OUTSIDE READINGS IN PRINCIPLES OF MACROECONOMICS: TEACHING STUDENTS TO SEE NUANCES

Krastina Dzhambova [t]

Abstract

Principles curricula frequently introduce students to complex social choice questions. The literature has emphasized the use of outside readings and real-world examples to improve students' understanding and economic literacy. This paper focuses on robotization and its macroeconomic consequences as an example of a multifaceted social transformation that is relevant to both the textbook material and current economic events. I present an assignment on this topic based on news articles. The proposed intervention builds on the knowledge students have at the end of a semester-long, undergraduate Principles of Macroeconomics course. The goal of the assignment is to improve students' ability to reconcile a complex trade-off. Using an experiment, I measure the contribution the assignment makes to students' learning experience. I show that exposure to the texts changes students' attitudes and preferences over policy. The paper contributes to the literature on outside readings and economic literacy.

Keywords: Newspaper Articles, Media Sources, Robotization, Automation, Experiment, Teaching Principles of Macroeconomics

JEL classification: A22, E19

Introduction

Every instructor of economics inevitably has to address the challenge of making the course material relevant to students. To this end, instructors typically include newspaper articles and other news media sources. Particularly in Principles courses, students are often asked to follow a news outlet with an economics or finance emphasis. According to Allgood and McGoldrick (2021), the use of texts outside the textbook is ubiquitous among economics instructors. Their survey results show that more than 80% of respondents use news articles in their courses and, in more than 85% of cases, the texts are used on a weekly or bi-weekly basis. However, in nearly half of the cases, these assignments are relatively low-stakes. They also tend to be discussion-based. In this paper, I provide an example of an assignment based on secondary sources. The assignment is fitted to a Principles of Macroeconomics course content. I show how such an assignment can be structured to assess student learning. I also report results on the contribution that the assignment makes to students' learning as well as to their opinions and attitudes. I find that after confronting the economic evidence in the assignment, students change their preferences over economic policy.

Principles curricula frequently introduce students to complex social choice questions. Foreign competition which may lead to structural unemployment and at the same time spur economic growth, unemployment insurance which may increase spells of unemployment but stabilize demand, and fiscal expansions which may crowd out investment but raise income more

than one-for-one are just a few examples of the "double edge swords" students encounter in their introductory macro experience. While separate textbook chapters would treat the seemingly contradictory aspects of these issues in isolation, the literature has emphasized the use of outside readings and real-world examples to improve students' economic literacy and understanding. To this end, I design an assignment titled "Automation and Jobs" on robotization and its macroeconomic consequences.[1] The students are asked to read two articles published in The Economist on the topic and answer questions on the texts. Students answer three groups of questions: a pre-treatment group, factual questions, and attitude questions. I develop a set of factual questions to assess the students' knowledge and understanding of the economic facts and analyses conveyed in the two newspaper articles. The knowledge-based questions span Bloom's cognitive processes dimension as described in Anderson and Krathwohl (2021). A separate set of questions measures whether the text changes students' attitudes towards automation. I split students in a semester-long Principles of Macroeconomics course into two groups: treatment and control. Each student is randomly assigned to either the treatment or the control group.[2] Students in the treatment group answer the attitude questions after having read the article, and students in the control group do so before. Both the treatment and the control groups answer the pre-treatment questions before reading the text. The design of the intervention allows me to measure the difference in attitudes that may be attributed to the economic evidence in the text.

I implement the intervention based on the assignment at a public, four-year university. The university is classified as M1 (Masters Colleges and Universities)/Larger programs by the Carnegie Classification of Institutions of Higher Education.[3] The institution is part of the U.S. News Regional Schools-Midwest ranking. The results from the pre-treatment questions suggest that even before students confront the textual evidence, they see robotization as welfare-improving on the whole.[4] While there is "no fear of the machine" among students, they, according to my pre- treatment results, are aware that occupation loss will make the distribution of welfare gains uneven. When prompted to think about automation in the context of their own life experiences, students see the transformation least favorably as workers and economists and most favorably as consumers of technology services.

While according to my knowledge-based assessment, students in both the treatment and the control group have an equal and satisfactory understanding of the two assigned articles, reading the texts had the biggest impact on students' preferences over policies. After reading the texts, students in the treatment group are more cognizant of the possible distributional effects of robotization. As a result, they lean towards fiscal responses to automation which balance the overall positive general equilibrium effects with concerns over groups who may be hurt. Differently from the control group, students in the treatment group are in favor of tax incentives for firms to minimize worker displacement due to automation and to provide retraining.

The articles the assignment is based on are "A Study Finds Nearly Half of Jobs Are

[1] Figure 1 outlines the experimental design.
[2] The randomization over student respondents is done in Qualtrics
[3] The Carnegie Classification of Institutions of Higher Education (n.d.). About Carnegie Classification. Retrieved (10/23/2023) from https://carnegieclassifications.acenet.edu/.
[4] The lack of skepticism and fear may be rooted in generational differences between respondents in my sample and a sample representative of the U.S. age distribution.

Vulnerable to Automation: Daily Chart." (The Economist (Online), 2018) and "Rise of the Robots; Workplace Automation."(The Economist (London), 2022). The Economist (2018) presents qualitative and quantitative evidence of the likely effect of automation on the labor market. Relative to the first article, The Economist (2022) adds more analysis of facts on the topic of robotization. Both articles have the advantage of introducing students to academic research in economics. The articles cite evidence presented in Frey and Osborne (2017), Nedelkoska and Quintini (2018), Adachi et al. (2022) and Tuhkuri et al. (2022), among others. The assignment topic and the articles were picked to represent an example of a topical and nuanced macroeconomic issue. In this way, the assignment achieves several goals. First, it shows students a real-world application of economics. The assignment acquaints the students with a complex transformation of the macroeconomy's labor market which is very likely to impact their own lives in the near future. Second, the topic requires students to consider the nuanced question of whether workplace automation and robotization will improve social welfare as well as the likely distribution of welfare gains. Commonly in a Principles course, students are confronted with examples of trade-offs that do not have a corner solution. The questions they encounter have a quantitative answer based on balancing competing effects. Robotization is an example of such a question. While it promises to be welfare-improving for society, automation may have different welfare outcomes across occupations. This creates potential opportunities for policy intervention, the design of which students have to analyze.

I introduce the assignment at the end of the semester in a Principles of Macroeconomics course. The assignment relates to several topics typically covered as part of an introductory course in macroeconomics. It touches, for example, on the topics of structural unemployment, long-run economic growth and technological improvement, total factor productivity, and business cycles. Since the assignment covers a broad set of topics discussed throughout the semester, I distribute the assignment during finals week as complementary to a standard final exam.[5]

The paper contributes to the literature on integrating newspaper articles into economic instruction. Ahlstrom (2021), Moryl (2021), Picault (2021), Ruder (2021) and Schneider (2021) are all recent examples of this literature. While these papers focus on instruction in microeconomics courses, the current study gives an example of how outside readings can be integrated into a macroeconomics course. I also contribute to the literature by providing evidence of the contribution of this approach to students' learning.

The paper is organized as follows. The next section reviews the related literature. "Description of the Assignments" lays out the assignment in detail, and "Results from the Classroom" presents the results I obtained after integrating the assignment in a Principles of Macroeconomics course. The last section concludes.

Literature Review

It is standard practice in economics courses to require students to follow newspaper outlets such as the Wall Street Journal, The Economist, Financial Times, etc. This approach, however, may have limited effectiveness because the assignment is not structured. Vidagan and de Arriba (2016), for example, cautions against using nonstandard material without a carefully

[5] The assignment could be easily adapted to any of the aforementioned topics and given before the end of the semester as well.

thought- out structure. This paper contributes to the literature by presenting a Principles of Macroeconomics assignment based on newspaper articles. The inclusion of news sources in instruction is a way to motivate students' interest and involvement in the course. Ghosh and Rahman (2011) emphasize the importance of current events and case studies in economics instruction for fostering student engagement. A number of studies have encouraged instructors to complement the traditional "chalk and talk" approach with methods that may improve engagement and interest - - Becker (2003), Wooten et al. (2021), Picault (2019), for example. From the Great Books and Shakespeare (see Hartley (2001) as an example) to pop culture (see Monaco (2018)), economists have found a plethora of nonstandard sources related to textbook economics and have incorporated them as a course element. Drawing on the cognitive and neuroscience literature as well as experiments conducted in economics courses,
Davis (2015) advocates for the inclusion of material outside the textbook to increase retention of economics concepts. Watts and Becker (2008), Watts and Schaur (2011), Goffe and Kauper (2014), and Ongeri (2017) survey economics instructors and document that although traditional lectures are still the predominant mode of instruction, there has been a sustained trend in instructors' seeking out alternatives and incorporating those in their course content. The current study discusses a way to adopt outside readings as well as the contribution such an assignment makes.

