



From Cheating to Learning: AI Integration in Introductory Economics

This paper addresses two AI-driven challenges for educational integrity and course design: academic dishonesty and the need for curriculum development. As students adopt AI faster than institutions can verify authenticity, instructors must also undertake labor-intensive revisions to integrate AI ethically and align assignments with learning goals. We propose a general framework for designing ChatGPT-integrated, economics-model-focused assignments and provide two adaptable, ready-to-use assignments for principles of microeconomics and macroeconomics. These activities position ChatGPT as a complement to learning and cover core introductory topics. We conclude with preliminary survey evidence on students' reported AI use and enjoyment.

Sayorn Chin[†], Kenese Io[‡], Fatih Kırşanlı^{*}, Teresa Perry[#]

†Lafayette College, ‡Glendale Community College *University of Ankara, #California State University

1. Introduction

Artificial intelligence (AI) is increasingly becoming a transformative tool in higher education, reshaping how institutions teach, how students learn, and how educational outcomes are measured (Chaloti, 2022). On one hand, AI tools present opportunities to aid educational outcomes; on the other hand, the increasing improper usage of AI in various academic settings has become a pressing issue. One article reports that one-third of college students use ChatGPT regularly (Stöhr et al., 2024). Generative AI can be used for written and quantitative assignments, which affects many departments across universities. The increase in AI usage is associated with an increased degree of academic dishonesty (Sweeney, 2023; Fyfe, 2023). Given the difficulties instructors and institutions face and the potential benefits AI brings, we argue that carefully and equitably integrating AI into coursework can be advantageous for students; however, it must be implemented in a way that minimizes opportunities for academic dishonesty. If instructors are willing to incorporate AI into assignments, it can mitigate unethical use and simultaneously teach students how to use AI appropriately and critically.

The use of technology as a teaching tool in economics courses has varied significantly over time, with many studies showing that the incorporation of technologies can improve student learning, accessibility, and performance outcomes while also making teaching easier for instructors (Middleditch et al. 2022; Becker and Birdi, 2018; Johnson and Meder, 2024; Raymond et al., 2008; Haleem et al., 2022). We recommend using ChatGPT, a generative AI tool, in the development of coursework, because many students are familiar with the tool, and instructors can use it quickly and effectively.

In support of our proposal, we offer two assignments that demonstrate the integration of AI into coursework. We follow the approach of Beck and Brodersen (2025) and provide economics instructors with a general structure to effectively integrate ChatGPT in economic model analysis, followed by two easily modifiable writing assignments for introductory economics courses. The assignments cover core concepts of price controls in microeconomics and fiscal policy, and their application in the aggregate demand and supply model. We constructed our writing assignments as in-class assignments to decrease the probability of improper use of the ChatGPT tool; however, when class time is constrained, each can be run entirely as homework, outside of class, at the instructor's discretion. We also incorporate peer-to-peer collaboration to help foster the active learning process (Abdallah et al., 2024). Additionally, we present findings from a survey of students on their current AI usage as an example of real-time feedback from students in courses with integrated AI assignments.

The paper is organized as follows: In Section 2, we detail the challenges presented by AI and the potential benefits of integrating AI in introductory coursework and outline how ChatGPT can be a valuable complement to student learning; In Section 3, we outline a general structure for integrating ChatGPT into assignments that analyze economic models; In Section 4, we provide two ready-to-implement assignment examples that integrate ChatGPT and detail how an instructor might use them in introductory economics courses; In Section 5, we discuss the results of surveys administered in different introductory economics courses regarding students' use and feelings about AI; We conclude with our final remarks and suggestions for further development in Section 6.

2. Challenges and Potential Benefits of AI Integration

A. Challenges Presented by AI

Historically, academic institutions lag behind the curve of technological innovation, and AI technology is no exception. The accessibility of AI tools has generated two primary issues for institutions. The first issue is academic dishonesty. Students are using AI tools to generate essays, discussions, and exam responses, and traditional plagiarism detection methods cannot sufficiently address the problem. The second issue focuses on teaching practices. Instructors have labored to build assignments for students that encourage them to incorporate applied concepts and the process of designing new assignments is time-intensive.

Sweeney (2023) notes that it may be prudent for instructors to move away from the traditional essays in favor of exams while detection software improves. The ease with which students can share and create academic work also provides the groundwork for a social dilemma. When students see their peers using AI tools to earn higher marks, it creates an incentive for students to adopt the same practices when they otherwise would not (O'Rourke et al., 2010). The proliferation of academic dishonesty issues is concerning not simply because of the ethical implications, but also because students who use these tools as a substitute for the learning process may not develop the concepts and skills to succeed in the labor force.

New assignment design must ensure that students are aware of the innovations in AI and must ensure that students are completing their assignments ethically (Lee, 2024; Ngo, 2023). The labor-intensive process surrounding the development of new assignments is a concern for instructors. Instructors need to develop assignments that integrate AI tools like ChatGPT while also encouraging students to engage in the critical thinking and effort involved in writing an essay or exam response. The development of this curriculum needs to recognize the existence of AI as an excellent complement to the learning process that augments students' learning capacity, as opposed to a substitute for students' work. Kerney (2025) highlights effective methods to detect AI usage in coursework. Instructors can utilize HTML features in Canvas to implement a 0 pt font phrase to set traps for AI or run assignments through AI tools to identify problems that AI fails to answer correctly.

