

April 17th, 2024

LEVERAGING CHATGPT TO CULTIVATE CRITICAL THINKING THROUGH GLOBAL PERSPECTIVES AND SOCIAL RESPONSIBILITY IN STEAMM EDUCATION

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AGENDA

- **Introduction**
 - Why Critical Thinking?
 - Social Responsibility
 - Global Perspectives in STEAMM Education
- **Challenges** of Incorporating Societal Issues with Technical Content
- Overview of **ChatGPT Principles**
- **Hands-On Activity:** ChatGPT in Action
 - Example Prompts from Presenters' Courses
 - Individual Work: Using ChatGPT to Create Content Ideas
- **Group Discussion** and Q&A

WHY CRITICAL THINKING IN STEAMM?



It is the ability to analyze, evaluate, and synthesize information to make informed decisions, essential for problem-solving, creativity and innovation.

Why it Matters in Education

- Enables students to approach complex problems systematically.
- Encourages questioning and exploration.
- Fosters creativity and innovation.

Benefits

- Prepares students for academic and professional success.
- Equips them to adapt to rapidly changing technological landscapes.
- Cultivates a mindset of lifelong learning.

ENHANCING CRITICAL THINKING THROUGH...



SOCIAL RESPONSIBILITY

Ethical conduct and responsible decision-making within local or organizational contexts

Scope	Primarily local or organizational
Objectives	Addressing social or environmental challenges within specific communities or organizations
Actions	Corporate social responsibility programs, community outreach efforts, ethical business practices
Emphasis	Responsibility towards stakeholders, sustainability, ethical behavior



GLOBAL PERSPECTIVES

Understanding global issues and appreciating cultural diversity

Scope	Global
Objectives	Promoting global citizenship and intercultural understanding
Actions	Engagement with global issues, cross-cultural collaboration
Emphasis	Appreciation of diverse perspectives, cultural awareness

INTEGRATION INTO CRITICAL THINKING EDUCATION



SOCIAL RESPONSIBILITY

Real-
World
Impact

- Prompts students to consider ethical and societal implications.
- Encourages critical reflection on broader consequences of decisions.

Analyzing
Complex
Issues

- Socially responsible projects involve multifaceted challenges.
- Requires critical evaluation of various perspectives and stakeholder needs.



GLOBAL PERSPECTIVES

- Exposes students to diverse cultural, social, and economic contexts.
- Broadens worldview and enhances critical thinking by challenging assumptions.
- Collaboration introduces new ideas and approaches.
- Encourages consideration of alternative solutions to complex problems.



THINK.



PAIR.



SHARE.

THINK (2 MINUTES) :

- Reflect individually on how you integrate critical thinking in your class.
- Consider specific examples or strategies used in teaching.
- Are there any challenges in incorporating critical thinking?

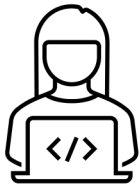
PAIR (4 MINUTES) :

- Pair up with a colleague nearby.
- Discuss how to incorporate social responsibility or global perspectives.

SHARE (2 MINUTE) :

- One person from the pair shares key insights with the group. (2 max)
- Group discussion of potential benefits and challenges.

KEY PRACTICAL CHALLENGES



CURRICULUM ALIGNMENT

Balancing the inclusion of societal issues without compromising the technical rigor and learning objectives of the course



RESOURCE CONSTRAINTS

Limited availability of teaching materials that effectively combine technical content with societal issues.



ASSESSMENT PARADIGMS

Traditional assessment methods might not reflect students' understanding and engagement with societal issues effectively



STUDENT ENGAGEMENT

Ensuring that discussions are engaging and relevant to students with diverse interests and backgrounds.



LIMITED TIME

Allocating adequate time for in-depth exploration of societal issues within an already packed course schedule.

WHY BOTHER? – WHEN THINGS GO HORRIBLY WRONG

SCIENCEINSIDER | BIOLOGY

CRISPR bombshell: Chinese researcher claims to have created gene-edited twins

Reports trigger shocked reactions and calls for regulation around the world

26 NOV. 2018 • BY DENNIS NORMILE

FORBES > INNOVATION

AI Bias In Recruitment: Ethical Implications And Transparency



Aditya Malik Forbes Councils Member
Forbes Technology Council **COUNCIL POST** | Membership (Fee-Based)



Sep 25, 2023, 09:15am EDT

[nature](#) > [news explainer](#) > [article](#)

News Explorer | Published: 24 September 2015

The science behind the Volkswagen emissions scandal

[Quirin Schiermeier](#)

[Nature](#) (2015) | [Cite this article](#)

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Debacle has wide-ranging implications, but many already knew that diesel emissions tests were problematic.

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Oil spill tops 1 million gallons, threatens Gulf of Mexico wildlife

As they work to contain the spill off the Louisiana coast, authorities are trying to determine if a pipeline was the source



By [Darryl Fears](#)

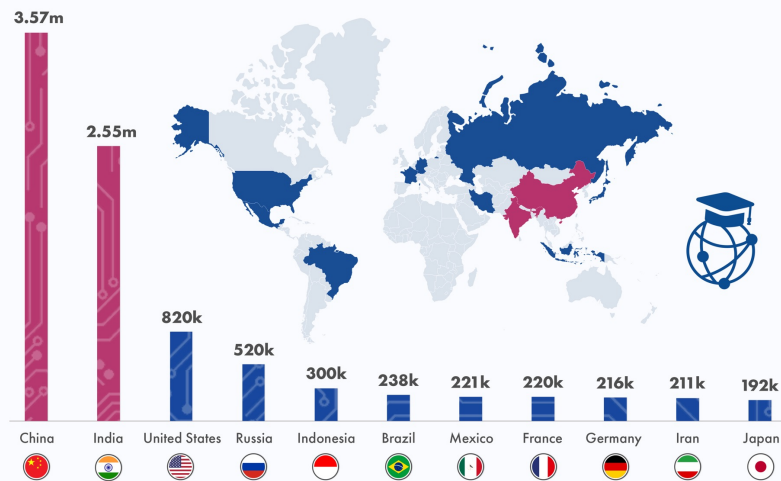
November 21, 2023 at 4:37 p.m. EST

WHY BOTHER? – WE LIVE IN A GLOBAL WORLD

The workforce is internationally diverse

Top Countries by Number of STEM Graduates

Graduates in Science, Technology, Engineering, and Mathematics in 2020



@CSETGeorgetown

Source: OECD and the statistical yearbooks of Russia, Indonesia, Iran, India, and China

