Evaluating the International Economic Summit:
A Research Design for Measuring Student Engagement:

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Probably everyone who has ever taught a class has experienced a situation where some students are more engaged in what goes on in the class than others. The engaged students are more attentive, excited, involved, and eager to participate. From the perspective of the instructor, it would seem that there would be a strong positive correlation between student engagement and student achievement. Although the general education literature addresses this topic, the economic education literature has not directly looked into the relationship between student engagement and student achievement. In this paper we investigate factors related to student engagement in high school economics classes in the context of evaluating the International Economic Summit (IES). We outline the design and preliminary results of a pilot study undertaken in the fall semester of 2011 to assess the effectiveness of the IES program on improving the economic knowledge of high school students. In addition to content knowledge, our pilot study also aims to explore the factors that potentially impact student engagement and may therefore contribute to the enduring popularity of the IES simulation with teachers and students.

Background: The International Economic Summit

The International Economic Summit (IES) is a world trade simulation for high school students, which teaches fundamental economic concepts within the context of international trade. Utilizing an experience-based learning model, the IES program challenges high school students to think critically about the benefits and costs of trade and to explore the multifaceted process of globalization. Throughout a ten-week curriculum, students work in teams as economic advisors to an assigned country, researching the social, political, and economic conditions in order to create a strategic plan to improve living standards for their population. The program culminates

in a Mini Summit competition at each participating school or a Regional Summit competition hosted at a local university. On the day of the summit, students implement their plans through a host of activities such as alliance negotiations, trade issue debates, flag and concept quizzes, and a trade session.

The IES program provides a comprehensive set of classroom materials and web-based resources and support for program implementation. The materials consist of 1) an extensive teacher's guide with 13 scripted lessons tied to the *Voluntary National Content Standards in Economics* (2000), detailed notes for implementing the experienced-based learning activities, and assessment guidelines; 2) a student "Player's Guide" with research and homework activities corresponding to each lesson plan; and 3) a dedicated website with the simulation rules, country profiles, and online tools for student submissions.

The IES lessons require active student involvement in each of the 13 lessons as well as participation in the culminating summit competition. Students take part in group research projects, cooperative learning activities, simulations, role-plays, and active demonstrations. Because of the active involvement and participation required of students by the IES, we believed that comparing IES classes to control classes would provide a valuable context for exploring the effects of student engagement.

Literature Review on Engagement

Student engagement in the context of learning is often referred to as a condition in which the learner is motivated to develop meaning about their experience and willingness to put forth sustained effort to that end (Rotgans & Schmidt, 2011; Blumenfeld, Kepler, & Krajcik, 2006). The interaction between motivation and interest is an important distinction as students can be

motivated about learning and school but disinterested in topics and tasks (Fredericks, Blumenfeld & Paris, 2004). A high level of student engagement involves a combination of directed motivation and sustained effort in a learning environment (Appleton, Christenson, Kim & Reschly, 2006).

Student engagement appears to be a multidimensional construct with three primary divisions that include behavioral, emotional, and cognitive engagement (Fredericks, Blumenfeld & Paris, 2004). Behavior engagement is represented by involvement in learning tasks, effort, persistence, and class participation. Emotional engagement includes the affective reactions to peers, teachers, the classroom, and school. Cognitive engagement involves investment in learning, learning goals, self-regulation, and planning (Rotgans & Schmidt, 2011).

Student engagement has been shown to be a relevant construct in explaining differences in student achievement in large, cross-sectional studies (Willms, 2000) and at the school and classroom level (Covington, 2002). These studies suggest that student engagement is a possible predictor of student achievement in a variety of settings (Walker, Green, & Mansell, 2006).

Design of Pilot Study

If student engagement is predicative of subsequent academic achievement, then what types of instructional strategies, programs, projects, and classroom and school characteristics promote student engagement? Our pilot study is designed to explore the ability of the IES program to promote student engagement and to affect academic achievement. We hypothesized that the IES program would engender engagement across all three dimensions - behavioral, affective, and cognitive- at levels greater than in the traditional classroom setting. We also

hypothesized that the greater degree of engagement would result in higher levels of student achievement.

In 2006, the Federal Reserve Bank of San Francisco (FRBSF) acquired the rights to implement the IES program throughout the nine-state 12th District[1] including producing materials, developing a web site, training teachers, and running regional large group events. By 2010, FRBSF had trained approximately 500 teachers in the IES program and reached over 100,000 students. In an effort to understand the impact of the program on student knowledge of economic content, FRBSF decided to undertake an evaluation of the IES program in fall 2011. A full-scale evaluation of the IES will take place in 2012, following analysis of pilot study results and making changes indicated by the results.[2]

In designing the pilot study we faced a number of common challenges related to evaluation of economic education programs including attempting to recruit an unbiased sample of students and teachers, incorporating valid control groups, and choosing or developing valid pre and post test instruments. In particular, we wanted our pilot study to provide a useful approach to the measure of student engagement in understanding the impact of a classroom simulation, the IES, on student achievement in economics. Identifying and measuring factors that influence student engagement in high school economics classes is perhaps new in the field of economic education.

