

Humanities as Technology in Teaching the Principles of Economics

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Abstract

As we know, technology is the process we choose for transforming a set of quantitative and qualitative factors of production into one or more outcomes. In teaching economics, we most often describe this as a process of transforming inputs such as student and teacher effort, textbooks, and Powerpoint slides into student learning outcomes. The purpose of this paper is to consider the promise of humanities as technology in the teaching of the principles of economics. Three examples of employing humanities as technology are discussed. First, instructors might design examination questions that give students the opportunity to prepare responses in the form of one-act plays that are situated in the context of the work students would most wish to engage upon graduation, and that mimic the job interviews for which they are preparing. Second, we might ask students to prepare term papers in which they discover principles of economics in poetry. Third, instructors might feature philosophical tracts such as Plato's Republic or David Hume's An Enquiry Concerning Human Understanding as platforms for discussing a number of economic principles. These technologies arguably make learning economics more interesting and more permanent for students than would otherwise be the case. Such technologies could make teaching economics more interesting for faculty, as they help make teaching a course that one may teach a number of times over the years nevertheless different each term. And the technologies enable economies of scope, which is valuable since we have such a short time to both teach the economic principles and to help impart a compelling general/liberal education.

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1. Introduction

There are two overarching goals in mind when teaching the principles of economics: introducing students to economic theory and practice per se, and contributing in a compelling way to each student's liberal arts or general education. There are of course many ways to frame these goals and to assess their accomplishment in both the perspectives of faculty and students. The argument in this paper is that it is useful to frame these many ways as alternative technologies in order to leverage consideration of our humanities on their own merits with student interest in technologies. The importance of doing so is that contributing as we do to a compelling liberal arts education may not resonate appropriately in a world of technology, given the difficulty in quantifying some aspects of a successful general education. The elegance and poignancy of economic theory and practice as a liberal art may not intuitively strike technologically-minded students as relevant. As Allgood *et al.* (2015, 286) describe, an aspect of economics that makes it challenging to teach is that it draws upon content and techniques from various fields, and combines them in unexpected ways. One consequence of this peculiar place that economics holds in the undergraduate curriculum is that students may inefficiently miss the opportunity to see the full richness of why certain technologies emerge in certain eras; how technologies evolve from and through the social fabric; how path-dependencies and networks arise and unfold; and how social and economic policy shapes and is shaped by technology. Students might reasonably conclude that since technology and the humanities are typically housed in different parts of campus and appear in clearly delineated sections of the curriculum, technology and the humanities must be quite different subjects that require a choice in terms of specializing in one or the other. Current social and economic policies reinforce this perceived dichotomy by focusing upon raising student interest in the so-called STEM subjects (science, technology, engineering,

and mathematics) while students in general education subjects (particularly in the humanities) are increasingly concerned about their job market prospects. As economists and liberal artists, however, we know that technology and the humanities are more likely to be complements than substitutes, and that economies of scope may certainly arise in teaching these subjects together rather than independently. The premise of this paper is that this could be made plain to students by teaching economics with our humanities *as the technology*.

How so? Economics instructors choose from an array of technologies as they prepare for every course they teach. As a baseline technology, we rely to a large extent upon a required textbook, lectures (with or without computer-generated slides that adhere fairly closely to the textbook), examples drawn from current events, and upon examinations that often feature multiple choice questions and perhaps some written responses (the balance of which typically tips away from multiple choice questions as the level of the course increases and enrollment decreases). We combine our labor with these instruments within a production or technology function, intending to produce assessable student learning outcomes in both the short-run and the long-run. Course grades based upon examination and project-based technologies enable assessment of short-run learning outcomes. In the longer-run, we hope to instill tools for cultivating lifelong learning and for maximizing career satisfaction; the extent to which we succeed along these lines is typically assessed via alumni feedback.

