Determinants of Excellence in High School Economics: 
Lessons from the Field

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Abstract

We conduct a series of interviews with principals and teachers involved in Hawaii public high school economics education. In conjunction with earlier work by Burnett and La Croix, we discover that the traditional one-semester high school economics course is not effective in imparting economic knowledge to students. We find the importance of teacher characteristics varies – in particular, a teacher’s level of comfort with economic modes of analysis is more important when teaching economics classes than the teacher’s formal background. By contrast, we find that teacher background in economics is an important indicator of whether or not that teacher will successfully incorporate economic education into consumer education classes. In addition, we find that the stock market simulation is an effective pedagogical tool. Based on these and other findings, we present recommendations for curricula, teacher training, and further research.

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I. Introduction

It is widely believed, though little-discussed, that economic education – and, in particular, high school economic education – has significant social externalities.\(^1\) This attitude has lead to the widespread adoption across the U. S. of both elective and required high school economics courses of various types, starting in the 1960s. In the state of Hawaii, both a semesterlong senior elective and a yearlong Advanced Placement course qualify for the Social Studies graduation requirements.\(^2\) While a few schools effectively require an economics course to graduate, most offer it as one of four or more Social Studies electives, with student interest determining the number of sections.\(^3\) Elementary and high school students receive much of their exposure to economics through the infusion curriculum, a methodology which is designed to infuse economic content into the curriculum of history and other social studies courses.\(^4\) With the passage of No Child Left Behind (NCLB), interest in high school economic education has again increased; economics is identified as one of the nine “core academic subject areas.”\(^5\)

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\(^1\) For example, Boyce and Danes (1998) detail the improved saving habits of high school seniors after taking a financial literacy course. In general, however, this conclusion is more assumed than supported.

\(^2\) The State requires four years of Social Studies education for a graduating high school senior; the first three of these are near-universally taken up by a Social Studies core consisting of U.S. History, World History, Modern Hawaiian History, and Participation in Democracy. Senior year allows for electives which vary by individual school.

\(^3\) This information is based on a telephone survey of high school economics offerings conducted by Ayako Tsuchida and Michael C. Kimmitt for the Hawaii Council on Economic Education in 2005.

\(^4\) Burnett and La Croix (2005a)

\(^5\) The main effect of identification as a core area is the requirement that teachers who teach the course are required to be “highly qualified,” but outside of the requirement for a bachelor’s degree each state may modify the definition of “highly qualified,” which makes the requirement straightforward to satisfy.
This paper reports the results from the 2005 Economic Education Case Study project. In 2004, the Hawaii Council on Economic Education (the “Council”) sponsored a survey of high school seniors’ knowledge of economic concepts using a 20 question exam developed by the National Council on Economic Education and regularly used to measure such knowledge. The survey and following analysis was conducted for the purpose of determining factors that lead to successful transmission of economic concepts to students, as measured by students’ scores on the survey instrument. Preliminary analysis lead to the conclusion that the variables being used by the Council to explain student success were evocative but lacked full explanatory power. Thus, we use a case study approach to generate more in-depth information about eight of the participating schools so as to discern appropriate variables for current and future research.

We innovate on the current literature by combining a case study approach with a recent survey of student knowledge, which gives us access to qualitative and quantitative results on the same subjects. We evaluate a particular pedagogical tool – the Stock Market Simulation – in the context of heterogenous student achievement and classroom environments. Finally, we examine the effects of teacher background as expressed through differing economics course curricula.

II. Literature Review

The body of current research on high school economic education is not particularly large. This research has laid an important foundation, but there is a need to compile data for Hawaii, as the state differs from others in numerous ways. In addition to the differences in demographics and

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6 Burnett and La Croix (2005b)

7 See Becker, Greene and Rosen (1990) and Walstad (2001) for summaries of current research
culture, Hawaii schools are funded centrally, in contrast to most school districts in the continental U. S., which operate on a combination of state and local funds.