CSET CENTER for SECURITY and EMERGING TECHNOLOGY

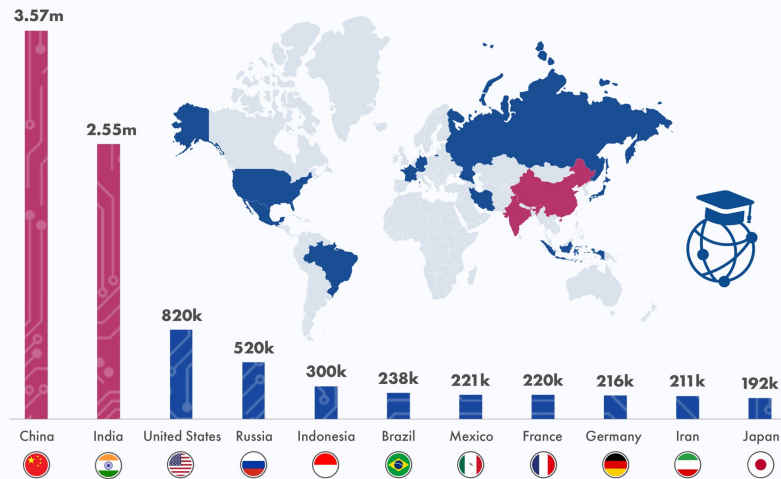
WHY BOTHER? – WE LIVE IN A GLOBAL WORLD

The workforce is internationally diverse

The problems/technologies have global impact

Top Countries by Number of STEM Graduates

Graduates in Science, Technology, Engineering, and Mathematics in 2020

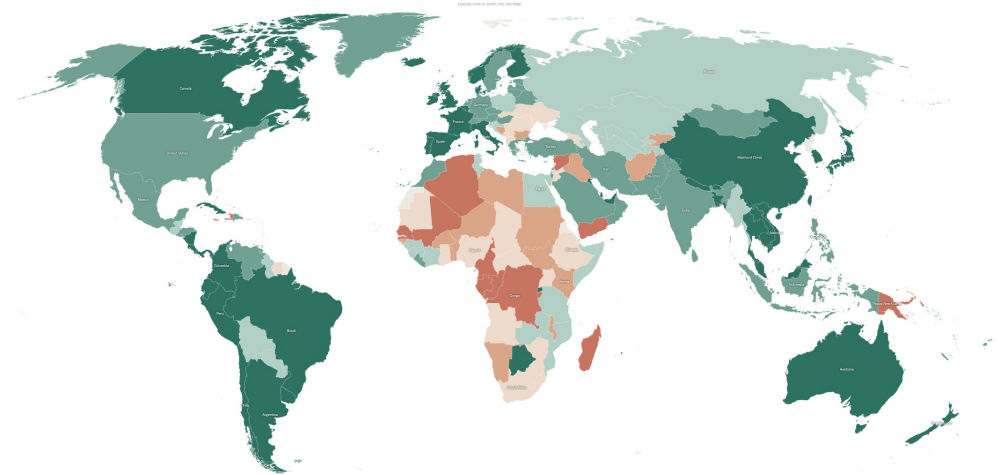
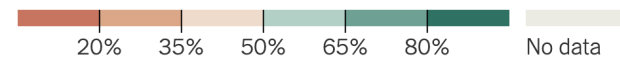


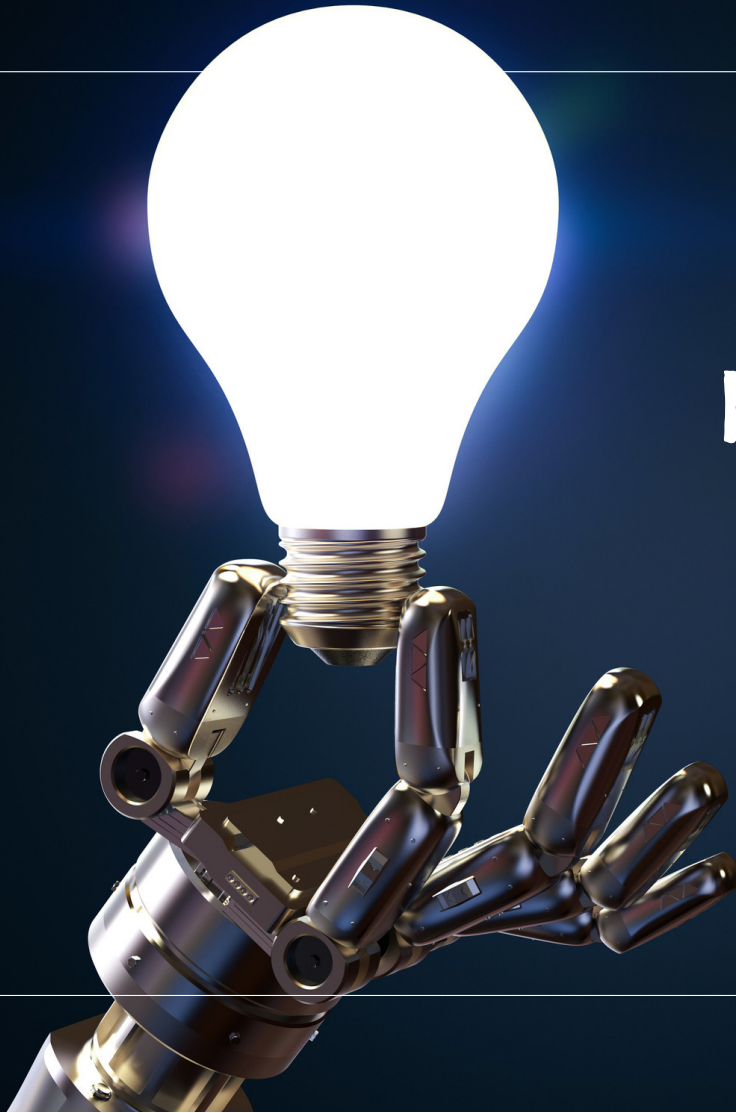
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Source: OECD and the statistical yearbooks of Russia, Indonesia, Iran, India, and China

CSET CENTER for SECURITY and EMERGING TECHNOLOGY

Share of population receiving at least one dose

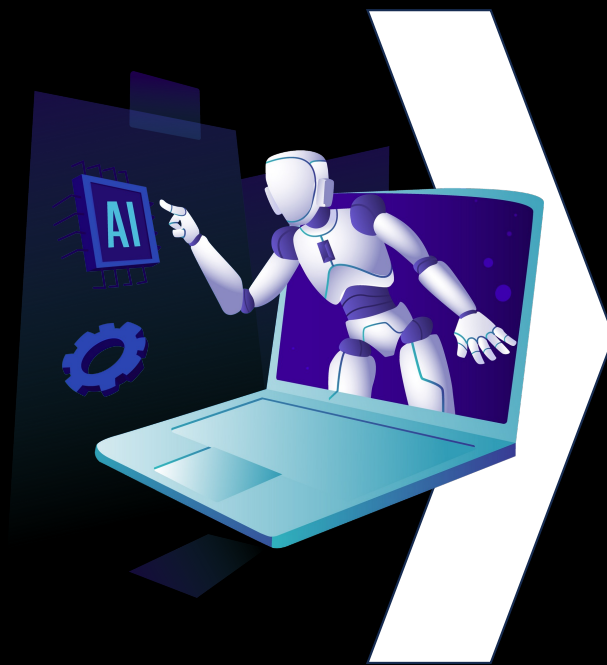




NATURAL LANGUAGE PROCESSING TO THE RESCUE

WHAT IS NATURAL LANGUAGE PROCESSING (NPL) ?

The process of extracting the meaning, or intent, behind human language...



... to generate appropriate responses, resulting in a natural conversation flow.

Contextual Understanding:



AI Limitation

Ability to understand the current, specific context of your course, the background knowledge of your students, or the detailed dynamics of your educational environment.

How You Can Help

Providing information

- specific learning objectives
- students' current level of knowledge
- context of the course can enable more tailored problem statements

Complexity and Nuance



AI Limitation

The nuances and complexities of social and ethical issues are not always fully captured by an AI, as it may lack the lived experience and the emotional understanding that humans possess.

How You Can Help

Providing information

- particular social issues you wish to focus on
- examples of ethical dilemmas previously discussed can help create more nuanced scenarios

Local and Cultural Relevance

AI Limitation

Not be fully aware of local, cultural, and recent industry-specific challenges that are pertinent to the students.