B. Potential Benefits Presented by AI

Because of the novelty of AI tools, there are limited peer-reviewed journal articles on the topic of potential benefits that AI brings to higher education. Nevertheless, some researchers have begun to examine ChatGPT's impact on education more closely. For instance, Winkler and Söllner (2018) explore the use of chatbots in educational settings and note that they "promise to have a significant positive impact on learning success and student satisfaction" by responding to individual intent and providing real-time feedback.

Moreover, the authors reported that chatbots can increase student motivation by giving learners greater control over their educational process. They also highlighted the advantage chatbots hold over asynchronous communication tools, as students can engage in conversation with them at any time (Winkler and Söllner, 2018). In another systematic review, Lo (2023) examines ChatGPT's potential applications and performance across various subject areas. The review found that while ChatGPT performed well in fields such as economics, it struggled in others, including mathematics. However, Lo (2023) emphasizes ChatGPT's promise as both an instructional assistant capable of developing course materials and a virtual tutor that can answer questions and support student learning.

Rizvi et al. (2023) finds that AI offers a learner-centric approach that facilitates comprehension of complex subjects, particularly pertinent to economics courses. By enabling students to draw upon their personal experiences and ideas, AI facilitates the bridging of abstract economic concepts with practical applications. This approach promotes cognitive and effective learning outcomes by fostering creativity, motivation, and interest in economic

education. Similarly, in a meta-analysis of experimental studies examining articles published between 2022 and 2024 on ChatGPT and education, Deng et al. (2024) concludes that ChatGPT positively impacts student learning, academic performance, and motivation while also reducing stress and pressure.

The integration of AI tools helps to increase student confidence as well. AI can help students evaluate and analyze the consistent evolution of economic policy, improving their media literacy and engagement. It can be difficult for students to critically engage with new policies using economic concepts (Ruget and Rosero, 2014). Students in principles classes often struggle or hesitate to bridge the gap between abstract concepts and current economic policy. When instructors provide students the opportunity to utilize AI, this can increase the students' confidence by providing them with the means to link concepts to policy. In addition, for non-native English speakers, AI programs offer corrective feedback on language, grammar, and word choice, thereby reinforcing confidence and removing barriers to tackle complex connections in written work (Koltovskaia, 2020; Rudolph et al., 2023).

3. General Structure of Generative AI assignments

Both of our example assignments encourage students to master the mechanics of the models that are examined in the assignment. We encourage a hands-on approach that incorporates active learning and real-world scenarios in tandem with generative AI use to enhance student engagement and learning (Beck and Brodersen, 2025). The applications provided in section 4 are specific to principles of microeconomics and macroeconomics courses, but in this section we provide a general outline to demonstrate how instructors can use the general application approach for economic models in all economic courses.

- The first step involves the instructor explaining when to use, cite, and refrain from using ChatGPT. Each instructor will vary in their flexibility here, but students must know where instructors are integrating AI into their assignments.
- The second step involves the basic modeling component, which we have students do through collaborative group-work. This step ensures students understand the basic mechanics and execute the drawing and interpretation of graphical models.
- The third step involves the integration of ChatGPT. Our method of ChatGPT integration involves using contemporary real-world policies and relaxing assumptions. Contemporary examples allow students to make connections to national or local policies to develop their understanding of the political-economic nexus. Relaxing assumptions allow students to begin the process of relaxing assumptions in the model. When students omit the *ceteris paribus* assumption and begin to think about how policies affect individuals and firms, they develop a deeper understanding of the models themselves and the importance of assumptions in the process of modeling.
- The fourth step asks students to discuss with their groups the importance of these assumptions and the validity of some of the core models used in economics. Students can then better understand both the benefits and limitations of the models.
- The fifth step asks students to write and reflect on their findings and use of ChatGPT. Students should consider the benefits and limitations of the use of ChatGPT, and their experience and enjoyment of the assignment. This will give instructors a gauge for where students stand on their assignment design and provide real-time feedback in order to ensure students grasp how AI can be used to effectively enhance their learning process. In section 5 we include a survey that we administer to students after they

work through our assignments in section 4. This survey provides some information regarding the students' feelings on AI after completing assignments that integrate ChatGPT. Instructors can use the survey statements in section 5 as an example of one method to receive feedback on the assignments and receive insight on how AI is used in their own classrooms.

While we follow Sweeney (2023)'s recommendation to incorporate more in-class writing, we are not suggesting that most or all assignments be moved to in-class. If instructors face the consistent issue of students substituting their own work with AI-completed assignments, we recommend adopting a variation of the assignments below. However, the following assignments can also be completed outside of class with instructor-specific modifications when in-class time would displace substantial coverage of other material.

4. Examples of Ready-to-Implement Assignments in Introductory Economics Courses

In this section, we provide two examples of ready-to-implement assignments: one assignment for macroeconomics and one for microeconomics. We provide each assignment approximately as it would appear to students, along with breakdowns of how to facilitate the assignment for instructors. The assignments below cover fundamental concepts in microeconomics and macroeconomics courses, but the links and policies will change with time and geography. Each assignment structure includes example policy proposals in the student-facing instructions that we used. The examples are italicized to indicate that instructors should feel empowered to update the policies to fit their classes. The appendix includes a table overview of the assignment learning outcomes, instructor guides, and a sample of student work.