In his summary paper, Walstad (2001) states that economic enrollments increased substantially in the country during the 80’s and 90’s; he points out the increasing number of states which require economics instruction for graduation. Because it is widely believed that economic literacy causes positive externalities, state mandates have become common. In his research, Peterson (1992) discusses the self-selection problems which are inherent to this sort of work; students who have an interest in and talent for economics will enroll in an elective course, making it much more difficult to evaluate those courses’ impacts. Some research suggests that state mandated economic education may be counterproductive. Marlin (1991) posits that the mandated economic education may create the situation where “less-than-qualified teachers who have no aptitude or interest in teaching economics may be commandeered into teaching… [an economics]…course.” His research confirms the intuitive positive relationship between teacher attitudes and student achievement; as a result of this and other factors, economics courses taught in states with mandates were less effective as a whole. However, one issue in Marlin’s research is missing data (e.g. some teachers not filling out the surveys); this may have introduced a selectivity bias. Other researchers have also reported on the impact that instructor background has on students.

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9 Allgood and Walstad (1999) report on the results of training designed to compensate for a light background in economics; Bosshardt and Watts (1990) show that teacher background in Economics in the form of undergraduate coursework is an important determinant of teacher success.
The utility of high school economics courses is not well-established. Belfield and Levin (2004) examine the relationship between mandatory economic courses and overall academic performance as measured on the Scholastic Aptitude Test. They find that the average SAT score for students taking a mandated economic course is lower than the average score of equivalent students who do not. Of course, these results may or may not apply to non-college-bound students. By the same token, Beron (1990) advocates an applied curriculum rather than a theoretical one, since only students who are interested in attending college would be interested in taking a theory course. Brasfield et al. (1993) report that high school economic education is positively correlated with students’ introductory economics grades in college; however, selection bias may have driven those results. In addition, Watts (1992) reports concerns that current high school economic education may be misleading and biased toward favoring the status quo due to the lack of sufficient coverage on some topics.

Other research is more focused on overall economic achievement of high school students. A study done by Walstad (1992) points out a low level of achievement even by students who have recently completed a high school economics course. He mentions the short length of said course as possibly the most important factor. On the other hand, Tennyson and Nguyen (2001) find that schools which mandate a specific course (e.g. savings/investment and income) display

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10 Not only is it likely that students who took an economics course would be relatively interested in economics, but the presence or absence of an economics course in a high school curriculum could be correlated with the overall quality of the school.

11 Watts (1992) reports a critique that the current high school economic education “serves as an apologia for the powerful interests of big business or old money.”

12 High school students with completion of an economics course scored 61 percent correct on a multiple-choice standardized test of economic literacy.
higher achievement in students’ financial literacy. Grimes (1994) looks into the differences between public and private education. Despite the popular perception that private schools provide a higher quality education than public schools, he reports that – controlling for student ability – public schools teach economics more effectively than private schools. Statistically, third-party involvement (e.g. teachers, outside support) was shown to have a positive and significant effect in public schools while the respective involvement is insignificant in private schools.

Sosin et al. (1997) report on primary school students’ economic understanding. Although it is often argued that economics may not be understood by younger children, their results suggest that their economic literacy can be improved. Similarly, another study that focuses on younger students emphasizes the instructor’s effect on coursework and suggests standardization of the curriculum.13 Georgiou (1996) conducts research on primary schoolchildren in Maryland, but obtains a somewhat mixed result. For example, although a positive correlation was observed between integration of economics into lessons and test outcomes, the schools that integrated economics curricula associated with lower grade levels performed below the state mean.

Burnett and La Croix (2003, 2005a, 2005b) report extensively on the current status of economic education in Hawaii. In contrast to the rest of the country, Hawaii’s enrollment in economics courses has declined substantially through the 1990s. They suggest that Hawaii’s negative economic growth starved the Department of Education (DOE), Hawaii Council on Economic Education and University of Hawaii (UH) of resources during this period.14 As a result, the DOE

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13 William Bosshardt and Michael Watts (1994)

14 Burnett and La Croix 2005a
focused on “core” courses at the expense of other electives; teachers were not in a position to make use of Council support; and fewer economics majors graduated from UH (which decreased the supply of potential teachers).

