

Preliminary and Incomplete Draft
Comments Welcome

**Using a Web-Based Questionnaire as an Aide for High School
Economics Instruction**

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This paper describes a new, web-based survey instrument that is designed to serve as an aide for teachers and an interactive exercise for introductory high school economics students. The survey is sponsored by the Princeton University Survey Research Center and is conducted over the web at www.wws.princeton.edu/~psrc/HSwebSurvey.html. The questionnaire asks students about their personal involvement with the economy by inquiring about employment status, consumption, and living standards, as well as a limited number of hypothetical consumer demand questions. Many of the questions are patterned on established surveys, such as the Current Population Survey and Census, which should help familiarize students with concepts such as the official measure of unemployment. After students have completed the questionnaire, teachers can generate an automated summary report on their classes' responses, including a comparison of their class with a national sample and suggested examples that can be inserted into class lessons.

The motivation for the survey is twofold. First, teachers will obtain valuable information that can be used to enhance their understanding of students' backgrounds and familiarity with certain types of economic activity, and receive suggestions for examples to use in class to illustrate economic concepts. Second, students will become familiar with the way economic survey data are collected. By providing teachers with examples that they can use in class based on their students' own experiences, it is hoped that students will better relate to the material, be more attentive in class, and be more actively engaged in learning.

The survey is easy to implement -- and possibly even fun. Teachers can assign students to fill out the questionnaire on the web either in class or as a homework

assignment. The questionnaire should take less than 15 minutes to complete. Teachers can then simply and quickly request a report directly from the website with summary statistics and advice on how to use the survey results. The report will be emailed to the teachers within a day or so.

The theory of learning underlying the survey exercise is loosely connected to the constructivist approach to instruction (e.g., Brooks and Brooks, 1993). The constructivist philosophy advances the idea that learners construct knowledge for themselves. In the proposed survey exercise, teachers will use the input of the class to structure lessons from which students can learn basic economic principles, such as the effect of price on the quantity demanded, as well as be intimately involved in the collection and use of economic data. The approach is also consistent with Becker and Watts's (2001) plea for more active learning and less chalk and talk. The utility of the survey exercise, however, has yet to be documented empirically. Consequently, the exercise outlined here should be viewed more as an experimental technique -- or a work in progress -- than a proven method.

The remainder of this paper is organized as follows. Section 1 describes the questionnaire. Section 2 describes the teacher report. Section 3, which concludes, discusses ways in which the method could be extended and evaluated.

1. The Questionnaire

The questionnaire, which is reproduced in the Appendix, consists mainly of four subject areas: demographics (e.g., grade level, age, race, ethnicity, parental education); work (e.g., employment status, job search activity, availability for work, pay);

consumption and wealth (e.g., computer ownership, internet access, family home ownership); and hypothetical economic questions. The employment questions are patterned after the Current Population Survey, and will enable a computation of the unemployment rate (albeit for a small sample).

The hypothetical questions (Q19, Q20, Q24-26) are intended to induce students to consider how their behavior would respond to different circumstances. Although there are justified concerns about contingent valuation methods (e.g., Diamond and Hausman, 1994), these questions are meant to be a starting point for discussion. Indeed, one question that could be raised in class is whether answers to hypothetical questions about demand at different prices constitute useful evidence.

The skip logic is fairly simple and skips are kept to a minimum. Only students who did not work for pay in the past week are queried about job search activity. Only students who have worked at some time in the past are asked about whether they had ever worked for the minimum wage.

The web-based software records students' responses. Internal checks in the program screen the responses to make sure that valid answers were provided to several questions, and students are prompted to provide valid answers to key questions (e.g., branching questions) that were left unanswered. Students can change their answers by moving back or forth in their web browser.

To satisfy a requirement of the Princeton Institutional Review Board (IRB), student participation in the survey is voluntary and anonymous. Consequently, our web program does not keep track of the identity of the students who completed the questionnaire. However, if the assignment is completed in class, teachers will be able to

monitor participation. In addition, the report to teachers will state the number of students who completed the questionnaire, so teachers will be aware of the nonparticipation rate. We think it is best, however, to treat the assignment as a voluntary homework exercise. Because filling out the questionnaire is not particularly taxing, we suspect participation will be high.