Selection of Teachers and Students: As stated above, the IES program has been available to teachers throughout the 12th District since 2006 and has been used by a pool of over 500 teachers in all nine states comprising FRBSF's region. Because each of the nine states within

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[1] The nine states in the 12th District are Alaska, Arizona, California, Hawaii, Idaho, Nevada, Oregon, Utah, and Washington.
[2] Because the study involves human subjects, we received full approval from the Institutional Review Board at Cal State East Bay.

the 12th District has its own set of economic content standards and course requirements, recruiting from throughout the District would introduce variation that we could not easily control. As an example, Arizona, California, and Idaho require a capstone course in economics for high school graduation but the other states in the 12th District do not. In addition, because of the variation in state standards and inclusion of these standards across a variety of courses, any type of comparison across state boundaries would be difficult. To control for this variation, our sample for the pilot study includes only California teachers and students. Limiting the sample to California as opposed to another state offers advantages in that the state has a large and ethnically diverse population with rural, urban and suburban school settings. Further, while it would be interesting to compare engagement and achievement across a variety of social studies courses, we limited our sample to high school economics classes to add additional controls to the study.

The design of our pilot study involves a comparison between a traditional model of high school economics instruction and the use of the IES program. For the treatment or experimental group, we randomly selected 25 IES teachers from the pool of 165 active IES economics teachers within the state of California. Email recruiting messages were sent to each of the 25 teachers describing the research study and requesting their participation in the pilot during the fall 2011 semester. Teachers chosen to participate in the experimental group agreed to use the IES curriculum and simulation during fall 2011 and to conduct a brief online pre and post test assessment and questionnaire with their students.

For the control group, we randomly selected 25 schools from the California Department of Education 2011 school database. The control group recruiting involved contacting the Social Studies Department chair at the selected schools and requesting the name of an economics

teacher who might be interested in serving in our control group. A subsequent recruiting call was made to the named economics teacher to introduce the research study. Once a verbal confirmation was established, an email with all the study details was sent to each of the control group teachers.

Eighteen teachers from throughout California initially agreed to participate in the fall 2011 pilot study, with a final cohort of five experimental and three control groups submitting pre test and questionnaire data.[3] All participating teachers were provided with explicit instructions for administering the pre test and questionnaire and sent a link to access the online pre test and questionnaire. The experimental group would be expected to complete the IES program during the course of the fall semester and the control group students would participate in their regular economics curriculum. Each teacher was offered a $300 consulting fee upon completion of the post test assessment and questionnaires by both their students and themselves.

Design of Pre and Post Tests and Surveys: The online pretest consists of a subset of 20 questions from Form B of the 40-question *Test of Economic Literacy* (TEL; Walstad and Rebeck 2001). The post test consists of parallel questions from the TEL Form A. The 20 questions were selected to correspond to each of the 20 Voluntary National Content Standards in Economics.[4] In the cases where more than one TEL question existed for a given standard, the pretest question was randomly selected from the available questions. Twenty questions were used rather than the full 40-question TEL to save time for students and to likely increase the probability that students would complete the instruments. Teachers were asked to administer the tests in a lab setting to monitor students to ensure that they did their own work.

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[3] The 10 teachers who initially agreed to participate but later dropped out did so for a number of reasons, the most common being changes in teaching assignments.

[4] The exception to each pretest question corresponding to one of the Voluntary National Standards is that TEL does not have a Form B question for Standard 17 (government failure, special interest groups). The corresponding Form B question is classified under Standard 5 (voluntary exchange & trade.)

The pretest was accompanied by a 16-question online survey that includes questions about student demographics, learning styles, and factors addressing engagement. The pre-class student survey or questionnaire is attached to this paper as **Appendix A**. Information is collected relating to age, sex, grade in school, race or ethnicity, preferred language, plans after high school, high school GPA, parent's education, and prior economics studied. Questions 13 and 16 on the pre-class survey are designed to capture information about expected engagement before the class begins. Involvement and time outside of class addressed cognitive engagement. Attitudes toward economics (whether it will be a favorite subject, anticipated excitement, and interest in current course, future course, and college major) addressed affective engagement. Behavioral engagement was addressed by discussing the course with family and friends outside of class.

The post-class student survey is attached as **Appendix B**. The first five questions are included to match pre and post responses. The remaining questions are related to engagement, and most are parallel to questions on the pre-class student survey. The parallel nature of the questions will allow comparison of expected engagement before the class with self-reported engagement after the class. New questions added to the post-class survey address other factors related to engagement by asking students about enjoyment of school and economics, whether they have studying strategies to try to address learning problems, whether they were intentionally disruptive in class, and class attendance.

Teachers are also asked to respond to an online survey or questionnaire containing 26 questions (control teachers) or 27 questions (experimental teachers.) The teacher survey is attached as **Appendix C**. We ask for information about teaching experience and background in economics, teaching style, and goals and barriers to teaching economics. In question 12 we

address teacher engagement in the economics class by asking questions similar to those asked to students relating to excitement, involvement, and interest in teaching economics. Because we are assessing the effect of the IES curriculum on student achievement, we ask experimental teachers how much of the curriculum was covered in the class in the study. We ask control teachers about the conduct and structure of their class to determine what teaching methods were emphasized.