III. Methodology

This study builds upon the analysis of a survey done by Burnett and La Croix (2005b). Teachers in 19 public high schools\textsuperscript{15} located on Oahu and several other Hawaiian islands administered a 20-question exam developed by the National Council on Economic Education. The surveys were conducted in a non-economics or consumer education class. The exam results did not affect students’ grades, and no compensation was paid to any student based on completion or score. Data collected on the individual students included: gender, participation in one-week or one semester economics or consumer education course, participation in a stock market simulation in high school, and plans to attend a two or four year college after graduation. Finally, the authors dropped a few observations from the sample due to evidence that students did not value performance on the exam. Preliminary results gave coefficients on some of the individual school dummies which were large and significant. We decided to investigate the school dummies, in the hopes of finding patterns which could be used both to reexamine the statistical data and inform investigations going forward.

\textsuperscript{15} 17 of the 19 schools offered economics courses at the time of the survey.
We posit that student learning of economics in high schools, as displayed by scores on the survey, would be of the following functional form:

\[
\text{Score} = f(\text{student interest and talent}) + g(\text{teacher ability and interest}) + h(\text{overall school quality}) + \varepsilon
\]

Other functional forms were posited (most notably a multiplicative approach), but these specifications were later dismissed, as they did not yield useful results.

The function of student interest and talent is only weakly observable in our data,\(^{16}\) and to the extent that it interacts with \(g(\bullet)\) and \(h(\bullet)\), it would cause bias in our coefficients. Some steps were taken to minimize this effect, but our small data set limited our abilities in this area.

Due to the exploratory nature of the work, a case study approach was used. Eight schools were selected to represent a range of results on the survey, and at each school, the principal and that school’s economics teacher were interviewed.\(^{17}\) Questions covered many areas, including: teacher background; classroom budgeting; preferred textbooks; use of content standards; and variables such as non-native English speakers, time of day for the course, and the number of teachers in the department who could teach the course. Once measures of teacher background and enthusiasm were identified, teachers at the remaining eleven schools were contacted and given brief telephone interviews.

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\(^{16}\) We were restricted to yes/no questions on whether or not the student planned to attend a two-year or four-year college.

\(^{17}\) At the time of the survey, all but two of the schools selected offered Economics as a senior elective.
The face-to-face interviews took between one half hour and two hours, depending on the interviewees’ schedule and level of interest. Each interview took place on the high school campus during the business day before, after, or between classes. Interviews with the principals were generally in a staff room, while interviews with teachers were generally in their classrooms. Responses were documented through note-taking. All interviews conformed to human subjects guidelines, and confidentiality was strictly maintained. Interviewees received no compensation for their time, and their answers were generally believed to be credible. The interview instrument can be found in Appendix I.

Some qualitative data was brought back to the regressions performed in Burnett and La Croix (2005b), using the same Average Treatment Effect (ATE) methodology described in that work. Based on that work, our literature review, and the interviews, we focused on the variables summarized in Table 1. These included proxies for school quality, student gender, proxies for teacher quality, and certain pedagogical techniques.

Each school’s students could be expected to share unobserved heterogeneity, a statistical event known as clustering. Due to the relatively small number of clusters – and the invariance of Burnett and La Croix (2005b)’s results to correction for selection and count data bias – we chose

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18 They relate, “An average treatment effect (ATE) is an average partial effect for a binary explanatory variable. \( w=1, \) treatment; \( w=0, \) no treatment. We use a stable unit treatment value assumption (SUTVA). \( \text{ATE} = E(y_1 - y_0), \) and average Treatment Effect on the Treated is \( \text{ATE}_1 = E(y_1 - y_0|w=1). \) For each student, we observe either \( y_1 \) or \( y_0, \) but never both values.”
to acknowledge our selection and count biases, rather than use econometric techniques to correct for them.

**IV. Results**

Our interviews were informative, with a wealth of anecdotal and statistical information. The variance between schools’ offerings was tremendous; one school effectively required economics of its seniors, while another had ceased offering the course in the eighteen months between the survey and the case studies. Some schools had a dedicated economics teacher with a BA or MBA, while in others, the teacher with the strongest background had a pair of undergraduate introductory classes. Many schools had business departments, which offered courses such as basic finance and marketing (and which may have incidentally conveyed economic principles). We were able to use quantitative data to augment the original regressions in Burnett and La Croix (2005b), while some data was of a more qualitative nature.