We have tested the questionnaire on 25 introductory economics students from Princeton High School. Most of the students filled out the questionnaire in class. The average student took 7 minutes to complete the questionnaire, and the median took just 5 minutes. After the students completed the questionnaire, we asked them a small number of questions about the exercise. The students' responses to these evaluative questions are summarized in Table 1. In general, the students liked the exercise and did not find it overly burdensome or intrusive. They reported having little difficulty answering the questions or understanding the concepts that were asked, and they seemed to understand the reason for the exercise.

Table 1
Follow-up Questionnaire

Please indicate how much you agree with the following statements.
1 = strongly disagree 5 = strongly agree

1. The questions address my personal economic experiences.

Average = 3.6 Median = 4

2. The questions on the survey are easy to answer.

Average = 4.4 Median = 5

3. I felt comfortable answering the questions that were asked.

Average = 4.5 Median = 5

4. I understand why I am taking the survey and how the survey will be used in class.

Average = 3.6 Median = 4

5. I am familiar with the concepts presented in the questions. (For example, minimum wage, the different types of bank accounts)

Average = 4.7 Median = 5

6. Being able to compare my class's economic experiences with other classes' will enhance the textbook lessons and will allow me to better grasp the lessons.

Average = 4.0 Median = 4

Sample size is 25 students from Princeton High School.

2. The Teacher Report

After his or her students have completed the questionnaire, a teacher can request a summary report by clicking on the “Teachers: Generate a Teacher Report” link at www.wws.princeton.edu/~psrc/HSwebSurvey.html. The teacher must enter his or her name and 6-digit school code, as well as provide an email address. A report will be emailed to the teacher within a day or so.

The report generation phase of this project is still under construction, but it will be available soon. The general outline and rationale for the report is described here. The next draft will include a sample teacher report in the Appendix.

For each teacher, the report will contain a simple tabulation of all of the basic questions on the questionnaire. (If a teacher in a particular school is assigned to teach multiple periods of the economics class, the report will contain results for all the classes combined. That is, the report will pool together all students who provided the teacher’s name and school code in the relevant section of the questionnaire.) For example, the report will provide the educational distribution of the students’ parents. It will also tabulate the fraction of students whose families own their own house or rent. This basic demographic information will provide teachers a better understanding of students’ experiences and provide a context for class examples. For example, a classroom lesson on rent control would probably be less accessible for students who live in families that own their own house.

Although I suspect that teachers already have a reasonably accurate understanding of their students’ socioeconomic circumstances, the summary of demographic characteristics may nonetheless enhance the teachers’ perceptions. Knowledge of the

students' math backgrounds (i.e., courses they have previously taken) can also be helpful for tailoring the level of mathematics presentation.

The summary will provide information regarding the requesting teachers' students as well as for *all* high school economics students who have filled out the questionnaire.

Although the latter is not necessarily a representative sample, it does provide a benchmark against which to compare the teacher's students on the same set of questions.¹ For example, it will probably be of interest to the students to know how long it takes them to commute to school compared with their classmates and compared with other high school students.

In addition to the comparison with other high school economics students who filled out the questionnaire, for several questions results for national samples will be provided. For example, bar charts containing the unemployment rate for various age groups will be presented along with the unemployment rate for the requesting teachers' students, as shown in Figure 1. This material could lead to a natural discussion in macroeconomics. What is unemployment? How is it measured? (The students should remember some of the relevant questions from the questionnaire.). Is unemployment voluntary? Why do teenagers have a higher unemployment rate than older workers? Why is the unemployment rate for the students higher or lower than the unemployment rate for teenagers nationally? The teacher report will provide suggestions for using the results to launch a discussion on unemployment.