Engagement Model and Confirmatory Factor Analysis

A confirmatory factor analysis (CFA) was used to assess the hypothesized factor structure of the engagement questions included in the student pretest questionnaire. CFA is a theory-driven technique designed to confirm the structure of an existing model (Schmitt, 2011; Schreiber, Nora, Stage, Barlow & King; 2006; Williams, Eaves & Cox, 2002). For the pilot study we included a small set of questions to measure students' expectations about their level of engagement in studying economics. Models of student engagement suggest a multidimensional structure and following this literature, we developed three plausible models to submit to a confirmatory factor analysis. The first model hypothesized a single dimension for student engagement, the second was an uncorrelated two factor model, and the third was a correlated three factor model. Using previous research and existing theory, we hypothesized that the three factor model would provide the best fit for the data. CFA was used to determine which of the three models of engagement represented the best fit for the pilot data. The theoretical model is presented in **Figure 1**.

The engagement section of the student questionnaire consisted of nine questions[5] measured on a five-point Likert scale. The means and standard deviations are shown in **Table 1**.

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[5] The nine questions are the eight parts of question 13 on the student questionnaire and question 16.

To assess the internal consistency of the nine items, Crohbach's alpha was computed for the entire set and for three subsets indicated by the three-factor theoretical model. The coefficient alpha for the full set was .83, indicating good reliability (Gregory, 2011). The coefficient alphas for the three subsets were .82, .70, and .38 respectively for the subsets of Affective, Behavioral, and Cognitive engagement.

The three models were tested using CFA to evaluate construct validity using Stata 12.0 (StataCorp, 2011). The full set of engagement questions was used to estimate Model 1, the single factor model in which student engagement is considered to be a one-dimension construct. Model 2, representing a two-factor structure, split the nine engagement questions into two subsets hypothesized to create the constructs of affect and cognition. Model 3, the correlated three-factor model, divided the engagement questions into three subsets hypothesized to form the constructs of affect, behavior, and cognition. **Table 2** displays the correlations for the observed variables used in constructing the three models.

The results of the confirmatory factor analysis were analyzed using several criteria as recommended in the CFA literature (Jackson, Gillaspy & Purc-Stephenson, 2009; Schmitt, 2011). Several statistical tests exist to determine the goodness of fit for a given model and best practices suggest using multiple criteria to evaluate the relative strength of a model (Williams, Eaves & Cox, 2002). We selected five measures on which to evaluate our three models that included the traditionally reported chi-squared likelihood ratio statistic, the comparative fit index, CFI, root mean square error of approximation, RMSEA, and two residual-based measures, the standardized root square mean residual, SRMS and the coefficient of determination, CD. The use of the chi-squared test for evaluating model fit is somewhat problematic due to the sensitivity of chi-squared to sample size, however it demonstrates the changes in model fit for the three

specifications. Acceptable values for the four other criteria include: RMSEA values between .05 and .08; CFI > .90, SRMR < .08; and CD > .95.

The summary of the chi-square and goodness of fit statistics for all three models appear in **Table 3**. Model 3 provides the best fit of the pilot data. The chi-square statistic for Model 3 ($\chi^2 = 298$, $p < .001$).showed improvement when compared to Model 1 ($\chi^2 = 377$, $p < .001$) and Model 2 ($\chi^2 = 326$, $p < .001$), note that the significance level of the test is not interpreted due to the large sample size (Schmitt, 2011; Williams, Eaves & Cox, 2002). The RMSEA lower bound value of .13 indicated a poor fit for Model 3, although the CFI of .867, SRMR of .058, and CD of .956 were somewhat supportive of the hypothesized model. Unstandardized parameter estimates for Model 3 are provided in **Figure 2;** standardized and unstandardized estimates for Model 3 are shown in **Table 4**.

Based on the results of the confirmatory factor analysis above, an engagement scale was constructed based on the three theorized dimensions of student engagement. The engagement score was represented by the sum of the means of affective, behavioral, and cognitive scores for each participant. **Table 5** summarized means and standard deviations for each subset (affective, behavioral, and cognitive) and total score. No significant differences in overall engagement were found across groups based on gender and race, $t(627) = .24$, $p = .81$, $F(6, 628) = .96$, $p = .44$, respectively. We did find a significant difference between the control group ($M = 8.98$, $SD = 0.12$) and IES group ($M = 9.57$, $SD = 0.07$).

Preliminary Results from Pilot Student Pretests and Pre-class Surveys[6]

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[6] At this time we have received complete pretests and student surveys from a total of 644 students (379 experimental and 265 control students) from the eight teachers in our pilot study. Because the fall school semester usually extends into January, post tests, post-class student surveys, and teacher surveys will be collected in January.