How You Can Help

Providing information

- regional or cultural considerations
- current industry trends
- local challenges that can make the problem statements more relevant and engaging.



Dynamic Updates

AI Limitation

Last training data includes information up to April 2023, and it is not aware of real-time changes or recent developments.

How You Can Help

Providing information

- recent updates
- emerging issues
- cutting-edge technologies that students should consider in their problem-solving process.



Assessment and Feedback

AI Limitation

Cannot assess student responses or provide feedback based on actual student performance or real-time interactions.

How You Can Help

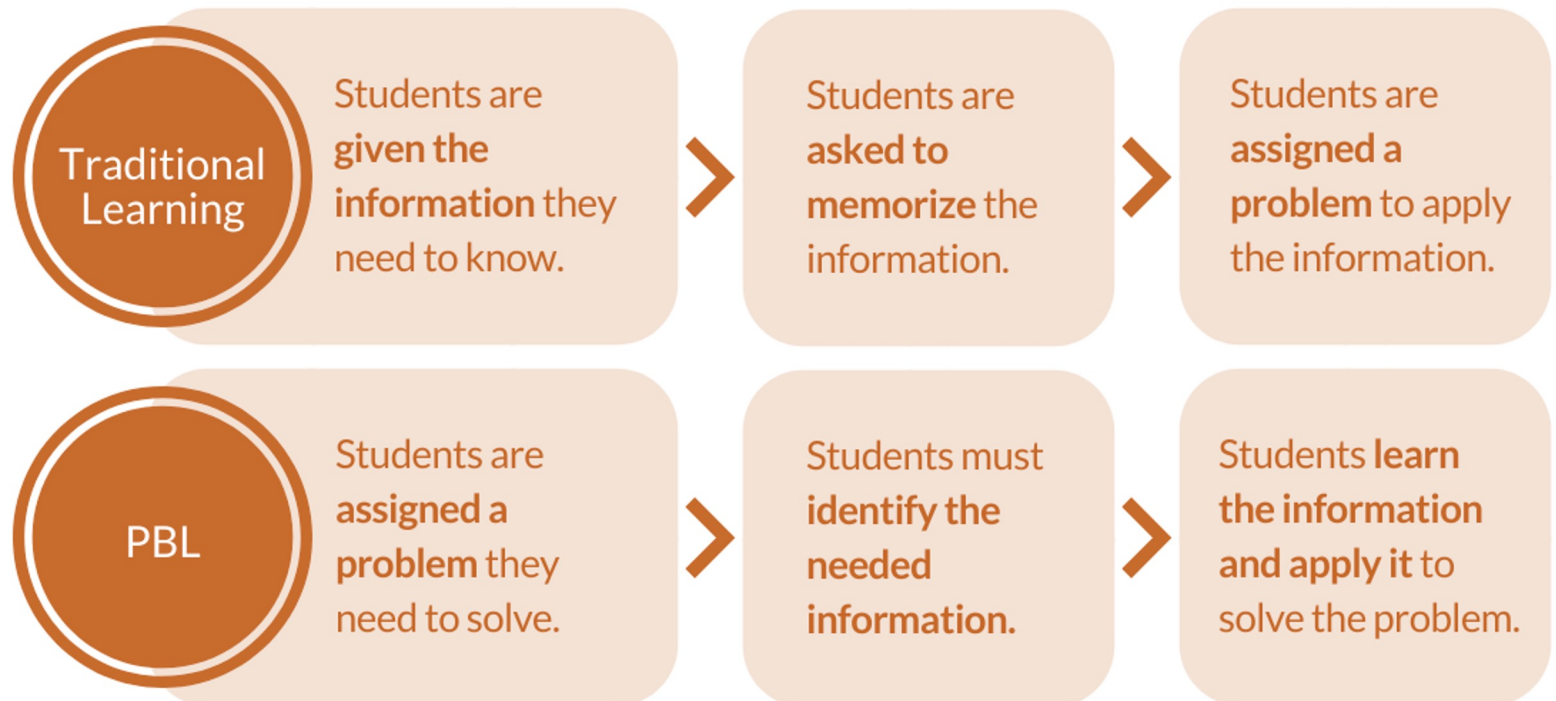
Explain the assessment criteria you have in mind and how you typically provide feedback, which could be incorporated into the PBL design.

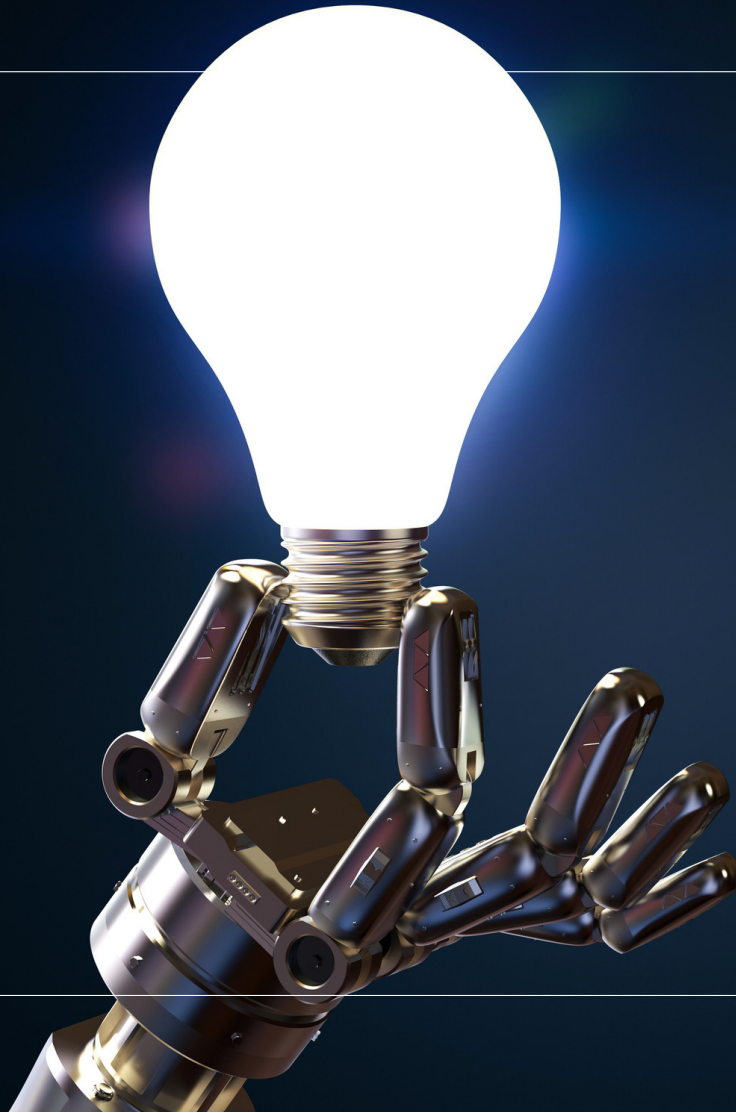


EXAMPLES

BLOOM'S TAXONOMY: HIGHER-LEVEL (ANALYZING / EVALUATING / SYNTHESIZING) :

Demonstrate the ability to analyze, evaluate, and synthesize complex information within their respective STEMM disciplines





TRANSFORMING A
BOOK PROBLEM
INTO A
CRITICAL THINKING
EXERCISE USING
SOCIAL
RESPONSIBILITY



What is Social Responsibility in engineering?