The plan for this paper is to explore the promise of three concrete examples of humanities as technologies: (1) Exam questions that require responses prepared in the form of a one-act play, (2) Term paper assignments that ask students to discover economic concepts and tensions in poetry of their choice, and (3) Lectures on economic concepts as they appear in widely-studied

philosophical tracts such as Plato's Republic and Hume's An Enquiry Concerning Human Understanding.

2. The One-Act Play As Technology

Instructors might design examination questions that give students the opportunity to prepare responses in the form of one-act plays that are situated in the context of the work students would most wish to engage upon graduation, and that mimic the job interviews for which they are preparing. Students seek tangible results in our economics courses—particularly in the principles course. Being well-prepared to give informative, confident job interviews is quite tangible. Consider the following Principles of Microeconomics sample exam question:

Suppose that one year from now, you obtain a job interview at a publicly-traded company that has significant market share in a high-tech industry. There are two representatives of the firm at the interview: an engineer and a lawyer. In the form of a one-act play, please engage the interview team in a discussion of the economic aspects of firm's situation in which it may be called upon by the US Justice Department to defend its significant market share, particularly if it is engaged in mergers and acquisitions.

How might the one-act play unfold? The following is a representative response:

Mary (job candidate): "Thanks very much for meeting with me. I've happily consumed your product for many years and it is exciting to have the opportunity to discuss this job opening with you."

Engineer: "So good to meet you in person, Mary. We were intrigued by your cover letter and your internship experience."

Lawyer: "Good to meet you, Mary. Thank you for meeting with us today."

Engineer: "We feel as though our prior success is making us a target for government anti-trust scrutiny, and so a key part of this job will be to help us craft a strategy for addressing such scrutiny. We see that you had Econ 101 a few years ago. Please share with us what you learned in that class that enables you to contribute to our team."

Mary: "Thanks, right, the principles of economics course gives us a lot of insight to this challenge. I think I would start with the basic idea that the purpose of undertaking R&D in one period is to create a reduction in marginal cost of production in the next period."

This generates an increase in economic welfare, as the area of consumer surplus plus producer surplus expands.”

Lawyer: “Exactly, society is better off.”

Mary: “True, but as noted earlier, one firm’s success can drive less efficient firms from the market, such that the market shares of survivors increase. While marginal cost decreases, the surviving firms can have greater market power and static deadweight loss can increase. Deadweight loss is the area between the demand curve and the marginal cost curve that is not being capitalized by trades between consumers and firms. The median voter may not describe it as such, but this is often what draws anti-trust scrutiny.”

Engineer: “How can we successfully explain that we did not intend to capture greater market share and generate more deadweight loss, as you called it? We just tried to create the coolest product in the market. We patented the ideas that resulted from our R&D efforts, and now we are being scolded by regulators.”

Mary: “I think the main idea is to keep attention focused upon how R&D in one period is growing economic welfare in subsequent periods. I would also take care not to create anything that could be considered an unfair or unreasonable barrier to entry for other firms. I would study up on why some of your competitors left the industry, and on cases in which new competitors joined, as evidence that your firm is not unfairly restricting market access. The patents you mentioned create barriers to entry. There are other ways to carry out R&D and formalize new property rights. It might be useful to explore ways of collaborating with some industry peers on basic research, perhaps in concert with university labs or one of the national labs.”

Lawyer: “I see what you mean, Mary. One thing in our favor is that we’ve grown these products on our own; we’ve not achieved market dominance via acquisition thus far. We’ve also looked for ways of investing some of our profits into local communities. We really do want to give back to our communities, and we are hopeful that young people will keep us in mind for future careers.”

This sample question could be tweaked to ask students to solve a numerical problem in the course of the play, or to create a graph and label areas such as the consumer surplus or deadweight loss. The question could be more general, asking each student the same questions but in the context of the work they are most interested in at present. These types of questions could also include a third interviewer who asks questions that need to be addressed by the others in the play. Sometimes I like to cast a third person making a statement that is just about right but needs qualification. Or we could have someone ask about the possibility of price discrimination

as a solution to the deadweight loss arising from market power, and what form that could take. The structure of the one-act play enables students to cover the concepts specifically stated in the question, but to add discussion of concepts that they find particularly interesting in the proposed context. At the A-grade-level, this is precisely what we would like to see—both in the classroom and in the workplace. We would like to see students take advantage of opportunities to apply and extend concepts beyond the basic level—to see connections that others do not see, or to see the connections more quickly than others. This economics examination technology promotes both convergent and divergent thinking skills that are critical for our students' long-run professional development.