Press articles are not only a way of piquing students' interest in the subject, but also an effective illustration of the applicability of economics to the real world. Additionally, instructors of economics have sought out different ways to adapt their teaching methods to the changing generational needs and skills of new cohorts. For example, Carrasco- Gallego (2017) and Morreale and Staley (2016) advocate adopting teaching practices to the skills and needs of the specific generational cohort of students. Economics news coverage is an effective way to both illustrate the applicability of the course content and to remain current.

Principles courses, whether they are taken by majors or an audience of both majors and non-majors, introduce students to the foundations of economics and influence their opinion on social issues. Allgood et al. (2012) report that students having taken more economics coursework are also more likely to have opinions on policy issues closer to those reported by U.S. economists. "Survey of Americans and Economists on the Economy," conducted by the Washington Post, the Kaiser Family Foundation, and Harvard University in 1996, highlighted differences in opinions held by the public on economic issues relative to those held by trained economists. Caplan (2001) and Caplan (2002), based on the same survey, found systematic differences in opinion between non-economists and economists.[6] These survey findings provide evidence that economics courses shape the views on social issues students are to hold as citizens and voters. Parsons and Mamo (2017) find that students coming into principles classes represent a demographic group with their own set of beliefs and potential biases on economic issues. Instructors of economics have to face the challenge of providing the students with the tools for a level-headed analysis of social issues. The intervention described in this paper sheds light on the contribution outside readings make to this goal.

Wood (1985) is an example of the early scholarship of education literature high-

[6] These differences were bridged by income growth, education, gender, and job security. Age was also a factor explaining differences of opinion in the 1996 survey.

lighting some of the pitfalls of news coverage in economics. The author observes that although students in principles classes are exposed economic news coverage alongside the economic content in their classroom experience, news reporting may fail to provide an objective perspective. Wood (1985) warns that the journalist's pattern tends to emphasize the short run, bad over good news, and to over-personalize rather than generalize. Today's world is very different from the print media world for which these warnings were issued. However, the freedom of information and expression introduced by social media makes these concerns even more relevant because the content you may encounter online is even less scrutinized and edited.

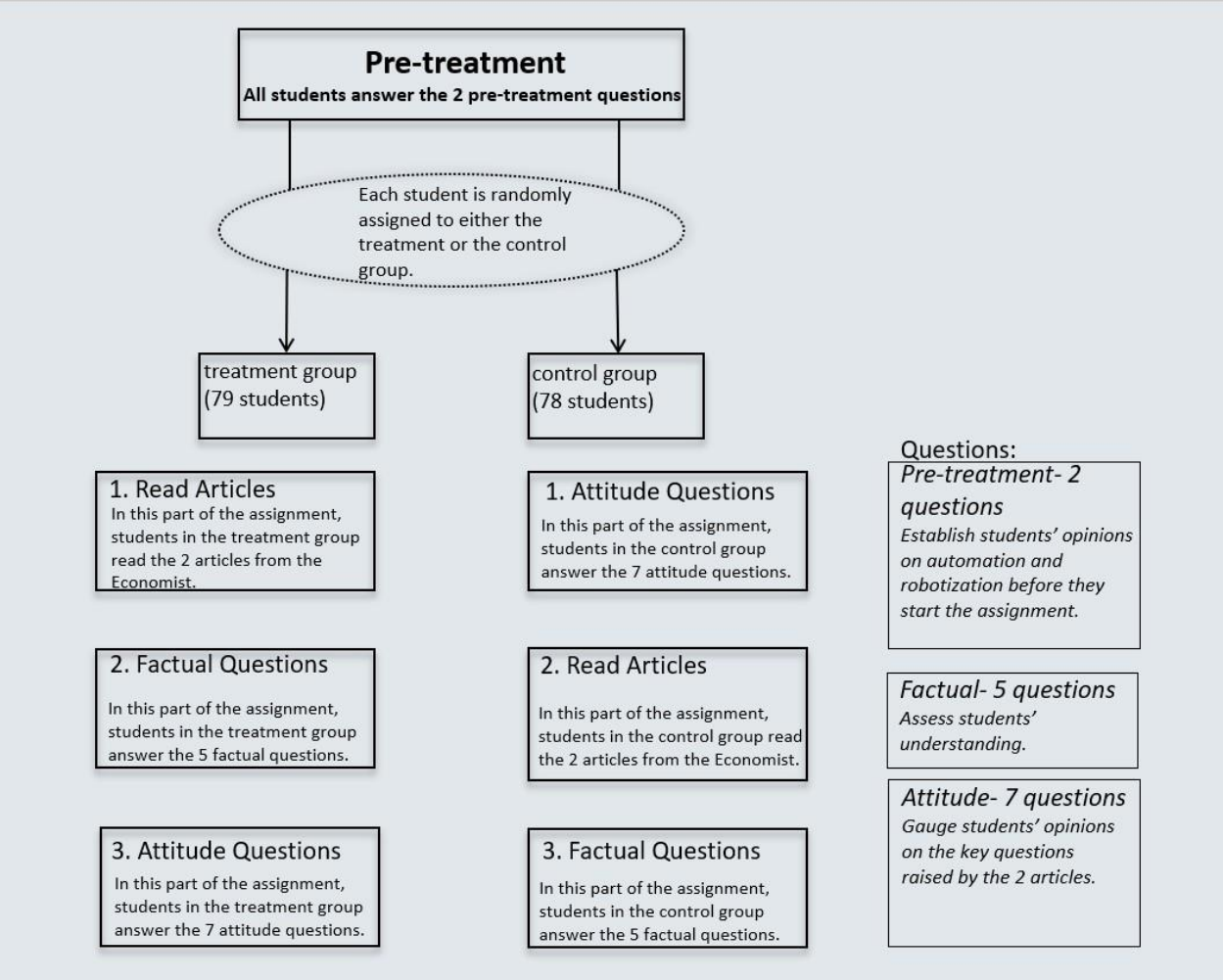
This puts the burden on the economics instructor to ensure that students in principles classes walk away not only with the habit of following economic news but also with a critical perspective as consumers of informational content.

Description of the Assignment

The assignment, titled "Automation and Jobs," is on the macroeconomic consequences of automation and robotization. The students are asked to read two articles from The Economist on the topic and answer questions on them. One set of questions is knowledge-based, while the rest measure how students' attitudes change as a result of encountering the texts.

The design of the assignment serves two distinct goals. First, the assignment acquaints the students with a complex transformation of the macroeconomy's labor market as a consequence of automation. It shows them a real-world application of economics. The questions raised in the assignment deal with an imminent issue that is very likely to impact their own lives in the near future. The topic requires students to consider the nuanced question of whether workplace automation and robotization will improve social welfare as well as the likely distribution of welfare gains. I show how this goal can be assessed. The second goal of the assignment is to measure whether the intervention changes students' attitudes toward automation. As the instructor of record, I randomly split a class of Principles of Macroeconomics students into two groups: treatment and control. The random assignment of students who are otherwise in the same course allows me to measure differences in attitudes that are attributable to the economic evidence in the text.

Figure 1



Notes: The figure outlines the experimental design. The sets of pre-treatment, factual, and attitude questions are identical between the treatment and control groups. The sequence in which a student answers the factual and attitude sets of questions depends on the assignment to the treatment versus control group.

Figure 1 outlines the experimental design. The assignment consists of two parts. The pre-treatment part serves the goal of establishing the students' opinions before they read the text. The second part consists of five factual questions and seven attitude questions. The factual questions assess students' understanding of the economic arguments laid out in the text. The attitude questions ask for the students' opinions on the topic.

Students are evenly and randomly split into a treatment and a control group.[7] Both groups encounter the same two pre-treatment questions, first. Then, the control group answers the attitude questions before they read the text. After answering the attitude questions, the control

[7] The random assignment is done in Qualtrics where students perform the assignment.

group reads the text and answers the factual questions. The treatment group first reads the text and answers the factual questions. Then, they have to answer the attitude questions. While both the control and treatment groups answer the factual questions after having read the article, the control responds to the attitude questions before they encounter the text. The treatment group responds to the attitude questions after they encounter the texts and the economic evidence in them.

Pre-treatment

The first bloc of the assignment has the two pre-treatment questions listed below.

1. Robots have benefited from rapid technology innovation. They can now do many tasks humans can, in many instances, even better than humans.
   Is this development in robotics beneficial to society?

   Yes
   No
   Neither agree nor disagree.

