed to explain things clearly and to greatest effect. If the 1970s was a decade of awareness that we must pay attention to economic education in general, and if the 1980s was a decade of awareness that we must pay attention to who is in our classroom, the 1990s attest to the awareness that we must find new ways to convey content that emphasizes clarity and relevance.

[Insert figure 1 about here]

In the broader academy, Bonwell and Eisen (1991) offer a formal treatment of “active learning” to educators and “critical thinking” too becomes a buzz word. We see these broader trends gaining ground with economic educators in the 1990s. Instructors of economics also respond as technology continues to advance, and we find classroom technologies becoming more sophisticated, software becoming more agile and able, and a usable and accessible Internet emerging.

Be Clear

The seminal article, “The Status and Prospects of the Economics Major” (Siegfried et al. 1991), sets the stage for many articles both within this decade and to present day. This work was part of a larger cross-disciplinary project designed to “describe the undergraduate major... and what each seeks to accomplish, to indicate how they are succeeding and failing, and what might be done to improve and strengthen them” (p. 198). Perhaps the most popularized phrase that arose out of this article describes “that enabling students ‘to think like an economist’ is the overarching goal of economics education.” (p. 199). The article contains a detailed description of what this entailed (i.e., problem-solving, deductive reasoning, decision making, etc.), the challenges on the horizon (resource pressure of increasing popularity, shifting demographics toward more women enrollments in college) and the realization that our knowledge about “the impact of the economics major on our students’ intellectual development” (p. 214) is lacking. Based on their review of the status of the major, Siegfried et al. (1991, 218) conclude with a series of recommendations for enhancing the foundations, breadth and depth of economics focusing on the goal that “students must obtain extensive practice at really *doing* economics.” Perhaps it is not surprising, then, that presentations of what and how we teach during this decade are rooted in discussions of enhancing student comprehension of economic analysis associated with specific

topics, of how key economic concepts are connected, or why particular methodological approaches are relevant.

Caudill and Mixon (1994) provide an example to enhance the presentation of cartel behavior that utilizes the context of an instructor curving an examination. They argue that students can more readily understand challenges of cartel formation (based on the number of participants and coordination issues) and behavioral incentives (such as cheating on the arrangement to enhance one's own grade) with this real-life application. Other pedagogical applications link theory to real-world policies. Williams (1997) uses the U.S. sugar quota policy to develop an analysis of welfare costs associated with trade barriers for an introductory economic course. Because the description of the market, quota policy and data associated with the sugar market are readily available, it allows for an assessable real-world problem in which to ground abstract theory.

Examples of graphical analyses provide an approach for reinforcing and expanding material as well as making connections across concepts. Heavey (1994, 303) argues that although most economics students learn the “graphical analysis of income and substitution effects of a price change, they often fail to appreciate that the same graph provides information on the income elasticities of the two goods.” He demonstrates how the graphical representation of a price change can be used to reveal the normal, inferior, and superior nature of the goods. Graphical representations are also a common approach for comparing outcomes across different market structures. However, while the basis of this comparison across perfect competition and monopoly is the price-quantity framework, other market structures (Cournot-Nash, Stackelberg) are presented in a quantity-quantity framework making it a challenge for students to compare outcomes. Fulton (1997, 56) provides a graphical exposition of a consistent price-quantity

framework that can be used by students to more “easily compare the efficiency and distributional impacts of these market structures.” The focus on using graphical enhancements, however, comes with a cautionary note. It is common to have students “claim that they understand economics verbally...but become confused when the verbal analysis is translated into a graph” (Strober and Cook 1992, 125). Using video-taping and content analysis, they suggest that while students are able to demonstrate geometric competency, it is the “concept formation” associated with economic analysis that limited their ability to use graphical analysis to solve a problem. They suggest that components of learning theory can help to explain this phenomenon and that their analysis implies “that economic educators need to do more to relate economic models to the experiences of our students” (p. 145).

Specific course content and presentation are also a subject of focus, with both microeconomics and macroeconomics represented. For example, intermediate microeconomics course discussions emphasize enhancing connections across topics and the use of mathematical tools. Katzner (1991, 154) cautions the reader that the current presentation of intermediate microeconomics should be enriched through the development of an overarching framework lest students “be left with the impression that microeconomic theory is only a collection of minimally related topics in which each topic is identified with certain kinds of problems and certain techniques for solving them.” Wilkins (1992, 317) provides a similar argument based on the importance of quantitative methods because “equations allow models to be linked together in ways that cannot easily be accomplished using graphs.” He demonstrates how such linkages can be enhanced using a presentation based on the production possibilities frontier and demand curve. Alternatively, the debates in macroeconomics focus on both content and methods. The debate over whether Keynesian economics should be eliminated from the principles course is

presented by Colander (1999). Focusing their discussion on intermediate macroeconomics, Erekson, Raynold, and Salemi (1996) argue that some of the pedagogical challenges of this course include translating generally accepted professional knowledge to the undergraduate course because of the wide range of methodological approaches used and continual developments in theory. Their discussion of this and other pedagogic challenges are based on a series of articles (in that same issue) that arose out of a conference dedicated to discussion of the course.

Get Real

There are many approaches represented in this decade that may be classified by their incorporation of real-world phenomenon and the development of students' ability to apply their economics toolkit. This is accomplished through use of topical materials, hands-on economic modeling, engagement in laboratory settings, and application of instructional techniques.

It is argued by Williams (1993) that students have entrenched, and often politically grounded, views on wealth distribution associated with the market economy. Student perspectives are unlikely to be broadened by passive reception of lecture-oriented materials and thus a simulation approach is offered as a way of engaging students to develop "a more complex view of the relative fairness of a market economy than most students had previously considered" (p. 325). It is also in this decade that we see a continued discussion of integrating the research on gender issues into the curriculum and altering assessment strategies to avoid inherent biases (Lage and Treglia 1996). Other examples of expanding topical coverage include the integration of heterodox perspectives to reveal "the complexity and larger context of economic issues and problems" (Barone 1991, 15), and the incorporation of homelessness as a topic to develop supply and demand modeling skills (Wasson 1998). Topical coverage is also used to facilitate the

development of algebraic modeling skills. Mead (1998, 48) describes how Social Security policy can be used to capture the attention of students (as most have either heard of it or have elderly relatives who receive it) and provide real-world context for the development of a basic algebraic model to demonstrate observed outcomes (such as its success at alleviating elderly poverty and the fiscal consequence of its structural flaws).

What distinguishes some of the experimental approaches in this decade is the emergence of the use of experiments as a systematic approach to teaching in addition to descriptions of single use experiments. For example, Wells (1991, 294) describes the semester-long use of a computer laboratory that provides “a setting for a scientific approach to the examination of economic principles.” Bartlett and King (1990) also argue for a laboratory approach, but one that is integrated throughout the curriculum and goes beyond the use of a single methodological approach. They argue that the “continuing hands-on experience” (p. 184) will help students to develop the skills of thinking like an economist and have the “opportunity to apply, to develop, or to practice the economic theory they read and hear about in lectures” (p. 191). In a follow-up article about this curricular approach, King and LaRoe (1991, 292) suggest that it led to unexpected innovations that furthered the integration of the real world and the classroom through the use of field trips, cases, and role-playing simulations.

The case method of teaching is introduced as a method for revealing the advantages of economic theory in decision making and teaches students to apply theory, identify and use evidence, and recognize the limitations of theory in the complexity of real-world applications (Carlson and Schodt 1995; Velenchik 1995). Similarly, the use of role-playing exercises puts students in the shoes of those making real-world decisions and provide “an ideal opportunity for students to understand how the practical issues of policy making frequently lead to real-world

divergence from economic principles” (Rodgers 1996, 222). Having students participate in a mock trial engages them as they play out what they observe as courtroom decisions in the news. “We found that staging a mock trial to assess damages in a wrongful death case was an outstanding method of motivating the student to apply economic concepts and to ‘think like an economist’” (Hersch and Viscusi 1998, 310). In a marked shift of the approach for synthesizing real-world constructs and the classroom, McGoldrick (1998) describes an experiential instructional technique based on the Kolb Learning Cycle. The learning process begins with a concrete student experience and moves through stages of observation and reflection, the formation of abstract concepts and generalizations, and ends with testing implications of concepts in new situations (p. 366). Grounding the learning process in a community-based project builds off the community service students already perform, promotes diversity by engaging different learning styles, and motivates students to better understand how economic analysis can explain real-world phenomenon.

Reflection and Critical Thinking

This decade begins with a series of articles motivating a closer look at instructional practice through the lens of cognitive processing. The difference between expert and novice approaches to problem solving are demonstrated through categories of domain-specific and metacognitive knowledge to highlight a method for evaluating the potential effectiveness of instructional practices (VanSickle 1992). The importance of metacognition is further explored as a tool for identifying student misconceptions. It is argued that without a more complete understanding of what drives the mindset that generates common misconceptions “otherwise effective educational strategies may fail to deliver reliable and persistent student mastery of subject matter” (Kourilsky 1993, 23). Perry’s scheme of intellectual and ethical development is presented, with an emphasis

on developing strategies for transitioning students to higher levels of cognitive development (Thoma 1993). Borg and Shapiro (1996) provide evidence that differences in learning styles impact performance and that students with styles that match their instructor's teaching style have performance gains over those that are mismatched. Taken as a whole, these studies suggest that greater care in the choice and implementation of instructional practices have the potential to enhance student knowledge acquisition.