Table 6 shows descriptive statistics from the pretest and pre-class student survey broken down into the experimental (IES) students and the control students. It is immediately evident that these groups are different from one another. The IES students score significantly higher on the pretest, are significantly less likely to be from a racial or ethnic minority group, and are more likely to choose English as their preferred language. The IES students self-report significantly higher GPAs, are significantly more likely to have a parent who graduated from college, and expect to earn higher grades in the class. In terms of the engagement-related questions, the IES students at the beginning of class are less likely to expect economics to be one of their favorite subjects and less likely to expect to major in economics. However, they expect to be significantly more involved in the class than their control counterparts, and expect to spend more time out of class preparing for their economics class.

The differences between the IES students and the randomly selected control students are perhaps not surprising. IES teachers self-selected to conduct the IES program, which takes a lot of commitment on the part of both the teachers and their students. To compete successfully in a regional summit, it is advantageous to have students who are motivated and committed to the program and who excel in their high school education in general. Students with these characteristics may be more likely to have the demographic characteristics displayed by the IES students in our sample. Teachers in schools with students with these characteristics may be more likely to participate in the IES program than are other teachers.

An investigation of the relation of the engagement factors to the pretest scores (not broken down into experimental and control groups) in most cases shows little correlation

between them.[7] (This is not surprising, as we would expect more effects on change scores or posttest scores.) An exception is shown in **Figure 3A**, which shows that students who expect to earn an A in the class score significantly higher on the pretest than students who expect to earn other grades. **Figure 3 B** shows that students who plan to prepare and study about four hours per week outside of class have significantly higher pretest scores than others, including those who plan to spend five or more hours per week studying and preparing. Those who plan to study five or more hours per week may include weaker students who have to try harder to get by.

Other student survey questions related to engagement and average pretest scores are shown in **Figure 4**. In the cases of anticipated excitement, favorite subject, involvement, interest, and talking with friends (where one is low and five is high) students who exhibit the very least engagement-related intentions in most cases score lower on the pretest than others. (However, in some cases the number of students in the very low categories is small.) Students who strongly agree that they are excited about taking economics score significantly higher on the pretest than those who strongly disagree. Students who agree that they expect to take future courses in economics have significantly higher pretest scores than those who disagree or strongly disagree with the statement. Beyond that, there are no other significant differences in expected engagement and pretest scores.

If the pretest results extend to the posttest and change scores in the full study, it may be that a minimum level of engagement is necessary for higher achievement, but that once this threshold is achieved more engagement does not promote higher achievement. As validated by other studies in the economic education literature, **Figure 5** shows a strong correlation between the pretest score and student (self-reported) GPA.

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[7]Significance levels were found using ANOVA and Tukey's test.

Future Evaluation Plans

For the full study following the pilot study, effort must be made to recruit more teachers for both the experimental and control groups. Because of the overall 33 percent response rate from the randomly selected teachers, more that 25 teachers for each group (and perhaps all 165 of the active California IES teachers) should be invited to participate. Because of the significant differences between the IES and control group students, control group teachers should be recruited from similar socioeconomic areas as the IES teachers. The results of the factor analysis on engagement that also show significant differences between pre-class expected engagement also points to the necessity of recruiting better-matched classes to test the effects of the IES program. Better-matched control group classes can be recruited using census zip code data or the California Department of Education database.

Future evaluations plans will include regression analysis comparing pre and posttest scores and controlling for demographic information collected in the student surveys. Student and teacher questionnaires may be revised so that questions more directly reflect the three dimensions of engagement. We will further investigate how teacher characteristics affect student achievement. Both teacher and student engagement factors will in included in regressions. We will investigate developing an index of engagement and using an instrumental variables approach.

Conclusions

This paper has described the research design of a pilot study to measure the effects of student engagement on student achievement in high school economics classes, in the context of evaluating the IES. The IES is a world trade simulation for high school students currently

conducted through the Federal Reserve Bank of San Francisco. The literature on engagement finds engagement to be multi-dimensional with cognitive, affective, and behavioral dimensions.

Our pilot study consisted of eight teachers and 644 students in California economics classes during fall, 2011. Five teachers and 379 students were in the experimental group and three teachers and 265 students were in the control group. Data from student pre-class questionnaires and pretests were analyzed in preparation for conducting a full study in spring 2012. Few significant correlations were found between student pretest scores and expected engagement in economics classes. Effects of engagement on posttest scores and changes scores, and changes from pre and post class engagement will form the basis of the full study.

Results from a confirmatory factor analysis on our engagement model and from an analysis of engagement factors and pretest scores both show that control group students were significantly different from experimental group students in our pilot study. Because the control group students in the pilot study exhibited significantly different characteristics from the experimental group students, care must be taken to select similar students for the full study.   If engagement can be measured and is found to affect student achievement, the next step is to identify and promote the curricula, materials, and teaching approaches that encourage engagement in high school economics classes.