When instructors integrate ChatGPT into coursework, it is best to assume that students do not have prior knowledge of how to use the tool. Instructors should allocate 15-20 minutes of class time to introduce students to the ChatGPT tool. Instructors should approach the use of ChatGPT with a positive attitude and emphasize the importance of using the AI tool as a complement rather than a substitute.

A. Principles of Macroeconomics Assignment

The macroeconomics assignment asks students to make the connection between contemporary fiscal policy options and the aggregate demand and aggregate supply model. ChatGPT is used to assist the student in understanding how economic language is used to convey political preferences. The primary purpose of the ChatGPT integration in the exercise is to encourage students to understand the importance of assumptions when using economic models. Students collaborate with their group to analyze the effect of an economic policy on the aggregate demand–aggregate supply model under the constraints *ceteris paribus*. When the students ask ChatGPT to assess the impact of the model, we have the students discuss the differences between their groups' interpretations and those of ChatGPT. This discussion allows students to explore how relaxing the *ceteris paribus* assumption can drastically change the interpretation of the policy impact.

In this assignment, students will explore the economic analysis of the president's proposals from two different economic think tanks. It is helpful to choose two different think tanks with differing political biases. In this assignment, we use the Institute on Taxation and Economic Policy (Left center source) and the Tax Foundation (Right center source).¹

A.1 Student Facing Instructions

Prompt: In this assignment, you will write a paper evaluating a tax proposal from our current president. You will draw from 3 outside resources to evaluate your policy proposals, namely, the *Institute of Taxation and Economic Policy (ITEP)*, the *Tax Foundation*, and *The New York Times*. The tax resources are nonpartisan think tanks that evaluate state and federal tax policy. You will use ChatGPT to evaluate the policies and reflect on that experience.

Section 1: Section 1 will evaluate the political leaning of the summary for the president's tax proposal from both think tanks. Begin by reading through each think tank's description and discussing your understanding of the think tank's political leaning. After your group evaluates the political leaning, log your interpretation and use the following two links to assess *President Trump's* proposals with ChatGPT:

- ITEP – [https:// itep.org/ a-distributional-analysis-of-donald-trumps-tax-plan-2024/](https://itep.org/a-distributional-analysis-of-donald-trumps-tax-plan-2024/) - Copy the first 2 paragraphs under the "Impact of President Trump's Tax Proposals by Income Group"
- Tax Foundation – [https:// taxfoundation.org/ research/ all/ federal/ donald-trump-taxplan-2024/](https://taxfoundation.org/research/all/federal/donald-trump-taxplan-2024/) - Copy the first 5 paragraphs

Once you have copied the summary for a source, use ChatGPT to evaluate the summary by entering the following prompt: Describe the political leaning of this description of a tax proposal ["Paste copied section here"].

Execute this evaluation for both the ITEP and the Tax Foundation summary. Once you generate the evaluation, summarize how ChatGPT describes the political leaning of each source. Identify two pieces of evidence that ChatGPT uses to determine the political leanings. Conclude section 1 by reflecting on the nonpartisan description of these think tanks and whether or not you view these think tanks as nonpartisan after completing your evaluation.

Section 2: Next, you will use the sources above to continue your analysis of the president's policy proposals and connect them to our AD/AS model. The ITEP has a section with an overview of the tax proposals.

- [https:// itep.org/ a-distributional-analysis-of-donald-trumps-tax-plan-2024/](https://itep.org/a-distributional-analysis-of-donald-trumps-tax-plan-2024/) - scroll down to the section titled "Overview of Former President Trump's Tax Proposals"

Choose 2 tax policies and describe the goal of each. Describe how each policy would impact **AD** if implemented. Would they shift AD to the left or right? What would be the impact of this policy on the price level, real GDP, and unemployment?

After completing your analysis of the President's policies, use ChatGPT to evaluate the impact of each policy by issuing the following prompt: Describe how the following policy would impact the price level, real GDP, and unemployment rate ["Paste policy here"]. Summarize how ChatGPT evaluates each policy. Is this different from your analysis?

¹ Institute on Taxation and Economic Policy is a think tank that focuses on tax fairness, equity, and how fiscal policies affect lower and middle-income communities. Its research frequently advocates for policies that reduce income inequality and promote a more equitable tax system. The Tax Foundation is widely regarded as right-of-center and emphasized pro-growth tax policies, aiming to foster economic expansion through lower tax burdens and reduced regulation.

Section 3: Reflect on the President's proposals. What are the pros and cons of the 2 policies you evaluated in section 2? Describe why you think each of your policies will be beneficial or harmful to the macroeconomy. Reflect on your experience using AI to analyze the topics in sections 1 and 2.

B. Principles of Microeconomics Assignment

The microeconomics assignment addresses multiple pieces of introductory microeconomic theory, including price ceilings, price floors, and market equilibrium. It is separated into multiple parts, allowing students to understand these theories from multiple different avenues. Appendix A2 highlights the learning outcomes for the assignment and Appendix A3 provides the instructor guide. The microeconomics assignment focuses on price controls. Price controls highlight difficult out-of-equilibrium scenarios that have readily accessible policy applications. This assignment integrates ChatGPT to build student confidence in approaching the concept while also encouraging students to go beyond the model and discuss some of the empirical results. Students use ChatGPT to simulate stakeholder discussions and through their stakeholder discussions the students develop a deeper understanding of the policy impact. The assignment concludes by presenting the students with some empirical results that run counter to the conclusions derived from their model. This improves the students understanding of the model by emphasizing the importance of the ceteris paribus assumption.