The one-act play examination technology emerged as a result of seeking a way of asking students what they know about various economic concepts in a manner that simultaneously gave them practice in expressing what they know in settings or contexts that mimic their individual, specific professional lives. In other words, many students agree with the idea that knowledge of economics might be useful for their general education and for their professional career; however, they tend to see economics as an abstraction from the professional work they envision doing. This reduces their interest in economics and, I would contend, the half-life of their understanding of the concepts. The one-act play technology has some features in common with DeBoer's (1998, 56) business-plan approach to teaching microeconomics, wherein having students learn microeconomics within the context of a business plan makes the concepts less abstract and therefore more accessible.

All exchanges of ideas have context—characters in roles, costumes, historical period, institutional setting (e.g. firm, household, school, place of worship), and purpose for the exchange. We each tailor our ideas for the context. Quite a lot of exchanges are oral and take

place in small-group settings. Our students will need to not only “know things” but to express those things in a compelling way—that is, with clarity, appropriate humor, and with humility. Multiple choice exams and even standard term paper assignments have their purpose, but they are not, in my experience, the most compelling expressions of what students know about economics in the professional contexts in which they will be called upon to share their knowledge. This is particularly true for students who are not Economics majors—students that comprise the vast majority of our principles students. Asking students to prepare one-act plays during exams shares some features with role-playing as a teaching technology that has been explored in a wide variety of disciplines. Jackson (2000, 1022), for example, found that the use of role-playing in analytic chemistry classes had a profound impact on students, as reported by former students years later in an alumni survey.

If students do not immediately perceive the contrast between how they are examined in college and how their knowledge is to be conveyed in professional settings, the difference becomes obvious to students on the occasion of their first professional job interviews. Students also find that practice interviews toward the end of their college years are not sufficient for the task of making this transformation between communication modes. Thus, we can provide a very valuable learning opportunity for our students while also examining their knowledge of economics by giving them regular and systematic interview practice. This could in principle occur via oral exams in every course the student engages (in economics and otherwise). However, this is would be a massive undertaking. Arguably, a close substitute is for the student to prepare what amounts to a brief, one-act play that expresses understanding of the course concepts in the professional context most interesting to the student. While this technology does not replicate the back-and-forth of a professional interview context, it does provide valuable

practice in imagining how that back-and-forth will unfold. Students who understand concepts very well know where people tend to misunderstand or misuse the concepts. They are able to create effective examples of the concept and they are able to explain implications from the use of the concepts in various contexts.

What do former students say about the one-act play format for exam questions?

“Many conversations I have with colleagues feel like real-life versions of the one-act plays from Economics classes.” Dan Irwin, Test Engineer, Google.

“At first sitting through the content and structure of the one-act play in class may seem irrelevant, but when you replicate this under pressure on an exam, you will replicate it under pressure in an interview. I enacted this during a phone interview, and I successfully progressed to the next stages.” Joshua Blondell, third-year student in Economics and Applied Statistics double major.

“I think that this type of question provides students with the opportunity to think of things in a different way. When students graduate and leave academia, business questions are not going to be as cut and dry as exam questions; so learning to approach things from different angles is helpful.” Nicole Fischer, Business Analyst, ZS Associates.

Five additional examples of one-act play format questions related to Principles of Microeconomics are as follows:

Suppose that five years from now, two colleagues in your workplace are discussing the merits of government intervention in the case in which private consumption of a product yields external or spillover benefits. Colleague Amy tells colleague Juan that when external benefits are generated, the government should subsidize private consumption. Juan says that in his judgment, subsidies create deadweight loss and should be avoided. Please join this conversation and **in the form of a one-act play**, help Juan and Amy settle this issue.

