



Ethical exploration of chatGPT in the modern K-14 economics classroom

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Abstract

This paper addresses the challenge of ethically integrating ChatGPT, a sophisticated AI language model, into K-14 economics education. Amidst the growing presence of AI in classrooms, it proposes the “Evaluate, Reflect, Assurance” model, a novel decision-making framework grounded in normative and virtue ethics, to guide educators. This approach is detailed through a theoretical decision tree, offering educators a heuristic tool to weigh the educational advantages and ethical dimensions of using ChatGPT. An educator can use the decision tree to reach a conclusion on using ChatGPT within the classroom environment by using ethical considerations to promote personalized learning and upholding academic integrity. The paper stresses the importance of ongoing professional development for educators in ethical AI usage and calls for institutional support in this pursuit. It also identifies future research directions, including long-term impact studies of ChatGPT and comparative analyses of various AI tools in economics education, underscoring the paper’s relevance to current educational technology discourse.

Keywords Normative ethics · Virtue ethics · Ethical decisions in teaching · ChatGPT · Economics education · Ethical integration

The usage and rise of ChatGPT, an artificial intelligence large language model by OpenAI, has sparked a new age of concern in impacts to student performance and

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outcomes in a modern educational classroom. Artificial intelligence often challenges human capabilities, thereby leading to rising conversations on leveraging such technologies to enhance educational outcomes, while navigating the shortcomings and ethical concerns, particularly in the economics classroom. This research can be found important to economics educators, education practitioners, and policymakers aiming to navigate the evolving technological landscape in the K-14 education settings. The approach of this work aims to address both fallacies and benefits of utilizing the ChatGPT technology in the classroom, however, also assuring balance in preserving educational outcomes and teaching performances. By examining the documented usages of ChatGPT and other literature, the ethical lens of normative and virtue ethics will be addressed in this paper. The scope of the paper provides a unique outlook of the educational and instructional application of using the ChatGPT technology.

Economics educators are interested in understanding how best to advance their classroom material and student learning outcomes within the K-14 classrooms. Student outcomes in educational environments provide practitioners, students, parents, administrators, and outside agencies the ability to review grades as an indicator of measurable knowledge, skills, and abilities. Often times, this is seen in reflection of individual grades or overall student performance in the classroom via assignments or assessments, individually or collectively (Stock et al. 2013). Historically, economics educators have shown comfortability of utilizing modern technology within the classroom to expand diversity efforts, introducing real-world applications of the field (Al-Bahrani 2022; Al-Bahrani et al. 2016; Geerling 2012; Wooten et al. 2020). This has inspired the creation of a repository with everyday popular culture items to showcase economics lessons that benefit the teachings of economics (Hobbs and Wooten 2021). Popular culture within the economics classrooms has taken on music selections (Ben Abdesslem 2022; Geerling et al. 2020; Scott and Bloodworth 2023), Broadway (Rousu 2016), Netflix (Ben Abdesslem and Picault 2023), and TikTok¹. These varying growth-related technologies support a welcoming embrace from economics educators in pursuit of maintaining relevance in the classroom (Wooten et al. 2020). These methods and approaches to teaching within the classroom are considered pedagogical and andragogical techniques, that support teaching performances.

Once artificial intelligence (AI), such as the free version of ChatGPT, was introduced for mass consumption by the public, educators became concerned about the potential misuses such as plagiarism (Can and Honca 2023; Lo 2023), altering classwork dynamics (Hill 2023), and broader impacts of AI's role in educational environments (Mhlanga 2023; Ray 2023). The field of economics embraces decision-making strategies by supporting optimal choices when faced with conditions brought from constraints. Economics educators must consider the dilemma of enhanced classroom exercises and increased productivity, while also understanding potential misuses of the technology can diminish academic rigor and student authenticity. The scope of normative ethics can be seen in the teachings of an economist, as the field