All of the teachers we spoke to were professional, candid, helpful, and very serious about attempting to meet their students’ needs. The quantitative data, combined with our survey data from Burnett and La Croix (2005b), gives us results which are summarized in Table 2.

Please note that these conclusions are based on a survey, rather than an actual application of economic knowledge, and the survey itself is a proxy for actual economic knowledge.

**IV.A. Class Structure**

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19 Seniors are required to take two Social Studies electives their senior year, and the school in question effectively had two electives available, one of which was economics.
Our analysis does not allow us to conclude that high school economics classes as currently taught in Hawaii are effective in improving student understanding of economics.\textsuperscript{20} This is a disappointing result, especially given the fact that one of the schools we interviewed required economics for graduation.\textsuperscript{21} Further, selectivity should have biased our coefficients \textit{upwards}, creating a possible spurious positive correlation.\textsuperscript{22}

We can, however, conclude that consumer education (CE) courses, in addition to whatever other benefits they may have, can increase student understanding.\textsuperscript{23} Once a CE teacher has had at least four economics courses in college, he or she improves students’ average test scores on our exam by 2-3 points (as much as 15\%).\textsuperscript{24} We posit that teachers with an economics background are successful in infusing economics education into a CE curriculum.\textsuperscript{25}

\begin{flushright}
\textsuperscript{20} See Table 2; note the small coefficient on the ECON variable and insignificance of the teacher quality variables. \\
\textsuperscript{21} See Footnote 19. \\
\textsuperscript{22} We would expect that students who take an Economics class would be students who are more interested in economics, which would logically lead to more effort in the course. In addition, our measure of student academic interest, intent to attend a four year university, was positively correlated with likelihood of taking an Economics class at the 95\% confidence level. \\
\textsuperscript{23} CE courses, not currently on the list of approved courses from the DOE, were available at the time of the survey. At this writing, the reasoning behind the decision to change designations is unclear, per author’s conversation with Department of Education officials. \\
\textsuperscript{24} It is unclear whether or not we would see selectivity bias in CE courses; our measure of student academic interest, intent to attend a four year university, was uncorrelated with whether or not a student took a CE course. If there were a bias, it would likely be downward, as CE and Economics fulfill the same requirement, and there was a sense among interviewees that students who took CE had less developed analytical skills than students who did not. \\
\textsuperscript{25} See Figure 1. The cubic form was chosen based on experimentation with several different forms; it represents, of course, a Taylor approximation of the true form taken at zero. Cubics centered around other quantities were also run, with no appreciable change in the results.
\end{flushright}
Our data serves to confirm Burnett and La Croix (2005b)’s result that a Stock Market Simulation is an effective pedagogical tool. Participation in one of the several different Stock Market Simulations offered by various teachers and schools gave an increase in average student scores of one point (5%).

In our discussions with teachers, most reported that teaching a unified economics course is very challenging for instructors, partially because of the wide variance in student backgrounds. Teachers are attempting to teach an analytic discipline to a class in which some students have difficulty with percentages and some students are taking AP calculus. The students who took economics seemed to fall essentially into two groups – college-bound seniors, and students who were looking for a consumer education course (and who found the abstract nature of the high school economics course to be uninteresting). Also, the one school which effectively required an economics course of its students did not achieve a particularly high average, despite its strong overall reputation for academic success.

Finally, we were unable to determine any patterns regarding the course structure (problem-based versus traditional) or textbooks (or lack thereof) used by teachers. Budgets for the course varied little; most schools used an informal system for managing their resources, with departments making decisions as to textbook and other large purchases. Extracurriculars were generally a function of individual teacher interest, rather than school policy.

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26 One teacher reported that he had come to the school to teach economics, but that his favorite class to teach was now geometry, because it was less frustrating to try to find the right level at which to teach.

27 This was obviously not the case for the school which effectively required economics.
Thus, we suggest the following policy, curriculum, and support changes:

1) As part of an overall reexamination of the nature of our approach to inculcating economics knowledge in our polity, create a course with a more applied curriculum (which might include such topics as interest rates and savings, risk, and how to conduct certain transactions) while still retaining a core of economics knowledge. The teachers who were successful at teaching both CE and Economics would be good resources for drafting the appropriate curriculum.