Consider the market for legal representation in a city. Suppose the supply of legal representation is upward-sloping while the demand for legal representation is downward-sloping. Suppose that the equilibrium established by the intersection of these two functions comprises 500 citizens per year who are privately demanding and receiving legal representation but that there are 600 citizens per year who are accused of crimes. Thus, suppose there are 100 citizens per year who are accused of crimes but cannot afford legal representation. The US Supreme Court ruled in 1963 (in *Gideon v Wainwright*) that in light of the Constitution’s Sixth Amendment, all persons, regardless

of income, are entitled to legal representation during criminal prosecutions. If someone accused of a crime that could result in imprisonment cannot afford an attorney, the state must provide one. Please graph this market scenario, and in the form of a **one-act play** including some neighbors, interpret its meaning in view of our Principles of Microeconomics course materials.

Suppose that three years from now, a friend is interested in starting a business that provides tutoring services to high school students in various subjects (including preparation for SAT exams). Your friend is a high school teacher and she knows multiple colleagues who are also interested in leaving their teaching positions and working at a tutoring services firm. Please meet with your friend to discuss both the cost side and the demand side of the market structure within which she will operate. During your discussion, **in the form of a one-act play**, please be sure to provide examples of fixed and variable factors of production; explain how the average variable, average fixed and marginal costs are derived from the total variable and total fixed cost; explain which of the four market structures seems like the best fit for her business, and why; and describe how she should select a profit maximizing output rate and how to compute the resulting profit or loss.

Suppose that five years from now, you and your regional manager attend a meeting at which the Chief Financial Officer stands up and says “I think our product is a very good complement to the product sold by ABC, Inc. in Hartford; I want someone to check into that and report the cross-price elasticity to me.” Everyone at the meeting nods his or her head enthusiastically, but then looks away when the CFO tries to make eye contact to secure a volunteer. **In the form of a one-act play**, please save your colleagues by stepping forward and introducing yourself; explaining what the cross-price elasticity means; and with some fictional numbers, showing how it is computed and how the results should be interpreted.

Suppose that next spring, you are able to interview for an internship or permanent position related to your current major. At the interview, time is of the essence and the busy interviewer says, “Let’s cut to the chase—describe to me what you learned in Principles of Microeconomics class that will enable us to make more money, and how will I be able to attribute that gain to you.” **In the form of a one-act play**, please engage the interviewer and steer the conversation down the path of victory.

3. Poetry as Economics Teaching Technology

Poetry is a terrific technology for teaching economics. As Davis (2015, 11) recently described, “The creative arts represent a natural way for students to learn and express their understanding of economics in a more personal and memorable way, and the evidence suggests this approach will improve learning outcomes and economic literacy.” My version of this technology was first

introduced in Wagner (2001) and was inspired by Michael Watts' papers on the use of literature and drama in economics—most notably Watts (2002). I've refined this technology in a number of directions in the ensuing fifteen years. The basic idea is that this technology enables us to examine a student's knowledge of economic principles while simultaneously encouraging the student's instinct for seeing connections and opportunities that others tend not to see. Most students do not expect to find economics course material in the seemingly unrelated context of poetry. But a good number of students surprise themselves upon doing so, responding well to the challenge of working with metaphor and simile in a compelling way. They realize early in their university experience that whatever they declare as a major, they will be in the business of discovering connections between ideas that others have overlooked heretofore.

Consider the following term paper assignment structure explained on the course syllabus:

I would like you to compose a paper that relates some of the concepts we discuss in class to a poem of your choice. The last name of the poet *must* begin with *I, J, K, or L*. [Note that these letters rotate from term to term.] One good source for poetry is www.poetryfoundation.org. Two key questions to keep in mind while writing the paper are “How am I thinking differently about this poem today than before I started this class?” and “How would I explain the economic tensions in this poem to someone who never studied economics?” More details regarding the structure of the paper are discussed in a paper I presented at an economics teaching conference in 2001, available to you at our course website; the title of that paper is “The virtues of poetry as a motivator of assessable economic education.” In addition to the details discussed there, note that your paper must be precisely four pages in length, exhibit double-spacing, twelve point font, 1” margins, and laser printing. The paper must have a cover page (in addition to the four pages of text) indicating the title of your paper, your name, course, and date, and must be presented in a neat, two-pocket folder. Please submit a copy of the poem along with your paper.