It is in this decade that we also find numerous articles about the use of writing in the economics classroom, many of which are grounded in the calls for change embedded in the Siegfried et al. (1991) status of the major report and the writing across the curriculum movement of the time. Consistent structural themes appear in the descriptions of writing-intensive courses including the explicit focus on developing critical thinking skills and utilizing the recursive nature of the writing process in conjunction with instructor feedback. Additionally, acknowledging that students will ultimately be writing for differing audiences post-graduation motivates the development of assignments that differ from more traditional research papers including creating abstracts, historical descriptions of policy, and debate preparations (Cohen and Spencer 1993; Abdalla 1993; Davidson and Gunnior 1993).

In stark contrast to the articles reviewed above, Chizmar and Ostrosky (1998, 3) report on a tool for the instructor "to obtain regular feedback from students." The "one-minute paper" requires students to identify (at the end of each lecture) the most important thing they learned and "the muddiest point still remaining" providing instructors with an opportunity to identify learning deficiencies in a regular and more timely manner than assessment tools commonly employed (p. 4). Thus, modifications to follow-up lessons can be used to correct common deficiencies in student understanding.

Continued Advances in Classroom Technologies, Software, and the Internet

We observe a veritable explosion of articles espousing the benefits of integrating technology to enhance the learning environment. These include descriptions of existing programs, ways in which specific technologies were incorporated into specific classes, and learning theory-based technological integration. Taken as a whole, they provide insight into how technology of the time could be used to enhance learning along with the repeated cautionary note that technology use should be grounded in sound pedagogic practice.

Some argue that technological integration to date was limited by a lack of software and its tendency for passive/linear structures but that recent advances in technology provide opportunities for instructors to develop personalized applications to overcome these challenges (Lovell 1991; Boyd 1993).

Computer-assisted instruction still merits attention as the debate continues on its effectiveness. The advancement of microcomputers and the advent of the Internet inspire innovation in the form of simulations and programs designed to actively engage students in both the course (Williams and Walker 1993) and the learning processes contained therein (Motahar 1994). Technology is also highlighted as a medium for facilitating interactions, between students as in group work (Greenlaw 1999, 33) and between the instructor and the student (Agarwal and Day 1998). Instructors employ other uses of technology to overcome student learning challenges such as “enable[ing] students to transcend the mathematics to focus on an understanding of the economics” (Walbert and Ostrosky 1997, 314).

Simkins (1999, 278) describes how “Web technology can be integrated with traditional teaching methods to enhance learning for students with a variety of learning styles, at the same time making economics more relevant, more interesting.” He describes the use of the Iowa

Electronic Markets as a learning environment providing students with an opportunity to engage with a real market at any time of day or night and follow-up discussions and assignments can link observation (of price movements) to theory (of supply and demand).

THE 2000s—THE PUSH TO SURPASS “CHALK AND TALK”

The number of students majoring in economics has once again begun to rise, but with the taste of past decline lingering and the lasting awareness within the profession of the 1996 publication, “Chalk and Talk” (Becker and Watts 1996), instructors of economics still feel pressure to provide a more relevant and engaging classroom experience for students. In a “chalk and talk” follow-up survey conducted in 2000, Becker and Watts (2001) find that while emphasis on and interest in teaching has increased within the profession, actual classroom technique has still seen little change and the traditional lecture format continues to dominate. On the technology front, a world of possibilities arises from the increased functionality of the Web as a truly usable teaching tool. Along with the advancement of technologies used in the classroom, these changes drive significant pedagogical innovation in economics. Additionally, pressure in the academy drives the call for assessment of courses and programs and a plethora of general literature describing learning theories hits the popular press. As a result, we find the teaching economist working harder to innovate and demonstrate effectiveness, resulting in more examples of pedagogical tools grounded in learning theory.

As we look at the first decade of the new millennium, we begin by considering technology-driven changes in economic instruction. We next consider ever-growing attempts to increase student engagement and convey relevance through activities centered in and out of the classroom. Also motivated by the need to increase student engagement and enabled by improved

technologies, an abundance of articles appears on ways to teach using alternative media. We close with a look at ways economists take into account learning theory.

Technology in the Classroom and Online

Goffe and Sosin (2005) describe the use of technology in economic education over the previous ten years in their article, “Teaching with Technology: May You Live in Interesting Times.” This time period is indeed interesting and the use of technologies for pedagogical purposes within the classroom and online flourish, far surpassing the pedagogical potential of similar technologies in the last three decades of the twentieth century. Additionally, as the potential for profit from well-tailored classroom technologies becomes evident, publishers, economists and a host of others race to produce more usable and accessible teaching technologies.

A variety of technological advances begin to infiltrate the traditional lecture format in economics classrooms across the United States. One notable technology is the classroom response system or “clicker,” described by Salemi (2009) and Ghosh and Renna (2009), who explain the value of the technology and offer advice for effective implementation. Even though, at the time, students were required to purchase or rent a remote response device and the instructor used a receiver with a classroom computer, many instructors, especially those teaching large lectures, found this technology an innovative and cost-effective way to engage students and punctuate the traditional lecture.

With an increase in computer access, software quality and availability, and connectivity in the classroom, many instructors begin to use spreadsheet software such as Microsoft Excel to demonstrate economic outcomes and solve problems during class. For instance, Strulik (2004) shows how to solve rational expectation models and Mixon and Hopkins (2008) engage students in general equilibrium analysis. Peterson (2000) shows how to use geographic information

system technology to create thematic maps and Suiter and Stierholz (2009) discuss using GeoFRED data to electronically create graphs while students observe or assist. A series of articles by Fung and Kolar, (i.e., 2004) describes how to use flash animation to more clearly derive graphical connections and outcomes. The animation is self-paced so the instructor can walk students step by step through a topic such as production and costs in the short run. The authors made the animation available to instructors on their Web site and offered it as a more effective, accurate and engaging way to present graphs. No additional articles regarding this technology appear in the *Journal* after this decade. While flash animation was a useful innovation at the time, it is likely that as publishers developed more electronic materials and instructors gained skill at animating their own presentation slides, this form of teaching technology diminished in relevance.

By the new millennium, most instructors of economics have begun to use the Web and electronic mail in their day-to-day work, so it comes as no surprise that attempts to adapt such technologies to economic instruction abound. In economics, as was the case in other disciplines, we realized the potential to offer a course fully online. We also began to augment and enhance the traditional brick and mortar class with online technology such as course management systems, discussion boards (Greenlaw and Deloach 2003), and electronic books (McCain 2000). Lage, Platt, and Treglia (2000) are the first in the *Journal* to describe an inverted (or flipped) classroom in which primary exposure to content is provided online and then class time is used to work with students as they process content in more engaging ways.

A continually evolving Web in combination with increased access also allow economists to share instructional materials with each other in new and exciting ways. It is in this decade that the *Journal* begins to offer a section dedicated entirely to online-related teaching and materials to

ensure that instructors can access instructional materials that are best delivered online or electronically (Sosin and Becker 2000). Goffe and Braden (2000) provide an overview of resources available to economists on the Internet at the time. Winston (2000) describes EconEdLink, an open Web site providing instructional materials for economic educators, and Sosin (2000) describes a similar Web site called EcEdWeb: Economic Education Web. Many more Web sites devoted to economic education or Web sites that include resources useful to teaching economists continue to emerge throughout the decade.

Engagement in the New Millennium—Still Playing Games—Only Better

Based on the distribution of instructional articles in the *Journal* in the 2000s, experiments, simulations, and games continue to be, by far, the most popular genre of techniques for demonstrating economic outcomes in the 2000s. Dixit (2005) in his article on restoring fun to game theory perhaps best explains this popularity when he states, “Game theory starts with an unfair advantage over most other scientific subjects—it is applicable to numerous interesting and thought-provoking aspects of decision-making in economics, business, politics, social interactions, and indeed to much of everyday life, making it automatically appealing to students” (p. 205). Delemeester and Brauer (2000), in their article, “Games Economists Play: Noncomputerized Classroom Games,” describe a Web site they have assembled with more than 113 classroom games played within a class period unassisted by technology. Holt and Capra (2000) describe teaching the prisoner’s dilemma in class with a low-tech approach, only using simple playing cards. Also, Bergstrom and Kwok (2005) describe simple trading pits to demonstrate outcomes in large classes. In fact, articles describing these approaches are abundant, but now, technology we use within the classroom and technology available online, begins to significantly alter the landscape. Enhanced technologies also open new avenues for cooperative

and collaborative learning to occur within and out of the classroom and this is reflected in the literature.

Goffe and Sosin (2005) describe the development of platforms such as Charles Holt's Veconlab that support economic experiments and simulations in the classroom and online, allowing for immediate results in the classroom, electronic student interaction outside of the classroom, and even interaction between students at different institutions. They also describe technologies such as Aplia that provide a more sophisticated response to the student user and allow for an interactive progression of learning for students. Bergstrom (2009) describes a classroom game called the "cannibal's dinner party" to demonstrate entry into a market using clicker technology. Cheung (2008) describes the use of mobile phones in the classroom as a response medium for classroom experiments. Schmidt (2003) discusses the advantages of using networked computers and the Internet to make classroom simulation exercises richer and more complex.

Technological advance in instructional software also begins to facilitate cooperation and collaboration for students engaging in various forms of group work. Manning and Riordan (2000) describe instructional technologies that facilitate student collaboration by adding structure to the group experience and mitigating logistical issues inherent in group work. This "groupware" software was relatively new in this decade and helped groups with communication, idea generation, evaluation, and record keeping when working in groups.