2) Promulgate the success of the stock market simulations, and suggest that teachers may find time spent experimenting with other simulations and games to be well-used.

IV.B. Teacher background and school quality

Our measure of teacher quality – the number of economics classes taken by the teacher in undergraduate work – is quite successful in predicting economic knowledge transmitted in CE classes, but was insignificant with regard to economics classes.\textsuperscript{28} Intuition tells us that enthusiastic teachers with strong pedagogical skills who have good economics backgrounds should be the most successful in imparting knowledge of economic theory and practice, but sorting out which of the three is most important for an economics course in particular has proven to be beyond the scope of our data.\textsuperscript{29} Anecdotally, the teachers who were more successful seemed to be the teachers who were \textit{comfortable} with economics, separately from their formal backgrounds. Our data set was small, so this is a fruitful area for future research.

\textsuperscript{28} See Figure 1 above.

\textsuperscript{29} Our proxy for teacher enthusiasm, a dummy for whether or not the teacher chose to teach the course, was generally both negative and insignificant. Based on this, we dropped it from our analysis.
Our proxy for school quality – the percentage of 10th graders who scored at or above Proficiency on the Hawaii State Assessment exams – was fairly effective in predicting students’ scores; for every percentage point difference between the schools, students did about 0.1 points (0.5%) better on the surveys. Burnett and La Croix (2005b) include dummy variables for the individual schools; our proxy was successful in predicting the sign on 15 of the 18.

Over the course of our interviews, it became clear that the teachers and principals to whom we spoke feel that economics seems to mix the analysis and “soft” skills associated with Social Sciences (critical reading, addressing “fuzzy” problems, looking at the big picture) with the “hard” skills of business (reducing problems to numbers, applying the results of those numbers).

New policy initiatives by the DOE and the individual high schools – most importantly the “pathways” initiative – will likely require an expansion of economics programs. Many schools do not have any teachers who are both qualified and willing to teach economics in addition to those already teaching it.

This leads us to suggest the following:

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30 Students who are interested in particular careers by the end of their 10th grade year will be steered into “pathways” – essentially, 3-course groupings associated with those careers. Students who successfully complete the pathway will receive diplomas with award notation to that effect. The three pathways discussed during interviews were Health Care, Information Technology, and Business, with the latter requiring an Economics course in all of the high schools which offered that particular pathway.
1) Consider creating a sub-certification within the Social Studies (and also within the Business) certifications for teachers qualified to teach economics in particular.

2) Reconsider how Principles of Economics courses are taught to Education majors at the University of Hawaii; if comfort with the approach is the vital factor, perhaps Education sections could be created with more of an emphasis in that direction.

3) Conduct further research on the nexus of teacher background, pedagogical skills, enthusiasm for the subject, and student interest.

IV.C. Content Standards

It was made clear during the interviews that the Content Standards published by the Department of Education formed the basis of instruction for economics courses. It is impossible to overemphasize the extent to which the Content Standards were the underpinnings of curriculum and instruction decisions. The Hawaii Content and Performance Standards (HCPS II) have recently been revised; HCPS III has just been published as of this writing. The authors have been unable to as yet evaluate the new standards. This leads us to recommend:

1) Make certain that stakeholders in Economic Education (businesses, banks, academic institutions, etc.) are thoroughly involved in the process of crafting these Standards.

2) Create standards which are of sufficiently high quality and specificity.

31 Please see Appendix II for HCPS II content standards and benchmarks relating to Economics; HCPS III standards are markedly different but were not used over the course of our survey work.
V. Policy Implications and Further Research

A rough estimate of the amount of money spent on high school economics education in the State of Hawaii comes to several million dollars per year.\textsuperscript{32,33} Yet, we cannot demonstrate conclusively that the classes are effective in teaching the subject matter for which they are designed. The implication is that a major curriculum review would be in order; this review should include a discussion of a more applied economics course which integrates economics content into a context which is more directly relevant to students’ needs.

However, before we would begin such a process, we must note that our data set suffers from its small size and the necessities of student confidentiality; it would be appropriate for institutions and stakeholders in this process to fund, in consultation with appropriate academic institutions, a larger survey with greater information on student attributes. Experimentation with different proxies for school quality – including inequality in the communities feeding into the schools – gave evocative but contradictory results which could bear fruit in further investigation. Hanging over all of our results is the specter of selectivity bias; while we can predict its direction, what is truly needed is more data.