What economic concepts do students tend to discover in the poems they select? Students discover the pervasiveness—but also the subtleties—of opportunity cost; equity versus efficiency; equal outcomes versus equal opportunities; government policy intervention in

markets (e.g. price floors, price ceilings, quotas, disclosure rules, liability law, and antitrust law) and its positive and negative consequences; the extent to which cost-benefit analysis captures what we need it to capture; the challenge of commensurability in weighing one's options; and reflections of their individual and family experiences in the micro and macro economy. Students also ponder the poet's usage of the concepts—the extent to which liberties are taken with the concepts, or the extent to which they address weaknesses in the concepts that are underemphasized by economists (for instance, the nuances of rationality that have given rise to behavioral economics as an exciting research focus, and critiques of the impression that cost-benefit analysis is norm-free or value-free).

Let us now consider in a concrete way how poetry-as-technology works. Consider the following stanzas from poems by Professors N. Scott Momaday, Robert Pinsky, and Jane Hirschfield.

From “Winter Solstice at Amoxiumqua” by N. Scott Momaday, recipient of the Pulitzer Prize for Fiction in 1969:

In the dull memory of its blood
the bear discerns the swirling flakes,
and points of cold
sting its nebulous eyes.
Then, when its wild brain
can no longer conceive of the sun or moon,
the shifting fog becomes almost luminous,
and it conjures, as a gift, the village below.

This is a great poem for encouraging students to think about the basic factors of production, starting with land. Students are intrigued by the question of how our natural resource base supports our economic growth, and, in turn, how our economic growth affects our natural resource base and our environmental quality. Students also ponder how cities formed over the long course of history—where cities are located with respect to other cities and with respect to key waterways and natural resource stocks such as coal, and how trade emerged from and encouraged further economic growth. Poems like this one also provoke student thinking about diverse cultures and beliefs about appropriate ways of organizing factors of production to meet personal and social goals/needs (expressed in a principles of economics course as the fundamental economic questions of what to produce, how to produce, and for whom to produce).

From “Jersey Rain” by former US Poet Laureate Robert Pinsky:

Now near the end of the middle stretch of road
 What have I learned? Some earthly wiles. An art,
 That often I cannot tell good fortune from bad,
 That once had seemed so easy to tell apart.

This stanza from Professor Pinsky’s poem nicely motivates student thinking about the nature of preferences and utility, and about the nature of human capital. On one hand, it may seem straightforward to students to rank what they like and do not like as per the standard completeness assumption that undergirds “well-behaved” preferences. But students soon discover the perplexities that can arise in ranking goods and life opportunities that are relatively unfamiliar, or that might include impacts of consequence to others, or that might look differently to the same person over time, as our wisdom accumulates and as the context for the ranking changes. Pinsky’s observations lead students to anticipate the emergence of concepts of interest

in behavioral economics. Then, as we know, the concept of human capital entails a wide range of factors: knowledge of “how to do things”—but also degrees of self-awareness, self-assessment, and humility. Pinsky reminds us of how difficult it can be to know if we have succeeded, for apparent defeats also contribute to our character—our human capital—going forward in ways that enable greater success later. Students anticipate that the abstractions they learn in school will give way upon graduation to problem-solving with aspects that are difficult to conceptualize and appropriately weigh within a cost-benefit analysis. We want students to nevertheless recognize the strengths of thinking in an economic, or cost-benefit, manner. Finally, in recognizing that one’s life comprises ‘earthly wiles’ or an art, students have the opportunity to contemplate both the art and the science of their anticipated careers. That is, while students might be tempted at first to conceptualize their productivity—and the productivity of others—in purely technical, quantitative terms (e.g. programming skill, number of patents received, number of degrees earned), qualitative factors such as the arts of persuasion, enthusiasm, loyalty, tenacity, and artistic sensibility are readily identified by students as critical factors of success to people who they identify as icons in their professions (e.g. Steve Jobs).