Razzle Dazzle Me

After William Becker (2001) authors an article for the *Chronicle of Higher Education* entitled "How to Make Economics the Sexy Social Science," we note numerous articles appearing in the *Journal* indicating economic educators taking this call to heart. The instructor mindset of

connecting what happens in the classroom to reality that emerged in the 1990s, perhaps combined with a genuine desire to make learning economics more enjoyable and enriching, develops into economists in the 2000s finding a plethora of ways to be creative in applying economics and using alternative media and interdisciplinary approaches more than ever before.

One seemingly small, yet very important, technological innovation was the ability to digitize video and music files. The resulting enhancements in the ability to store, transport and share various materials, along with a desire to make the class atmosphere more engaging and fun, led to a significant increase in the use of film, television shows, and music. Whereas in previous decades showing a video meant wheeling in a television, inserting a VHS tape and finding the right spot in the video, the digitized files allowed the professor to more readily access and present such media. Leet and Houser (2003), in their article, “Economics Goes to Hollywood,” discuss the use of plots from classic movies and television serials to illustrate basic economic principles. Sexton (2006) describes using short movie and television clips that demonstrate an economic concept or outcome in a specific scene. Considine (2006) cleverly connects a long-running cartoon series, *The Simpsons*, with the classic writings of Jonathan Swift and George Orwell to teach public choice.

Alternative media use in the classroom is not limited to film and television. Tinari and Khandke (2000) are the first in the *Journal* to propose a comprehensive incorporation of twentieth century songs with the emphasis on content embedded in lyrics. They explore a wide range of genres from jazz to pop to rap and they span many decades to consider time-relevant themes. Lawson, Hall, and Mateer (2008) offer similar advice in their piece entitled, “From ABBA to Zeppelin, Led: Using Music to Teach Economics,” in which they describe a Weblog they have produced to facilitate the use of music in the classroom. On this site, they have

identified themes that illustrate economic concepts in lyrics of modern rock, pop, and rap tunes and they make a comprehensive anthology available.

While not having the same visual or auidial impact as film and music, unless perhaps read aloud, the incorporation of classic literature in the classroom, with an initial exploration in the 1990s, saw an experiencing of full-blossoming in the 2000s. Both Hartley (2001) in his article, “The Great Books and Economics,” and Watts (2002) in his piece, “How Economists Use Literature and Drama,” provide an extensive set of detailed examples demonstrating how economists might connect economic content to classic literature. When describing why economists might want to incorporate the classics of literature, Watts (2002, 377) quite aptly states that such passages describe, “human behavior and motivations more eloquently, powerfully, or humorously than economists typically do.” Hartley and Watts both describe a broad expanse of creative works economists might call upon, including Shakespearean plays, poems by authors such as Frost and Yeats, and classic literature from the likes of Mark Twain, Charles Dickens, William Faulkner, and John Steinbeck, just to name a few.

In a refreshing turn, some economists decide they might even produce their own fictitious narrative literature with the intent of conveying economic content and arousing student interest. Breit and Elzinga (2002) describe the use of detective fiction they have written under the pseudonym of Marshall Jevons, to help students solve economic mysteries. They liken the thought processes of an economist solving a problem to the mystery-solving skills of a seasoned detective. These are just a few examples arguing that a civilization’s creative outputs such as music, film and literature are a crucial aspect of what makes us human and when economic educators connect to these, we consequently humanize economics and provide new pathways for students to connect to economics.

Also, in the vein of making economics exciting and appealing to our young adult audience, economists look for ways to connect with provocative aspects of culture and develop interdisciplinary connections and approaches. Colander (2003) discusses the incorporation of sex and drugs in the principles course, Solman (2008) describes teaching economics with news clips from the Iraq War, Dixon and Griffiths (2006) consider survival on the *Titanic*, Mixon (2000) incorporates the Salem witch trials, and Cloutier and Kaufman (2008) draw examples from the world of professional sports. In an attempt to connect to the immediate concerns of students, Thornton (2009) describes a labor course research project centered on the market value of a college degree.

Learning Theory and Frameworks

Follow-up studies investigating how personality type influences learning outcomes expand their analyses to document gender and racial differences and whether results established for the introductory-course-level persist in upper-level courses. Such research has the instructional consequence of drawing attention to whether assessment practices accurately measure the impact of pedagogic practices, and how the assessment method might not capture the full impact of the practice across student groups. Findings continue to support the conclusions that there are differences in personality types across demographic characteristics and that these influence performance outcomes. Further, many of these differences persist in upper-division courses (Ziegert 2000; Borg and Stranahan 2002). The importance of personality type goes beyond contributions to our understanding of performance differences in that it is also a determinant of the effectiveness of pedagogic interventions. Emerson and Taylor (2007) find that although experiments generate higher levels of performance, this was not universally the case across all personality types. For example, there is “some evidence... that students in the experimental

classroom whose thinking tends to be more concrete and factual may not perform as well as more abstract thinkers” (p. 18).

Hansen (2001) updates and expands his proficiencies framework. He argues that if the objective of the major is to generate graduates who “think like economists,” then we must define how students should be able to demonstrate such skills. He acknowledges that his proficiency-based approach “would require transforming both our approach to teaching and learning, as well as our method of assessing what students learn” (p. 232). And this is exactly what one economics department did when they redesigned their curriculum “so that students simultaneously become more skilled in various tools and increase their mastery of proficiencies as they take additional courses and advance through the major” (Carlson, Cohn, and Ramsey 2002, 183). A capstone experience (attached as an additional unit hour to an existing upper-level course) provides students with a final opportunity to demonstrate their proficiencies (typically) through the completion of a research paper and presentation.

Articles describing specific exercises or course-long projects are introduced as active or experiential alternatives to the documented domination of chalk and talk (Becker and Watts 1996), emphasizing the potential for learning gains when students are actively involved in “doing” economics. For example, Hawtrey (2007, 146) describes an activity in which student teams “conceive, script, and perform” a weekly radio commentary for a local station. Alternatively, Brooks and Schramm (2007, 37) describe a semester-long project that requires students to apply their economic tools to a community-provided problem, grounded in research, educational, and service-oriented goals.

Writing assignments and courses built around the writing process describe it as a useful tool to demonstrate the applicability of economics to students as well as a method for advancing

and assessing student learning. The economic naturalist assignment (Frank 2006, 60) requires students to demonstrate command of basic economic principles by posing and answering original questions. Frank argues that students enjoy the assignment and it acts as an effective assessment tool. McGoldrick (2008, 345) describes a senior capstone research course that is designed entirely around the writing process that “requires students to demonstrate their ability to perform economic analysis on a specific problem of their own choosing.” Course objectives explicitly linked to Hansen’s proficiencies and provided to the students establish a basis for performance evaluation.

THE 2010s—A SPOTLIGHT ON ECONOMIC EDUCATION

The most recent decade, while not yet complete, already shows great promise for economic education. Several prominent economists join the conversation with contributions from leaders in the discipline such as Acemoglu (2013), Blinder (2010), Friedman (2010), Karlan (2017), Cutler (2017), List (2014), Rajan (2010), Rouse (2017), and Shiller (2010). When renowned voices in the discipline share their insights on how to teach economics, it not only provides top notch advice to economic educators, it lends credibility to the field of economic education within the discipline. It is also in this decade that the American Economic Association bolsters support for economic instruction with the decision to support an annual conference devoted to teaching and research in economic education, CTREE (Conference on Teaching and Research in Economic Education). This too fosters increased interest and conversations regarding economic instruction and related scholarship, likely leading to an increase in submissions of instructional articles to the *Journal* in this decade.

The distribution of articles in the 2010s attests to the fact that significant interest remains for conveying economic content by tapping into the arts and culture. Increased sophistication in

multimedia technologies along with the continued desire to connect to the student information set likely drive this continued trend. A variety of articles appear describing ways to incorporate television such as an overview piece by Mateer, Ghent, and Stone (2011) and an article incorporating the show *Survivor* (Karlan 2017). Additionally, we find advice for using film such as Braun's (2011) piece on teaching capitalism based on Western movies by John Ford. Watts and Christopher (2012) describe the analysis of paintings and drawings to teach economic concepts. Klein (2015), Van Horn and Van Horn (2013), and Rousu (2016) provide insight for using song lyrics to engage students and demonstrate concepts. We still find classic literature as a vehicle with Vachris and Bohanon (2012), who use American novels to teach labor economics, and Cotti and Johnson (2012), who incorporate historical novels.

We find, as in every decade, that games and simulations are the apparent pedagogic staple for teaching economists. With the continuous improvement and adaptation of interactive classroom and online technologies, the use of games and simulations grows pervasive and ever more sophisticated. Among the bounty of articles describing games and simulations, we see pieces on banking games such as Kassis, Hazlett, and Battisti (2012) and Hazlett (2016), a game about choosing marriage partners from Bergstrom, Bergstrom, and Garratt (2013), and a market for pollution permits (Caviglia-Harris and Melstrom 2015) and Lewis (2011), just to name a few.

Beyond connections to culture and the use of games and simulations, other apparent themes emerge in the 2010s. A significant number of articles appear that focus on learning economics by doing economics through field experiments, research projects, data use and role playing. Also, while the country reels from a financial crisis, teaching economists seem to reel as well from a rattling of paradigm and technique for teaching macroeconomics, and we grapple with coverage of the financial crisis in the classroom and how we teach macroeconomics in

general. While most classroom technologies continue to advance, we begin to see a new presence of and role for social media, blogging, and podcasts. And finally, we see economists embracing the latest developments in learning theory.