✓ Let it know about your topic, pedagogy, audience, your role



Social Responsibility in engineering refers to the ethical obligation of engineers to ensure that their work contributes positively to society and minimizes harmful effects on the environment, public health, safety, and welfare. This concept encompasses a range of considerations that engineers must take into account when designing, implementing, and maintaining technological systems and infrastructure. Here are several key aspects of social responsibility in engineering:



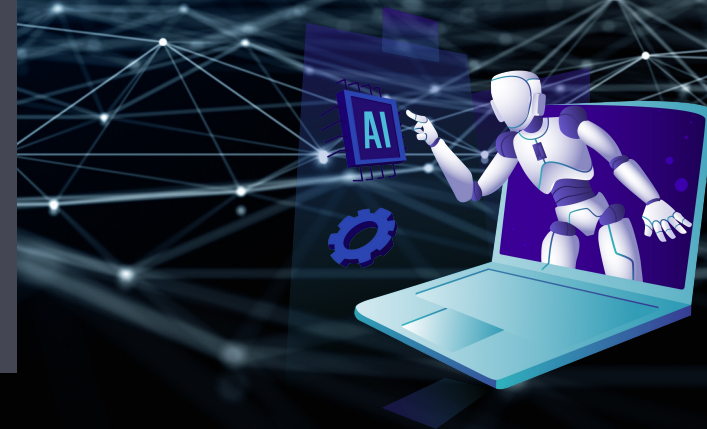


What is Problem-based Learning in engineering and how can we use it to integrate social responsibility into the chemical engineering curriculum ?



Problem-based Learning (PBL) is an educational approach that uses complex and challenging problems as the starting point for learning, rather than traditional lecture-based instruction. In PBL, students work in groups to solve real-world problems, which requires them to research, apply knowledge, think critically, and communicate their findings. This method is particularly effective in engineering education because it mirrors the way engineers work in their professional lives.

To integrate social responsibility into the chemical engineering curriculum using PBL, one could design problem scenarios that require students to consider the social, ethical, environmental, and economic implications of their engineering solutions. Here's how PBL can be used for this purpose:



1. **Select Real-World Problems:** Choose problems that chemical engineers are likely to face, which have significant social responsibility implications. For instance, issues like pollution control, sustainable processes, waste management, and safe chemical production are good candidates.
2. **Encourage Interdisciplinary Learning:** Incorporate perspectives from disciplines such as environmental science, economics, sociology, and public policy. This encourages students to think about the broader context of their engineering solutions.
3. **Define Clear Learning Objectives:** In addition to technical knowledge, include objectives related to understanding social impact, ethical decision-making, safety considerations, and sustainability.



4. **Foster Ethical Reasoning:** Present dilemmas where students must balance economic and technical feasibility with ethical considerations, encouraging them to think about the welfare of society and the environment.
5. **Promote Stakeholder Engagement:** Design scenarios that require students to identify and interact with various stakeholders, such as community members, government agencies, and industry partners. This can help students understand different viewpoints and the social context of their engineering decisions.
6. **Incorporate Service Learning:** Combine PBL with service learning opportunities, where students work on projects that benefit communities, fostering a sense of social responsibility.



7. **Use Case Studies:** Introduce case studies of chemical engineering projects that have had significant social impacts, both positive and negative, to stimulate discussion and learning.
8. **Develop Communication Skills:** Ensure that students present their solutions to both technical and non-technical audiences, explaining the societal implications of their engineering decisions.
9. **Assessment:** Design assessments that evaluate not only the technical solution but also the consideration of social, ethical, and environmental factors.
10. **Reflection:** Encourage students to reflect on the role of the chemical engineer in society and how their solutions can affect the world around them.



Keep the following Homework problem in your memory, until I prompt you: In the production of ethanol by the hydrolysis of ethylene, diethyl ether is produced as a byproduct. A typical feed stream composition is 55% ethylene, 5% inerts, 40% water; and product stream: 52.26% ethylene, 5.49% ethanol, 0.16% ether, 36.81% water, 5.28% inerts. Calculate the selectivity of ethylene for ethanol and for ether.

✓ Let it know the book problem.



✓ Ask to integrate everything it knows



Rewrite the above problem statement using Problem-based Learning and integrating Innovation for Social Good: Engineers are encouraged to use their skills to address social challenges, such as improving healthcare, education, and access to clean water and energy.



To rewrite the above homework problem using Problem-Based Learning (PBL) and integrating Innovation for Social Good, we will present it as an open-ended scenario that challenges students to consider the broader implications of the production process. Here is how it could be framed:

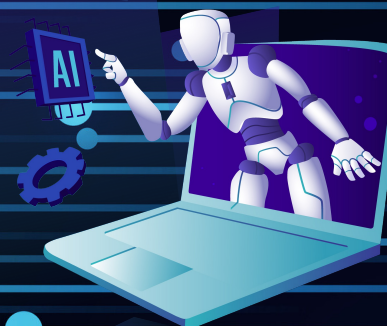


Homework Problem - PBL Format: Sustainable Ethanol Production

Background Scenario:

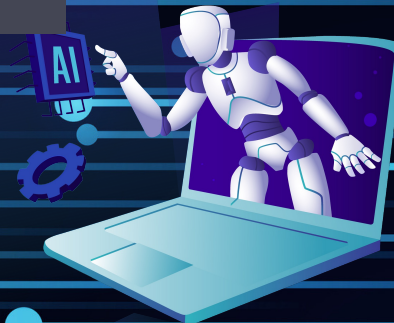
✓ Explore, enjoy, optimize!

In a world striving towards sustainability and responsible consumption of resources, the chemical engineering industry is facing pressure to innovate processes that are not only efficient but also environmentally friendly and socially responsible. Ethanol, as a biofuel, plays a significant role in reducing reliance on fossil fuels and minimizing carbon emissions when used in transportation and energy generation. However, its production process can sometimes lead to the generation of unwanted byproducts that may pose environmental and economic challenges.



The Challenge:

You are a team of chemical engineers tasked with optimizing the production of ethanol from ethylene via hydrolysis, with the goal of minimizing the production of diethyl ether as a byproduct. The current production process yields a feed stream composition of 55% ethylene, 5% inerts, 40% water; and a product stream of 52.26% ethylene, 5.49% ethanol, 0.16% ether, 36.81% water, 5.28% inerts.



Your Tasks:

1. **Process Optimization:** Calculate the current selectivity of ethylene for ethanol and for ether. Discuss how selectivity reflects the efficiency of the process and propose modifications to the process that could improve the selectivity for ethanol while reducing the formation of ether.
2. **Environmental Impact Analysis:** Evaluate the environmental impact of the diethyl ether byproduct. Consider its effects on local ecosystems, air and water quality, and potential uses or disposal methods that comply with environmental regulations.
3. **Social Good and Community Engagement:** Consider how the improved process can contribute to social good. For instance, explore how the production of ethanol can support local communities, either by providing cleaner fuel alternatives, creating job opportunities, or through educational initiatives.

✓ Explore, enjoy, optimize!



4. **Innovation for Sustainability:** Propose a detailed plan for the integration of a new technology or innovation within the production process that can enhance sustainability. This could involve recycling strategies, renewable energy integration, or the development of a novel catalyst.
5. **Stakeholder Presentation:** Prepare a presentation for the stakeholders, including non-technical community members, explaining how the improved process aligns with the principles of social responsibility and environmental stewardship.
6. **Reflection on Social Responsibility:** Reflect on the role of engineers in society and how the decisions made in the process design can have far-reaching implications on environmental and public health.