2. In the summer of 2021, the local grocery store adopted self-service checkout. Is this a positive change?

   (a) Answer as a customer:
   Yes
   No
   Indifferent

   (b) Answer as an employee:
   Yes
   No
   Indifferent

   (c) Answer as a member of the community:
   Yes
   No
   Indifferent

   (d) Answer as an economist:
   Yes
   No
   Indifferent

   The questions were designed to gauge students' preconceptions before they encounter

the economic evidence. The first question measures their overall attitude towards automation. The second question leads the students to draw on their personal experience and to see economics in the context of their own day-to-day lives. The town which is home to the university at which the assignment was conducted features a chain grocery store. The store implemented a switch from cashier checkouts to self-checkout kiosks in the summer of 2021. Students are frequently customers or employees or both at the local store. They have most likely also witnessed similar transitions at other chain stores. The second question introduces the idea that the same question may have different answers for different groups of society. It also establishes whether entering into the assignment, the students find that automation will affect these groups differently. The groups of society are consumers who are likely to benefit from efficiency gains introduced by technology and workers, the welfare effect on whom is likely to have dispersion. The question asks the students to step into the shoes of two more groups: "community members" and "economists." These categories nudge the student to evaluate the overall social effect of automation. While the "economist" perspective leads the student to tap into what they have learned in their Principles courses and evaluate the expected social welfare outcome, the "community member" perspective is there to pick up any individual preferences that may bias what the students anticipate in terms of the overall effect of automation. By using the local store as an example, I put the question in a context which the students are familiar with.

The Text

This section of the assignment consists of two articles published in The Economist: "A Study Finds Nearly Half of Jobs Are Vulnerable to Automation: Daily Chart." (The Economist (Online), 2018) and "Rise of the Robots; Workplace Automation." (The Economist (London), 2022). The Economist (2018) presents qualitative and quantitative evidence of the likely effect of automation on the labor market. The article cites evidence from two academic sources: Frey and Osborne (2017) and Nedelkoska and Quintini (2018). The article is a short read and offers an example of data journalism. While the first article emphasizes the evidence on the risk of automation across countries and industries, the second article which students have to read, The Economist (2022), discusses the economic implications of job automation. I have selected the articles for two reasons. First, they introduce a topical issue in the area of growth and labor economics. Secondly, both articles also have the advantage of acquainting Principles students with academic research in economics in an abridged way.

The Economist (2018) emphasizes the public concern over job automation by citing evidence on Google searches. The article presents one of the main findings in Frey and Osborne (2017), according to which the jobs that could be easily automated are 47% of all jobs. They also cite evidence from the cross-country study by Nedelkoska and Quintini (2018), which puts 14% of jobs across 32 economies at high risk[8] of automation. The article discusses the evidence gathered in Nedelkoska and Quintini (2018) on cross-country and cross-industry differences in the share of jobs potentially affected by automation. The evidence suggests that industry mix, aggregate income, and organizational structure influence the share of jobs at risk.

While the first article presents evidence on possible job displacement ushered in by

[8] 70% probability of automation or more.

robotization, the second article that students have to read as part of the assignment weighs the pros and cons of automation for overall social welfare and for individual groups of society. The Economist (2022) points out that the probability of job automation does not necessarily translate into an equivalent probability of job destruction and unemployment. The article cites micro evidence based on Adachi et al. (2022), who find that for Japanese firms between 1987 and 2017 an increase in robot use actually boosted a company's employment. As pointed out by The Economist (2022), Tuhkuri et al. (2022) find corroborating evidence based on Finnish firms data. On the macro level, the article also cites research from Bank of Korea which finds that while robotization shifts labor among sectors, there is no negative effect on overall unemployment.

The Economist (2022) is optimistic about robotization's welfare-improving effect on society on the whole. One example that the article gives is the recent labor shortages that certain industries experienced after the COVID-19 Pandemic and robots filling in the labor shortage in some cases. The article acknowledges that some groups of workers may be on the losing end. While automation creates jobs and alters the skill content of existing jobs, some jobs will become obsolete. Workers whose jobs are eliminated or who have skills different from those required by a changing workplace will likely be net losers. The Economist (2022) draws an interesting parallel between robotization and the globalization of the early aughts. Globalization, another important structural transformation, has, according to the article, resulted in an overall welfare improvement. The distribution of the welfare gains, however, has been uneven. For some, it has resulted in a loss that has not been compensated by social transfers. According to the article, robotization poses a similar risk of uneven outcomes.

Factual Questions

Table 6 lists the five factual questions included in the assignment. The table also gives the correct answer to each question. This group of questions is designed to gauge students' understanding of the articles. In this way, I ensure that students in the treatment group have read and understood the texts. I use Bloom's taxonomy to assess the student learning outcomes in this segment of the assignment. Table 5 lists the six categories and the associated cognitive processes in Bloom's taxonomy.[9]

The first question falls under the "remember" category. The question restates a fact from The Economist (2022). The definition of this category relates to tasks that ask students to "retrieve knowledge from long-term memory." Admittedly, the students have access to the article when answering this question. They did not have to memorize and reproduce the information. However, if this were a key element in the assessment, the instructor could ask (the treatment group) students to read the article in advance and reproduce the facts. The goal of the question in this intervention is to establish whether students have read the article and have a basic grasp of the text.

Questions 2 and 3 in the factual group are part of the "understand" cognitive category. The students have to *classify* statements A through D in question 2 according to whether each statement correctly *summarizes* the arguments made in the article. Both statements A and C do so. In addition, students have to select the statement that is not only a correct summary but is also a valid argument to the main proposition stated in the question. Thus, A becomes the

[9] I direct the reader to Anderson and Krathwohl (2021) for further details on Bloom's taxonomy.

correct answer to question 2. Since students not only find a correct statement but also use the prompts to *construct* an argument, the question falls under both the "understand" and the "apply" cognitive categories.[10] Question 2 ensures that students have recognized one of the arguments that The Economist (2022) makes for the potential welfare-improving effect of robotization. The argument is that robots can be useful in bridging labor shortages which for example arose in some industries after the Pandemic. The statement also illustrates how the state of the economy can affect the pace of automation.

Question 3 falls under both the "understand" and "apply" categories, too. After students have reviewed the evidence on the probability of robotization across industries in The Economist (2018), as well as potential gains and risks in The Economist (2022), the question emphasizes the parallel between workplace automation and globalization. The question recaps the likely uneven distribution of benefits. It reminds students that while robotization is likely welfare improving, there will probably be a subset of net losers from robotization. This is among the key takeaways from The Economist (2022).

Question 4 falls under both the "apply" and "analyze" categories. Students rely on what they have learned in their Macro Principles course to *attribute* the type of unemployment likely to result from workplace automation to one of three types of unemployment--frictional, structural, and cyclical—which are typically discussed in an introductory macro course. In doing this, they have to "apply" the familiar textbook definitions to the real-world issues raised in the articles. The question aids the students in drawing a link between their course experience and the textual evidence they have to analyze.

Question 5 from the factual group asks students to determine if a statement is correct. There are four statements, and three of them are correct. The question belongs to the "analyze" and "evaluate" categories. The students need to *distinguish* which statements from the list can be used in support of the argument that robotization will not result in widespread unemployment. In doing this, they have to *judge* which of the four claims can be used to explain how robotization would not result in job loss. The next section discusses the assignment's attitude questions. They are intended to gauge the change in attitudes if any after students have encountered the economic evidence in the two articles.

Some of the questions ask students to *design* policies to accommodate the structural change associated with robotization. In doing that, students need to *hypothesize* about the proposed policies' effect on the labor market, firm productivity, and the overall macro economy. This group of questions would fall under the "create" cognitive category.

Attitude Questions

This group of questions gauges the change in attitudes toward robotization and its potential effects on the labor market and the economy. I want to measure attitude changes attributable to students' having read the two articles discussed in the Description of the Assignment Section. For these purposes, students are randomly split into a treatment and a control group. The treatment group answers the attitude questions after they have read the

[10] In their application of Bloom's taxonomy to computer science courses, Thompson et al. (2008), too report that assessment instruments commonly span more than one category on Bloom's cognitive process dimension.

articles and the control group before they have read the articles.

The first three questions from the attitude group elicit the students' opinions on the key arguments made in The Economist (2018) and The Economist (2022). Both articles argue that robotization is slated to make big changes in the labor market. The evidence for this comes from the academic research cited in the two articles on the probability of automation across jobs. While The Economist (2022) highlights the technological innovations that have made robots suitable for a wide range of tasks, The Economist (2018) points out that people tend to fear these changes. Question 1 asks whether students have internalized and agree with these arguments.