¹ Dr. Chris Clarke has over 44,200 followers on TikTok and discusses economic concepts. Dr. Clarke's work has been well documented within economics teaching conferences, news articles, and blogs. However, no formal paper or conference presentation has been made publicly available for citation of the work. You can find Dr. Clarke's TikTok account www.tiktok.com/@EconChrisClarke.

utilizes normative approaches, known as normative economics (Berg 2003; Colander 2016; Northrop 2000). It is the work of Ray (2023) that showcases ChatGPT can perform a variety of tasks from supporting college essay writing to also exhibiting major concerns in prejudice biases and ethical concerns. Therefore, the purpose of this study is to explore ChatGPT usage in the K-14 economics classroom from an ethical perspective. This leads to the research question, is it ethical to use ChatGPT in the K-14 economics classroom?

At the time of this writing, ChatGPT 4.0 can access and search the worldwide web. Furthermore, ChatGPT versions hold a disclosure statement indicating the technology could get important information wrong.² Throughout the rise of ChatGPT, educators have expressed interest and caution to integrating the application within the classroom (Geerling et al. 2023). Researchers have been actively evaluating the modern classroom with generative pre-trained transformer (GPT) technology, raising concerns of diminishing student achievement, yet also supporting educational exploration and composition (Steele 2023). However, the biases that were shown by the GPT has educators expressing doubt that tolerance of the bot would erode critical skill development in primary and upper primary school-age children (Yu 2023).

While much of the conversation has been around academic integrity standards and evaluation of issues from a learning standpoint, there are other practical implications to consider, such as social disparities. ChatGPT has several versions, with older versions being provided as a free tool. However, the most updated ChatGPT model is hidden behind a pay wall. Additionally, to monetary constraints, individuals who would be interested in using this would need a computer or smartphone that has cellular data and web service capabilities. While this does not particularly answer the research question, it would be a dilemma for economics educators to not consider the social disparity that arises due to the barrier of the service. In addition to paywall, research work has advocated for ethical considerations of using advanced technological tools (Scott 2023). These truths also hold concern for students who may not have access to the basic fundamentals that would be required to enhance skills with the GPT technology. Furthermore, broadening concerns in education classrooms may acknowledge that students unfamiliar with this technology or lack of access could exacerbate social status. From an ethical perspective, the concerns of addressed around ChatGPT usage can align with normative ethics, which has embraced justice and individual rights (Ackerly and Attanasi 2010).

Students benefit from the opportunity to gain experience with GPT technology and receive personalized learning (Ray 2023; Steele 2023; Yu 2023). The ability to utilize GPT within the economics classroom can benefit students in receiving individualized learning experiences that support closing knowledge gaps. Furthermore, this can be further achieved by utilizing the GPT as interactive learning, allowing students to ask questions, without fear of peer critique, and receive instant feedback (Steele 2023). The concerns from Yu (2023) expresses that students could lean on the GPT as a crutch for guidance and not as an aid. In economics education, it is heavily important for students to achieve a learning outcome that allows applicable theories to real-world scenarios. The usage of GPT could be the tail of two stories— one that supports

² ChatGPT 4 statement is verified on 28th December 2023.

economic exploration and the other that significantly diminishes critical thinking. However, the virtue ethics approach embraces that educators hold an intention of strengthening academic performance, outcomes, and teaching performance. Therefore, utilizing the scope of normative ethics and virtue ethics, this paper recognizes the role of the educator is to build and enhance classroom experiences and outcomes.

The economics educator must consider the ethical approach of using ChatGPT within the classroom. In addition to, the approach must be within reason to enhance classroom experiences and outcomes, not for relevancy only. While the first part of this paper has focused on bringing forth introductory components of the research question and ethical framework, the next section will use literature to justify the decision framework in supporting educator decision-making.