That said, some results were strong enough to be useful to principals and teachers immediately. The consistent success of the stock market simulations of various types indicates that the simulation is an effective pedagogical tool. In addition, the success of the simulations implies that experimentation with other game style interactions may be worth the time and effort of teachers who are interested.

\textsuperscript{32} Author’s calculations, based on telephone survey above.

\textsuperscript{33} Plus, of course, the opportunity cost of the students’ time, an often-overlooked quantity.
Our anecdotal evidence suggests that principals looking to fill sections of economics classes should seek out teachers who are comfortable with the type of analysis that is inherent to economics – and that said teachers can come both from the social studies side or the business side, including the business world as a whole. We also suggest that teacher training regarding economics should emphasize an approach designed to give teachers a sense of familiarity with economic ways of thinking, rather than particular economic theories or approaches.

As heads of households and as citizens, our high school graduates continue to enter a world of ever-increasing economic complexity. We do them no service by failing to give either our college-bound students or our students entering the work force directly a basic understanding of economic principles. It is not enough to offer a course entitled “Economics.” We must make certain that the course gives insight that is useful to those seeking to actively participate in society and make well-informed decisions based on fundamental economic reasoning.
Figure 1: Change in student scores as a function of teacher background
Table 1: Summary Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Score</strong></td>
<td>11.2</td>
<td>3.7</td>
</tr>
<tr>
<td>Student score on a standardized test of economic knowledge, out of 20.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gen</td>
<td>.46</td>
<td>.50</td>
</tr>
<tr>
<td>Gender (Male = 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Econ</td>
<td>.33</td>
<td>.47</td>
</tr>
<tr>
<td>Self-report on student's having taken an Econ class (Yes = 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher*Econ</td>
<td>1.8</td>
<td>3.3</td>
</tr>
<tr>
<td>Interaction term between number of undergraduate courses a teacher has taken and Econ, max 9 courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher*Econ</td>
<td>13.9</td>
<td>29.2</td>
</tr>
<tr>
<td>Interaction term between square of undergraduate classes a teacher has taken and Econ, max 9 courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher*Econ</td>
<td>118.2</td>
<td>263</td>
</tr>
<tr>
<td>Interaction term between cube of undergraduate classes a teacher has taken and Econ, max 9 courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CE</td>
<td>.27</td>
<td>.45</td>
</tr>
<tr>
<td>Self-report on student’s having taken a CE course (Yes = 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher*CE</td>
<td>1.6</td>
<td>3.0</td>
</tr>
<tr>
<td>Interaction term between number of undergraduate courses a teacher has taken and CE, max 9 courses.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher*CE</td>
<td>11.6</td>
<td>24.9</td>
</tr>
<tr>
<td>Interaction term between square of undergraduate classes a teacher has taken and CE, max 9 courses.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher*CE</td>
<td>91.1</td>
<td>217.7</td>
</tr>
<tr>
<td>Interaction term between square of undergraduate classes a teacher has taken and CE, max 9 courses.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SMS</td>
<td>.25</td>
<td>.44</td>
</tr>
<tr>
<td>Self-report on student’s participation in a Stock Market Simulation (Yes = 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-year</td>
<td>.57</td>
<td>.50</td>
</tr>
<tr>
<td>Self-report on student’s plan to attend a four year college (Yes = 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DMath</td>
<td>1.2</td>
<td>6.7</td>
</tr>
<tr>
<td>Deviation from the sample mean of the school’s percentage of students who scored at or above proficiency on the Hawaii State Assessment exams. Used as a proxy for school quality.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nineteen schools, 487 observations.

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34 Based on the literature, the point of diminishing returns seems to be around 16 credit hours (a little over five courses). In addition, if an Economics major (8 courses at UH Manoa) is not enough to prepare one for teaching introductory high school economics, what would be? Teachers with an MBA were assigned a score of 9.