B.1 Student Facing Instructions

Prompt: This assignment is designed to help you analyze the economic implications of price floors and price ceilings using both theoretical models and real-world applications. The assignment is divided into three sections. The first captures a theoretical analysis, and the second involves a simulation of real-world conversations using ChatGPT. The third section asks students to draw from empirical results to reflect on their models and conversations.

Section 1: Theoretical analysis of price floors and ceilings using the supply and demand model.

Define what price floors and price ceilings are in the context of market economics. Use a standard supply and demand graph to demonstrate the effects of:

- A price floor set above the equilibrium price.
- A price ceiling set below the equilibrium price.

For each case, explain:

- How price controls affect quantity supplied and quantity demanded, and the resulting surplus or shortage.
- The implications for consumer and producer surplus.
- Provide examples of real-life price floors (e.g., minimum wage) and price ceilings (rent control), and explain how these policies might relate to the theoretical outcomes you analyzed.

Section 2: Discussion of Stakeholders Perspectives using ChatGPT

Exploring Real-World Impacts. Choose **one** of the following scenarios, or propose your own (subject to instructor approval):

- *Minimum wage increases in the city of Los Angeles. Reference Minimum Wage LA for the updated minimum wage in the city of Los Angeles.*
- *The impact of rent stabilization in Los Angeles. Reference the City of Los Angeles Housing Department for details on allowable rent increases.*

Use ChatGPT to simulate perspectives from different stakeholders involved in the policy (e.g., consumers, producers, policymakers, and economists). Make sure to record your prompts. For example, you might ask:

- “What might a landlord in a rent-controlled city think about these policies?”
- “How would a firm like McDonalds or Burger King deal with the minimum wage increase differently than a local restaurant?”

Discuss different perspectives you generate with your table. Log your notes from your discussion. What points of the simulated discussion resonated with you? Describe how you would feel in the shoes of various different stakeholders.

Section 3: Empirical Applications

Critically evaluate the discussions in Section 2 with this linked article: *Minimum wage BLS*. What are some methods that businesses can use to deal with the increase in labor costs? Explain how the use of these methods may not result in the conclusions we draw in our model.

Critically evaluate the difference between rent control and rent stabilization using this linked article: *Rent control versus rent stabilization*. Explain how the real-world evolution of these policies aligns or diverges from the theoretical models discussed in Section 1.

5. Student Feedback

We report results from a survey administered across two principles of microeconomics and two macroeconomics sections for a total of 160 students at Glendale Community College under one instructor. The sample is limited in scope with two important considerations: First, Glendale Community College is a commuter school, which lends itself to less spillover of information. At a state school with a 300-person lecture in a principles course, the widespread student adoption of AI happens quickly. In commuter schools, this type of information travels more slowly as students generally need more time to feel confident enough to ask their peers about studying tools. Second, these sections also include several nontraditional students. In our experience, nontraditional students have demonstrated a much stronger aversion to AI adoption and integration in coursework. These notes do not diminish the limited scope of the survey, but are important to keep in mind because it is our understanding that the community college results should serve as the lower bound for the students’ level of adoption and excitement for AI integration.

Figures 1–3 report results in three areas: (i) usage and enjoyment; (ii) views on academic integrity; and (iii) confidence when AI use is permitted – measured on a four-point agreement scale (strongly agree, agree, disagree, strongly disagree).

complete the tasks at hand. It is worth noting about 40% of respondents feel that using AI to assist in their coursework when not permitted by the instructor does not qualify as academic dishonesty.

The survey responses illustrate the fact that the large majority of students use and enjoy using AI to help them complete their coursework. A large percentage of students also feel that this does not violate academic honesty. These results highlight the fact that students are going to continue to use these tools. We argue that instructors should adapt to the changing technological landscape and begin the process of integration. With instructor supervision, ethical use of AI is possible and provides students with valuable job market skills moving forward.

In Appendix A5, we include a sample of student work for the macroeconomics assignment. In this assignment, the student reports that the overall experience using ChatGPT was enjoyable. The interesting element here is that the student was able to grapple with some of the assumptions and shortcomings of using the AD/AS model. They execute this assignment following the introduction of the model in class. As a result, students rely heavily on the *ceteris paribus* assumption and focus on short-run static modeling impacts. The use of ChatGPT allows the student to begin viewing the model more dynamically by thinking about both short and long-term consequences. It also encourages students to begin relaxing the *ceteris paribus* assumption by recognizing the fact that each variable in the aggregate demand equation will respond differently to different policies.

The assignments above integrate ChatGPT to meet students where they are at and push them to think past the model. The integration gives students a greater degree of confidence in approaching the assignment while also allowing the student to identify some of the limits of the models covered in class.