A policy that is often covered in introductory economics classes is the minimum wage. One reason why the minimum wage is a popular subject is undoubtedly because it

¹ If the sample turns out to be far from representative of high school economics students, we can consider recruiting a random sample of high school economics classes to participate in the survey. Results for this sample could be used in the teacher report instead of the results for the classes that voluntarily participated.

is one of the few economic policies that students have had direct contact with. The report will describe the proportion of students who have worked for the minimum wage, and compare this to national numbers. The report will also provide suggestions for leading a discussion about the economic analysis of the minimum wage (see also Krueger, 2001). For example, students can be asked whether they have ever worked in a job that paid the minimum wage when the minimum wage increased. They can then be asked whether they or their coworkers had their jobs eliminated or hours reduced. Finally, they can be engaged in a discussion about whether such experiences do or do not provide compelling evidence on the economic effects of the minimum wage.

Question 24, which asks, “How much money do you think a family of four would have to earn in a year to live comfortably,” can lead naturally to a discussion of poverty. Is poverty an absolute or relative concept? How do the class’s expectations compare to average income? What is the poverty line? The report will provide teachers with questions to lead a discussion, and some relevant national statistics, such as the poverty line for the average family of four (\$18,810 in 2003) and average income of a family of four in 2003 (average was \$80,710; median was \$65,093). Teachers will also be provided with references to resources on the web for relevant data and further details about the concepts. For example, links to the relevant Census Bureau web pages for the aforementioned statistics will be provided.

Another section of the report will consider the payoff to education. In questions Q25 and Q26, students were asked how much they thought they would earn in a year if they had a college degree or if they had only a high school degree. These questions are patterned after Dominitz and Manski (1996). The students anticipated return to college

education will be compared with the actual return. In addition, the average anticipated return to education will be reported separately for students who said they plan to attend college and those who said they did not plan to attend college in Q6. This material should lead naturally to a discussion of the opportunity cost of schooling, the return to investing in education, non-monetary benefits of education, and decision making. Teachers will be provided with sample questions to lead such a discussion.

Student responses to Q7 -- whether they are considering joining the U.S. military service upon leaving school – can also be used to motivate a discussion of career choices. The teacher report will tabulate this question separately by gender, and provide national information on military pay and enlistment to facilitate a discussion.

The income and career data can also be used to launch a discussion of income inequality. Why do incomes vary? How can we summarize the degree of income inequality? What are the consequences of income inequality? The teacher report will present a Lorenz curve of family income for the U.S. as a whole, which will provide a visual description of income distribution for the students. We will also present an age-earnings profile based on CPS data, and compare it to the average earnings for students in the class. This can lead to a discussion of why earnings rise over most of the career, and fall near retirement.

The information on hypothetical movie demand collected in Q19 will be used to construct a *class-level* demand curve. This could be used illustrate how individual demands are aggregated to a market level. The report will also compute the elasticity of demand, and provide an explanation of how this parameter could be used in practice that ambitious teachers who cover the concept of elasticity can use in a lesson. The data on

demand can also be used to motivate a discussion of price discrimination by movie theaters (Why do they charge students less than adults?).

The information in Q20 can be used to discuss a common bias in decision making: the failure to recognize that sunk costs are sunk. High school economics texts do not cover behavioral economics, which is an emerging and important field of economics, and a topic that should be easily accessible to students and of practical value.

The information on commuting time to school (Q18) will be compared to national statistics on the amount of time that it takes workers to commute to work. Together with the material on mode of transportation to school (Q17), this is intended to facilitate a discussion of time allocation. Why are certain modes of transportation selected? What are the relevant constraints? The question on the price of gasoline – a common good used to illustrate demand in principles courses -- is intended to gather information about students' awareness of prices. The report will tabulate the average absolute deviation between the reported price of gasoline and the average national price by whether the student drives a car or does not drive a car.

The questions on whether students' possess a bank account (Q22) and whether they own stocks (Q23) are intended to launch a discussion on national savings. The students' responses will be compared to national estimates for the U.S. population. This material could be used to discuss the concepts of savings, the banking system, interest, and the capital market.