Learning by Doing

Hansen's call (2001) of the previous decade to have students "do economics" still resonates and we find many contributions describing ways students might mimic the work of economists both in and out of the classroom. Continued pressure from the academy for evidence-based and applied pedagogy as well as the rise of behavioral economics as a field with broad popular appeal lead to a wide range of contributions about ways students might learn economics experientially. Articles in this decade emphasize learning economics by doing economics through field experiments, research, data use and role playing.

The point of experiential education is for students to learn from experience. Moving beyond classroom games and simulations, work with field experiments is an increasingly popular way to impart such experience. John List (2014) offers a compelling piece describing what he views as the important role that field experiments play in how we teach economics. He provides examples of field experiments applied to factor markets, behavioral economics, and discrimination to demonstrate how this approach captures student attention and engages them in new and powerful ways. Castilla (2014) describes a course where students conduct field experiments on campus to test their theories for a behavioral economics course. The author describes substantial student enthusiasm and enhanced ability to defend their ideas and think critically.

While economists often question the ability of undergraduates to do the type of research that generates new economic knowledge, many economists who teach economics find

undergraduate research endeavors to be a vital component of undergraduate training. In a symposium of articles on undergraduate research in economics (Hoyt and McGoldrick 2017), representatives from top-tier programs describe the full range of ways in which research is incorporated into the undergraduate economics programs at Princeton (Brunnermeir 2017), Wellesley (Butcher and Weerapana 2017), Macalester (Ferderer and Krueger 2017), Dartmouth (Feyrer 2017), and Chicago (Lima and Tsiang 2017). Authors describe infusion of elements of research as early as the principles course, field courses with research components, research method courses, capstone experiences, senior theses, and undergraduate research workshops. In Archibong et al. (2017), economists from Barnard College, Carleton College and UC-Berkeley explain how they find synergies with other resources and offices on their campuses to facilitate undergraduate research for their majors.

Beyond this symposium of pieces, Dowd et al. (2015) describe efforts at Duke University to provide a consistent and interactive research experience for majors through a structured honor's thesis. Fenn et al. (2010) offer a model for undergraduates to produce publishable research and Henderson (2016) describes a capstone research experience that involves community interaction and seems effective for students of varied skill levels.

Additionally, a variety of pieces describe ways to let students get their "hands dirty" with data even though not engaging in a full-scale thesis project. Elmslie and Tebaldi (2010) describe how to teach growth theory with data, Diduch (2012) explains the use of data when teaching poverty, Singh, Guo, and Morales (2015) describe data use in a research-based development course, and McDonald and Thornton (2011) enable students to calculate gender wage gaps and derive outcomes for themselves. Suiter and Taylor (2016) catalog resources for economic educators provided by the Federal Reserve Bank of St. Louis and Mendez-Carbajo and Asarta

(2017) and Staveley-O'Carroll (2018) discuss ways to teach a variety of topics by allowing students to work with FRED data. And finally, Ball and Medeiros (2012) try to teach integrity in empirical research as they provide students engaged in undergraduate research with a protocol for documenting data management and analysis.

Another experiential approach allows students to play various roles as they wrestle with economic content. Buchs and Blanchard (2011) incorporate policy maker role-playing to explore the concept of sustainable development. And, Dalton (2010) puts students in the role of interviewer/story teller to produce personal narratives when teaching economic principles. Vehicles for the “learning by doing experience” are varied and instructors can incorporate them in many ways and settings, but the important underlying theme is that students have the opportunity to hypothesize, analyze, interpret, and create, using the tools of economists while also developing general skills such as abilities to write, present, manage time, and work with others.

Grappling with Financial Crisis

The financial crisis that began in the second half of the previous decade has lingering effects on both the economy and economic instruction. In the wake of the crisis, articles appear that offer advice to instructors on how to teach the specifics of the financial crisis in our courses such as Gärtner et al. (2011), who offer an interactive primer on the macroeconomics of financial crisis. This learning package allows students to role-play as central bankers and government policy makers and they see the various implications of financial crisis. Alternatively, Madsen (2013) uses both quantitative and qualitative analysis to chronicle the lack of significant textbook coverage of the financial crisis and provides a guide for enhancing the coverage of this major economic event. Gärtner, Griesbach, and Jung (2013) conduct a survey of undergraduate

instructors in Europe and the United States to assess the impact of the financial crisis on how they teach macroeconomics and the concepts they cover. While they find little change in the models instructors choose to present, they do find increased emphasis on financial markets and economic history.

But perhaps of greater consequence to the discipline as a whole, we find a broader discussion of paradigm as we question how to teach macroeconomics in light of the financial crisis. Colander (2010), realizing that students will want to know why the financial crisis happened and potential policy remedies, organizes a symposium consisting of insightful contributions by macroeconomic experts such as Friedman (2010), Shiller (2010), Blinder (2010), and Rajan (2010). This collection provides “some excellent guidance to macroeconomic professors on how to integrate topics on the problems that caused the crisis into our teaching of macroeconomics” (Colander 2010, 383). Additionally, Friedman (2013) and Gertler (2013) offer advice on how to analyze and discuss monetary policy in the “post-crisis” macroeconomics course. Acemoglu (2013) argues for a macroeconomics course with greater emphasis on economic growth and development, claiming it is of greater interest to students and less abstract than other topics often covered in a traditional macroeconomics class.

Technology Gets Personal and Social

As we enter the 2010s, instructional technologies in the classroom and online continue to grow in usability and sophistication. The online section of the *Journal* flourishes and it is in this decade that the *Starting Point* online teaching portal becomes available for economics instructors (Maier, McGoldrick, and Simkins 2012), allowing a substantial sharing of technique and advice on a scale not yet seen in the discipline.

A few pieces that highlight technological innovation in this decade include Bostian and Holt (2013), who describe using Veconlab along with remote response technology (clickers) to conduct experiments and simulations in class with more interaction and more complex outcomes as they demonstrate the wisdom of the crowd and the winner's curse. Also, Scott (2011) describes a lecture presentation enhanced by the use of a tablet computer to create dynamic and vivid presentations through wireless technology that allows the instructor to draw on the tablet device, project the image in real time, and then save and distribute the presentation. This technology is especially useful in a discipline such as economics that calls upon a great deal of graphical presentation.

As mentioned earlier, this decade shows a pronounced increase in data-aided instruction and this is very likely driven by improved data management software, better classroom computers, and better online connectedness for students and instructors during and after class. Additionally, students not only have access to computers on campus, most have their own laptop computer or tablet and most own cell phones. Imazeki (2014) discusses allowing the use of a student's own device (cell phone, laptop, or tablet) for remote response in class, rather than using the more limited single-task clicker device, as a means of response in polling and experiments. Cochran et al. (2015) also capitalize on the presence of sophisticated student-owned electronic devices as they describe various applications that instructors can use in class to facilitate the learning process. They provide a listing of available apps that includes how each app might be used in the economics classroom along with user ratings of app quality.

Alternative media such as blogs and podcasts become popular teaching tools for the teaching economist, and we begin to see a strong presence and pedagogical role for social media as a means for students to receive and share content. In some instances, the student takes the role

of consumer, reading a blog that might provide immediate access to the thoughts and opinions of some of the greatest minds in discipline. In other cases, the student might take on the role of producer and use social media to express their understanding and evaluate the work of others, all the while developing their ability to write and think critically. Cameron (2012, 397) describes how he uses student-generated blog posts to teach economics, stating, “blogs provide a dynamic interactive medium for online discussion, consistent with communal constructivist pedagogy.” Greenlaw (2011) provides a Web site to assist economics instructors in using social software to teach economics with blogs and wikis.

We also note articles describing the use of memes, pencasts, and podcasts for economic instruction. A meme is a concept that spreads quickly from one person to another through forums, blogs, instant messaging and various social media. They add a shot of humor and fun in presenting economic ideas and connect content to current culture. Engel, Murphy, and Fisk (2014) is an online piece describing the “Economics Memes” Web site, where teaching economists can share memes they have created or draw from a well-organized library in which memes are indexed by topic and accompanied by suggested classroom assignments. Murray (2012) describes the use of pencasts, a video of someone writing on a notebook page while describing what they are writing. These are instructor-created and intended to walk students through problems and complement face-to-face or online lectures. Murray and Nunley (2018) describe and share a Web site with pencasts they have created for six different economics courses.

Podcasts provide audio content about current events and Moryl (2014) describes an online podcast library that she has created for instructors containing over 100 economics-themed podcasts from sources such as *Planet Money*, *Freakonomics*, and *EconTalk*. The collection offers

an alternative delivery format for content for a variety of economics courses taught at varied levels with suggested companion assignments for students. Moryl (2016) goes on to extoll the benefits of student-generated podcasts as a vehicle for learning economic concepts.

In a decade when a president's preferred mode of communication seems to be Twitter, we also find many economists trying out social media such as Twitter, Facebook, and Instagram for educational purposes inside and outside of the classroom. Kassens (2014) explains that the use of Twitter, an online microblogging utility that allows for posts of up to 140 characters, offers a complement to traditional lecture. Student-generated tweets force students to express their thoughts concisely and can encourage reflection and fosters a sense of community. Al-Bahrani and Patel (2015) offer a guide to instructors for incorporating Twitter, Instagram, and Facebook inside and outside of class, using both student-generated media output and the output of economists and other producers of interest. When looking at the span of technological advance and its impact on economic pedagogy in this decade, it seems that often a thoughtful technological step forward can sometimes take educators a healthy step back to the basics of writing and critical thinking.