After taking stock of the evidence on the risk of automation and the way it has affected public attitudes, The Economist (2022) offers an interpretation of the likely consequences from a macro perspective. The article surmises that there will be a group of society for whom the change in welfare is negative. They also posit that the overall change in welfare will be significant and positive. Questions 2 and 3 ask students whether they agree with the arguments on the general equilibrium effects of robotization. Question 3 specifically asks them to list groups of society that may be left behind.

Questions 4, 5, 6, and 7 ask students to design policies to improve the distribution of welfare gains that would result from robotization. Question 4 asks about the role of tax policies in giving incentives to firms to automate processes in a way that does not displace workers. Such policies tie back to the argument made in The Economist (2018) that organizational structure can shield jobs from being lost to robotization.

Questions 5, 6, and 7 ask students to think about retraining workers. In particular, students have to decide whether retraining programs should be private, through employers themselves for example, or public. A third possibility would be to leave securing retraining up to the worker. The combination of questions 5, 6, and 7 also asks students to think about whether public funding should be used to finance retraining programs or whether that funding should be made available as incentives to employers and firms to provide (re)-training programs.

Results from the Classroom

This section discusses the results I, as the instructor of record, collected at a public university. Specifically, the assignment was distributed in a semester-long Principles of Macroeconomics course. The course is taken as a pre-requisite by all students at the College of Business and Economics within the university. The students taking the course are business and economics majors. They typically take the course before their major-specific coursework. The university is classified as M1 (Masters Colleges and Universities)/Larger programs by the Carnegie Classification of Institutions of Higher Education.[11]

The textbook for the course was Parkin (2022), which is typically adopted by instructors at the school. The intervention in this paper is easily complementary to most other widely used Principles of Macroeconomics textbooks. I administered the intervention during finals week. I administered the assignment in my Fall 2022 and Spring 2023 courses. Although not reported, the tests of proportions show no significant differences between the Fall and the Spring waves. Total number of respondents is 157. 78 students are in the control group and 79 students

[11] The Carnegie Classification of Institutions of Higher Education (n.d.). About Carnegie Classification. Retrieved (10/23/2023) from https://carnegieclassifications.acenet.edu/.

are in the treatment group. The assignment was distributed via Qualtrics. The students completed the assignment online.

Students' Background Knowledge

Students have to draw on their course experience to understand the reasons for some of the claims made by The Economist (2022). While the article offers no explicit evidence, students have encountered the important link between technology improvement, productivity growth, and income growth in their coursework. They see this for the first time in the Long Run Economics Growth module, which is typically part of the syllabus. As part of Neoclassical Theory within Growth Economics, students learn that labor productivity growth which relies on technological improvement is the engine of long-run growth. They can use this to understand the claim in The Economist (2022) that "the potential gains from the robot revolution are huge." The students can also look to the short-run fluctuations part of the Principles of Macroeconomics course for arguments in favor of technology. Within the Aggregate Supply Aggregate Demand module, total factor productivity shocks are among the drivers of business cycles. The students can rely on having mastered types of unemployment and structural unemployment, in particular, to understand the issue related to job displacement.

Discussion of Results

The pre-treatment questions establish that students recognize the benefits to firms and households from robotization and automation. Contrary to the views expressed in The Economist (2022), students do not seem to share the alleged public fear of automation. An overwhelming majority of the student respondents across both the control and treatment groups see automation as welfare improving. This result could be due to generational differences between university students and the general population. Generation Z has grown up with technology and its ubiquitous presence in their lives. The vast majority of Generation Z students have not had to depend on a landline to place phone calls, rely solely on a map or a compass, ask routinely for directions when getting lost, mail in college or job applications, etc. These are among the many examples of technology changing or eliminating the need for routine tasks. As is typically the case, younger generations have experienced fewer transformations ushered in by technology, but have rather been directly introduced to the results of technology improvement. This may make them relatively more receptive to further changes.

Relatedly, survey results reported by Zhang (2022) show that respondents in the U.S. tend to underestimate the risks of occupation displacement and job polarization brought about by industrial robots. The study finds that after presenting respondents with information on risks associated with automation and job polarization, survey respondents tend to change their beliefs about the threat to their jobs. Respondents, however, did not change their preferences on welfare, immigration, and trade policies. While I find that students in both the control and treatment groups are not alarmed by the possible economic risks of automation, I also establish that as a result of reading the assignment texts, students in the treatment group change their preferences over policies. The key impact of the economic facts and opinions in the two texts is that students in the treatment group relative to the control group tend to move away from laissez-faire as their preferred response to automation. Students in the treatment group become more cognizant of the possible distributional effects of robotization which could differ across occupations while being overall positive. The specific fiscal policies that gather approval in the

treatment group are tax incentives for firms to minimize worker displacement due to automation and to provide retraining. This set of policies provides an avenue to balance the overall positive general equilibrium effects with concerns over groups who may be hurt. On the whole, there is skepticism about the government's role as a direct supplier of retraining.

The rest of the section discusses the results from the assignment I collected in a semester-long Principles of Macroeconomics class in detail. Below I discuss results from the pre-treatment section as well as the factual and the attitude questions.

Results: Factual Questions

Table 6 lists the five factual questions included in this segment of the assignment. The Description of the Assignment section discusses each question and its categorization according to Bloom's taxonomy. In this section, I summarize the results I obtained in my classes. Table 7 reports the student success rate on each of the five questions.

The first question asks students to recall a basic fact from The Economist (2018). The correct response rate to this question is 100% by construction. Students can proceed to the next question only after answering this question correctly. Questions 2 through 4 ask students to use skills from the "understand," "apply," and "analyze" categories. For all three questions, the success rate is above 80%. These results give me confidence that students have read and understood the texts well. Question 5 belongs to the "evaluate" cognitive process category in Bloom's taxonomy. To answer correctly, students have to recognize that options A, B, and C are all correct, which makes the question harder. Question 5 proves more difficult, indeed with an overall success rate of 39.5%. However, nearly 80% of students marked statement A, Question 5, as correct. The statement emphasizes that the overall impact of robotization on unemployment may be attenuated by the new jobs created by it. Fewer students, 64.32% marked statement B, Question 5, as correct. Even fewer, 57.32% marked statement C, Question 5, as correct. The two statements, B and C, deal with retraining as well as adapting to a new environment without occupational loss as possible responses to robotization. These outcomes are briefly discussed in The Economist (2022). However, the claim made by statement A, Question 5, is more heavily emphasized and illustrated in The Economist (2022) relative to retraining and adapting. From this standpoint, it comes as no surprise that the majority of students recognize statement A as correct while a smaller share agrees with statement B or C. At the same time, only 14.65% of students wrongfully marked statement D, Question 5, as correct. The Economist (2022), based on Nedelkoska and Quintini (2018), illustrates the point that industry mix alone does not raise the share of vulnerable jobs. The cross-country comparison reported in the two articles suggests that organizational and managerial structure seem to be important in isolating jobs from the risk of automation and displacement.

On the whole, the student responses to the factual questions across cognitive categories are reassuring. Students have read the articles and grasped the key facts and arguments in the texts.

Results: Pre-treatment Questions

I replicate the two pre-treatment questions along with the results below for convenience.