6. Conclusion

In this paper, we propose integrating AI into in-class assignments in introductory economics courses. Bridging the gap between theoretical concepts and the application of these concepts to policies is a difficult task. Allowing students to use AI with instructor approval gives students the flexibility and confidence to critically engage with difficult concepts that they otherwise may shy away from. To this end, we designed two assignments for introductory microeconomics and macroeconomics courses. Our goal is to hopefully improve student learning and confidence while providing practical ways to teach effective AI use in economics, potentially helping to ease course-level authenticity-verification pressure. However, fully reducing institutional pressures related to authenticity verification is, in itself, an entirely different issue and outside the scope of this paper. More specifically, these assignments are designed to increase student participation, promote teamwork and communication, and improve writing proficiency. The assignment designs integrate contemporary events to promote student engagement and use ChatGPT to further enhance media literacy by strengthening students' ability to access, analyze, evaluate, and act on media messages.

Although we anticipate that these assignments will offer meaningful pedagogical benefits, further research is needed to empirically measure their effectiveness in achieving the stated learning objectives. Future studies should focus on systematically collecting and analyzing data to assess the impact of AI-integrated assignments on student engagement, knowledge retention, skill development, and overall academic performance.

Our proposal is merely a starting point for AI integration. Further developments should consider additional complications we do not address in this paper. While introducing generative

AI into the classroom can create a rich and dynamic learning experience, it can also exacerbate existing inequalities (Perry and Lee, 2019). To use generative AI, students need access to a reliable device (such as a tablet, smartphone, or laptop) and a stable internet connection. Students in rural areas or from low-income households may find it difficult to secure these resources. Furthermore, most generative AI platforms are only free for a limited number of searches, after which users must pay a monthly subscription fee, creating an additional barrier. Providing students with this information—alongside details about university-supported resources—can help ensure equitable access to AI-based assignments and allow all learners to benefit from incorporating AI into their coursework.

References

- Abdallah, A. K., Alkaabi, A. M. , & Al-Riyami, R., (2024). *Cutting-edge innovations in teaching, leadership, technology, and assessment*. IGI Global. DOI: [10.4018/979-8-3693-0880-6](https://doi.org/10.4018/979-8-3693-0880-6)
- Adewumi, T., Alkhaled, L., Buck, C., Hernandez, S., Brilioth, S., Kekung M., Ragimov, Y., & Barney, E. (2024). Procot: Stimulating critical thinking and writing of students through engagement with large language models (LLMs). arXiv preprint. DOI: [10.33902/Jpsp.202536789](https://doi.org/10.33902/Jpsp.202536789)
- Beck, S., & Brodersen, D. (2025). Fostering generative ai literacy in economics: A hands-on approach. *Journal of Economics Teaching.*, 10(4), 285-295. DOI: [10.58311/jeconteach/2534048e3992add6409a9e52b78bdd8c88786281](https://doi.org/10.58311/jeconteach/2534048e3992add6409a9e52b78bdd8c88786281)
- Becker, R., & A. Birdi (2018). Flipping the classroom: Old ideas, new technologies. *International Review of Economics Education*, 29, 1–5. DOI: [10.1016/j.iree.2018.06.001](https://doi.org/10.1016/j.iree.2018.06.001)
- Chalioti, E. (2022). Economics of artificial intelligence and innovation. *The Journal of Economic Education*, 53(2), 188–191. DOI: [10.1080/00220485.2022.2038331](https://doi.org/10.1080/00220485.2022.2038331)
- Deng, R., Jiang, M., Yu, X., Lu, Y., & Liu, S. (2024). Does ChatGPT enhance student learning? A systematic review and meta-analysis of experimental studies. *Computers & Education*, 105224. DOI: [10.1016/j.compedu.2024.105224](https://doi.org/10.1016/j.compedu.2024.105224)
- Fyfe, P. (2023). How to cheat on your final paper: Assigning AI for student writing. *AI & Society*, 38, 1395–1405. DOI: [10.1007/s00146-022-01397-z](https://doi.org/10.1007/s00146-022-01397-z)
- Haleem, A., Javaid, M., Qadri, M.A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, 3, 275–285. DOI: [10.1016/j.susoc.2022.05.004](https://doi.org/10.1016/j.susoc.2022.05.004)
- Johnson, M., & Meder, M. E. (2024). Twenty-three years of teaching economics with technology. *International Review of Economics Education*, 45, 100279. DOI: [10.1016/j.iree.2023.100279](https://doi.org/10.1016/j.iree.2023.100279)
- Kerney, W. (2025). Treachery and deceit: Detecting and dissuading AI cheating. *Journal of Computing Sciences in Colleges*, 40(9), 10–17.
- Koltovskaia, S. (2020). Student engagement with automated written corrective feedback (AWCF) provided by Grammarly: A multiple case study. *Assessing Writing*, 44, 100450. DOI: [10.1016/j.asw.2020.100450](https://doi.org/10.1016/j.asw.2020.100450)
- Lee, H. (2024). The rise of ChatGPT: Exploring its potential in medical education. *Anatomical Sciences Education*, 17(5), 926–931. DOI: [10.1002/ase.2270](https://doi.org/10.1002/ase.2270)
- Lepik-Verliin, K. (2024). Trust, but Verify: Students' Reflections on Using Artificial Intelligence in Written Assignments. In: Kurbanoglu, S., et al. *Information Experience and Information Literacy. ECIL 2023. Communications in Computer and Information Science, Springer, 2042*, pp. 27–38. DOI: [10.1007/978-3-031-53001-2_3](https://doi.org/10.1007/978-3-031-53001-2_3)
- Lo, C. K. (2023). What is the impact of ChatGPT on education? A rapid review of the literature. *Education Sciences*, 13(4), 410. DOI: [10.3390/educsci13040410](https://doi.org/10.3390/educsci13040410)
- Middleditch, P., W. Moindrot, & S. Rudkin (2022). Teaching with twitter: An extension to the traditional learning environment. *International Review of Economics Education*, 41, 100252. DOI: [10.1016/j.iree.2022.100252](https://doi.org/10.1016/j.iree.2022.100252)