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Tables and Figures
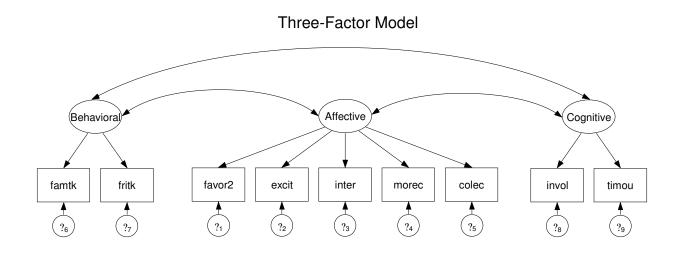
Figure 1. Hypothesized Model Structure

Three-Factor Model

Table 1. Engagement Questions: Means, Std Devl, Min and Max					
Variable	Obs	Mean	Std. Dev.	Min	Max
excit	644	3.559006	0.873631	1	5
favor2	639	3.112676	0.91306	1	5
inter	639	3.680751	0.855439	1	5
morec	640	2.879688	0.960679	1	5
colec	640	2.117188	0.975611	1	5
famtk	641	3.124805	1.051796	1	5
fritk	640	2.979687	1.029104	1	5
invol	641	3.943838	0.815838	1	5
timou	644	2.427019	1.203656	1	5

Table 2. Correlations of the Observed Variables

	excit	favor2	inter	morec	colec	famtk	fritk	invol	timou
excit	1								
favor2	0.6628	1							
inter	0.6039	0.5093	1						
morec	0.4882	0.5696	0.4211	1					
colec	0.3153	0.4499	0.2759	0.6102	1				
famtk	0.4028	0.3601	0.458	0.4184	0.2836	1			
fritk	0.3786	0.3865	0.3775	0.4438	0.3414	0.5277	1		
invol	0.4689	0.3419	0.5392	0.2812	0.1772	0.3341	0.3171	1	
timou	0.1734	0.1398	0.1697	0.1998	0.1114	0.2025	0.2249	0.2446	1

Table 3. Chi-Square and Goodness-of-Fit Indices for Tested Models

Factor Model	df	$\chi2$	RMSEA	CFI	SRMR	CD
One-factor	27	378	0.144	0.827	0.066	.871
Two-factor	27	326	0.136	0.852	0.062	.925
Three-factor	27	298	0.135	0.865	0.058	.956

Note: CFI = RMSEA = root mean square error of approximation, CFI - comparative fit index, SRMR = standardized root mean square residual, CD = coefficient of determination

Figure 2. Model 3, Parameter Estimates, Unstandardized

Three-Factor Model

Table 4. Standardized and Unstandardized Coefficients for Model 3

Observed Variables	Latent Construct	b	B	SE
excit	Affective	0.80	0.96	0.05
favor2	Affective	0.78	1.0	
inter	Affective	0.71	0.84	0.05
morec	Affective	0.70	0.93	0.04
colec	Affective	0.53	0.72	0.04
famtk	Behavioral	0.78	1.0	
fritk	Behavioral	0.71	0.95	0.07
invol	Cognitive	0.73	1.0	
timou	Cognitive	0.35	0.7	0.11

Table 5. Engagement Scales: Means, Std Dev., Min and Max

Variable	Observations	Mean	Std. Dev	Min	Max
affsco	632	3.073734	0.698702	1	5
behsco	639	3.054773	0.907633	1	5
cogsco	641	3.185647	0.808556	1	5
totalsco	629	9.331797	1.912715	3	15

Table 6: Student Pretest and Pre-class Survey Responses (selected questions)

	Experimental (IES) Mean [std dev]	Control Mean [std dev]	t (sig)
TEL 20 question pretest	9.99 [3.89]	8.49 [3.37]	5.07*** (.000)
Male	.499 [.501]	.509 [.501]	-0.27 (.789)
White	.232 [.423]	.049 [.216]	6.48*** (.000)
Communicate better in a language other than English	.008 [.089]	.053 [.224]	-3.53*** (.000)
Plan to attend 4-year college or university[1]	.745 [.436]	.693 [.462]	1.42 (.156)
Self-reported high school GPA	3.20 [.61]	2.82 [.55]	7.97*** (.000)
Parent graduated from college[2]	.380 [.486]	.380 [.322]	7.70*** (.000)
Took an economics class before	.021 [.144]	.026 [.161]	-0.44 (.661)
Excited about studying economics[3]	.604 [.490]	.562 [.497]	1.063 (.288)
Expect an A in economics class	.670 [.471]	.423 [.495]	6.43*** (.000)
Expect economics favorite subject[3]	.277 [.448]	.346 [.477]	-1.88* (.061)
Expect to be involved[3]	.809 [.394]	.727 [.446]	2.45** (.015)
Expect to be interested[3]	.676 [.468]	.630 [.484]	1.22 (.223)
Expect to talk to family a lot about class[3]	.378 [.486]	.338 [.474]	1.03 (.302)
Expect to talk to friends a lot about class[3]	.316 [.465]	.270 [.445]	1.24 (.214)
Want to take more economics[3]	.241 [.428]	.240 [.428]	0.05 (.958)
If go to college, plan to major in economics[3]	.053 [.225]	.098 [.299]	-2.189** (.029)
Expected time spent out of class on economics[4]	2.63 [1.21]	2.14 [1.14]	5.24*** (.000)
Lectures helpful in learning[3]	.299 [.458]	.347 [.477]	-1.29 (.197)
Discussions helpful in learning[3]	.569 [.496]	.515 [.501]	1.35 (.177)
Games/simulations helpful in learning[3]	.590 [.492]	.629 [.484]	-0.98 (.329)
Creative activities helpful in learning[3]	.692 [.462]	.692 [.462]	-0.01 (.991)
Group cooperative learning helpful in learning[3]	.663 [.473]	.643 [.480]	0.54 (.591)
	n = 379	n= 265	