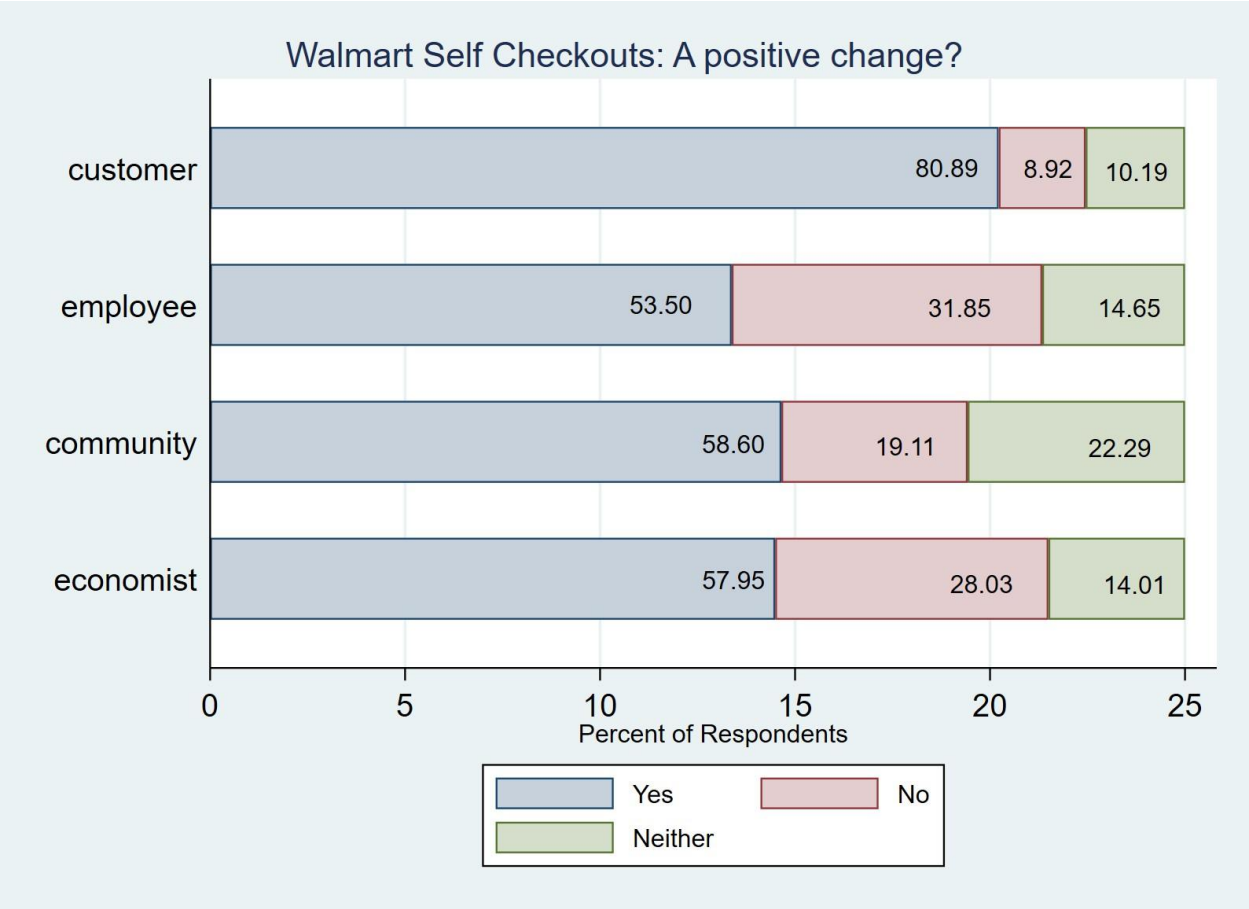
Question 1: Robots have benefited from rapid innovation in technology. They can now do many tasks humans can, in many instances, even better than humans.
Is this development in robotics beneficial to society?

91.7% of students agree with the statement. This result suggests that even before familiarizing themselves with the texts, students see automation and robotization as welfare improving for society as a whole. This relates to the key argument in the second article: The Economist (2022). The second article emphasizes that on the aggregate level, the changes are expected to be welfare improving. However, the distribution of welfare gains depends on labor market outcomes, with people in certain occupations being potentially net losers. Question 2 in the pre-treatment section asks students to make a distinction between aggregate social welfare gains and the impact on different groups. The question asks students to think about households as both buyers in the goods and services market but also as sellers in the labor market. While the general equilibrium change may imply welfare gains in the aggregate, the distribution of those gains will depend on labor outcomes. To facilitate students' understanding of this distinction, question 2 asks them to draw on an example from their life experience. The results are discussed below.

Question 2: In the summer of 2021, the local grocery store adopted self-service checkouts. Is this a positive change?

Students answer this question four times: as a customer, an employee, a member of the community, and as an economist. Figure 2 reports the share of responses by role.

Figure 2



Notes: Proportion of respondents. Total number of respondents is 157.

Answering as customers, students are the most likely to see self-checkouts as a positive change and least likely when answering as a store employee. This pre-treatment result demonstrates that even before encountering the economic evidence and interpretation in the texts, the students anticipate that occupation loss is among the most serious risks ushered in by automation. At the same time, their experience with self-checkouts as a customer seems to be overwhelmingly positive or at least not substantially different from before self-order kiosks.[12] These results once again reaffirm that students are generally receptive to technological change, automation, and robotization.

The share of positive responses in the "community member" and "economist" roles is roughly identical at 58.6% and 57.95% respectively. Table 1 reports the tests of proportion. The table confirms that the share of those who see self-checkouts as a positive change is significantly higher in the customer role than in the other three roles. Although I do not report the tests, the rest of the shares in the employee, community, and economist roles are not significantly different from one another. Those who agree as employees that the change is positive are a slightly lower share, 53.5%, than the shares in the community member and economist role. However, the

[12] 10.19% report that they see the change as neither positive nor negative in the customer role.

difference is not statistically significant. The biggest difference between the community member role

Table 1: Pre-treatment Question 2- Self-Checkouts: A positive change?

Group	Share of Yes	Std. Err.	Ha: *diff* < 0	Ha: *diff* ≠ 0	Ha: *diff* > 0
			diff = prop(customer) - prop(i)		
customer	0.809	0.031			
employee	0.535	0.04	1.00	0.00	0.00
community	0.586	0.04	1.00	0.00	0.00
economist	0.58	0.039	1.00	0.00	0.00

Notes:
Share of Yes Responses. The table reports the share of respondents who provided a positive response within each role. Column 2 reports the shares, column 3- the standard error of the estimate, columns 4, 5 and 6 report the probabilities for one- and two-sided tests of proportions. Total number of respondents is 157.

and those of an employee and an economist is highlighted in table 2. The table reports tests of proportion for the share of students who answered "no." The share in the community role is the lowest and significantly different from the shares in the employee and economist roles.[13] As economists, students are more likely to share the pessimism of employees rather than as community members. The high share of "yes" responses in the customer roles and the lack of pessimism in the community member role as evidenced by the relatively low share of negative responses in this role suggest that students are not particularly sensitive to potential issues of dehumanizing the shopping experience or making it more difficult. On the contrary, as consumers of technology services students are overall receptive of technology.
.

[13] The share of negative responses is the lowest in the customer role. Table 2 reports tests of proportion among the remaining three roles: employee, community member and economist.

Table 2: Pre-treatment Question 2- Self-Checkouts: A positive change?

Group	Share of No	Std. Err.	Ha: *diff* < 0	Ha: *diff* ≠ 0	Ha: *diff* > 0
			diff = prop(employee) - prop(i)		
employee	0.318	0.037			
community	0.191	0.031	0.995	0.010	0.005
economist	0.28	0.036	0.77	0.46	0.22

Notes:

Share of No Responses. The table reports the share of respondents who provided a negative response within each role. Column 2 reports the shares, column 3- the standard error of the estimate, columns 4, 5 and 6 report the probabilities for one- and two-sided tests of proportions. Total number of respondents is 157. 78 students are in the control group and 79 students are in the treatment group.

Results: Attitude Questions

Table 3 reports the share of yes responses to attitude question 1 through 6. I replicate the questions and discuss the results below.

Attitude question 1: Automation and robotization will bring big changes to the work- place. Do you agree?

Yes
No

Neither agree nor disagree.

The majority of students agree that automation and robotization will affect labor in a meaningful way. As table 3 reports, this is the case for both the treatment and the control groups. As the test of proportions reported in table 3 suggests, there are no significant differences in opinion between the two groups on the first attitude question.

Attitude question 2: Workplace automation will leave some people on the losing end of change even though overall robots will make society as a whole better off. Do you agree with the statement?

Yes
No

Neither agree nor disagree.

While students anticipate that automation will change the workplace regardless of whether they have read the texts or not, question 2 on the distribution of overall gains shows a significant difference in opinion between the treatment and control groups. The students who have read the articles are more likely to agree that both overall social gains and losses to individual groups are likely results. The fraction of responses in agreement with the statement increases by nearly ten percent points for the students who have read the texts. The test of proportions shows that the share of positive responses in the control group is significantly higher. The two-sided test is also significant at the 10% level.

Table 3: Attitude questions 1-6: Do you agree?

			diff = prop(0) - prop(1)		
Group	Share of yes	Std. Err.	Ha: *diff* < 0	Ha: *diff* ≠ 0	*Ha : diff* > 0
		Attitude question 1			
treated (1)	96.2	0.022	0.6647	0.6705	0.3353
control (0)	97.4	0.018			
		Attitude question 2			
treated (1)	89.9	0.034	0.0497	0.0995	0.9503
control (0)	80.5	0.045			
		Attitude question 4			
treated (1)	44.3	0.056	0.057	0.114	0.943
control (0)	32.1	0.053			
		Attitude question 5			
treated (1)	37.2	0.055	0.015	0.03	0.985
control (0)	54.4	0.056			
		Attitude question 6			
treated (1)	61	0.056	0.5143	0.9715	0.4857
control (0)	60.76	0.055			

Notes:

Share of Yes Responses. The table reports the share of respondents who provided a positive response within each role. Column 2 reports the shares, column 3- the standard error of the estimate, columns 4, 5, and 6 report the probabilities for one and two-sided tests of proportions. Total number of respondents is 157. 78 students are in the control group and 79 students are in the treatment group. Question 3 is omitted in this table because the question requires a word entry only.