From “I Imagine Myself in Time” by Guggenheim Fellow Jane Hirschfield:

And that other self, who watches me from the distance of decades,
 what will she say? Will she look at me with hatred or with compassion,
 I whose choices made her what she will be?

If we could have our principles of economics students retain a single concept forever more, it might be that there are opportunity costs to the choices we make: we cannot have more of everything. If that were somehow achievable, then arguably we do not have an economic problem. As simple as that sounds, economists know that this can be quite difficult to implement

in practice, starting in our own lives. Professor Hirschfield’s poem also enables economics instructors to emphasize one of the great challenges we face in social science, and that is that we will not have the opportunity to try a policy prescription and then try an alternative policy in the same time period. The social conditions are unique to each time period; we do not have the luxury of rolling back time and approaching the social challenge we face—whether it be poverty, environmental sustainability, public health, trade disputes, or criminal justice concerns—with a different policy. Carrying out the first policy alters the conditions that would frame a second policy attempt. Thus, we need our students to be creatively mindful of the factors that comprise opportunity costs in various contexts; to be able to describe those to non-specialists; and to be able to look into the medium-term and long-term to anticipate how to assess the performance of the policy and formulate “course corrections” when opportunity costs appear to be ignored.

What do former students say about poetry as economic education technology, years following their graduations from college?

“Having a poetry-based term paper for an Economics course was something I never expected. However, it forced me to think outside the box and be creative. In the process I learned that economics really touches all aspects of our lives. Professor Wagner had told us that many times, but I was somewhat skeptical. Now I regularly bring this notion of economics in everything into discussion no matter the topic.” Christine Longo, US Department of Homeland Security and student at George Washington University School of Law.

“I should point out that my experience changing jobs last summer closely mirrored a point I remember making in my Economics/Poetry paper from 2003 about the importance of carefully considering opportunity costs.” Dan Irwin, Test Engineer, Google.

4. Philosophical Tracts as Technology

For a third technology, economics instructors might feature philosophical tracts such as Plato’s Republic or David Hume’s An Enquiry Concerning Human Understanding as platforms

for discussing a number of economic principles. Wagner (2007) outlines the two essential economic themes in Plato's Republic: a theory of how and why cities form, and a theory of human motivation. The theory of how and why cities form that is discussed by Plato, Socrates, Plato's brother Glaucon, and others in Republic directly informs the opening chapters of Adam Smith's Wealth of Nations (summarized in Smith's pin-making example) and is strongly present in contemporary discussions of division of labor, economic globalization, and global economic fragmentation. The theory of human motivation presented in Republic (Book II) features the legend of the ring of Gyges, the theme of which students recognize not only in the modern Lord of the Rings story and blockbuster movie, but also as a strong theme in Star Wars, Star Trek, and Harry Potter books and films. The theory features both extrinsic and intrinsic motivation, presaging economists' and psychologists' interests in explaining human decision-making that features a material rewards component as well as a concern for "doing the right thing" and other-regarding concerns.

Introducing these two economic themes of considerable modern interest in the context of Plato's Republic from around 380 BC creates a powerful contrast that facilitates student insight to what is truly modern as opposed to what has been of concern to humankind for many years and in all cultures. Since 2007, I've refined the technology in a number of ways. First, I've broadened my use of Republic beyond the principles course to my Environmental Economics course and to my Industrial Organization course. In both of these upper-division courses, it is hard to overstate the importance of the division of labor and attendant specialization to the opportunities and challenges we have for devising policies in anti-trust, intellectual property, and