Ngo, T. T. A. (2023). The perception by university students of the use of ChatGPT in education. *International Journal of Emerging Technologies in Learning* (Online), 18(17), 4. DOI: [10.3991/ijet.v18i17.39019](https://doi.org/10.3991/ijet.v18i17.39019)

Office of Academic Integrity and Student Conduct (2025). Resources for faculty encouraging ai use in their courses. <https://oaisc.fas.harvard.edu/academic-integrity-and-teaching-without-ai/>

O'Rourke, J., J. Barnes, A. Deaton, K. Fulks, K. Ryan, & D. A. Rettinger (2010). Imitation is the sincerest form of cheating: The influence of direct knowledge and attitudes on academic dishonesty. *Ethics & Behavior*, 20(1), 47–64. DOI: [10.1080/10508420903482616](https://doi.org/10.1080/10508420903482616)

Perry, A. M., & N. T. Lee (2019). Ai is coming to schools, and if we're not careful, so will its biases. *Brookings Institution*. <https://www.brookings.edu/articles/ai-is-coming-to-schools-and-if-were-not-careful-so-will-its-biases/>

Raymond, F., A. Raymond, & M. McCrickard (2008). Stuck behind the math: Just how helpful can one expect technology to be in the economics classroom? *International Review of Economics Education*, 7(1), 62–102. DOI: [10.1016/S1477-3880\(15\)30094-3](https://doi.org/10.1016/S1477-3880(15)30094-3)

Rizvi, S., J. Waite, & S. Sentance (2023). Artificial intelligence teaching and learning in k-12 from 2019 to 2022: A systematic literature review. *Computers and Education: Artificial Intelligence*, 4, 100145. DOI: [10.1016/j.caeai.2023.100145](https://doi.org/10.1016/j.caeai.2023.100145)

Rudolph, J., S. Tan, & S. Tan (2023). Chatgpt: Bullshit spewer or the end of traditional assessments in higher education? *Journal of Applied Learning and Teaching*, 6(1), 342–363. DOI: [10.37074/jalt.2023.6.1.9](https://doi.org/10.37074/jalt.2023.6.1.9)

Ruget, V. & K. H. Rosero (2014). What's new? assessing the effectiveness of current events assignments. *Currents in Teaching & Learning*, 6(2).

Stöhr, C., A. W. Ou, & H. Malmström (2024). Perceptions and usage of ai chatbots among students in higher education across genders, academic levels and fields of study. *Computers and Education: Artificial Intelligence*, 7, 100259. DOI: [10.1016/j.caeai.2024.100259](https://doi.org/10.1016/j.caeai.2024.100259)

Sundberg, M. D. (2002). Assessing student learning. *Cell Biology Education*, 1(1), 11–15. DOI: [10.1187/cbe.02-03-0007](https://doi.org/10.1187/cbe.02-03-0007)

Sweeney, S. (2023). Who wrote this? essay mills and assessment—considerations regarding contract cheating and ai in higher education. *The International Journal of Management Education*, 21(2), 100818. DOI: [10.1016/j.ijme.2023.100818](https://doi.org/10.1016/j.ijme.2023.100818)

Winkler, R., & Söllner, M. (2018). Unleashing the potential of chatbots in education: A state-of-the-art analysis. In *Academy of Management Proceedings*, Volume 2018, pp. 15903. Academy of Management Briarcliff Manor, NY 10510. DOI: [10.5465/AMBPP.2018.15903abstract](https://doi.org/10.5465/AMBPP.2018.15903abstract)

Appendix A1. Principles of Macroeconomics Assignment Learning Outcomes

Table 1. Microeconomics Assignment

Learning Objectives	<ul style="list-style-type: none">• Critical Thinking Skills<ul style="list-style-type: none">◦ Analyze economic models.◦ Interpret the impact of real-world policies on macroeconomic indicators.◦ Use interdisciplinary thinking to understand how economic policies interact with the political sphere.◦ Begin to develop a discerning approach to political analysis.• Communication Skills<ul style="list-style-type: none">◦ Collaborate with peers and the instructor regarding the structure of their writing.◦ Concise economic writing that includes a positive and normative analysis of policy proposals and their economic impact.• Research Skills<ul style="list-style-type: none">◦ Translate abstract models from lecture to real-world policy proposals.◦ Read and interpret economic analyses from economic think tanks like the Institute on Taxation and Economic Policy and the Tax Foundation.• Function of AI<ul style="list-style-type: none">◦ AI is used to help in discerning subtle yet important details that indicate a political bias in the analysis.◦ AI helps reinforce the intuition behind the model while also providing some additional details for discussion that involve relaxing some initial assumptions in the abstract modeling process.
Prerequisites/Courses	Aggregate Demand and Supply Model
Teaching Materials	Internet Access and Computers
Time	90-12 minutes in class
Assessments	Rubric grading for high-stakes writing