Review of the literature

For the ethical integration of ChatGPT into the K-14 economics classroom, both instructors and students should first grasp the foundational concepts of the technology. The knowledge and familiarity of the ChatGPT interface enhances educational experiences and allows users the ability to recognize potential biases that may occur (Yu 2023). A well-informed classroom of both instructors and students can support one another in recognizing biases (Keles 2023), which may create impactful and new teaching techniques in elevating student learning outcomes (Hargreaves 2008). When the technology of ChatGPT was first introduced into the public, economics educators became interested in how well the application would perform in current economics assignments. Geerling et al. (2023) noted the ChatGPT application placed in the 91st percentile for microeconomics and 99th percentile for macroeconomics on the standardized Test of Understanding in College Economics (TUCE). Furthermore, it was Geerling et al. (2023) who presented a potential opportunity with augment learning with the chatbot.

While AI and GPT have faced considerable criticisms, the usage and integration within society cannot be overlooked. Recent developments of artificial intelligence have been deployed into societal and cultural integration within applications for movies, music, and websites (Longoni and Cian 2020). OpenAI has seen ChatGPT become part of Hardee's restaurants drive-thru ordering system, as well (The Wall Street Journal 2023). Given the cultural and educational relevance, it is understandable that economics educators are curious about integrating ChatGPT into the classroom. The academic community has also shown interest in the limitations and utility for enhancing academic writing, education, and programming (Meyer et al. 2023). Meyer et al. (2023), much like Yu (2023), and Sallam (2023), recognize that limitations are apparent in the available technology and also highlighted biases. This work recognizes that Meyer et al. (2023, p. 6) calls on the applicability of using ChatGPT within the K-12 and undergraduate space. Thus, raising the scope of this paper in evaluating the ethical approach within the K-14 economics classroom.

ChatGPT offers significant educational promise. However, the application can create some inaccurate outputs impacted from several issues. Yu (2023) highlights potential biases in the application's responses. While Sallam (2023) has found the

application may produce information that is copyrighted, display discrimination based on lower quality training data, present hallucinations, or offer incorrect content. In the context of economics, hallucinations in ChatGPT can be problematic for the classroom, as the application presents information as fact, when it could be inaccurate. These inaccuracies that could be presented in the ChatGPT application could become pedagogical opportunities (Hargreaves 2008). This would allow instructors to leverage the inaccuracies as opportunities to explore common misconceptions in economics. This balance is one that supports the virtue ethics approach, which limits the diminishing impact of utilizing this technology in the classroom.

The new era of GPT technology embodies the fourth industrial revolution by providing new technologies that greatly increase human efficiency (Philbeck and Davis 2019). It is important for economics educators to realize that GPT technology is not just a one industry fits application. In fact, the GPT application is revolutionizing several different industries from finance, health, and restaurants (Longoni and Cian 2020). This application can be greatly expanded and benefit students not just for classroom usage, but for the future of the new age and creating a modernized classroom. However, a modernized classroom is equally as strong as the funding that is received. Students are still expected to perform homework and parents are still expected to provide the necessary tools to succeed. This opens the door towards digital inequality, one that recognizes wealth inequalities that create knowledge gaps in digital tools and applications (Khan and Paliwal 2023). The Khan and Paliwal (2023, p. 1646) calls for government intervention and other community organizations to support in narrowing the gap of digital inequality. Although the work does not address social inequalities, albeit recognizing that care should be given towards user experiences. The care that is being tasked with economics educators is extending the conversation of Khan and Paliwal (2023) by addressing the ethical approach and utilization of ChatGPT within the classroom. Economics educators must embrace the uncomfortable reality of particular assignments and tasks utilizing ChatGPT may not be accessible at home, thus widening social and digital disparities (Khan and Paliwal 2023). If educators do not accept the inequality and disparity that exists, it could diminish the intended gains of utilizing the technology, by furthering the disparity gap within the classroom.