environmental contexts.¹ This extension of Plato's insights to my upper-division economics courses has, in turn, generated conversations that I've been able to bring back to the principles course. For instance, Holmström and Roberts (1998, 91) describe the importance of information acquisition as a driving force in modern merger and acquisition rates; rather than firms trying to generate their own new knowledge/information, firms often find that it is cost-effective to simply buy a firm that already has the specialized information of interest. These points regarding specialization—discussed a long time ago in Republic—can enrich our presentations of total product, marginal product, and the consequent cost curves in our principles courses. For a second example, I've found that Republic facilitates a good discussion of the relative importance of talent versus organization in the power of the division of labor. As Buchanan and Yoon (2002) describe, whereas David Ricardo emphasized the differences in talent between agents that could be productively harnessed in a specialized production process, Adam Smith argued that we are born as blank slates. As such, Smith anticipated that significant productivity gains could be achieved via clever organization of labor into assembly lines independent of, or in addition to, the specialized talent labor may have. This is why Smith featured the straightforward technology of pin-making as his example in Chapter 2 of *Wealth of Nations*, rather than his friend James Watt's new steam engine technology. This consideration of whether it is the number of workers or the quality of workers that determines productivity gains is raised, however, in Republic, a document with which Smith was quite familiar, featuring it in his many years of lectures on moral philosophy. Students find these specialization possibilities quite interesting in the context of the work they expect to do upon graduation, for in many ways the questions are the same today as they were in Plato's time: to what extent can we raise productivity by reorganizing our

¹ Some of the classroom materials developed along these lines are elaborated upon in Wagner (2004) and Wagner (2013).

factors into more finely divided—even fragmented—steps in an assembly line, and to which extent can we rely upon growing more skills per worker in such a process?

What do former students say about using Plato’s Republic as an economics teaching technology?

“I found it interesting and useful to tie these overarching thoughts/ principles to my econ work. Being able to think out of the box and tie thoughts together from different types of work is something that I do every day in consulting.” Nicole Fischer, Business Analyst, ZS Associates.

“Since reading Plato's Republic for Professor Wagner's class, I have found myself in numerous discussions regarding justice in later courses, law school, and my work. Having studied Plato's Republic in conjunction with economics, I have a deeper perspective on the tome and its implications for 21st century everyday life. The lessons from the course even play a part in my work at a federal law enforcement agency as we constantly face questions of what is justice and what is the perfect state.” Christine Longo, US Department of Homeland Security and student at George Washington University School of Law.

5. Conclusions and Directions for Future Research

Humanities as technology helps students see their confluence as a way to understand and explain fundamental economic concepts—and to do so in novel ways. Novelty is important, for as Ball *et al.* (2006, 446) note: “When things get dull in a chemistry class, the instructor can start a fire or blow something up. In economics, we have no interesting chemical reactions to fall back on.” Thinking of our humanities as technology also preserves the wonder of teaching the principles of economics over many years. As Professor Elzinga (2001, 251) emphasizes in his Thesis #4: “Refrigerators and lectures both need to be regularly emptied of items that have gone stale and to have fresh items put in.” In my own case, I gave my first principles of economics lecture 27 years ago. The structure of these technologies refreshes my lectures and provides unboundedly creative work by students that makes each class unique. Timeless concepts are covered in ways that are tuned to current student interests and career expectations.

Arguably these approaches enable economies of scope benefits in our dual roles as economics and general education educators. As Allgood *et al.* (2015, 294) note, only a small fraction of the more than one million economics principles students per year will pursue economics as a major. Most indeed are in our courses for a general education. Calling our students' attention to the fascinating economic content of materials more often described as being situated in the humanities rather than in the social sciences helps students gain a truly interdisciplinary experience during their brief undergraduate education. Our recognition of the synergies between our humanities and our social science materials and interests also builds important camaraderie between economics faculty and faculty in other programs within the general education framework. Strengthened camaraderie amongst the general education faculty can motivate more opportunities for co-developing and co-teaching interdisciplinary courses, as well as more opportunities for interdisciplinary research.

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