35 This is not zero due to the different sample sizes from each school; DMath is calibrated to the average school percentage, rather than the average student percentage.
Table 2: Results

<table>
<thead>
<tr>
<th>Dependent: Score</th>
<th>ATE regression, clustered by school (1)</th>
<th>ATE regression, clustered by school (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(0.4)</td>
<td>(0.3)</td>
</tr>
<tr>
<td>Gen</td>
<td>0.9***</td>
<td>0.9***</td>
</tr>
<tr>
<td>Econ</td>
<td>1.0</td>
<td>1.0***</td>
</tr>
<tr>
<td>Teacher*Econ°</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Teacher°Econ°</td>
<td>-0.2</td>
<td>-0.2</td>
</tr>
<tr>
<td>Teacher°Econ°</td>
<td>-0.2</td>
<td>-0.2</td>
</tr>
<tr>
<td>CE</td>
<td>1.6 (2.1)</td>
<td>1.7 (2.2)</td>
</tr>
<tr>
<td>Teacher*CE</td>
<td>-3.6** (1.5)</td>
<td>-3.4** (1.5)</td>
</tr>
<tr>
<td>Teacher°CE</td>
<td>1.1*** (0.3)</td>
<td>1.0*** (0.3)</td>
</tr>
<tr>
<td>Teacher°CE</td>
<td>-0.08*** (.02)</td>
<td>-0.08*** (.02)</td>
</tr>
<tr>
<td>SMS</td>
<td>1.0*** (0.4)</td>
<td>1.0*** (0.4)</td>
</tr>
<tr>
<td>4-year</td>
<td>1.3*** (0.3)</td>
<td>1.3*** (0.3)</td>
</tr>
<tr>
<td>DMath</td>
<td>0.1*** (0.02)</td>
<td>0.1*** (0.02)</td>
</tr>
<tr>
<td>Constant</td>
<td>9.3*** (0.3)</td>
<td>9.2*** (0.3)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.15</td>
<td>0.15</td>
</tr>
</tbody>
</table>

*significant at 10% level, **significant at 5% level, ***significant at 1% level
°Interaction terms between Teacher and Econ jointly insignificant.
Appendix I: Interview Instrument

Questions About the Class:

NB: This instrument contains notes about questions we would like answered. The precise wording of the questions and order in which they will be asked will depend on the ebb and flow of the interview. Every effort will be made to ensure comparability across responses.

Each question will be asked both of a member of the administration (Principal or Vice-Principal) and a teacher (an Economics teacher or the head of the Social Studies Department). They are divided into two categories solely for purposes of organization.

1) Which classes, precisely, are offered?
   Econ or Consumer Ed?
   Are some or all of the Econ courses AP courses?
   How many students take the AP?
   If so, how many students pass the AP (get a 3 or higher)?

2) How many students are in one section?
   How many sections are there?
   How have sections and numbers changed over the past 3 years?
   Why do you think you see this pattern of enrollment?

3) Which classes do you expect to offer over the next two years?
   How is that decision made?

4) Are there other teachers available to teach the course? E.g. what happens if you are unable?

5) What textbook(s)/study guides do you use, if any?
   Why do you prefer this particular book?

6) What other media do you use?
   Films
   Multimedia
   Computer Usage

7) What kind of instruction do you practice?
   Teacher-directed instruction
   Interactive Learning
   Simulations
   What kind?
   Stock Market Sim
   Small Business Sim
   Demonstrations
   Junior Achievement

8) How many years has the course been offered in its present form?
   (If less than 3) what other forms was it offered in?
Questions About the Class (cont’d)

9) What kinds of homework are assigned?
   - Project-based
   - Problem sets
   - Graphs
   - Term Paper
   - Current Events

10) Teacher background:
    - Social Studies Praxis or other form of accreditation?
    - Teacher’s major/minor in college
      - How many econ courses?
      - Which courses?
    - How many years teaching econ?
    - What challenges do you face with regard to Continuing Education?
      - Ideal time slots
      - Orgs
        - HCEE
        - FTE
        - SF Fed
        - Others
    - What other subjects do you teach?
      - Which subject is your personal focus?
      - Was teaching this course your choice or was it assigned?
Institutional Support:

NB: This instrument contains notes about questions we would like answered. The precise wording of the questions and order in which they will be asked will depend on the ebb and flow of the interview. Every effort will be made to ensure comparability across responses.