* significant at .10 level
** significant at .05 level
*** significant at .01 level

[1] Identified option as "likely" or "very likely"
[2] At least one parent graduated from a 4-year college or has a graduate degree
[3] Selected "agree" or "strongly agree"
[4] For average, calculated "1 hour per week or less" as 1, "5 or more hours per week" as 5.
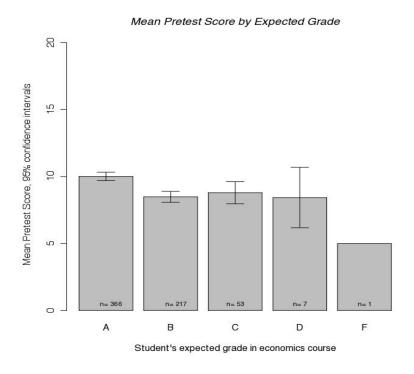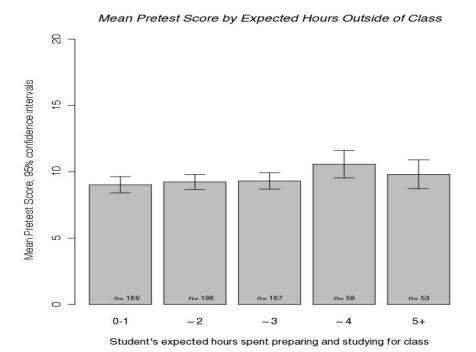
Figure 3 A:

Mean Pretest Score by Expected Grade

Figure 3 B:

Mean Pretest Score by Expected Hours Outside of Class

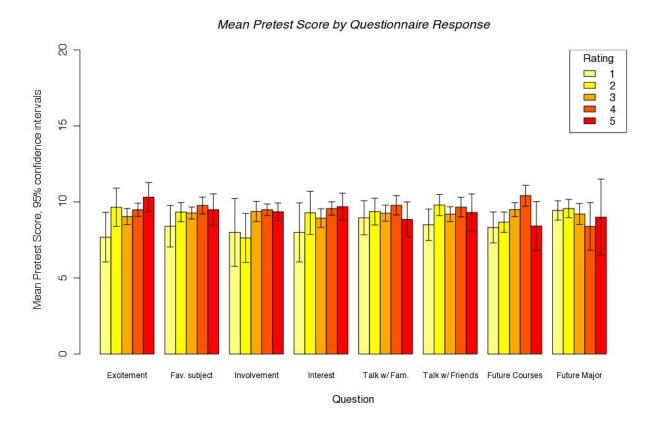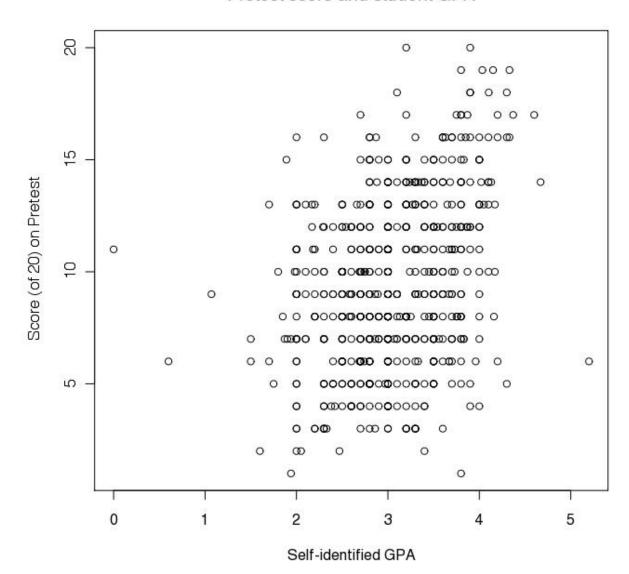**Figure 4**:

Mean Pretest Score by Questionnaire Response

Figure 5:

Pretest score and student GPA

Appendix A: Pre-class Student Survey

The Federal Reserve Bank of San Francisco (FRBSF) and California State University, East Bay are studying how to help high school students learn about economics. We invite you to take part in our project! Your participation involves two parts. Today, we ask you to complete a short questionnaire and take a pretest about economics. Toward the end of your course, you will take a post test and answer a few additional survey questions. We ask that you agree to release your responses and scores to the FRBSF. There are 16 questions on this questionnaire and 20 multiple-choice questions on the pretest. Your participation in this project is voluntary, and results will remain entirely anonymous. Any identifying information about you will be used only to match your pre- and post-test responses, after which it will be promptly deleted. If you respond to the questionnaire, we assume you are agreeing to participate in the project, and we thank you very much.

