

AN ETHICAL APPLICATION OF AI IN THE EDUCATION SECTOR

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The Problem & Background

The integration of AI in education faces significant challenges due to ethical concerns, particularly around academic integrity. Current AI tools, such as ChatGPT, often provide direct answers, which can lead to issues like plagiarism and reduced critical thinking. This has limited the potential of AI as an effective learning aid, creating hesitation among schools to adopt AI technologies. These concerns affect **both specialized and non-specialized schools, contributing to inconsistencies in AI policies and practices, and leaving students without access to regulated, beneficial AI tools.**

According to the US Department of Education, there is a growing demand for AI in education. Our own research has highlighted that **43.2% of surveyed students use AI for learning purposes**, primarily for brainstorming and idea generation. However, educators express concerns about the misuse of AI diminishing students' creativity and critical thinking. Policies across schools vary significantly, with specialized schools having stricter guidelines, while non-specialized schools take a broader, less consistent approach. Our research incorporates perspectives from students, teachers, and administrators across diverse school demographics to ensure our solution addresses these challenges comprehensively.

Hypothesis

Using AI in schools is governed by universal standards and implemented through an adaptable educational platform, which can positively impact student development and learning outcomes, enhancing creativity and critical thinking while addressing ethical concerns.

Methods

Our research and development methods consisted of 4 key phases: **Literature Review, Real World Data, Product Design, and Testing.**

To get a better understanding of AI in schools, we researched the AI policy of multiple schools in New York and other regions. We made sure to research both private and public schools to fully consider multiple viewpoints. We also went through multiple research papers and educational board reports to see how others have applied AI to education. Then we gathered real-world data, using a Google form to compile information on how students and teachers use AI right now. With this information, we were able to design a solution and test it in a classroom setting.

Solution & Testing Results

In order to meet this growing demand for AI in education, we decided to create an online AI platform for schools that follows a set of a certain rulebook that is in adherence with school guidelines, which allows students to explore AI while supporting creative thinking. Essentially creating an interactive, adaptable (to the student's knowledge) AI chatbot that complies with the norms and regulations of a school setting. To test our solution, we incorporated it within a personalized teaching environment. We conducted an experiment with middle school students where one group was taught with a standard curriculum, and another was taught by a personalized curriculum developed by AI. After analyzing the results, we saw that **Group B scored on average 5 points higher than Group A on the test.**

Methodolog - Data/Feedback

Phase 1: Background Research

Specialized High Schools:

We researched specialized schools like Bronx Science, Stuyvesant, and Brooklyn Tech usually integrate technology into their curriculums, especially in STEM fields. We found they emphasized academic integrity, restricting AI use in assignments and/or requiring proper citations if AI is used. Additionally, AI policies often vary by subject. For example, some schools might allow AI in computer science courses, while banning its usage in humanities/essay-based assignments.

Non-Specialized Schools:

We found some schools have broader guidelines that encourage the responsible use of technology without specifically addressing AI. For example, Edward R. Murrow High School and Millennium High School allow AI in research-based projects but require students to follow the general academic integrity policy.

Students are generally expected to use AI tools ethically. While policies may emphasize original work and proper citation, the specific rules are often left to the discretion of individual teachers or departments.

General Trends:

The central focus of these policies is maintaining academic integrity, ensuring that students use AI tools responsibly and ethically. At the same time, many schools leave specific decisions about AI use to the discretion of individual teachers or departments. These approaches reflect the adaptability of technology policies, as schools continue to update their guidelines in response to the growing influence of AI.

Phase 2: Peer/Teacher Feedback

To better understand how AI is perceived in education among students (Grades 8-12) and teachers, we surveyed various school districts to obtain primary input on their perspectives.

For students, 43.2% responded saying they use AI often in their learning, emphasizing the importance of providing a resource that supports this. As seen in Figure 1, the biggest use for AI among students was as a tool to search for information. However, we also see a percentage of students who use AI to complete their homework or search for answers, highlighting concerns from a teacher's perspective in which AI diminishes a student's ingenuity. However, this showcases the use of an AI platform that provides regulated responses that prompt a student's ability to think critically rather than provide an answer.

From a teacher's perspective, a major concern is a decline in students' thinking; however, as Figure 2 shows, almost 65.9% of teachers stated they would be open to using AI to help students get ideas rather than just answers. Both data sets indicate a real-world application for our proposed solution.

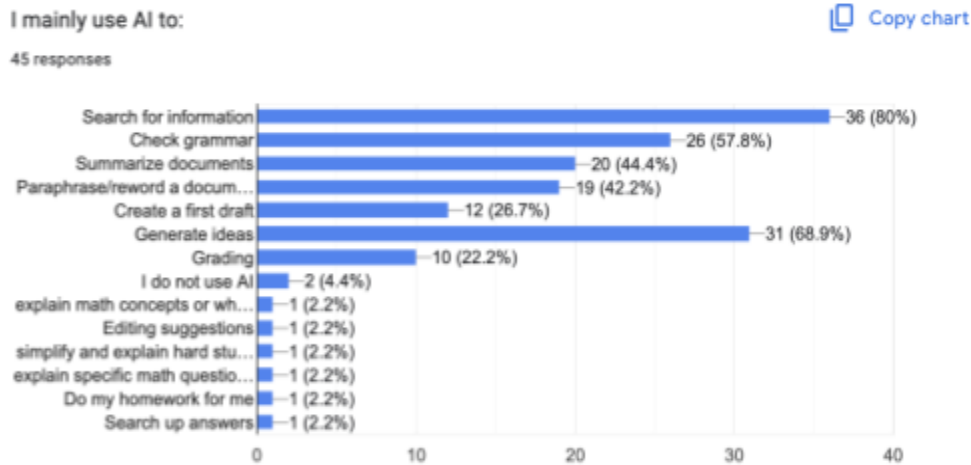


Figure 1: Prompt Questions - I mainly use AI to:

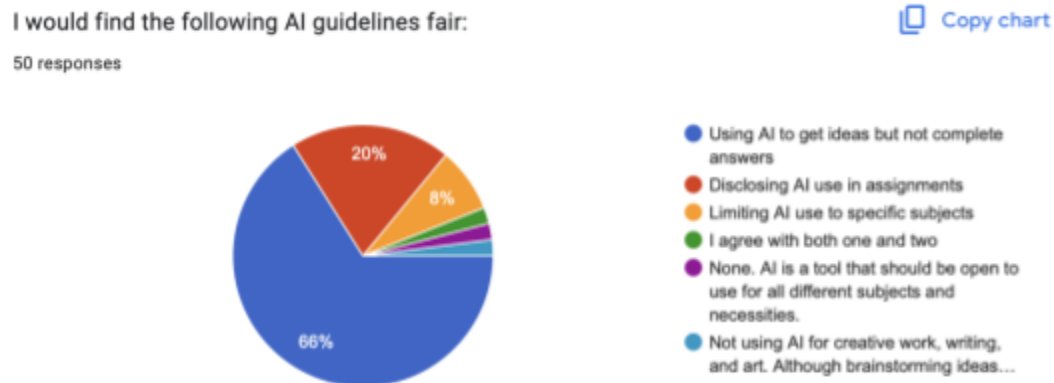


Figure 2: Question Prompt - I would find the following AI guidelines fair:

Phase 3: Testing Technology

What colour is the sky?



The sky appears blue during the day because of a phenomenon called Rayleigh scattering. Sunlight is made up of different colors, and as it passes through Earth's atmosphere, the shorter blue wavelengths scatter more than the longer red ones, spreading blue light in all directions and making the sky look blue to us.

At sunrise and sunset, the sky can appear red, pink, or orange. During these times, sunlight has to travel through more of the atmosphere, scattering shorter wavelengths and letting more of the reds and oranges reach our eyes.



Can you lead me to the answer instead of telling me



Sure! Let's break it down step-by-step with questions to guide your thinking:

1. **What is sunlight made of?** Think about what colors you see in a rainbow. Sunlight contains all those colors, right?
2. **What happens when sunlight enters Earth's atmosphere?** Imagine shining a flashlight through a dusty room. What happens to the light? Similarly, what do you think happens to sunlight when it passes through the particles in our atmosphere?
3. **Which colors of light are scattered the most?** Some colors have shorter wavelengths than others. Which colors do you think might scatter more easily as sunlight moves through the atmosphere?
4. **How does this scattering affect what we see?** If certain colors are scattered more and spread out in different directions, what color might dominate the sky?
5. **Why does the sky look different at sunset?** Think about the position of the sun and how much atmosphere the light must pass through when it's low on the horizon. Which colors might be scattered out, and which ones are left for us to see?

Let me know if you'd like hints for any of these questions!



After entering a prompt into ChatGPT, the response was as expected: it responded directly with an answer rather than guiding the user toward the answer. For our model, we aim to focus specifically on education based on the user's learning abilities.

Analysis

Our testing shows several key trends in student uses and opinions of AI. For students, contrary to what may be expected, the use of AI is more directed towards brainstorming and ideation - a pattern visible both in the majority of students who emphasized generating ideas as their primary use of AI and preferred restricting AI usage to brainstorming rather than complete answers. This will inform our solution development, as our rulebook can emphasize brainstorming as an effective use of AI. In terms of limitations, while over 40 students were surveyed for the form, the data should ideally have more input from teachers, since their perspectives on AI's impact on learning would also be crucial to note. Additionally, a goal for the coming days will be to ensure that a variety of perspectives, including public, private, rural, and urban schools are represented in order to design a solution pertinent to different backgrounds.

Overall, AI has incredible potential to transform the education industry. Our solution serves as a forward step in developing AI that can be trusted by teachers and supportive of a student's academic career.

Future

We will start creating pictures of current progress. This will allow us to visualize the data and see trends in certain topics. Also, we will expand to a wider sample size to precisely tweak the rulebook to changing circumstances, thus creating a more refined version of the model. Further, we aim to apply the rulebook model in a real-world setting, including adapting the school curriculum to fit AI use. This may take more time due to legal policies, however, can be beneficial in the long run. Our next goal is to further develop the AI model, creating the rulebook to be implemented across various AI platforms. For future growth, we want to expand to different sectors like finance and healthcare. Issues like loan approval can be aided through AI use and understanding the data.