Attitude question 3- Workplace automation will leave some people on the losing end of change even though overall robots will make society as a whole better off.

Who will be on the losing end?

Table 4 reports the answers students in the control and treatment groups gave to attitude question 3. I have grouped their responses according to the specific factors they identified as risks that may put someone on the losing end of change. Most commonly students in the control group expect that workers in general or workers in specific occupations with a relatively high risk of automation would be affected negatively by the change. In the control group, 18.1% answer labor in general and 22.98% occupation-specific risk of automation. The share of respondents who identify workers in certain occupations (without specifying particular jobs) to be at risk of being on the losing end is smaller by 7 percentage points in the treatment group. The share of students who give the response that workers in general are potentially on the losing end of change drops by 11.3 percentage points for those who have read the texts. The biggest difference between the control and the treatment group is that 16.1% of students who read the texts see lack of retraining as the factor which could lead to a negative welfare change while at the same time, no one identifies it in the control group. It should be noted that attitude questions 6 and 7 show that students in both groups are pretty skeptical about the government-supplied retraining opportunities. Those who identify lack of retraining as a risk factor often emphasize in their answers insufficient demand rather than supply of retraining opportunities.

Additionally, 16.9% of students in the control group associate a negative welfare change with low-skill occupations. This share drops only slightly in the treatment group where this answer claims 13.6%. A non-negligible share of respondents in the control group, 8.4%, associate low rank with a higher risk of occupational loss. This share drops significantly in the treatment group to 3.4%. Again, 8.4% of the control group associate routine and manual skill content with a high risk of a negative impact. Half of the control group share, 4.2% in the treatment group, highlight routine and manual skill job content as a risk factor. A higher share in the treatment group than in the control group, 10.8% versus 18.6%, sees industry mix as a factor in determining welfare losses.[14]

[14] The Economist (2022) emphasizes industry mix but also elaborates that it cannot alone explain cross-country differences.

Table 4: Attitude Question 3

Reported Risk Factors	Control		Treatment	
Occupation specific risk of automation	19	22.89	19	16.10
Labor in general	15	18.07	8	6.78
No retraining			19	16.10
Low skill jobs	14	16.87	16	13.56
Routine occupations	5	6.02	3	2.54
Manual occupations	2	2.41	2	1.69
Low rank positions within a job	7	8.43	4	3.39
Industry	9	10.84	22	18.64
Manufacturing	8	9.64	13	11.02
Other Industries	1	1.20	9	7.63
Construction	1	1.20	4	3.39
Transportation			2	1.69
Food preparation			2	1.69
Retail			1	0.85
(Lower) Income	5	6.02	9	7.63
Age of workers	3	3.61	10	8.47
Lower Education	1	1.20	1	0.85
Nobody	1	1.20	1	0.85
N/A	2	2.41	4	3.39
Totals	83	100	118	100

Notes:

Summary of responses to attitude question 3 by control and treatment group. Columns 2 and 4 report the count of respondents who provided the answer. Columns 3 and 5 report the fraction of respondents, instead. The sum of responses is greater than the number of students, because respondents provide more than one answer.

Attitude question 4- Check the statement you agree with:

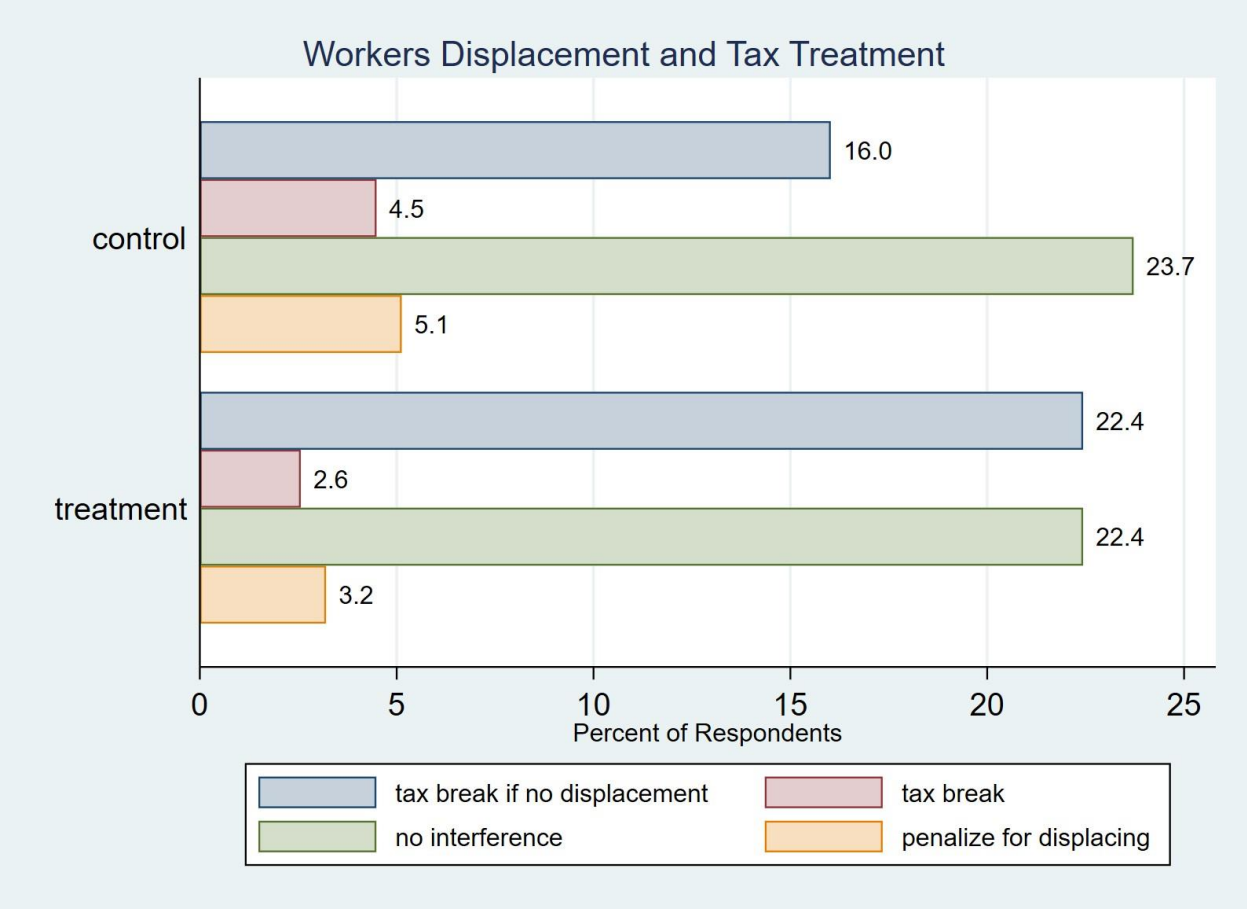
1. *We should give tax incentives (tax breaks and/or subsidies) to companies in WI which adopt*

technology only if it will not displace workers on their payroll.

2. *We should give tax incentives (tax breaks and/or subsidies) to companies in WI which adopt new technology regardless of whether it will displace some workers on their payroll.*
3. *We should neither penalize nor give incentives to companies in WI adopting new technology.*
4. *We should penalize companies adopting technology only if it will displace workers on their payroll.*
5. *We should penalize companies in WI adopting technology regardless of whether it will displace any workers on their payroll.*

Figure 3 reports the fraction of responses to the fourth attitude question sorted by the group the student belongs to.

Figure 3



Slightly less than a quarter of the students in both groups choose laissez-faire in response to displacement. This is the most common answer in the control group. Going from the control to the treatment group, the tax policy which rewards companies for automating without displacing workers claims a larger number of respondents. As a matter of fact, it becomes equally common as the laissez-faire answer. While "no interference" becomes only slightly less common among students who have been exposed to the economic evidence, responses switch out of an unconditional tax break as well as penalizing companies for