Learning Theory—Think Big and Learn Deep

There is a clear recognition that learning theory has the potential to enhance our understanding of why students fall short in achieving the learning goals of the major. The desire of instructors to promote deep learning and empower transfer of knowledge and skills to new situations, motivates a number of pedagogic innovations. Ill-structured problems (ones that better mirror complex problems of the real world and don't have a single correct solution) are proposed as the basis for developing critical thinking and problem-solving skills. McGoldrick and Garnett (2013, 390) develop a "big think" learning module for principles of microeconomics that "motivates

and enables student learning by moving beyond formulaic problem solving.” Intermediate microeconomics courses might be viewed as reinforcing surface learning to the extent that they are dominated by mathematical algorithms. Green, Bean, and Peterson (2013, 144) describe how they scaffold assignments, beginning with algorithmic problems and building towards those that have more ill-structured elements, in order to “promote deeper processing of course concepts.” Requiring students to act as economic advisors throughout an entire semester, reacting to real-time events and proposing and evaluating appropriate macroeconomic policy, is yet another example of how to develop deeper learning (Strasser and Wolfe 2014).

The process of “contrasting” is also a method grounded in learning theory that helps students “develop a more finely differentiated understanding of a concept” (Green et al. 2015, 33). Such comparisons can be conducted within a disciplinary concept, as when Green et al. (2015) employ assignments that contrast equilibrium with disequilibrium, or across disciplines, such as in a course that requires “students to think critically and comparatively within the context of distinguishing how sociologists and economists think about a selected set of health behaviors and outcomes” (Wade and Stone 2010, 72).

Other innovations focus on the development of skills using specific tools. For example, Joerding (2010) describes the use of software to generate unique homework assignments for each student. He argues that this approach can encourage students to develop a shared understanding of material as they discuss the assignment as opposed to the potential for simply sharing answers without any associated comprehension gains when all assignments are identical. Focusing on visual communication and processing as an important learning conduit, VanderMolen (2017) describes assigning students with the task of developing an infographic in a health research course. “Infographics are visual representations of information, data, or knowledge, which can be

an efficient way to communicate information to an audience” (p. 198). Writing continues to be a tool used to deepen student understanding and develop communications skills. However, students must learn what good writing entails (using assignments that teach evaluative skills such as with referee reports) and it requires an iterative process with constructive feedback (Schmeiser 2017).

CONCLUSION: WHERE DO WE GO FROM HERE?

This article provides one perspective of the themes that have been predominant in economic instruction throughout the first 50 years of the *Journal*. We based our review on the *Journal* as a whole, not limiting our work to articles that were strictly published in the Economic Instruction section. This broader perspective allowed us to develop a more holistic representation of instructional articles. We are cognizant of the fact that conducting such a qualitative review necessarily incorporates our own perspectives, experiences, and biases. It is our hope that we have nonetheless captured dominant themes and represented the work described therein accurately and fairly.

Our review leaves us with a number of concluding thoughts, all related to the overarching theme that we are not yet finished with our task as economic educators engaged in adapting pedagogic practices and enhancing our understanding of their effectiveness. Simply put, we must continue to evolve our practices as the world in which we teach our students changes. For example, as colleges and universities continue to enhance opportunities for community engagement, we envision students taking the lead and participating in more community-based projects. Our challenge is to ensure that their work is grounded in sound economic principles. Issues of diversity and inclusion underlie many current discussions in higher education; how might we as economic educators participate in broader higher education discussions such as

those developing inclusive pedagogic practices? We have demonstrated that technology has had a consistent presence throughout the decades, but the challenge that lies ahead is how we might be more purposeful and develop more informed, learning-centered uses of technology. And lest we be accused of ignoring the elephant in the room, we leave you with the following: we must acknowledge that lecture is still the dominant pedagogic practice in economics, but is this in the best interests of our students and if so, how might we develop even more effective lecture methods?

REFERENCES

- Abdalla, A. E. A. 1993. A country report project for an international economics class. *Journal of Economic Education* 24 (3): 231–36.
- Acemoglu, D. 2013. Economic growth and development in the undergraduate curriculum. *Journal of Economic Education* 44 (2) 169–77.
- Adams, F. G., and E. Kroch. 1989. The computer in the teaching of macroeconomics. *Journal of Economic Education* 20 (3): 269–80.
- Agarwal, R., and A. E. Day. 1998. The impact of the Internet on economic education. *Journal of Economic Education* 29 (2): 99–110.
- Al-Bahrani, A., and D. Patel. 2015. Incorporating Twitter, Instagram, and Facebook in economics classrooms. *Journal of Economic Education* 46 (1): 56–67.
- Allison, E. 1975. Self-paced instruction: A review. *Journal of Economic Education* 7 (1): 5–12.
- Archibong, B., H. Dekker, N. D. Grawe, M. L. Olney, C. Rutz, and D. Weiman. 2017. Forging on-campus connections to enhance undergraduate student reasoning, writing, and research skills. *Journal of Economic Education* 48 (4): 317–26.
- Ball, R., and N. Medeiros. 2012. Teaching integrity in empirical research: A protocol for documenting data management and analysis. *Journal of Economic Education* 43 (2): 182–89.
- Barone, C. A. 1991. Contending perspectives: Curricular reform in economics. *Journal of Economic Education* 22 (1): 15–26.
- Bartlett, R. L., and P. G. King. 1990. Teaching economics as a laboratory science. *Journal of Economic Education* 21 (2): 181–93.
- Becker, W. E. 2001. How to make economics the sexy social science. *The Chronicle of Higher Education*, December 7, B10–B11.

- Becker, W. E., and M. Watts. 1996. Chalk and talk: A national survey on teaching undergraduate economics. *American Economic Review* 86 (2): 448–53.
- . 2001. Teaching methods in U.S. undergraduate economics courses. *Journal of Economic Education* 32 (3): 269–79.
- Bergstrom, C. T., T. C. Bergstrom, and R. J. Garratt. 2013. Choosing partners: A classroom experiment. *Journal of Economic Education* 44 (1): 47–57.
- Bergstrom, T. C. 2009. Teaching economic principles interactively: A cannibal’s dinner party. *Journal of Economic Education* 40 (4): 366–84.
- Bergstrom, T. C., and E. Kwok. 2005. Extracting valuable data from classroom trading pits. *Journal of Economic Education* 36 (3): 220–35.
- Blinder, A. 2010. Teaching macro principles after the financial crisis. *Journal of Economic Education* 41 (4): 385–90.
- Bonwell, C. C., and Eison, J. A. 1991. Active learning: Creating excitement in the classroom. ASHE-ERIC Higher Education Report, Washington DC: George Washington University, School of Education and Human Development.
- Borg, M. O., and S. L. Shapiro. 1996. Personality type and student performance in principles of economics. *Journal of Economic Education* 27 (1): 3–25.
- Borg, M. O., and H. A. Stranahan. 2002. Personality type and student performance in upper-level economics courses: The importance of race and gender. *Journal of Economic Education* 33 (1): 3–14.
- Bostian, AJ, and C. A. Holt. 2013. Veconlab classroom clicker games: The wisdom of crowds and the winner’s curse. *Journal of Economic Education* 44 (3): 217–29.

- Boulding, K.E. 1969. Economic education: The stepchild too is father of man. *Journal of Economic Education* 1(1): 7–11.
- Boyd, D. W. 1993. The new microcomputer development technology: Implications for the economics instructor and software author. *Journal of Economic Education* 24 (2): 113–25.
- Braun, C. R. 2011. Capitalism in six westerns by John Ford. *Journal of Economic Education* 42 (2): 181–94.
- Breit, W., and K. G. Elzinga. 2002. Economics as detective fiction. *Journal of Economic Education* 33 (4): 367–76.
- Brooks, N., and R. Schramm. 2007. Integrating economics research, education, and service. *Journal of Economic Education* 38 (1): 36–43.
- Brunnermeir, S. 2017. Learning by doing: The challenge of engaging undergraduates in economics research. *Journal of Economic Education* 48 (4): 290–94.
- Buchs, A., and O. Blanchard. 2011. Exploring the concept of sustainable development through role-playing. *Journal of Economic Education* 42 (4): 388–94.
- Butcher, K. F., and A. Weerapana. 2017. Striving to involve undergraduates in economic research at Wellesley College. *Journal of Economic Education* 48 (4): 295–300.
- Cameron, M. P. 2012. ‘Economics with Training Wheels’: Using blogs in teaching and assessing introductory economics. *Journal of Economic Education* 43 (4): 397–407.
- Carlson, J. A., and D. W. Schodt. 1995. Beyond the lecture: Case teaching and the learning of economic theory. *Journal of Economic Education* 26 (1): 17–28.
- Carlson, J. L., R. L. Cohn, and D. D. Ramsey. 2002. Implementing Hansen’s proficiencies. *Journal of Economic Education* 33 (2): 180–91.