Where applicable, the teacher report will link the questions and suggested class discussions with the NCEE standards. In addition, the report will link the material to the

relevant chapters of my forthcoming textbook, *Explorations in Economics* (Bedford, Freeman & Worth Publishers).

3. Conclusion

As mentioned, the survey exercise described here should be viewed as a work in progress. The questionnaire can be extended in a number of directions. Most obviously, additional questions could be added about students' economic experiences. For example, questions could be added about recent or planned purchases or investments. In a different direction, questions could be added regarding students' knowledge of economic institutions (e.g., the Federal Reserve Bank) or about current economic policy issues (outsourcing, Social Security). Students could also be quizzed on basic economic concepts, such as scarcity, although that seems more appropriate for a traditional test format.

Another possibility would be to use the data generated from the survey to structure an exercise to give students an introduction to analyzing and interpreting economic data. A longstanding complaint of mine is that introductory economics courses have not kept up with the economics profession's expanding emphasis on data and empirical analysis. To partially remedy this lack of statistical analysis, teachers could be provided with an easy-to-access spreadsheet with the micro data generated from the survey, and with instructions on how to use the data to teach basic empirical techniques. For example, students could use the data to compute the unemployment rate. Additionally, ambitious teachers could use the data to teach hypothesis testing, correlation and basic Ordinary Least Squares estimation. Because students are familiar

with the nature of the data from their participation in the survey, analyzing the data should be of greater interest and less intimidating than would be the case with an off-the-shelf data set commonly used for problem sets.

Lastly, evaluating and testing the effectiveness of this survey exercise would seem a priority. The gold standard in this regard would be a random assignment evaluation in which some classes were randomly assigned to a treatment group that used the survey exercise and others to a control group that did not. Student performance on a standardized test of economic knowledge could then be compared between the treatment and control groups. But it is perhaps unreasonable to expect a short exercise to affect overall performance on a standardized test of economic knowledge by a sufficient margin to be detectable. A less ambitious but still meaningful approach to evaluating the utility of the survey exercise would be to survey students to assess their engagement in the exercise and subjective assessment of it compared with more traditional classroom methods.

If the survey exercise is ultimately deemed efficacious – in either engaging students or in conveying relevant concepts and methods -- it could be extended for college students, with relatively minor tweaks.

References

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Appendix

A Survey of High School Economics Students

The survey you are being asked to participate in is being conducted by the Survey Research Center at Princeton University. The purpose of the survey is to measure the economic experiences and backgrounds of high school students. The data will be used to compile reports for each of the high school economics classes that participates in the survey. With this report your class will be able to compare its responses to the responses from a national sample of high school students.

Please read the message below before continuing on to take the survey. If you have any questions or concerns about the survey, please send an email message to psrc@princeton.edu or call the Princeton University Survey Research Center at 1-800-305-0950. Please click on this [Information for Parents](#) link to get detailed information about this survey (note - this link will open a new browser window).

If I choose to participate, I understand that:

- this survey is completely voluntary. I do not have to answer any questions if I so choose.
- this survey is anonymous.
- the results will be used to compile a report for my high school economics class. The report will have aggregate statistics only and will not identify any individual participants.

Please indicate if you want to participate

- Yes, I would like to participate in the survey
- No I do not want to participate

[Submit My Participation Response](#)

A Survey of High School Economics Students

1. What is your current grade level?

- 9th
- 10th
- 11th
- 12th

2. Do you have a computer in your home?

- Yes
- No

2a. If yes: How often do you use the computer in your home?

- Every day
- A few times a week
- Once a week or less
- Never

3. Do you have Internet access at home?

- Yes
- No

3a. If yes: Is it dial-up or a high-speed?

- Dial-up
- High-speed

4. What math class are you taking now or have you already taken?(Check all that apply)

- Algebra 1
- Algebra 2
- Geometry
- Business Math
- Calculus
- Other

5. Did either of your parents go to a 4-year college?

- Yes
- No

5a. If yes: Did at least one of them graduate from college?