From a virtue ethics perspective, the integration of ChatGPT into the classroom is more than simply questioning the right or wrong approach of teaching with the application in the classroom. Using tools like ChatGPT can support learning and cultivate virtues in both classroom audiences— instructors and students. Research has discussed virtue ethics and normative ethics in using ChatGPT from an academic integrity issue, but stops short of addressing classroom implications (Uzun 2023). Utilitarians would see that while fallacies exist in ChatGPT, there are many potential benefits of using this application in the classroom. However, without appropriate care, students or instructors could lean too heavily on the ChatGPT technology, diminishing the gains and virtuous approach into one that is self-interested. The usage of ChatGPT within the economics classroom is a valid consideration given the cultural and societal integration that is occurring with the technology.

When considering virtue ethics, one may find the end goal of education is not just knowledge acquisition and demonstration, but also the cultivation of strong moral

character. Instructors can foster this personal development within the classroom by nurturing virtues such as curiosity, critical thinking, and resilience. If ChatGPT is used to explore deeper understanding of subject material, embrace critical thinking, and genuine interest in economics, the goal of virtue ethics, eudaimonia, is achieved. If, on the other hand, the ChatGPT technology is used to bypass learning assignments and runs into ethical dilemmas that have been expressed by cautious researchers (Khan and Paliwal 2023; Sallam 2023; Uzun 2023; Yu 2023). Much of the literature review has seen peaked curiosity and continued caution on implementation. The goal of this work is to embrace the ethical approach of utilizing ChatGPT within the classroom and support educators in making these decisions.

Mills et al. (2022) discusses the balance of using technology in the classroom and assuring that students are acceptance to the capabilities of different technologies and application usages. Just as economics educators utilize popular culture (Ben Abdesslem 2022; Geerling et al. 2020; Hobbs and Wooten 2021; Scott and Bloodworth 2023), Broadway (Rousu 2016), and Netflix (Ben Abdesslem and Picault 2023) to enrich learning exercises, these supplements foster deeper understanding and promote critical thinking. Personal teaching characteristics cannot be replicated by ChatGPT and this missing piece is vital to classroom learning. Recognizing that while ChatGPT can perform well on assignments (Geerling et al. 2023), normative views acknowledge the overall student performance growth, tolerating occasional shortcomings. Which is why this paper also introduces virtue ethics and classroom management, to support in building a more virtuous student.

Methodology

This section addresses the decision-making process that is required from instructors to understand if application of ChatGPT is useful from an ethical viewpoint in the classroom. The methods to build the decision-tree in [Appendix A](#) were created based on literature review showcased in the previous section. [Appendix A](#) allows instructors the opportunity to carefully navigate through various decision nodes with the aim of supporting decision-making of integrating ChatGPT in the K-14 economics classroom. While this section discusses the principles of the decision-tree, [Appendix A](#) was carefully crafted to support normative ethics and virtue ethics decisions for the educator evaluating the model. Normative ethics considers the intent of the educator in enhancing the classroom environment and outcomes by utilizing ChatGPT. The decision tool provided in [Appendix A](#) provides instructors with a pathway that results in a guided framework of normative ethics. However, on the other hand, virtue ethics seeks to understand the moral agent other than moral act. This leaves virtue ethics with evaluating the GPT application for biases, ensuring equitable access, and cultural relevance that are noticed by utilizing the ChaptGPT application. This places the decision-tree model as a tool that supports educators with approaches on integrity, awareness, and commitment to fairness in the classroom.

The nodes of [Appendix A](#) showcase ethical considerations of normative and virtue ethics, as these are pivotal in assessing the pedagogical integration of artificial intelligence technologies. To support the practical application of this decision tree,

each node was designed integrating the literature's insights on potential benefits and shortcomings associated with ChatGPT usage within the classroom. The intentional design of the framework supports educators in deliberate evaluations on equity, educational outcomes, academic integrity, and virtues. This approach ensures decisions will align with both ethical theory and practical teaching practices that were shown to be important to the economics educator throughout the literature. The importance of [Appendix A](#) is to support educators in arriving at a decision for usage based on instructor knowledge of the program, proper evaluation on the educational impacts of the usage within the classroom and addressing equity and access for the classroom population. ChatGPT, much like alternative artificial intelligence software, continuously goes through updates and new phases of design, making [Appendix A](#) even more important to the time-pressed educator in making informed decisions on software implementation.