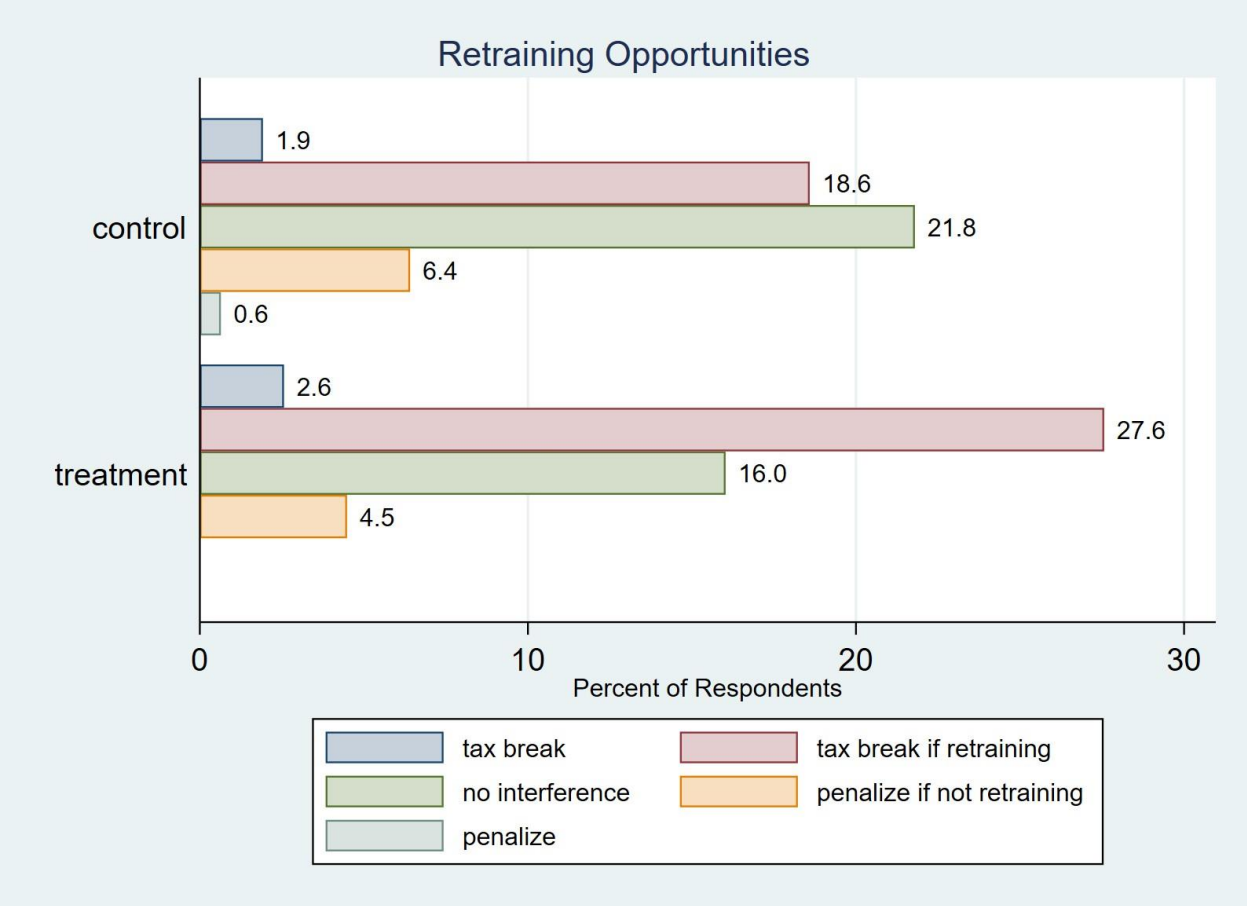
displacing workers in the control group. This is consistent with the analysis in The Economist (2022), which discusses the trade-off between overall social gains and potential losses for some workers. The article also discusses factors which ameliorate job displacement. As a result, more students are convinced of a fiscal policy that balances the benefits of automation with the uneven distribution of gains and losses across occupations. Table 3 reports the share of respondents who agree with the policy to make tax incentives for firms conditional on minimizing displacement by the group. The one-sided test reported in the table is significant at the 10% level. The result shows that the share of respondents in agreement with this policy is significantly higher in the group who read the articles.

Attitude question 5- Check the statement you agree with:

1. *We should give tax incentives (tax breaks and/or subsidies) to companies in WI which automate their processes regardless of whether they provide retraining opportunities for displaced workers.*
2. *We should give tax incentives (tax breaks and/or subsidies) to companies in WI which automate their processes only if they provide retraining opportunities for displaced workers.*
3. *We should neither penalize nor give incentives to companies in WI which automate their processes.*
4. *We should penalize companies in WI which automate their processes regardless of whether they provide retraining opportunities for displaced workers.*
5. *We should penalize companies in WI which automate their processes only if they do not provide retraining opportunities for displaced workers.*

Attitude question 5 shows that the treatment group is relatively more supportive of fiscal incentives to firms to retrain workers. This policy draws respondents from the no interference option, as well as both from the unconditional support and the unconditional penalty options in the treatment group relative to the control group. The fraction of responses in support of providing tax incentives for retraining is nine percentage points higher for the group that read the article. The test reported in Table 3 also confirms that this response share is significantly higher in the treatment group. This result suggests that the texts convince students of the need for policy intervention and incentives for firms specifically to provide retraining.

Figure 4



The last two questions in the attitude group relate to the students' views on the government's role in providing retraining for displaced workers. In particular, the questions gauge their perception of the government directly supplying retraining. Overall, students are skeptical of the role of the government as a direct source of training. Whether they have read the economic evidence or not does not make a difference, either. I discuss the results for the last two attitude questions below.

Attitude question 6. If on-the-job training and private-sector training are insufficient to offset the unemployment resulting from automation, it is the role of the government to fill the gap by offering government-sponsored retraining programs. Do you agree?

While the majority of students answer the question in the positive, it is only a slim majority, at 61% for both groups. The percentage of positive responses is roughly the same for both groups as well.

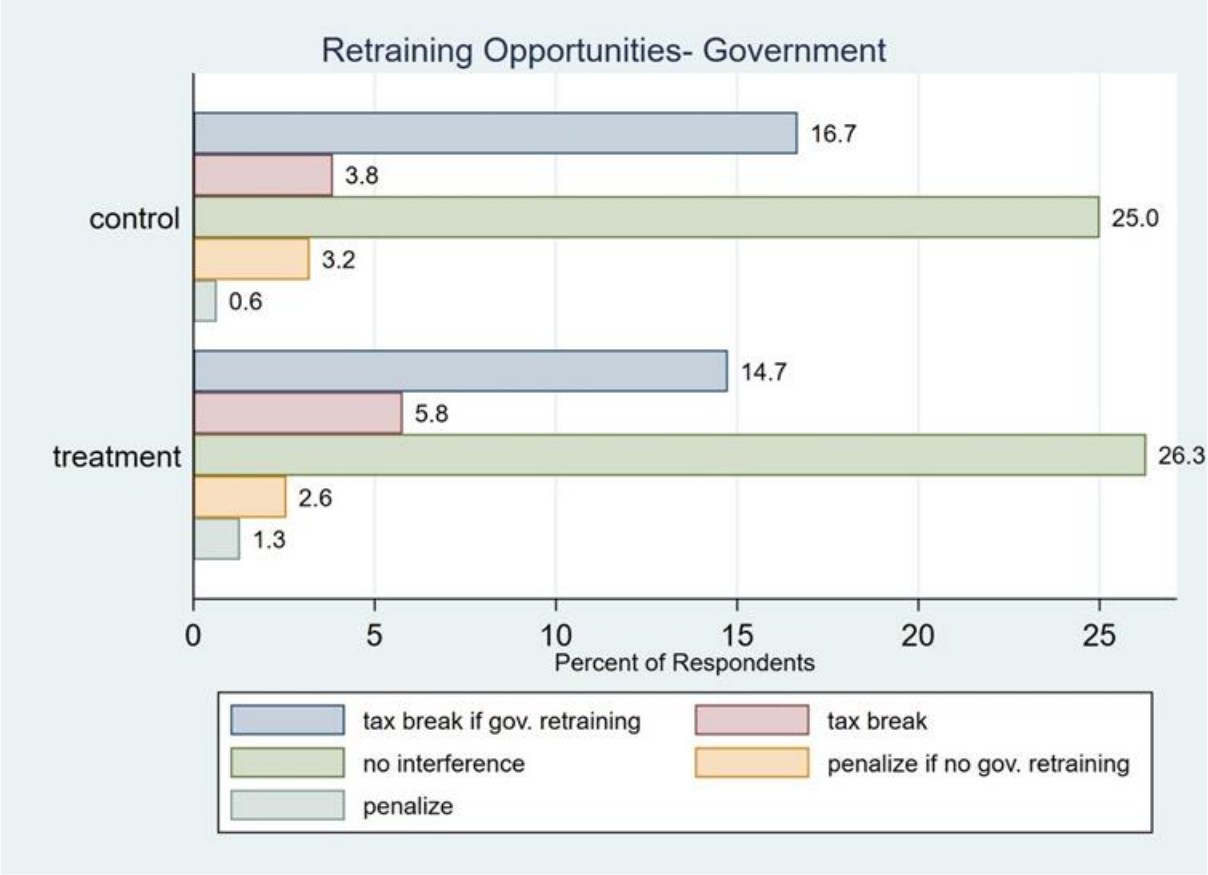
Attitude question 7. Check the statement you agree with:

1. *We should give tax incentives (tax breaks and/or subsidies) to companies in WI which automate their processes regardless of whether there are government-sponsored retraining opportunities.*

2. *We should give tax incentives (tax breaks and/or subsidies) to companies in WI which automate their processes only if there are government-sponsored retraining opportunities.*
3. *We should neither penalize nor give incentives to companies in WI which automate their processes.*
4. *We should penalize companies in WI which automate their processes regardless of whether there are government-sponsored retraining opportunities.*
5. *We should penalize companies in WI which automate their processes only if government- sponsored retraining opportunities available to displaced workers are insufficient.*

Figure 5 reports the proportion of respondents who chose one of the five options listed in question 7 by group. Laissez-faire is the most commonly selected answer for both groups. A quarter of students in the control group chose the no interference option. Slightly more, 26.3% of the students, chose the no interference option in the treatment group. The option to make tax incentives conditional on the availability of public retraining programs follows laissez-faire by popularity. However, it only 16.7% and 14.7% of respondents in the control and treatment groups respectively who select this option. Although not reported, the test of proportion shows no significant difference between control and treatment for this question.