Each question will be asked both of a member of the administration (Principal or Vice-Principal) and a teacher (an economics teacher or the head of the Social Studies Department). They are divided into two categories solely for purposes of organization.

1) Is the course a school requirement?  Is it part of a list of electives to satisfy a given requirement?

2) How often is the course offered? (2 times/semester, 1/yr, etc.) Historically, over the past 3 years, how often has the course been offered?

3) What support, if any, do you receive from the DOE w/r/t economics education? Training Seminars Evaluations

4) How is the budget for the economics class set, and by whom? How does it compare to other classes?

5) If an AP class, how are the students who take the AP selected? If an AP class, how are the students who take the AP assisted? Help with scheduling “Day of” assistance with taking exams Study groups

6) How is academic success awarded and recognized? Econ Math General

7) What is the math sequence leading up to the class? (Algebra, geometry, advanced algebra, pre-calc, calc, etc.) Prerequisites Effective average math knowledge of students Variance
8) What is the English background of the students?
   Prerequisites
   Native speakers vs. non-native speakers
   Effective average knowledge of students
   Variance

9) What time of the day is the course?

10) Do you expect to make use of any online AP resources?

11) What is the overall level of student interest in the course? (sought-after, usual interest, little interest)

12) Is there a gender difference between the economics class population and the student population as a whole?

13) For students who are interested, are there economics or Social Studies: Extracurriculars? Co-curriculars?

14) How do the continuing education requirements for your economics teachers work out in practice?

15) How are content standards used in your Social Studies classes?

16) Is Economics taught, using the “infusion” paradigm, in other Social Studies courses? Do you believe that the infusion is useful?

17) What was the reasoning behind the decision to offer an Economics course? How and by whom was that decision made?
Appendix II: HCPS II

A better understanding of economics enables people to comprehend the forces that affect them every day and helps them identify and evaluate the consequences of private decisions and public policies. Economics should and can be interwoven in all subject areas for economic decisions are the basis for human activity.

<table>
<thead>
<tr>
<th>CONTENT STANDARDS</th>
<th>6 - 8</th>
<th>9 - 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIMITED RESOURCES AND CHOICE</td>
<td>• Give examples of choice and opportunity cost for individuals, business, and government.</td>
<td>• Explain why their choices and opportunity costs are subjective and explain why they differ with individuals and society.</td>
</tr>
<tr>
<td>1. Students understand costs and benefits of economic choice and use this knowledge to make sound economic decisions.</td>
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<tr>
<td>ROLE AND FUNCTION OF MARKETS</td>
<td>• Explain how the price of a good or service can cause a shortage or surplus.</td>
<td>• Compare market structures, their barriers for entry, and how they promote market efficiency and lower prices.</td>
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<tr>
<td>2. Students understand how markets function and analyze the role of prices and incentives to realize how economic interactions affect human behavior.</td>
<td></td>
<td></td>
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<tr>
<td>ECONOMIC INTERDEPENDENCE</td>
<td>• Describe and give examples of the economic interdependence among countries around the world.</td>
<td>• Analyze how the distribution of the world’s resources, political stability, and national efforts encourage or discourage trade and the flow of investment patterns.</td>
</tr>
<tr>
<td>3. Students evaluate the costs and benefits of trade among individuals, nations, and organizations to explain why trade results in higher overall levels of production and consumption.</td>
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<td></td>
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<tr>
<td>ROLE OF GOVERNMENT</td>
<td>• Explain the opportunity cost of the government providing public goods and services.</td>
<td>• Explain economic roles of the government such as providing public goods and services, redistributing income, encouraging employment, and sustaining reasonable rates of economic growth.</td>
</tr>
<tr>
<td>4. Students understand how the government influences the well being of people and institutions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECONOMIC ANALYSIS</td>
<td>• Use economic data to compare quality of life in various areas of the world.</td>
<td>• Interpret information from indices, averages, and distributions around the average to analyze economic changes and their impact on nations.</td>
</tr>
<tr>
<td>5. Students understand and use the tools of the economist to help them make informed decisions.</td>
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<td></td>
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</tbody>
</table>
References