Appendix A2. Principles of Macroeconomics Instructor Guide

Instructors should aim to allocate 90-120 minutes of in-class time for this assignment. Break students into groups and have them read both think tanks' analyses of the economic proposals. This in-class time should allow students 25 minutes to read through the economic analysis and have an open discussion with their group members regarding their interpretation of the political bias of each think tank, and write a rough draft of their initial interpretation. During this time, they should also choose 2 policies to focus on in the assignment. The instructor should travel around the room and participate with each group. The next 20 minutes should allow students to collaborate and draw the shift in the AD/AS model that fits their chosen policies. Instructors should travel around to each group, ensuring that student models are on the right track, and prompting students to discuss the assumptions built into the model. The instructor should then use the next 45 minutes to guide students to the ChatGPT website and provide instructions on how to use the tool in the assignment. If instructors have additional time, then they should reflect on their interpretation with their group and draft a summary of the AI's analysis and their reflection.

Instructors should allocate 20-30 minutes for the final portion of the assignment, which explores their normative analysis of the president's policies. At this point, they have been able to explore the political biases of the sources, and they have interpreted the impact of the policies in their own words and complemented this with AI support. Instructors can modify this section to be independent writing if they feel students adequately grasp the fundamental concepts. Students often feel comfortable participating in reflective writing with this level of instructor and technological support. Allow students to write freely in this section and describe whether they feel the president's proposals will be harmful or beneficial to the country's economy and wrap up with a quick reflection regarding their experience with using ChatGPT in the assignment. The activity should conclude with a structured student reflection on their AI use, a component that has been shown to reduce the likelihood of unethical AI practices, stimulate creative and critical thinking, and deepen student understanding of the advantages and limitations of AI (Sweeney, 2023; Adewumi et al., 2024; Lepik-Verliin, 2024).

Appendix A3. Microeconomics Assignment Learning Outcomes

Table 2. Microeconomics Assignment

Learning Objectives	<ul style="list-style-type: none">• Critical Thinking Skills<ul style="list-style-type: none">◦ Analyze economic data.◦ Interpret key perspectives about economic policy.◦ Analyze graphical analysis on price ceilings.◦ Analyze economic policies.• Communication Skills<ul style="list-style-type: none">◦ Communicate in written form about price ceilings◦ Visually highlight microeconomic principles.◦ Summarize various perspectives about economic policy.• Research Skills<ul style="list-style-type: none">◦ Interpret minimum wage and rent policies.◦ Examine a graphical analysis and interpret the graphical changes.• Function of AI<ul style="list-style-type: none">◦ AI is used to help introduce different and often opposing perspectives about economic policies to students.
Prerequisites/Courses	The supply and demand model, price ceilings, price floors.
Teaching Materials	Appendix B1 and B2
Time	90-120 minutes of class time
Assessments	Rubric grading for high-stakes writing

Appendix A4. Microeconomics Assignment Instructor Guide

Instructors should break students into groups and use about 20 minutes to have them collaborate to build their own graphs for a price floor and price ceiling. ChatGPT has difficulty creating original graphs, which makes ethical use of it difficult for this part of the assignment. Instructors should allow for 20-30 minutes for Section 2 of the assignment, which incorporates ChatGPT and gives students practice in using AI as a tool. Students choose one of two “real-world” impacts and ask ChatGPT to create different perspectives from people affected by or analyzing the price ceiling or floor (including consumers, producers, policymakers, and economists). This allows students to engage with ChatGPT critically, using it to analyze different perspectives on the policy. After simulating the stakeholders’ perspectives, give them time to discuss the results with their group. Instructors can modify section 2 to summarize the generated perspectives as a deliverable. Instructors should allocate 30-40 minutes for students to collaborate and write their own assignment in Section 3. Students analyze a summary of some empirical results to compare with the outcomes generated in Section 1.

This assignment improves learning in several dimensions. By separating the assignment into different stages, some of which allow generative AI and others that do not, students receive a balance between technology use and their analysis (Office of Academic Integrity and Student Conduct, 2025). The assignment also gives students opportunities for different types of learning, encompassing qualitative and quantitative analysis, which can also improve learning outcomes (Sundberg, 2002). The three stages of the analysis also balance real-world implications with the theoretical model, allowing students to have a more comprehensive understanding of price ceilings and price floors.

Appendix A5. Student Writing Sample

Professor Io Economics 102

8 April 2025

Writing Assignment

Section 1:

President Trump has proposed a new tax policy framework for his new administration, which consists of individual income tax cuts, corporate tax cuts, and tariffs. In this paper, I will evaluate the political leaning of two think tanks, analyze President Trump's Tax proposals, and interpret the benefits of these new policies.

1. An article by the *Tax Foundation* makes the political leanings appear nonpartisan since they focus on analytical evidence and policy rather than a particular ideology. The article highlights the benefits of proposals like permanent expensing for R&D and equipment. On the other hand, the article also criticizes proposals like income exemptions and tariffs since they appear inefficient and harmful to the tax structure. Therefore, this article provided a balanced assessment of President Trump's tax proposals and highlighted the pros and cons. An article by the *Institute of Taxation and Economic Policy* makes political leaning appear progressive since it focuses on the distributional impact of new tax policies on classes.