- Castilla, C. 2014. Field experiments in a course on behavioral economics: Nudging students around campus. *Journal of Economic Education* 45 (3): 211–24.
- Caudill, S. B., and F. G. Mixon. 1994. Cartels and the incentive to cheat: Evidence from the classroom. *Journal of Economic Education* 25 (3): 267–69.
- Caviglia-Harris, J. L., and R. T. Melstrom. 2015. Airing your dirty laundry: A quick marketable pollution permits game for the classroom. *Journal of Economic Education* 46 (4): 412–29.
- Cheung, S. L. 2008. Using mobile phone messaging as a response medium in classroom experiments. *Journal of Economic Education* 39 (1): 51–67.
- Chizmar, J. F., and A. L. Ostrosky. 1998. The one-minute paper: Some empirical findings. *Journal of Economic Education* 29 (1): 3–10.
- Cloutier, N. R., and D. A. Kaufman. 2008. Show me the money! An interactive lesson on demand, total revenue, and pricing in professional sports. *Journal of Economic Education* 39 (2): 207.
- Cochran, H., M. V. Velikova, B. D. Childs, and L. L. Simmons. 2015. Apps for economics. *Journal of Economic Education* 46 (2): 231–32.
- Cohen, A. J., and J. Spencer. 1993. Using writing across the curriculum in economics: Is taking the plunge worth it? *Journal of Economic Education* 24 (3): 219–30.
- Colander, D. 1999. Teaching Keynes in the 21st century. *Journal of Economic Education* 30 (4): 364–72.
- . 2003. Integrating sex and drugs into the principles course: Market-failures versus failures-of-market outcomes. *Journal of Economic Education* 34 (1): 82–91.
- . 2010. Introduction to symposium on the financial crisis and the teaching of macroeconomics. *Journal of Economic Education* 44 (1): 383–84.

- Considine, J. 2006. *The Simpsons*: Public choice in the tradition of Swift and Orwell. *Journal of Economic Education* 37 (2): 217–28.
- Cotti, C., and M. Johnson. 2012. Teaching economics using historical novels: Jonathan Harr's *The lost painting*. *Journal of Economic Education* 43 (3):269–81.
- Crowe, D., and J. Youga. 1986. Using writing as a tool for learning economics. *Journal of Economic Education* 17 (3): 218–22.
- Cutler, D. M. 2017. Teaching health care in introductory economics. *Journal of Economic Education* 48 (3): 218–23.
- Dalton, P. 2010. The use of narrative interview in teaching principles of macroeconomics. *Journal of Economic Education* 41 (3): 252–58.
- Davidson, L. S., and E. C. Gumnior. 1993. Writing to learn in a business economics class. *Journal of Economic Education* 24 (3): 237–43.
- Day, E. 1987. A note on simulation models in the economics classroom. *Journal of Economic Education* 18 (3): 351–56.
- Delemeester, G., and J. Brauer. 2000. Games economists play: Noncomputerized classroom games. *Journal of Economic Education* 31 (4): 406.
- Diduch, A. M. C. 2012. Using the consumer expenditure survey to teach poverty measurement. *Journal of Economic Education* 43 (1): 99–106.
- Dixit, A. 2005. Restoring fun to game theory. *Journal of Economic Education* 36 (3): 205–19.
- Dixon, R., and W. Griffiths. 2006. Survival on the *Titanic*: Illustrating Wald and Lagrange multiplier tests for proportions and logits. *Journal of Economic Education* 37 (3): 289–304.

- Dowd, J. E., M. P. Connolly, R. J. Thompson, and J. A. Reynolds. 2015. Improved reasoning in undergraduate writing through structured workshops. *Journal of Economic Education* 46 (1): 14–27.
- Elmslie, B. T., and E. Tebaldi. 2010. Teaching economic growth theory with data. *Journal of Economic Education* 41 (2): 110–24.
- Emerson, T. L. N., and B. A. Taylor. 2007. Interactions between personality type and the experimental methods. *Journal of Economic Education* 38 (1): 18–35.
- Engel, R., P. R. Murphy, and C. Fisk. 2014. Economics memes: How to use memes to teach and learn economics. *Journal of Economic Education* 45 (1): 75–76.
- Erekson, O. H., P. Raynold, and M. K. Salemi. 1996. Pedagogical issues in teaching macroeconomics. *Journal of Economic Education* 27 (2): 100–107.
- Feiner, S. F., and B. A. Morgan. 1987. Women and minorities in introductory economics textbooks: 1974 to 1984. *Journal of Economic Education* 18 (4): 376–92.
- Fels, R. 1984. Student papers on macroeconomic policy. *Journal of Economic Education* 15 (3): 237–38.
- Fenn, A. J., D. K. N. Johnson, M. G. Smith, and J. L. Stimpert. 2010. Doing publishable research with undergraduate students. *Journal of Economic Education* 41 (3): 259–74.
- Ferber, M. A. 1984. Suggestions for improving the classroom climate for women in the introductory economics course: A review article. *Journal of Economic Education* 15 (2): 160–68.
- Ferderer, J. P., and G. Krueger. 2017. Building research skills in the Macalester economics major. *Journal of Economic Education* 48 (4): 301–5.

- Feyrer, J. 2017. Undergraduate research in the Dartmouth Economics Department. *Journal of Economic Education* 48 (4): 306–9.
- Fraas, J. W. 1982. The influence of student characteristics on the effectiveness of simulations in the principles course. *Journal of Economic Education* 13 (1): 56–61.
- Frank, R. H. 2006. The economic naturalist writing assignment. *Journal of Economic Education* 37 (1): 58–67.
- Friedman, B. M. 2010. Reconstructing economics in light of the 2007–? financial crisis. *Journal of Economic Education* 41 (4): 391–97.
- . 2013. The simple analytics of monetary policy: A post-crisis approach. *Journal of Economic Education* 44 (4): 311–28.
- Fulton, M. 1997. A graphical analysis of the Cournot-Nash and Stackelberg models. *Journal of Economic Education* 28 (1): 48–57.
- Fung, K. K., and S. H. Kolar. 2004. Production and cost (short run)—Flash animation. *Journal of Economic Education* 35 (4): 417.
- Gärtner, M., B. Griesbach, and F. Jung. 2013. Teaching macroeconomics after the crisis: A survey among undergraduate instructors in Europe and the United States. *Journal of Economic Education* 44 (4): 406–16.
- Gärtner, M., B. Griesbach, F. Jung, and A. Kleiner. 2011. An interactive primer on the macroeconomics of financial crises. *Journal of Economic Education* 42 (3): 315.
- Gertler, M. 2013. Monetary policy after August 2007. *Journal of Economic Education* 44 (4): 329–38.
- Ghosh, S., and F. Renna. 2009. Using electronic response systems in economics classes. *Journal of Economic Education* 40 (4): 354–65.

- Goffe, W. L., and E. Braden. 2000. Resources for economists on the Internet. *Journal of Economic Education* 31 (1): 8.
- Goffe, W. L., and K. Sosin. 2005. Teaching with technology: May you live in interesting times. *Journal of Economic Education* 36 (3): 278–91.
- Green, G. P., J. C. Bean, and D. J. Peterson. 2013. Deep learning in intermediate microeconomics: Using scaffolding assignments to teach theory and promote transfer. *Journal of Economic Education* 44 (2): 142–57.
- Green, G. P., B. D. Kelly, D. J. Peterson, and J. C. Bean. 2015. Using integrative graphic assignments to promote deep learning of the market mechanism. *Journal of Economic Education* 46 (1): 28–44.
- Greenlaw, S. A. 1999. Using groupware to enhance teaching and learning in undergraduate economics. *Journal of Economic Education* 30 (1): 33–42.
- . 2011. Augmenting teaching and learning with social software. *Journal of Economic Education* 42 (1): 97.
- Greenlaw, S. A., and S. B. Deloach. 2003. Teaching critical thinking with electronic discussion. *Journal of Economic Education* 34 (1): 36–52.
- Grunin, L., and D. L. Lindauer. 1986. Economic analysis in plain English: A course in economic journalism. *Journal of Economic Education* 17 (3): 223–28.
- Hall, C. 1982. Giving more choice to students in economic education: Results and evaluation. *Journal of Economic Education* 13 (1): 19–31.
- Hallagan, W., and J. Donnelly. 1985. An integrated modular approach to teaching introductory economics. *Journal of Economic Education* 16 (2): 129–34.

- Hansen, W. L. 1983. Improving classroom discussion in economics courses. *Journal of Economic Education* 14 (1): 40–49.
- . 1984. Teaching the concept of demand: Another approach. *Journal of Economic Education* 15 (2): 148–56.
- . 2001. Expected proficiencies for undergraduate economics majors. *Journal of Economic Education* 32 (3): 231–42.
- Hartley, J. E. 2001. The great books and economics. *Journal of Economic Education* 32 (2): 147–59.
- Hawtrey, K. 2007. Using experiential learning techniques. *Journal of Economic Education* 38 (2): 143–52.
- Hazlett, D. 2016. A classroom experiment with bank equity, deposit insurance, and bailouts. *Journal of Economic Education* 47 (4): 317–23.
- Heavey, J. F. 1994. A simple geometry of income elasticities. *Journal of Economic Education* 25 (4): 303–8.
- Henderson, A. 2016. Growing by getting their hands dirty: Meaningful research transforms students. *Journal of Economic Education* 47 (3): 241–57.
- Hersch, J., and W. K. Viscusi. 1998. The courtroom comes to the classroom: Estimating economic damages as an instructional device. *Journal of Economic Education* 29 (4): 301–11.
- Holt, C. A., and M. Capra. 2000. Classroom games: A prisoner’s dilemma. *Journal of Economic Education* 31 (3): 229–36.
- Hoyt, G. M., and K. McGoldrick. 2017. Models of undergraduate research in economics: Advice from eight exemplary programs. *Journal of Economic Education* 48 (4): 288–89.