First, instructors need to embrace familiarity with the ChatGPT model and recognize that availability of the most recent update, ChatGPT-4, is hidden behind a pay wall (Ray 2023; Yu 2023). If an instructor is not familiar with the ChatGPT application, it is encouraged the instructor receives additional training and learns more about potential biases (Khan and Paliwal 2023; Ray 2023; Sallam 2023; Uzun 2023; Yu 2023). Otherwise, if the instructor knows or goes through additional training, proceeding into evaluation of how to utilize is encouraged.

Upon completion of the foundational knowledge of ChatGPT, instructors are encouraged to consider a series of ethical and pedagogical queries to support decision-making. This includes understanding the educational impacts towards improved student outcomes using ChatGPT, or similar technologies, and their impacts on student learning outcomes (Geerling et al. 2023; Mills et al. 2023). The teaching performances of individual economics educators are seen in research spanning across popular culture (Hobbs and Wooten 2021), Broadway (Rousu 2016), and Netflix (Ben Abdesslem and Picault 2023) are important to classroom culture and relevance. Sallam (2023) recognized that training aids of the ChatGPT tool led to biases in the data, which could be reproduced as output for students and instructors. This opportunity for instructors to find these misconceptions on the topics within economics could become teaching opportunities (Hargreaves 2008).

Considering social disparities and access equality was brought forward from research by Khan and Paliwal (2023). The decision chart provides instructors guidance on assuring the aligned applicability of the methods achieves careful consideration of the disparities brought by ChatGPT's paywall functions and equal access for all students. Weighing out cultural relevance of ChatGPT within the classroom is conscious to instructors who are aligned in the practice of providing real-world context to everyday economics lessons (Scott and Bloodworth 2023). Assuring local schools and jurisdictions have an equitable game-plan supports the relevance of this work for school and institutional administrators. Furthermore, considering the equal and equitable access of all students for assignments is critical for the instructors, administrators, and policymakers to consider when allowing ChatGPT technology considerations.

The decision tree within [Appendix A](#) should be viewed as a heuristic tool that enables educators to quickly navigate through complex ethical and practical con-

siderations in the integration of ChatGPT. The decision tree is not intended to be a static checklist but a dynamic model that must be revisited as new information becomes available. This iterative approach is crucial, given the rapid evolution of AI technologies. Therefore, if upon initial evaluation, an instructor decides against the use of ChatGPT, or if the technology no longer meets the educational needs or ethical standards, the tree provides a basis for a ‘hard reset’—a comprehensive reevaluation of all relevant factors.

The decision-tree within [Appendix A](#) presents a model that arrives at a specific decision in time, meaning that if an instructor arrives at a decision to remove the usage of ChatGPT or terminate the consideration of the application, the consideration is terminated. However, this is not the suggested process of the author in this paper. Instead, it is encouraged to re-evaluate the decision tree if an instructor has resolved all shortcomings or newer versions of ChatGPT has arrived. Educator approaches and evaluation could be altered quickly, thanks to the ever-changing and evolving ChatGPT application and model. A one-stop checklist does not maintain authenticity and authority to continue using the GPT model within the classroom. What may have passed one case, does not always qualify going forward. Therefore, the author supports a hard reset each time evaluation must occur on the usage of the GPT model. The framework was built to support instructors in quickly making decisions based on the given software provided, in the current version, and reassessing the checklist on appropriate implementation within the K-14 economics classroom.