Figure 5



Conclusion

Outside readings are typically included in Principles courses. Students may be asked to follow a news outlet with an economics or finance emphasis or may have structured assignments on material selected by the instructor. In this paper, I provide an example of an assignment based on newspaper articles. I show how such an assignment can be structured to assess student learning. I also report results on the contribution the assignment makes to students' opinions on a topical issue as well as their preferences over the relevant economic policies. I find that after confronting the economic evidence in the assignment, the students tend to favor policies that balance maximizing overall social well-being with distributional consequences. Specifically, I find that a higher fraction of students in the treatment relative to the control group anticipates that robotization will result in both overall social gains and also losses to individual groups. Going from the control to the treatment group, the tax policy that rewards companies for automating without displacing workers claims a larger number of respondents. The difference in this share of respondents in the two groups is statistically significant.

Relatedly, there are fewer responses in the treatment group on the extreme ends of the fiscal response distribution. There are fewer students in the treatment group who favor an unconditional tax break to firms for automation. At the same time, fewer students choose penalizing companies for displacing workers in the treatment group than in the control group. The treatment group is also relatively more supportive of fiscal incentives to firms to retrain workers. On the whole, the evidence suggests that students who have read the articles are reassured about the social welfare gains and cognizant of the possible net losses for specific groups of workers. This results in statistically significant differences between the policy choices in the treatment and in the control group. The results I obtain from the classroom demonstrate that outside readings play an important role in advancing students' economic literacy and understanding.

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Additional Tables

Table 5: Cognitive Processes Dimensions, Bloom's Taxonomy

Categories 1-3	Cognitive Processes	Cognitive Processes (Alternative Names)	Categories 4-6	Cognitive Processes	Cognitive Processes (Alternative Names)
1. Remember	Recognizing	Identifying	4. Analyze	Differentiating	Discriminating
	Recalling	Retrieving			Distinguishing
2. Understand	Interpreting	Clarifying			Focusing
		Paraphrasing			Selecting
		Representing		Organizing	Finding
		Translating			Coherence
	Exemplifying	Illustrating			Integrating
		Instantiating			Outlying
	Classifying	Categorizing			Parsing
		Subsuming			Structuring
	Summarizing	Abstracting		Attributing	Deconstructing
		Generalizing	5. Evaluate	Checking	Coordinating
	Inferring	Concluding			Detecting
		Extrapolating			Monitoring
		Interpolating			Testing
		Predicting	6. Create	Generating	Hypothesizing
	Comparing	Contrasting		Planning	Designing
		Mapping		Producing	Constructing
		Matching			
	Explaining	Constructing models			
3. Apply	Executing	Carrying out			
	Implementing	Using			

Table 6: Factual Questions

Q #	Question	Cognitive Category	Correct Answer
1	According to the article, researchers at the Massachusetts Institute of Technology looked at .....firms and found that their use of advanced technologies led to ..... in hiring. A. South Korean firms; an increase B. Finnish firms; a decrease C. South Korean firms; a decrease D. Finnish firms; an increase	Remember	D
2	According to the article, one of the reasons why robots "could not be coming at a better time" is because: A. In the aftermath of the Pandemic, the demand for labor recovered faster than expected, outpacing the recovery in labor supply and creating labor shortages. B. in the aftermath of the Pandemic, the demand for labor has been slow to recover, and wage growth has been sluggish as a result. C. recent advances in machine learning have made robots less clunky and more elegant. D. as shown in a paper published in 2013 by economists at Oxford University, 47% of American jobs were at risk of being "shipped abroad".	Understand/ Apply	A
3	According to the article, in what way is workplace automation like the globalization of the 1990s and 2000s? A. Like in Capek's play, the robots may cause "mass unemployment and worse". B. Like the globalization of the 1990s and 2000s, automation will resolve issues with labor surpluses. C. Like the globalization of the 1990s and 2000s, automation will slow down wage growth. D. Like growth in trade, workplace automation promises productivity gains and creates better jobs. However, some people may be on the losing end and feel left behind.	Understand/ Apply	D
4	What type(s) of unemployment is the shift in skills brought about by workplace automation and robots most likely to create? A. The shift in skills is most likely to create frictional unemployment. B. The shift in skills is most likely to create structural unemployment. C. The shift in skills is most likely to create cyclical unemployment. D. The shift in skills will most likely not affect natural unemployment.	Apply/ Analyze	B
5	Frey and Osborn, 2013 (note the study is cited in both articles) find that for 47 % of total US employment, the risk of automation is 70% or higher. The authors also note that high-probability occupations are likely to be substituted by computer capital relatively soon. Does this finding imply that automation will result in widespread unemployment? Check all that apply. A. No; automation creates new jobs. While some occupations are lost, new ones will be created with overall unemployment not being as severely impacted or even declining as a result. B. No; people employed in jobs that have been automated may see the skill content of their job alter, but be still able to keep their jobs- like bank tellers, for example. C. No; people whose jobs have been lost to automation may retrain to take advantage of other available jobs. D. Yes; according to the article, jobs in manufacturing regardless of the organizational and managerial structure are highly vulnerable to being lost to automation.	Analyze/ Evaluate	A, B, C

Notes:
Factual Questions.

Table 7: Factual Questions

Q #	Question	Percent Correct
1	According to the article, researchers at the Massachusetts Institute of Technology looked at .....firms and found that their use of advanced technologies led to ..... in hiring. A. South Korean firms; an increase B. Finnish firms; a decrease C. South Korean firms; a decrease D. Finnish firms; an increase	100%
2	According to the article, one of the reasons why robots "could not be coming at a better time" is because: A. In the aftermath of the Pandemic, the demand for labor recovered faster than expected, outpacing the recovery in labor supply and creating labor shortages. B. in the aftermath of the Pandemic, the demand for labor has been slow to recover, and wage growth has been sluggish as a result. C. recent advances in machine learning have made robots less clunky and more elegant. D. as shown in a paper published in 2013 by economists at Oxford University, 47% of American jobs were at risk of being "shipped abroad".	81.41%
3	According to the article, in what way is workplace automation like the globalization of the 1990s and 2000s? A. Like in Capek's play, the robots may cause "mass unemployment and worse". B. Like the globalization of the 1990s and 2000s, automation will resolve issues with labor surpluses. C. Like the globalization of the 1990s and 2000s, automation will slow down wage growth. D. Like growth in trade, workplace automation promises productivity gains and creates better jobs. However, some people may be on the losing end and feel left behind.	87.82%
4	What type(s) of unemployment is the shift in skills brought about by workplace automation and robots most likely to create? A. The shift in skills is most likely to create frictional unemployment. B. The shift in skills is most likely to create structural unemployment. C. The shift in skills is most likely to create cyclical unemployment. D. The shift in skills will most likely not affect natural unemployment.	87.18%
5	Frey and Osborn, 2013 (note the study is cited in both articles) find that for 47 % of total US employment, the risk of automation is 70% or higher. The authors also note that high-probability occupations are likely to be substituted by computer capital relatively soon. Does this finding imply that automation will result in widespread unemployment? Check all that apply. A. No; automation creates new jobs. While some occupations are lost, new ones will be created with overall unemployment not being as severely impacted or even declining as a result. B. No; people employed in jobs that have been automated may see the skill content of their job alter, but be still able to keep their jobs- like bank tellers, for example. C. No; people whose jobs have been lost to automation may retrain to take advantage of other available jobs. D. Yes; according to the article, jobs in manufacturing regardless of the organizational and managerial structure are highly vulnerable to being lost to automation.	A: 78.98%; B: 64.33%; C: 57.32%; A, B, C: 39.5%

Notes:
Factual Questions.