- Hurst, J. B., J. P. Lesage, and S. J. Weiss. 1980. The systems approach to instructional design for introductory economics. *Journal of Economic Education* 11 (2): 55–59.
- Imazeki, J. 2014. Bring-your-own-device: Turning cell phones into forces for good. *Journal of Economic Education* 45 (3): 240–50.
- Joerding, W. 2010. Teaching and learning with individually unique exercises. *Journal of Economic Education* 41 (2): 125–35.
- Joseph, M. L. 1970. Game and simulation experiments. *Journal of Economic Education* 1 (2): 91–96.
- Journal of Economic Education (JEE)*. 1972. Special report: Behavioral objectives and student learning contracts in the teaching of economics. *Journal of Economic Education* 4 (1): 43–49.
- Karlan, D. 2017. *Survivor*: Three principles of economics lessons as taught by a reality television show. *Journal of Economic Education* 48 (3): 224–28.
- Karpoff, J. M. 1984. Barter trading as a microeconomics teaching device. *Journal of Economic Education* 15 (3): 226–36.
- Kassens, A. L. 2014. Tweeting your way to improved #writing, #reflection, and #community. *Journal of Economic Education* 45 (2): 101–9.
- Kassis, M. M., D. Hazlett, and J. E. Y. Battisti. 2012. A classroom experiment on banking. *Journal of Economic Education* 43 (2): 200–214.
- Katzner, D. W. 1991. Unity of subject matter in the teaching of intermediate microeconomic theory. *Journal of Economic Education* 22 (2): 154–63.
- Kelley, A. C. 1973. Individualizing education through the use of technology in higher education. *Journal of Economic Education* 4 (2): 77–89.

- . 1983. The newspaper can be an effective teaching tool. *Journal of Economic Education* 14 (4): 56–58.
- King, P. G., and R. M. LaRoe. 1991. The laboratory-based economics curriculum. *Journal of Economic Education* 22 (3): 285–92.
- Klein, C. C. 2015. The music industry as a vehicle for economic analysis. *Journal of Economic Education* 46 (4): 403–11.
- Kourilsky, M. 1993. Economic education and a generative model of mislearning and recovery. *Journal of Economic Education* 24 (1): 23–33.
- Krynski, K. J. 1987. Women and work: A survey of textbooks. *Journal of Economic Education* 18 (4): 437–44.
- Lage, M. J., and M. Treglia. 1996. The impact of integrating scholarship on women into introductory economics: Evidence from one institution. *Journal of Economic Education* 27 (1): 26–36.
- Lage, M. J., G. J. Platt, and M. Treglia. 2000. Inverting the classroom: A gateway to creating an inclusive learning environment. *Journal of Economic Education* 31 (1): 30–43.
- Lawson, R., J. Hall, and G. D. Mateer. 2008. From ABBA to Zeppelin, Led: Using music to teach economics. *Journal of Economic Education* 39 (1): 107.
- Leet, D., and S. Houser. 2003. Economics goes to Hollywood: Using classic films and documentaries to create an undergraduate economics course. *Journal of Economic Education* 34 (4): 326–32.
- Lewis, L. Y. 2011. A virtual field trip to the real world of cap and trade: Environmental economics and the EPS SO₂ allowance auction. *Journal of Economic Education* 42 (4): 354–65.

- Lima, V., and G. Tsiang. 2017. Training young researchers: Successful strategies from University of Chicago college economics. *Journal of Economic Education* 48 (4): 310–16.
- List, J. A. 2014. Using field experiments to change the template of how we teach economics. *Journal of Economic Education* 45 (2): 81–89.
- Lovell, M. C. 1991. Sponsoring public goods: The case of CAI on the PC. *Journal of Economic Education* 22 (1): 39–53.
- Luker, W., M. Bonds, W. Black, and T. C. Holland. 1975. The quasiexperimental study of the differential impact of four delivery systems on economics understanding. *Journal of Economic Education* 6 (2): 134–37.
- Lumsden, K. G. 1970. The promises and problems of games and simulation. *Journal of Economic Education* 1 (2): 85–90.
- Lumsden, K. G., and A. Scott. 1987. The economics student reexamined: Male-female differences in comprehension. *Journal of Economic Education* 18 (4): 365–75.
- Madsen, P. T. 2013. The financial crisis and principles of economics textbooks. *Journal of Economic Education* 44 (3): 197–216.
- Maier, M. H., K. McGoldrick, and S. P. Simkins. 2012. *Starting point*: Pedagogic resources for teaching and learning economics. *Journal of Economic Education* 43 (2): 215–20.
- Manning, L. M., and C. A. Riordan. 2000. Using groupware software to support collaborative learning in economics. *Journal of Economic Education* 31 (3): 244–52.
- Marlin, J. W., Jr., and J. F. Niss. 1982. The advanced learning system, a computer-managed, self-paced system of instruction: An application in principles of economics. *Journal of Economic Education* 13 (2): 26–39.

- Mateer, G. D., L. S. Ghent, and M. Stone. 2011. TV for economics. *Journal of Economic Education* 42 (2): 207.
- McCain, R. A. 2000. Essential principles of economics: A hypermedia textbook. *Journal of Economic Education* 31 (1): 9.
- McConnell, C. R. 1983. Readability: Blind faith in numbers? *Journal of Economic Education* 14 (1): 65–71.
- McConnell, C. R., and C. Lamphear. 1969. Teaching principles of economics without lectures. *Journal of Economic Education* 1 (1): 20–32.
- McDonald, J. A., and R. J. Thornton. 2011. Estimating gender wage gaps. *Journal of Economic Education* 42 (4): 405–13.
- McGoldrick, K. 1998. Service-learning in economics: A detailed application. *Journal of Economic Education* 29 (4): 365–76.
- . 2008. Doing economics: Enhancing skills through a process-oriented senior research course. *Journal of Economic Education* 39 (4): 342–56.
- McGoldrick, K., and R. Garnett. 2013. Big think: A model for critical inquiry in economics courses. 44 (4): 389–98.
- McNown, R. F., and G. L. Hunt. 1984. An econometrics laboratory. *Journal of Economic Education* 15 (1): 71–76.
- Mead, A. C. 1998. Algebra and social security: A perfect fit. *Journal of Economic Education* 29 (1): 47–53.
- Mendez-Carbajo, D., and C. J. Asarta. 2017. Using FRED data to teach price elasticity of demand. *Journal of Economic Education* 48 (3): 176–85.

- Miller, J., and G. Weil. 1986. Interactive computer lessons for introductory economics: Guided inquiry—from supply and demand to women in the economy. *Journal of Economic Education* 17 (1): 61–68.
- Mixon, F. G. 2000. Homo economicus and the Salem witch trials. *Journal of Economic Education* 31 (2): 179–84.
- Mixon, J. W., and B. N. Hopkins. 2008. General equilibrium analysis using Microsoft Excel. *Journal of Economic Education* 39 (4): 403.
- Moryl, R. L. 2014. Podcasts as a tool for teaching economics. *Journal of Economic Education* 45 (3): 284–85.
- . 2016. Pod learning: Student groups create podcasts to achieve economics learning goals. *Journal of Economic Education* 47 (1): 64–70.
- Motahar, E. 1994. Teaching modeling and simulation in economics: A pleasant surprise. *Journal of Economic Education* 25 (4): 335–42.
- Murray, J. 2012. Pencasts for introductory macroeconomics. *Journal of Economic Education* 43 (3): 348.
- Murray, J. and J. Nunley. 2018. Econocast.net: Pencasts to supplement the undergraduate economics curriculum. *Journal of Economic Education* 49 (2): 222.
- Paden, D. W., B. R. Dalgaard, and M. D. Barr. 1977. A decade of computer-assisted instruction. *Journal of Economic Education* 9 (1): 14–20.
- Peterson, K. D. 2000. Using a geographic information system to teach economics. *Journal of Economic Education* 31 (2): 169–78.
- Phillips, J. A. 1972. Instructional objectives and economic understanding. *Journal of Economic Education* 3 (2): 112–17.

- Rajan, R. 2010. The financial crisis and the death (or hegemony) of development economics. *Journal of Economic Education* 41 (4): 398–402.
- Rodgers, Y. M. 1996. A role-playing exercise for development and international economics courses. *Journal of Economic Education* 27 (3): 217–23.
- Rouse, C. E. 2017. The economics of education and policy: Ideas for a principles course. *Journal of Economic Education* 48 (3): 229–37.
- Rousu, M. C. 2016. Broadway economics. *Journal of Economic Education* 47 (3): 268.
- Salemi, M. K. 2009. Clickenomics: Using a classroom response system to increase student engagement in a large-enrollment principles of economics course. *Journal of Economic Education* 40 (4): 385–404.
- Saunders, P. 2012. A history of economic education. In *International handbook on teaching and learning economics*, ed. G. M. Hoyt and K. McGoldrick, 3–31. Cheltenham, UK and Northampton, MA: Edward Elgar.
- Scheraga, J. D. 1986. Instruction in economics through simulated computer programming. *Journal of Economic Education* 17 (2): 129–39.
- Schmeiser, K. 2017. Teaching writing in economics. *Journal of Economic Education* 48 (4): 254–64.
- Schmidt, S. J. 2003. Active and cooperative learning using Web-based simulations. *Journal of Economic Education* 34 (2): 151–67.
- Scott, R. H., III. 2011. Tableau économique: Teaching economics with a tablet computer. *Journal of Economic Education* 42 (2): 175–80.
- Sexton, R. I. 2006. Using short movie and television clips in the economics principles class. *Journal of Economic Education* 37 (4): 406–17.