Discussion

This section demonstrates the application of the decision-making framework, as shown in [Appendix A](#), to address the central research question. The framework is operationalized through an “Evaluate, Reflect, Assurance,” process, guiding an instructor through the ethical integration of ChatGPT in the K-14 economics classroom:

1. **Evaluate:** Instructors critically assess their understanding of ChatGPT’s capabilities against the current educational and ethical landscape. They review scholarly discourse on AI in education to ensure a nuanced understanding of ChatGPT’s benefits and ethical considerations, examining potential biases and aligning the technology’s capabilities with educational goals.
2. **Reflect:** Instructors consider the normative ethics impact of ChatGPT, deliberating how its use could potentially enhance the overall educational experience. Instructors should engage in reflective practice to align the use of ChatGPT with virtue ethics, examining whether the technology’s integration will cultivate virtues such as honesty and diligence within the learning environment, thereby supporting academic integrity.
3. **Assurance:** A thorough review of academic integrity measures and equity considerations is conducted to confirm that the use of ChatGPT does not compromise the rigor of the educational process. Instructors ensure that the integration of ChatGPT promotes equitable access and addresses any potential disparities, in

line with the commitment to provide all students with the opportunity to benefit from this technology.

By adhering to this process, instructors can arrive at a decision that is ethically sound and educationally beneficial. The conclusion, as facilitated by the decision tree, is that ChatGPT, when integrated with intention and ethical foresight, can significantly contribute to the economics classroom.

The results from the application of the “Evaluate. Reflect. Assurance.” process underscores the critical importance of ongoing ethical reflection and the need for educators to remain informed about the evolving capabilities of AI technologies like ChatGPT. It is through this process that instructors can ensure their pedagogical practices with ChatGPT are beneficial, equitable, and ethically sound.

Conclusion

This section examines the results of the “Evaluate, Reflect, Assurance” decision-making process from the decision-tree in [Appendix A](#). The approach was to support educators by providing a structured approach to ethically integrating AI tools like ChatGPT in the classroom. [Appendix A](#) simplifies the complex tasks of aligning technological innovations with ethical principles, supporting educators to make informed and conscientious decisions in demanding educational environment. The importance of examining this research was to answer the question, what decision-making framework can guide instructors to use ChatGPT ethically in the economics classroom? In a growing time of AI development and rapid implementation within the educational environment and consistent student interest in harnessing capabilities, this paper developed a model for economics educators to refer to when considering application. The process demonstrated how instructors could ethically integrate ChatGPT into the K-14 economics classroom, balancing educational benefits with ethical considerations. The key conclusion is that when used with careful ethical consideration, ChatGPT can be a valuable tool in enhancing the educational experience in economics classrooms.