Deliverables:

- A report containing the calculations of selectivity, process modifications, environmental analysis, and sustainability proposals.
- A stakeholder presentation that effectively communicates the technical aspects and the social/environmental benefits of the improved process.
- A reflective essay on the ethical responsibilities of chemical engineers and the potential impact of their work on society.





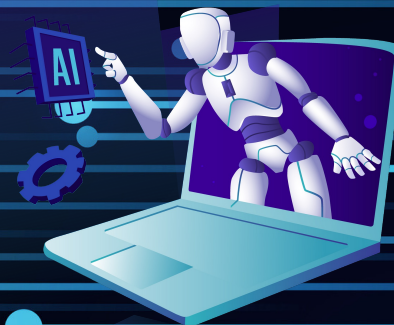
Experiment with Evaluation



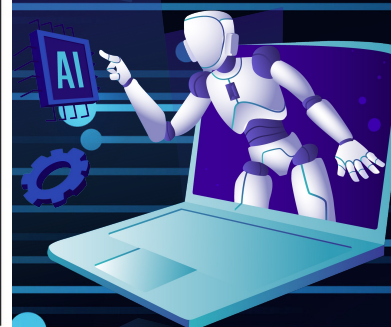
Suggest a rubric to evaluate student critical thinking skills used to evaluate social responsibility in the problem statement you propose above. Display in a table format



Creating a rubric in a text-based medium like this chat can be challenging, but I will format it as a table using text representations. Here is a rubric you might use, with the columns representing the levels of achievement and the rows representing the criteria for assessment:



Criteria	Exemplary (4 points)	Proficient (3 points)	Developing (2 points)	Beginning (1 point)
Understanding of Social Responsibility	Demonstrates comprehensive understanding of social responsibility in engineering and clearly connects it to the project.	Shows good understanding of social responsibility with clear connections to the project, minor details may be overlooked.	Displays basic understanding of social responsibility, but some connections to the project are superficial or incomplete.	Lacks clear understanding of social responsibility; connections to the project are unclear or incorrect.
Analysis of Ethical Implications	Conducts a thorough and insightful analysis of the ethical implications of the engineering project, considering multiple stakeholders.	Provides a clear analysis of the ethical <u>implications</u> , but may lack depth or consideration of some stakeholders.	Offers a basic analysis of ethical <u>implications</u> , but is limited in scope and detail; some stakeholders may be neglected.	Analysis of ethical implications is cursory or missing; fails to consider stakeholder perspectives adequately.
Application of Critical Thinking	Applies critical thinking consistently to evaluate the project's social impact, considering various perspectives and implications.	<u>Generally</u> applies critical thinking to assess the project's social impact but may miss subtle nuances or alternatives.	Shows some attempt at applying critical thinking, but analysis may be simplistic or lack rigor.	Demonstrates minimal application of critical thinking; analysis is superficial or incomplete.
Problem-Solving and Innovation	Presents innovative solutions that address social responsibility while enhancing project sustainability and effectiveness.	Proposes solid solutions addressing social responsibility with consideration for sustainability, but innovation may be limited.	Suggests basic solutions with some consideration for social <u>responsibility</u> , but lacks innovation or full sustainability integration.	Provides simplistic or vague solutions with little to no evidence of innovation or sustainability consideration.
Communication and Presentation	Articulates complex concepts related to social responsibility exceptionally well, with clarity and conviction to a range of audiences.	Communicates concepts related to social responsibility clearly but may lack some persuasiveness or adaptation for different audiences.	Exhibits some problems in communicating concepts related to social responsibility clearly or effectively to different audiences.	Struggles to communicate concepts related to social responsibility; messages are unclear or confusing.
Reflection on Ethical Responsibility	Provides a deep, insightful reflection on the role of engineers in society and the potential impact of their work.	Reflects adequately on the role of engineers and their impact, though may lack some depth.	Shows basic reflection on the role of engineers with a superficial understanding of their potential impact.	Lacks reflection on the role and impact of engineers in society, with little to no personal engagement.



✓ Integrate in your courses!

HUMAN-CENTER DESIGN: TASK: CREATE AN EMPATHY MAP FOR THE POTENTIAL USERS OF HEALTHY SNACKS.

Using information from the literature and my experience in the food industry, I developed the following personas using Chat GPT.

Persona 1: The Busy Professional

- **Name:** Sophia, 25 years old
- **Occupation:** Process Engineer
- **Lifestyle:** Extremely busy, often eats on the go, keen on maintaining a professional and healthy lifestyle.
- **Needs and Goals:** Requires quick, convenient snacks that can be consumed during short breaks in her busy schedule. Health-conscious, looking for snacks that are not only nutritious but also delicious and satisfying.
- **Challenges:** Has limited time for meal preparation, often finds herself relying on quick but less healthy food options due to her hectic schedule.



Qualitative Data:

- **Interview Excerpts**
 - "I often skip breakfast because I'm in a rush. I need something I can grab and eat at my desk. It should be healthy, but it's hard to find snacks that are both good for me and actually taste good."
 - "I love going for runs on weekends. It helps me de-stress."
- **Self-Reported Behavior:**
 - Frequently purchases coffee and a pastry at a local café in the morning. Occasionally seen eating fast food during lunch breaks.
 - Engages in high-intensity workouts four times a week.
 - Reports an average of 6 hours of sleep per night due to work demands.
 - Often declines social outings on weekdays to prioritize work.
 - Reports high stress due to work, seeks ways to relax in minimal time. Worried about long-term health effects of her current lifestyle.
 - Expressed a preference for snacks with a balance of sweet and savory flavors. Mentioned a desire for more protein-rich options.
 - Spends an average of 10 hours at work daily, often attends late meetings.
- **Social Media Post:** Shares articles about work-life balance and time management.
- **Peer Observation:** Colleagues mention she often volunteers for new projects at work.
- **Environmental and Contextual Data:**
 - Has access to a shared kitchen with a microwave and fridge.
 - Commutes about 30 minutes each way, typically drives to work.
 - Often eats alone at her desk or in brief meetings.

Quantitative Data:

- **Survey Results:**
 - 70% of respondents similar to Sophia skip breakfast at least twice a week. 80% prefer snacks that are under 200 calories.
 - 40% of respondents like Sophia enjoy outdoor activities on weekends. 30% read books related to professional development.
- **Purchase History:**
 - Buys snacks that are convenient and quick to consume, with a 60% tendency towards sweet flavors over savory.
 - Occasionally buys high-end fitness equipment and work-related books.
- **Nutritional Preference:** 65% look for high-protein content, 50% seek low-sugar options.

Persona 2: The Single Parent Engineer

- **Name:** Taylor, 38 years old
- **Occupation:** Civil Engineer
- **Lifestyle:** Taylor is a single parent and a full-time civil engineer who manages a busy schedule. He prioritizes nutritious food choices for himself and his child, often facing challenges in finding quick, healthy snack options.
- **Needs and Goals:** Requires quick, convenient snacks that can be consumed during short breaks in his busy schedule. Taylor values health and wants to instill the same in his child by choosing nutritious food options.
- **Challenges:** Has limited time for meal preparation, often finds themselves relying on quick but less healthy food options due to his hectic schedule.