Section 2:

President Trump has made two tax proposals focusing on income taxes and tariffs. He wants to lower the income tax burden on Americans by exempting taxes on tips, social security, and overtime, and by extending his 2017 Tax Cuts and Jobs Act. He also wants to implement tariffs on imports coming into the country to balance the trade deficit and incentivize US manufacturing.

1. Tariffs: If President Trump were to implement sweeping tariffs on countries worldwide, such as 20% and 60% on China, the effect this would have on aggregate demand would be shifting the curve to the left. The demand curve would shift to the left because if one focuses on consumption, which makes up 60% of the US economy, people would spend less due to less purchasing power. After all, tariffs could cause shortages and cause US companies to raise their prices on the consumer to make up for the tariffs. If the demand curve were to shift to the left, this would cause an increase in unemployment, a decrease in GDP, and a decrease in the price level.

2. Tax Cuts: If President Trump were to get a bill passed through Congress to exempt taxes on tips, social security, and overtime, and extend the 2017 TCJA, the effect on the aggregate demand curve would shift to the right. The demand curve would shift to the right because this policy would increase consumption by increasing consumer confidence and purchasing power. It could lead to an increase in prices due to high consumer spending and close to full employment in the economy due to businesses willing to invest more from tax cuts. In addition, real GDP would increase due to increased consumption and investment. Therefore, if the demand curve were to shift to the right, this would cause an increase in price level, a decrease

in unemployment, and an increase in GDP.

ChatGPT: According to ChatGPT, Tariffs proposed by President Trump would increase the price level, decrease real GDP, and increase unemployment. This is similar to my perspective, although ChatGPT argues that it would cause an increase in price level due to the price of tariffs being passed to the consumer through higher prices and less competition for domestic producers. Tariffs would raise the price level. Although on a graph moving the demand curve to the right due to less consumption would cause a decrease in the price level. ChatGPT states that President Trump's tax cut proposals would increase the price level, decrease unemployment, and increase real GDP. Similar to my perspective, as I argued, prices would increase due to increased consumer spending, real GDP would increase from increased investments and consumer spending, and unemployment would decrease due to businesses investing more and creating more jobs.

Section 3:

Regarding President Trump's tax cut proposals, the pros on aggregate demand in the macroeconomy would outweigh the cons. If unemployment were to decrease, this would be positive, as more Americans would have jobs to support themselves and their families. If real GDP were to increase, this would be positive as, ideally, there would be a response from increased consumer spending and business investments due to tax cuts. In addition, this would mean that Americans would have more disposable income and feel an increase in material wealth. The only con would be an increase in the price level, although the level of inflation is unpredictable. If economic growth causes a moderate increase in the price level, it would likely be balanced out due to more disposable income.

Regarding President Trump's tariff plan, the cons outweigh any possible pros. The cons include an increase in price level, unemployment, and a decrease in real GDP. These factors would materially hurt American families, making it difficult to see a positive outcome. The Trump Administration touts that these tariffs will balance the trade deficit and encourage domestic manufacturing. It would be smart to implement reciprocal tariffs on countries that impose tariffs on us and try to incentivize domestic manufacturing. However, this would require a robust plan that includes investment in manufacturing plants and a targeted incremental increase in tariffs. A sweeping tariff strategy would create economic panic, decrease consumer confidence, and hurt the macroeconomy.

Generative AI reflection:

Overall, my experience with generative AI was positive and a good direction tool. With the first question, I think I would have been able to see a slight bias in the article by the ITEP since it was more critical of President Trump's policies. But overall, neither were highly partisan and both could be considered somewhat centrist. The only way the generative AI helped me classify the article by the ITEP as progressive leaning was by its response stating that the article focused on the distributive impacts of the lower and middle classes. For the most part, the AI agreed with my evaluation of President Trump's policies. The AI only disagreed by stating that tariffs would increase the price level. While I agree, the aggregate demand chart would suggest a decrease in the price level due to the demand curve shifting to the left. However, I enjoyed using AI because it gave me confidence in my evaluation and gave me more information that furthered my understanding of the topics.

Citations:

Describe how the following policy would impact the price level, Real GDP, and unemployment “20% Tariffs on all countries and additional 60% on China” prompt. *ChatGPT*, 24 Apr. version, OpenAI, 24 Apr. 2025, chat.openai.com/chat.

Describe how the following policy would impact the price level, Real GDP, and unemployment “Exempting taxes on tips, social security, overtime, and extending the 2017 Tax Cuts and Jobs Act” prompt. *ChatGPT*, 24 Apr. version, OpenAI, 24 Apr. 2025, chat.openai.com/chat. “A Distributional Analysis of Donald Trump’s Tax Plan.” *ITEP*, itep.org/a-distributional-analysis-of-donald-trumps-tax-plan-2024/. Accessed 24 Apr. 2025.

Trump Unveils Expansive Global Tariffs - The New York Times, www.nytimes.com/2025/04/02/business/economy/trump-tariffs.html. Accessed 24 Apr. 2025.

York, Erica, et al. “Trump’s Tax and Tariff Ideas: Details & Analysis.” *Tax Foundation*, 4 Apr. 2025, taxfoundation.org/research/all/federal/donald-trump-tax-plan-2024/.