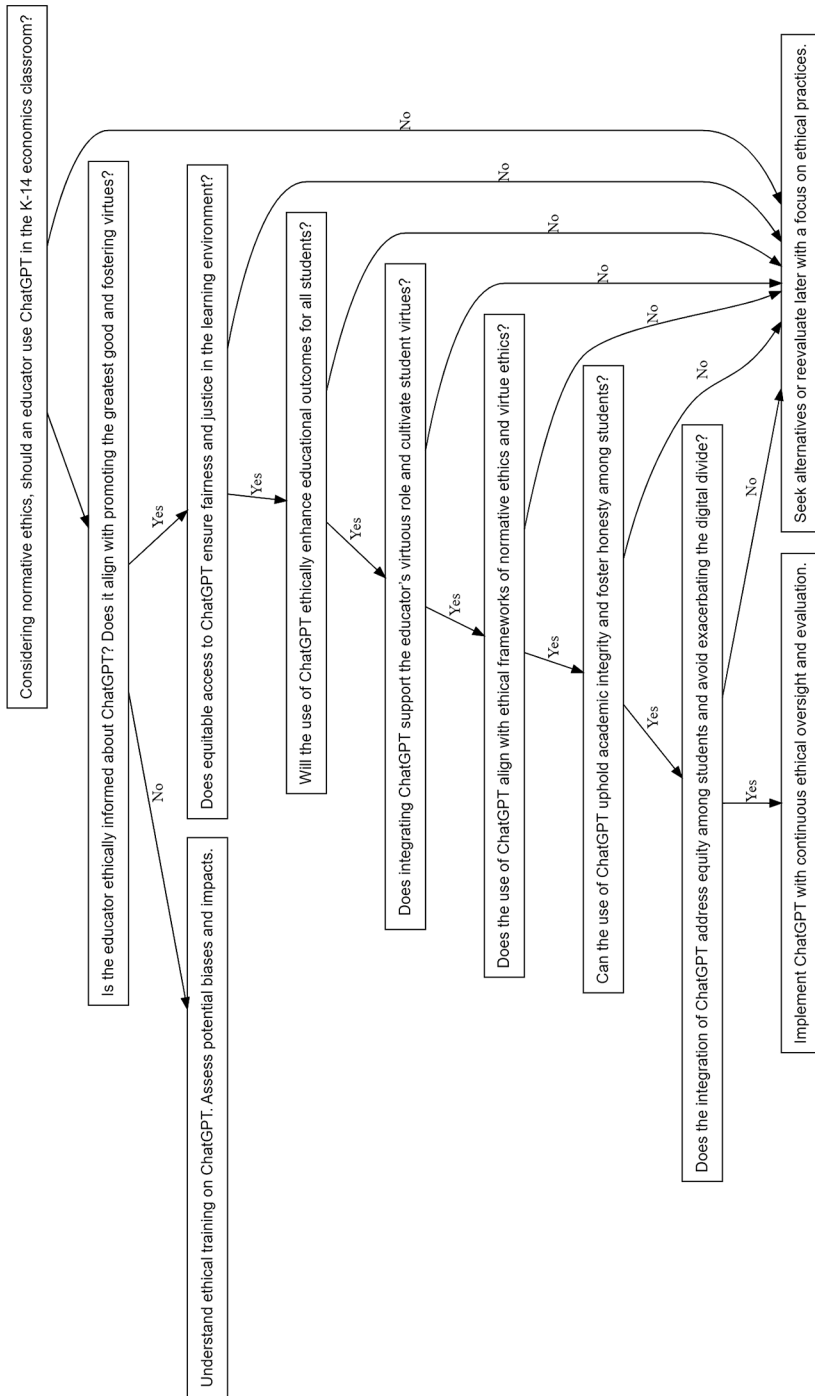
The findings suggest that ChatGPT can be integrated into teaching methodologies to enhance learning experiences if educators remain vigilant about the ethical implications of its use. The decision-making process emphasizes the importance of instructor’s awareness with ethical considerations in the use of AI in education. Furthermore, this highlights the need for educators to continuously evaluate their use of technology against evolving ethical standards and educational goals. The results underscore the necessity for ongoing professional development for educators, a concern for the K-14 community, as these are teaching-focused roles. Staying updated with AI advancements and understanding their ethical ramifications is crucial for effective and responsible teaching. Therefore, policymakers and administrators should take note that technical AI training and awareness supports teaching-focused instructors in the classroom. Continued professional development in ethical AI workshops and training sessions would be greatly beneficial in lowering the start-up cost of model applications.

While this paper builds the first, to the best of our knowledge, framework to use ethical guidelines of using ChatGPT in the K-14 economics classroom, future studies could conduct comparative analyses of various AI tools in economics education, evaluating their effectiveness, ethical considerations, and impact on student engagement and learning outcomes. Such comparative studies would offer valuable insights into the optimal use of AI technologies in enhancing educational experience.

In summary, the “Evaluate, Reflect, Assurance” process developed in this study offers a pragmatic and ethical approach to integrating ChatGPT in the economics classroom. It balances the potential benefits of AI in education with the need for ethical vigilance, ensuring that technological advancements are harnessed to enhance learning while upholding moral and educational standards. This study paves the way for a more ethically aware and educationally sound integration of AI tools in the classroom. It contributes to a paradigm shift in educational technology, encouraging educators and policymakers to prioritize ethical considerations in the rapidly evolving landscape of AI in education, thus ensuring that technological advancements serve to enrich learning experiences while upholding moral and pedagogical integrity.

Appendix A

Decision tree analysis for instructors to use in determining ethical usage of ChatGPT in the economics classroom.



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