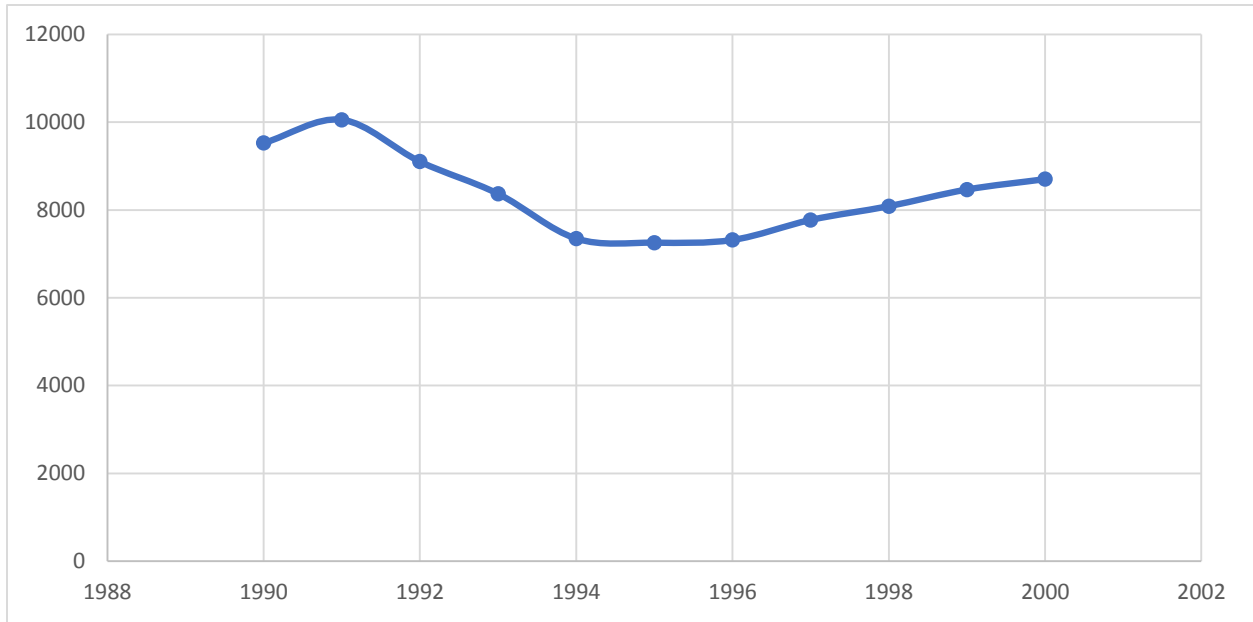
- Shiller, R. J. 2010. How should the financial crisis change how we teach economics? *Journal of Economic Education* 41 (4): 403–9.
- Siegfried, J. J. 2002. Trends in undergraduate economics degrees, 1991 to 2001. *Journal of Economic Education* 33 (3): 291–94.
- Siegfried, J. J., R. L. Bartlett, W. L. Hansen, A. C. Kelley, D. N. McCloskey, and T. H. Tietenberg. 1991. The status and prospects of the economics major. *Journal of Economic Education* 22 (3): 197–224.
- Simkins, S. P. 1999. Promoting active-student learning using the World Wide Web in economics courses. *Journal of Economic Education* 30 (3): 278–87.
- Singh, P., H. Guo, and A. Morales. 2015. A research-based development economics course for undergraduates. *Journal of Economic Education* 46 (3): 274–84.
- Solman, P. 2008. Economics of war. *Journal of Economic Education* 39 (4): 391–400.
- Soper, J. C. 1973. Programmed instruction in large-lecture courses. *Journal of Economic Education* 4 (2): 125–29.
- . 1974. Computer-assisted instruction in economics: A survey. *Journal of Economic Education* 6 (1): 5–28.
- Sosin, K. 2000. *EcEdWeb*: Economic education Web. *Journal of Economic Education* 31(3): 302.
- Sosin, K., and W. E. Becker. 2000. Online teaching resources: A new journal section. *Journal of Economic Education* 31 (1): 3–7.
- Staveley-O’Carroll, J. 2018. Integrating graphing assignments into a money and banking course using FRED. *Journal of Economic Education* 49 (1): 72–90.

- Sternberg, M. J. 1982. The use of a field-based approach to economic education. *Journal of Economic Education* 13 (2): 47–50.
- Strasser, G., and M. H. Wolfe. 2014. Learning to argue with intermediate macro theory: A semester-long team writing project. *Journal of Economic Education* 45 (3): 191–210.
- Strober, M. H., and A. Cook. 1992. Economics, lies, and videotapes. *Journal of Economic Education* 23 (2): 125–51.
- Strulik, H. 2004. Solving rational expectations models using excel. *Journal of Economic Education* 35 (3) 269–83.
- Suiter, M. C., and K. Stierholz. 2009. GeoFRED™: A picture is worth a thousand words. *Journal of Economic Education* 40 (4): 446.
- Suiter, M. C., and K. G. Taylor. 2016. Resources for economic educators from the Federal Reserve Bank of St. Louis. *Journal of Economic Education* 47 (1): 71–75.
- Swartz, T. R., W. I. Davisson, and F. J. Bonello. 1980. Why have we ignored ‘The distribution of benefits from college instruction’? *Journal of Economic Education* 11 (2): 28–36.
- Thoma, G. A. 1993. The Perry framework and tactics for teaching critical thinking in economics. *Journal of Economic Education* 24 (2): 128–36.
- Thornton, R. J. 2009. What’s your college degree worth? A research project for the labor economics course. *Journal of Economic Education* 40 (2): 166–72.
- Tinari, F. D., and K. Khandke. 2000. From rhythm and blues to Broadway: Using music to teach economics. *Journal of Economic Education* 31 (3): 253–70.
- Vachris, M. A., and C. E. Bohanon. 2012. Using illustrations from American novels to teach about labor markets. *Journal of Economic Education* 43 (1) 72–82.

- Van Horn, R., and M. Van Horn. 2013. What would Adam Smith have on his iPod? Uses of music in teaching the history of economic thought. *Journal of Economic Education* 44 (1): 64–73.
- Van Metre, D. 1976. A learning theory for economics instructional development. *Journal of Economic Education* 7 (2): 95–103.
- VanderMolen, J., and C. Spivey. 2017. Creating infographics to enhance student engagement and communication in health economics. 48 (3): 198–205.
- VanSickle, R. L. 1992. Learning to reason with economics. *Journal of Economic Education* 23 (1): 56–64.
- Velenchik, A. D. 1995. The case method as a strategy for teaching policy analysis to undergraduates. *Journal of Economic Education* 26 (1): 29–38.
- Villard, H. H. 1969. Statement of purpose. *Journal of Economic Education* 1(1): 5-6.
- Vredeveld, G. M. 1982. Economics and programmed instruction. *Journal of Economic Education* 13 (2): 14–25.
- Vrooman, D. H. 1974. The use of computers in economic education: A further comment. *Journal of Economic Education* 5 (2): 135–37.
- Wade, B. H., and J. H. Stone. 2010. Overcoming disciplinary and institutional barriers: An interdisciplinary course in economic and sociological perspectives on health issues. *Journal of Economic Education* 41 (1): 71–84.
- Walbert, M. S. 1989. Writing better software for economics principles textbooks. *Journal of Economic Education* 20 (3): 281–89.
- Walbert, M. S., and A. L. Ostrosky. 1997. Using Mathcad to teach undergraduate mathematical economics. *Journal of Economic Education* 28 (4): 304–15.

- Wasson, R. R. 1998. Guidelines for a classroom presentation on homelessness: A demand and supply curve analysis. *Journal of Economic Education* 29 (3): 212–26.
- Watts, M. 2002. How economists use literature and drama. *Journal of Economic Education* 33 (4): 377–86.
- Watts, M., and C. Christopher. 2012. Using art (paintings, drawings, and engravings) to teach economics. *Journal of Economic Education* 43 (4): 408–22.
- Watts, M., and R. F. Smith. 1989. Economics in literature and drama. *Journal of Economic Education* 20 (3): 291–307.
- Wells, D. A. 1991. Laboratory experiments for undergraduate instruction in economics. *Journal of Economic Education* 22 (3): 293–300.
- Wilkins, A. J. 1992. Facilitating the transition from graphical to algebraic models: A teaching challenge for intermediate microeconomics. *Journal of Economic Education* 23 (4): 317–31.
- Williams, A. T. 1997. Estimating the cost to consumers of the U.S. sugar quota: An exercise for introductory economics classes. *Journal of Economic Education* 28 (2): 173–81.
- Williams, A. W., and J. M. Walker. 1993. Computerized laboratory exercises for microeconomics education: Three applications motivated by experimental economics. *Journal of Economic Education* 24 (4): 291–315.
- Williams, R. B. 1993. Market exchange and wealth distribution: A classroom simulation. *Journal of Economic Education* 24 (4): 325–34.
- Winston, M. M. 2000. *EconEdLink*. *Journal of Economic Education* 31 (1): 10.
- Yates, J. 1981. Diversity as a means of individualizing instruction. *Journal of Economic Education* 12 (2): 26–33.

Ziegert, A. L. 2000. The role of personality temperament and student learning in principles of economics: Further evidence. *Journal of Economic Education* 31 (4): 307–22.



Note: Each point reflects an academic year, so 1990 shows 1990–1991, etc. (Siegfried 2002).

**FIGURE 1: Total Number of Baccalaureate Degrees in Economics
Awarded by U.S. Colleges and Universities 1990–2001**