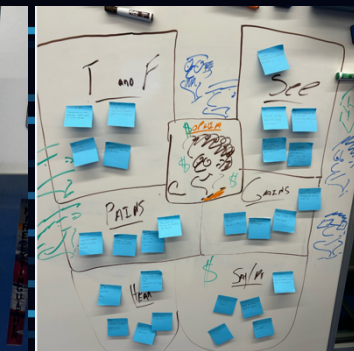
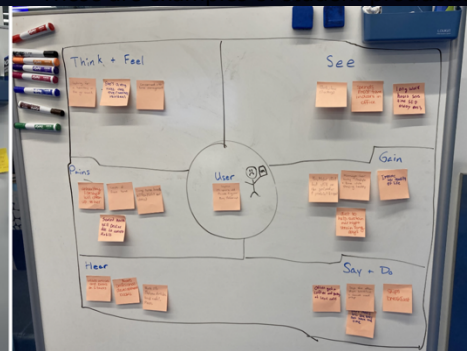
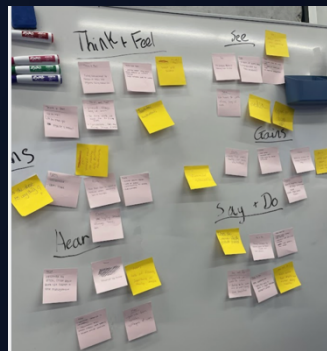
Qualitative Data:

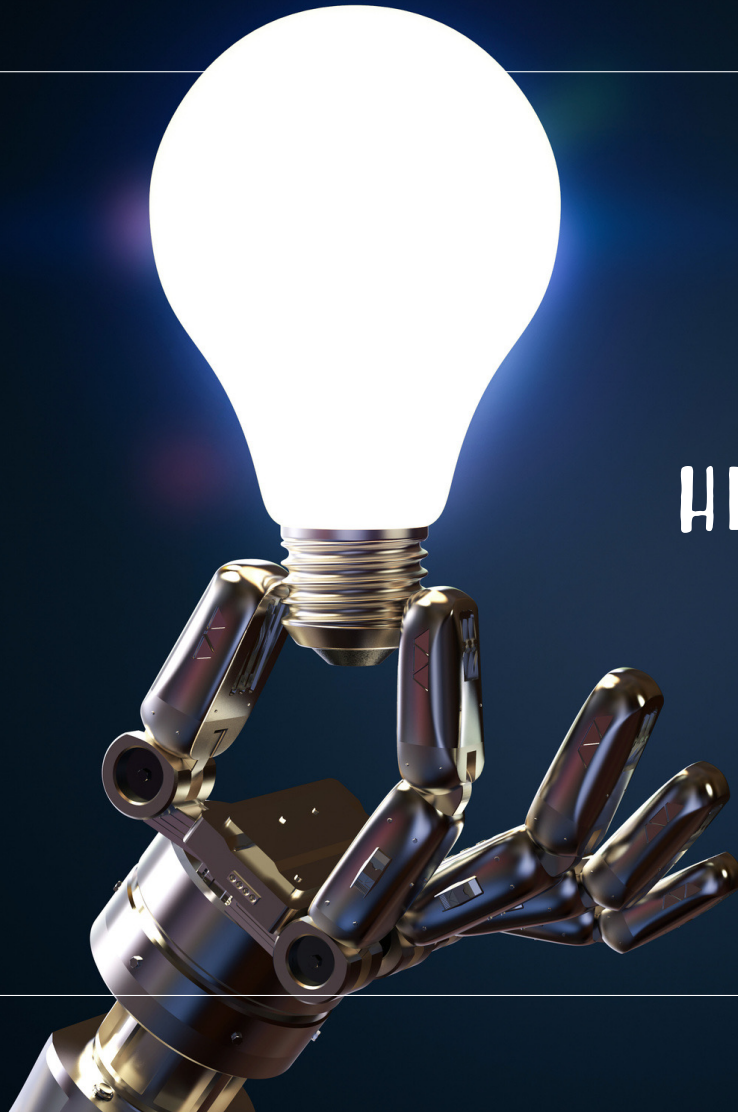
- **Interview Excerpts**
 - "It's challenging to balance work and parenting. I look for efficiency in everything I do."
 - "I often struggle to find time to prepare healthy snacks for my child and me."
 - "I wish there were more snack options that are quick to make and still nutritious."
 - "It's a challenge to find snacks that are both healthy and appealing to my child."
 - "I prefer snacks that don't require refrigeration due to my busy schedule."
 - "On weekends, I enjoy hiking and outdoor activities with my child."
 - "It's hard to keep my child interested in healthy snacks. They prefer something fun and tasty."
- **Self-Reported Behavior:**
 - Often feels overwhelmed but also proud of managing dual roles effectively.
 - Shares stories of attending parent-teacher conferences and then working late to meet project deadlines.
 - Has a small kitchen, limiting extensive snack preparation activities.
 - Often buys pre-packaged snacks due to time constraints.
 - Tries to read nutritional labels but is sometimes in too much of a hurry.
 - Looks for snacks that can be easily packed for their child's school lunch.
 - Meal preps on weekends, but often runs out of time for snack prep.
 - Balances work, parenting, and personal health, leading to a need for efficient snack solutions.
 - Enjoys a supportive workplace that occasionally allows telecommuting.
 - On average, spends 20 minutes in the snack aisle at the grocery store.

Quantitative Data:

- **Survey Results:**
 - 80% of single parents, like Taylor, report having less than 30 minutes to prepare snacks daily.
 - 70% are looking for snacks with less than 5 ingredients.
 - 60% prefer snacks that have a shelf life of at least two weeks.
 - 75% of single parents indicate a preference for organic snacks.
- **Purchase History:**
 - Frequently purchases snacks high in protein and fiber.
 - Limited purchases of snacks with artificial colors or flavors.
 - Routinely checks for snack options online to find the best deals and nutritional information.
- **Nutritional Preference:** Prefers snacks with less than 10g of sugar per serving and seeks at least 5g of protein in snack options.

These are examples of student products:





A DISCUSSION ON
ETHICS & GLOBAL
HEALTH USING CASE
STUDIES IN A
GRADUATE CLASS



You

I am teaching a class on global health in biomedical engineering. In the past modules of the class we talked about global determinants of health, barriers to global participation in biomedical engineering, examples of applications, major global health challenges worldwide, and healthcare systems. In the third Unit we are discussing ethical issues, equitable collaborations and challenges for global health projects. Can you please suggest pre-class materials and a lesson plan to discuss ethical issues associated with global health projects in biomedical engineering?





ChatGPT

Certainly! Teaching ethical issues associated with global health projects in biomedical engineering is an important topic. Here's a suggested pre-class reading and a lesson plan to help you structure your class:

Lesson Plan: Ethical Issues in Global Health Projects

Objective: To understand and critically evaluate ethical issues associated with global health projects in biomedical engineering, and to promote responsible and equitable collaborations.

Duration: 90 minutes

Introduction (15 minutes):

- Welcome and review the previous class materials briefly.
- Explain the importance of ethics in global health projects.
- Share the learning objectives for the class.