If you have any questions or feedback about this study, you may call:
-Jody Hoff (Manager of Economic Education) at the FRBSF: (415) 974-2952
-Jane Lopus, PhD (Professor of Economics) at Cal State East Bay: (510) 885-3140
-The Office of Research and Sponsored programs at Cal State East Bay: (510) 885-4212.

1. Select the first two letters of your last name. For example, a student named James Lee should choose "L" and "E".

2. What is your date of birth?

3. Please enter your 4-letter teacher code here. Your teacher will provide you with this information. (Hint: If you've forgotten your code, it is the first two letters of your teacher's last name and the first two letters of your school.)

4. Sex

Male / Female

5. Grade in school

9 / 10 / 11 / 12

6. How would you describe your race or ethnicity? Choose all that apply.

Asian / Pacific Islander / Black or African American / Latin American / Hispanic / Chicano / Native American / Alaskan native / Arab / Iranian / White / Other (please specify

7. I communicate...

better in English than in another language. / better in another language than in English. / equally well in English and another language.

8. How likely is each of the following options for you after high school?

[1(extremely unlikely), 2 (unlikely), 3 (neither likely nor unlikely), 4 (likely), 5 (extremely likely)]

Finding a full-time job / Enlisting in military service / Enrolling in a vocational / technical school / Enrolling in a degree program at a two-year community college / Enrolling in a degree program at a four-year college or university / Other

[Optional open-ended response] If you have an "other" option in mind, please describe

9. What grade do you expect to earn in this high school economics class?

A / B / C / D / F

10. What is your high school grade point average (GPA)? (For example, 2.7)

11. Which of the following describes the highest level of education achieved by your mother or father (whichever parent went the furthest in school)?

did not finish high school / graduated from high school / attended some college / graduated from a two-year college / graduated from a four-year college / has an advanced degree (MA, PhD, MD, etc.) / I don't know.

12. Have you studied economics before, prior to the class that you are now taking? Choose the statement that best applies to you.

No, I have never studied economics before. / Yes, I took an economics class before. / Yes, I have studied economics in other classes, but I have not taken an economics course before.

13. How strongly do you agree with each of the following statements? *[1(strongly disagree), 2 (disagree), 3 (neither agree nor disagree), 4 (agree), 5 (strongly agree)]*

I am excited about studying economics.

I think economics will be one of my favorite subjects.

I expect to be very involved in class assignments and projects in my economics class.

I expect to be very interested in my economics class.

I expect to talk to my family a lot about my economics class.

I expect to talk to my friends from outside the class a lot about my economics class.

I want to take more economics courses in the future.

If I go to college, I want to major in economics.

14. Here is a list of some different materials that might be used in high schools. How useful do you think each of the tools would be in helping you to learn in your class? *[1(not at all useful), 2 (a little useful), 3 (useful), 4 (very useful), 5 (extremely useful)]*

Videos / Textbooks / Computer software / The internet / Newspaper or magazine articles / Other (please specify)

[Optional open-ended response] If you have an idea about an "other" useful material, please describe it here.

15. Here is a list of some teaching methods that might be used in high schools. How useful do you think each of the methods would be in helping you to learn in your class?

[1(not at all useful), 2 (a little useful), 3 (useful), 4 (very useful), 5 (extremely useful)]

Lectures / Discussions / Games/simulations / Creative activities / Group cooperative learning activities / Other (please specify)

[Optional open-ended response] If you have an idea about an "other" useful method, please describe it here.

16. How much time do you expect to spend outside of class (including time working with classmates) preparing and studying for your economics class?

1 hour or less per week / About 2 hours per week / About 3 hours per week / About 4 hours per week 5 or more hours per week

Thank you for answering the survey questions!
Please take the pretest now.

Appendix B: Post-class Student Survey
(IRB information not included)

1. Select the first two letters of your last name.
2. What is your date of birth?
3. Please enter your 4-letter teacher code here.
4. Sex

Male / Female

5. Grade in school

9 / 10 / 11 / 12

6. What grade do you expect to earn in this high school economics class?

A / B / C / D / F

7. How strongly do you agree with each of the following statements?

[1(strongly disagree), 2 (disagree), 3 (neither agree nor disagree), 4 (agree), 5 (strongly agree)]

My economics class was exciting.

Economics is one of my favorite subjects.

I regularly participated in class assignments and projects in my economics class.

My economics class was interesting.

I talked to my family a lot about my economics class.

I talked to my friends from outside of class a lot about my economics class.

I want to take more economics courses in the future.

If I go to college, I want to major in economics.

I generally like school.

I enjoyed learning economics.

If I am having trouble learning economics, I try to figure out why.

I put a lot of effort into class assignments and projects in my economics class.

At some point this semester, I was a disruption in class on purpose.

I use specific strategies or ways of studying to help me learn economics.

[Optional open-ended response] Brief description of my strategies or ways of studying:

8. How much time did you spend outside of class (including time working with classmates)   preparing and studying for your economics class?