- Yes
- No

6. Do you intend to go to college?

- Yes
- No

6a. If yes: Do you intend to go to a 4 year school or a 2 year school?

- 4 year school
- 2 year school

7. Are you considering joining the U.S. military service after you leave school?

- Yes
- No
- Maybe

8. Did you work this past summer?

- Yes
- No

8a. If Yes: What was your hourly wage? \$

8b. How much did you earn each week? \$

8c. Approximately how many hours did you work each week last summer?

9. LAST WEEK, did you do ANY work for either pay or profit? Mark "Yes" even if you worked only 1 hour, or helped without pay in a family business or farm for 15 hours or more.

- Yes
- No

Next Section

A Survey of High School Economics Students

10. Have you been looking for work during the last 4 weeks?

- Yes
- No

11. LAST WEEK, could you have started a job if offered one, or returned to work if recalled?

- Yes, could have gone to work
- No, because of own temporary illness
- No, because of all other reasons (in school, etc.)

12. When did you last work for pay, even for a few days?

- Within the past 12 months
- 1 to 5 years ago
- Over 5 years ago
- Never worked

Next Section

A Survey of High School Economics Students

13. During the PAST 12 MONTHS, how many WEEKS did you work? *Count paid vacation, paid sick leave, and military service.*

14. Have you ever worked for the minimum wage?

Yes

No

Next Section

A Survey of High School Economics Students

15. Do you drive a car?

- Regularly
- Sometimes
- Rarely
- Never

16. What is your best guess of the current price of a gallon of regular gasoline?

\$

17. How do you usually get to school?

- Car
- Walk
- Bike
- Bus
- Metro
- Other

18. From the time you leave home, how long does it usually take you to get to school?

- Less than 10 minutes
- 11-20 minutes
- 21-30 minutes
- 31-45 minutes
- 46-60 minutes
- More than one hour

19. The following schedule lists different prices for movie tickets. Fill in the number of movies you think you would pay to see in a typical month at each price:

Price	Number of movies per month
\$2	<input type="text"/>
\$6	<input type="text"/>
\$10	<input type="text"/>
\$14	<input type="text"/>

20. Suppose you paid \$8 to buy a ticket to see a movie early one Sunday afternoon, and when you showed up at the theater to watch the movie that evening you discovered that you had lost the ticket during the day. Which of the following would you do: (check one)

- Pay \$8 to buy another ticket
- Complain to the manager
- Leave in disgust without watching the movie

21. Does your family own or rent the home in which you live?

- Own
- Rent

22. Do you have a bank account?

- Yes
- No

22a. If yes: What type of account do you have? (mark all that apply)

- Checking account
- Savings account
- Other

23. Do you own any stocks?

- Yes
- No

24. How much money do you think a family of four would have to earn in a year to live comfortably?

\$ per year (please do **not** include commas in your answer)

25. When you are age 25, about how much money do you think you would earn per year if you did not go to a 4-year college and worked full-time?

\$ per year (please do **not** include commas in your answer)

26. When you are age 25, about how much money do you think you would earn per year if you had earned a 4-year college degree and worked full-time?

\$ per year (please do **not** include commas in your answer)

27. What is your current age?

- 13 or younger
- 14
- 15
- 16
- 17
- 18 or older

28. Are you of Hispanic or Latino origin?

- Yes
- No

29. What race do you consider yourself to be? (Check all that apply)

- White
- Black or African American
- Asian
- American Indian or Alaska Native
- Native Hawaiian or Other Pacific Islander
- Other

30. Were you born in the United States?

- Yes
- No

31. What is your gender?

- Male
- Female

32. What is your home zip code?

33. What is the name of your economics teacher?

- Mr.
 - Ms.
-

34. What school do you attend?

35. Please enter the 6-digit College Board code for your high school. To find the code for your school, click http://apps.collegeboard.com/cbsearch_code/codeSearchHighschool.jsp to open a separate browser window. After you look up the code for your school, please enter it below:

Thank You

Figure 1: Unemployment Rate by Age