Discussion of Pre-class Readings and Case Studies (30 minutes):

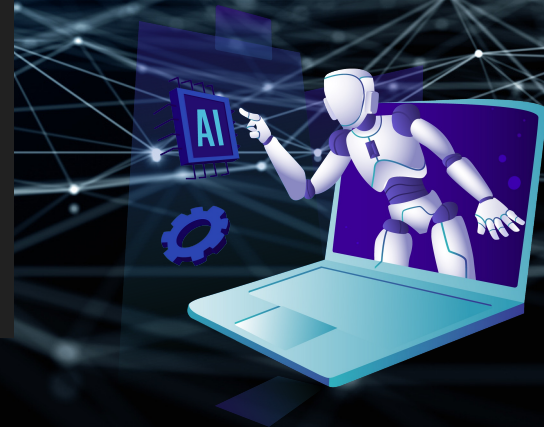
- Engage students in a discussion of the pre-class readings and case studies.
- Encourage them to share their thoughts and insights on the ethical issues raised in the readings and cases.
- Facilitate a conversation about the challenges of balancing the goals of global health projects with ethical principles and cultural sensitivity.

Key Ethical Issues in Global Health Projects (20 minutes):

- Present a list of key ethical issues related to global health projects in biomedical engineering, including informed consent, power dynamics, resource allocation, and cultural competence.
- Discuss each issue briefly and provide examples.
- Encourage students to ask questions and share their thoughts on these issues.

Breakout Group Activity (15 minutes):

- Divide the class into small groups.
- Provide each group with a hypothetical scenario involving an ethical dilemma in a global health project.
- Ask groups to discuss the scenario, identify the ethical issues, and propose solutions.





You

Can you please help me come up with the ethical scenarios?



ChatGPT

Certainly! Here are some ethical scenarios that you can use for the breakout group activity in your class:

1. Informed Consent Dilemma:

- Scenario: A team of biomedical engineers is conducting a clinical trial in a low-income community in a developing country. They face challenges in obtaining informed consent from participants due to language barriers and low literacy rates. What ethical issues does this situation raise, and how can they address them?

2. Resource Allocation Conflict:

- Scenario: A biomedical engineering team has limited resources for a global health project. They must decide whether to invest in a state-of-the-art medical device for a small population or provide basic healthcare services to a larger community. How should they make this ethical decision?





You

I decided to have students analyze real cases of global health ethical issues. Can you please give me 5 concrete examples?



ChatGPT

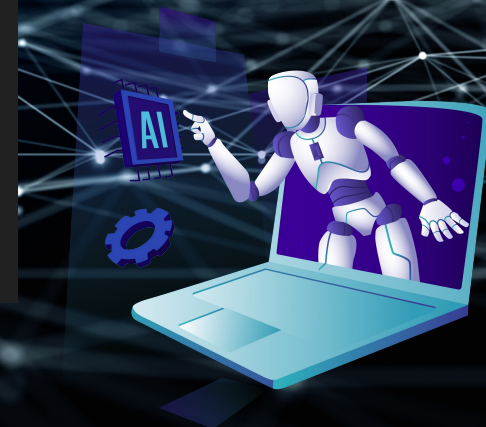
Certainly! Here are five real cases of global health ethical issues that your students can analyze:

1. Tuskegee Syphilis Study (1932-1972):

- The Tuskegee Syphilis Study is a notorious example of ethical misconduct in research. The study was conducted by the U.S. Public Health Service and involved withholding treatment for syphilis in African American men without their informed consent. The ethical issues include lack of informed consent, deception, and the withholding of treatment, leading to long-term harm to participants.

2. HeLa Cell Line (1951-Present):

- Henrietta Lacks' cells were taken without her knowledge or consent and became the foundation for the HeLa cell line, a critical tool in biomedical research. The ethical issues include lack of informed consent, exploitation, and concerns about privacy and commercialization. The case raises questions about the ownership and use of biological materials for research.





You

I need the cases to me specific to global health, please don't give me U.S. based examples



ChatGPT

Certainly, I apologize for the oversight. Here are five global health-specific cases of ethical issues:

1. Trials of Suramin for Sleeping Sickness (1920s-1930s):

- Researchers conducted trials of suramin, an arsenic-based drug, on individuals in the Belgian Congo without proper informed consent. The ethical issues included exploitation, lack of informed consent, and potential harm to participants. This case highlights the historical exploitation of vulnerable populations in the pursuit of medical advancements.

2. AZT Clinical Trials in Developing Countries (1990s):

- Clinical trials for the antiretroviral drug AZT (zidovudine) to prevent mother-to-child transmission of HIV were conducted in several developing countries. The ethical issues included concerns about the standard of care provided to control groups, access to treatment after the trials, and the power dynamics between researchers from high-income countries and participants in low-income countries.





You

Can you please provide me with 5 more global health-specific cases of ethical issues that took place after 2000 with the years noted?



ChatGPT

Certainly! Here are five additional global health-specific cases of ethical issues that occurred after 2000:

1. The Guatemala Syphilis Experiments (1946-1948, but revealed in 2010):

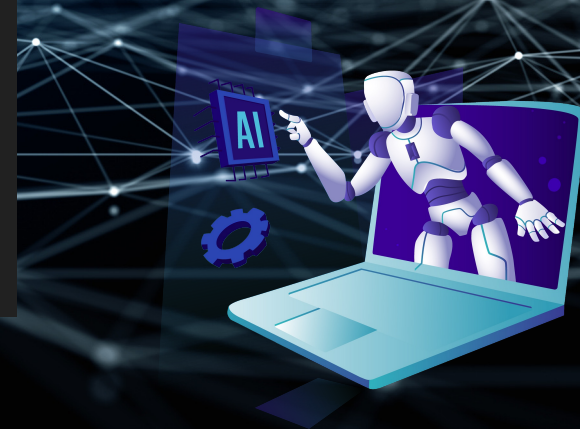
- In 2010, a study published in the journal "Public Health Reports" revealed the unethical syphilis experiments conducted in Guatemala by U.S. researchers from 1946 to 1948. The study involved intentionally infecting individuals with syphilis and other sexually transmitted infections without their consent to study the effectiveness of penicillin. This case raised significant ethical concerns about informed consent, exploitation, and historical injustices in medical research.

2. The WHO Response to the Ebola Outbreak in West Africa (2014-2016):

- During the Ebola outbreak in West Africa, the World Health Organization (WHO) faced criticism for its delayed and inadequate response to the crisis. Ethical issues included concerns about the prioritization of bureaucratic procedures over emergency response, the lack of coordination among international organizations, and the failure to provide timely assistance to affected countries. This c



highlighted the ethical responsibilities of global





You

can you please help me design the group activity discussion to discuss these global health ethics case studies?



ChatGPT

Certainly! Here's a structured group activity discussion plan to facilitate a thorough analysis of the global health ethics case studies:

Group Activity: Global Health Ethics Case Study Discussion

Objective: To critically analyze ethical issues in global health through case studies and engage in collaborative discussion to propose ethical solutions.

Duration: 30-45 minutes



1. Introduction (5 minutes):

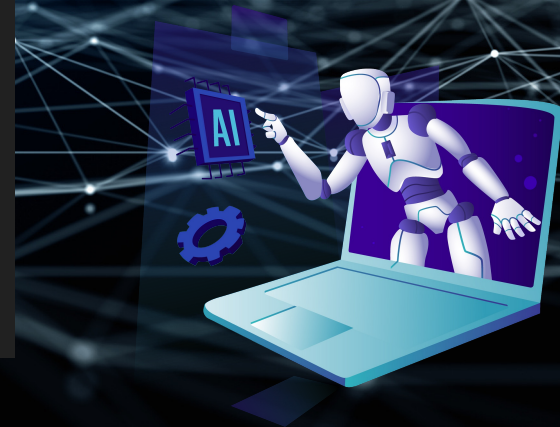
- Welcome the students and introduce the objective of the group activity.
- Briefly explain the importance of ethical considerations in global health projects.
- Divide the class into small groups (4-6 students per group) and assign each group one of the global health ethics case studies.