1 hour or less per week / About 2 hours per week / About 3 hours per week / About 4 hours per week / 5 or more hours per week

9. Which statement best describes your attendance in your economics class?

I did not miss any classes.
I attended regularly, but I missed from 1 - 3 classes.
I attended somewhat regularly, but I missed from 4 - 10 classes.
I missed from 11 - 20 classes.
I missed more than 20 classes.

Thank you for answering the survey questions! Please take the posttest now.

Appendix C: Teacher Survey

Thank you so much for participating in the research project to evaluate the International Economic Summit conducted by the Federal Reserve Bank of San Francisco and the California State University, East Bay Center for Economic Education. Your answers will be kept strictly confidential and will only be reported in summary form so that nothing could identify you, your students, or your school. We greatly appreciate you responding to the questions below.

I. TEACHER INFORMATION:

1. Name _____   2. Sex (circle one)   Male   Female

3. How many years of general teaching experience do you have? _____

4. How many years have you been teaching economics? _____

5. What percent of your total teaching load do economics courses represent? _____

6. What was your undergraduate college major? _____   7. Minor(s)? _____

8. Do you have an advanced degree (e.g. MA, MS, etc.)? (check one) _____ Yes _____No

9. If you have an advanced degree, what is the subject area? _____

10. If you do not have a major, minor, or advanced degree in economics, approximately how many formal university-level courses in economics have you taken (not including workshops for teachers that may have offered credit)? _____

11. Approximately how many economics workshops for teachers have you attended in the past five years? _____

12. How strongly do you agree with each of the following statements?
(1 strongly disagree; 2 disagree; 3 neither agree nor disagree; 4 agree; 5 strongly agree)
Teaching economics is exciting.
Economics is one of my favorite subjects to teach.
I am very involved in class assignments and projects in my economics class.
I am very interested in teaching economics.
I talk to others outside the school a lot about the economics classes I teach.
I hope to continue teaching economics in the future.
I generally like teaching.
I put a lot of effort into teaching my economics classes.

13. Here is a list of different materials that might be used in high schools. How helpful do you find each in teaching economics?
(1 not at all helpful; 2 somewhat helpful; 3 helpful; 4 very helpful; 5 extremely helpful)
Videos / Textbooks / Computer software / The Internet / Newspaper of magazine articles /
Other (please specify)

14. Here is a list of some teaching methods that might be used in high schools. How helpful do you find each in teaching economics?
(1 not at all helpful; 2 somewhat helpful; 3 helpful; 4 very helpful; 5 extremely helpful)
Lectures (including PowerPoint) / Discussions / Games / Simulations / Creative Activities / Group cooperative learning activities / Other (please specify)

15. How much time do you spend outside of class (including time working with other teachers) preparing for your economics class?
1 hour or less per week / About 2 hours per week / About 3 hours per week / About 4 hours per week /
5 or more hours per week

16. Listed below are a number of different goals for economics instruction. How important are these goals for your economics classes?
1 not at all important; 2 somewhat important; 3 important; 4 very important; 5 extremely important

To teach students basic economic concepts
To prepare students to make intelligent decisions
To increase understanding of how the US economy works
To increase understanding of how the global economy works
To help students understand current economic issues
To teach students practical skills such as using credit cards etc.
To help students learn to work together
Other (please specify)

18. Which of the following barriers do you face in teaching economics? (check as many as apply)

_____ Limited classroom time to teach   _____ Poor textbook
_____ Limited preparation time for teaching   _____ Need more real-life applications
_____ Limited background in economics   _____ Lack of supplementary materials
_____ Lack of student interest in economics   Other(s) (specify) _____
_____ Economics is too difficult for students   _____

II. COURSE INFORMATION:

19. What is the grade level of the class that participated in this study?
20. How many hours per week does this class meet?
21. In total, how many weeks does this class meet?
22. Which of the following best describes the students in the classes used in this study? (Check one)
        _____ Advanced Placement   _____ Non-college bound
        _____ College Prep / Honors   _____ Mixed ability
23. Will the post test for this project count toward students' grades in your course?
(check one)   _____ Yes _____ No

24. Did you conduct the International Economic Summit in the economics class that is participating in this study? Yes / No (If no, skip to 27)

25. Check one of the following with respect to the summit at the end of the IES:
      My class participated in a Regional Summit at a university
      My class participated in a Mini Summit held in my school or classroom
      My class did not participate in a summit at the end of the IES program.

26. What portion of the 13 IES curriculum lessons did your students complete?
- My students completed most or all (12-13) of the IES lessons.
- My students completed most (9-11) of the IES lessons
- My students completed about half (6-8) of the IES lessons.
- My students completed one or a few (2-5) of the IES lessons.
- My students completed one or none of the IES lessons

27. (For non-IES teachers):
How frequently do you use the following in your economics classes? (1 = not at all to 5 = all the time)
Lecture / Discussion / Group work / Simulation / Other (please describe)

28. We welcome any further comments you may have about teaching economics, or about programs or materials that you would like the San Francisco Federal Reserve Bank to develop in the future.