2. Case Study Analysis (15-20 minutes):

- Distribute the printed case studies to each group and provide instructions for analysis.
- Ask each group to read the case study carefully and identify the ethical issues presented.
- Encourage groups to discuss the following questions:
 - What are the key ethical dilemmas or concerns raised in the case study?
 - Who are the stakeholders involved, and what are their interests?
 - What are the potential consequences of different courses of action?
 - Are there any cultural, social, or political factors influencing the ethical considerations?

3. Group Discussion (10-15 minutes):

- Reconvene the class and facilitate a group discussion.
- Invite each group to present a summary of their case study analysis to the class.
- Encourage other groups to ask clarifying questions and provide feedback on the ethical issues identified.
- Facilitate a discussion on common themes and differences between the case studies, encouraging students to consider the complexities of ethical decision-making in diverse global health contexts.





ETHICAL CASE STUDIES



1. Get in your groups & assign roles
2. Find the case assigned to your team
3. Explore & study the case
4. Discuss the two questions in the document
5. Report out to group

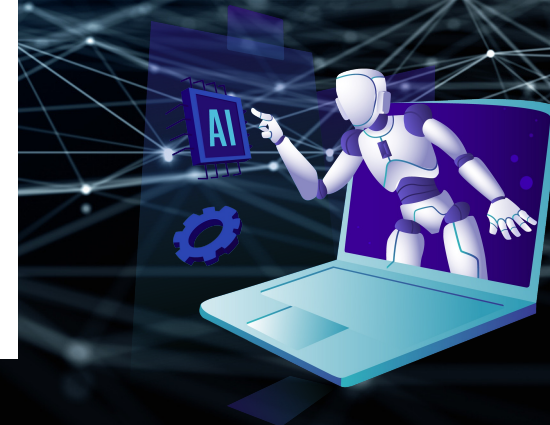


Global Ethics Case Studies

Below, you will find a series of real case studies, all uncovered after 2000. Several of them have massive ethical breaches and are not even close to being defensible. However, the point of this exercise is not necessarily to judge the researchers or bask in our moral superiority, but rather to identify how community engagement and equitable partnerships could have helped avoid most of these major ethical breaches.

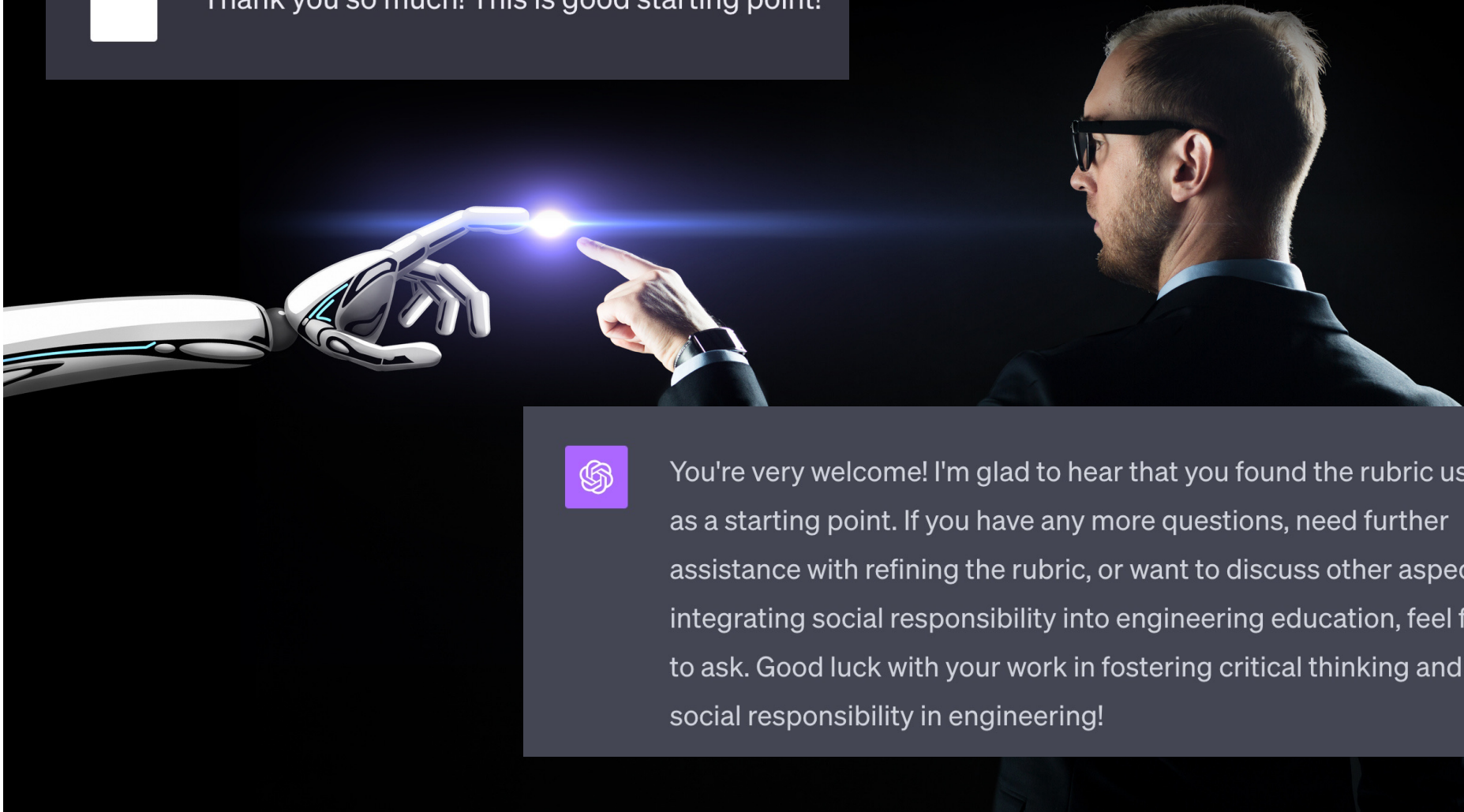
Overall Steps

1. Assign roles:
 - a. Facilitator
 - b. Notetaker
 - c. Reporter (i.e. the person who will represent the group at the end)
2. Find your assigned case, read the associated materials and do a little bit of extra research with your team
3. Discuss the following questions :
 - a. Keeping in mind international guidelines like the Declaration of Helsinki, the Brocher Declaration, and the Cartagena Protocol on Biosafety, what exactly went wrong in this case? What specific ethical issues were involved?
 - b. What are the potential impacts for the individuals involved in the study and for the community as a whole?
 - c. Considering this week's pre-class readings, what recommendations on community engagement and equitable partnerships would you have made had you been part of the research team?
4. Report out to the group. Keep this at 3-4 mins. Quickly summarize:
 - a. The case itself and what exactly makes it unethical/problematic
 - b. Your team's suggestions on specific community engagement or partnership practices that should have been implemented





Thank you so much! This is good starting point!



You're very welcome! I'm glad to hear that you found the rubric useful as a starting point. If you have any more questions, need further assistance with refining the rubric, or want to discuss other aspects of integrating social responsibility into engineering education, feel free to ask. Good luck with your work in fostering critical thinking and social responsibility in engineering!