

Difficult in taking perspectives other than their own, or to think about conflicting perspectives of different stakeholders.	Make each group work out the specific perspectives of a single "stakeholder". Assembling the different perspectives afterwards.
Students go astray with the discussion, discussing irrelevant issues.	Teachers can avoid students discussing irrelevant issues by enforcing a structured approach and giving timely advice.

Resources for teachers

Resources for teachers on what is an ethical matrix and how to build it:

- This MIT resource for AI and Ethics education for middle school students (10-14) provides guidance to explain and build an ethical matrix, based on the concept of algorithms as opinion (connected to the concept of algorithm bias). It includes slides, teacher guide and activity sheet (in English)
<https://docs.google.com/document/d/1e9wx9oBq7CR0s5O7YnYHVmX7H7pnITfoDxNdrSGkp60/edit#>
- A brief guide on how to manage dialogue concerning controversial issues in the classroom: *Difficult Dialogue in the Classroom Guidance and activities to give teachers the skills to manage difficult dialogue* – Training resource from Tony Blair Institute for Global Change:
<https://generation.global/assets/resources/difficult-dialogue-english.pdf>

More in-depth literature:

- Mepham, B., Kaiser, M., Thorstensen, E., Tomkins, S., & Millar, K. (2006). *Ethical matrix manual*. LEI, onderdeel van Wageningen UR.
- Jensen, K.K., Forsberg, EM., Gamborg, C. *et al.* Facilitating Ethical Reflection Among Scientists Using the Ethical Matrix. *Sci Eng Ethics* **17**, 425–445 (2011).
<https://doi.org/10.1007/s11948-010-9218-2>
- Ethical Matrix Manual: <https://core.ac.uk/download/pdf/29269684.pdf>

Activity 3.2.3. - Class Code of Ethics on AI

Estimated duration	40 minutes
Requirements	Modules 1 and 2. Large sheets of paper, coloured pens.
Hardware and Software tools used	Remote: Software - Video-conferencing software. Real time online collaboration text editor and presentation software.

	Hardware - Desktop/laptop computer
Type of assessment	Oral presentation, groups written outcome of the activity. Quality of arguments during class discussion.

The goal of the activity is to make students think about ethical issues in an AI area of their choice and co-create a Class Code of Ethics.

Procedure (steps)

Anticipatory Set

1. First, the teacher narrates a story that explores and exposes an ethical issue underlying a particular Artificial Intelligent System. For example, the teacher could create a fictional story in which a person is unfairly treated or mistakenly portrayed based on pervasive facial recognition software. Engage students in a small discussion about the story and its fairness/unfairness to make them start thinking about those concepts.

Direct Instruction

2. Teachers should provide students with a list of AI areas and research questions that will guide students' ethical inquiries. See *AI Ethics Research Areas* and *AI Ethics Research Reflection* in "Resources for Teachers" section.
3. The teacher should divide students into working groups.
4. Students should agree on the distribution of Artificial Intelligence areas between groups.

Guided Practice

5. Each group should think and discuss ethical issues and problems pertaining to their specific AI area. They should follow the research guidelines provided and consult the teacher when needed.
6. Each group should develop solution-oriented principles that address ethical shortcomings in their chosen area of AI.

Check for Understanding

7. The teacher can go around the groups to check the quality of work and guarantee the discussion remains relevant. Teachers can solve doubts and give insights when prompted.

Independent Practice

8. Groups get together and create a shared document with all the principles devised. Conflicting principles should be discussed with the class and contradictions solved in the final document.

Closing

9. The final document should be the Class Code of Ethics is presented to the whole class with a shared presentation, either in physical or virtual format.

Troubleshooting

Possible issue	Possible solution
Students having difficulty in reasoning about the issues and providing solution-based principles.	Providing the students the research guidelines printed or as a virtual document for reference.
Difficulty in solving or arriving at a compromise between conflicting principles in the class discussion phase.	Teacher guidance when necessary and mediation of class discussion.

Resources for teachers

- Description of the activity with steps and links for useful documents:
<https://curriculum.code.org/hoc/unplugged/5/>
- AI Ethics Research Areas from code.org:
<https://docs.google.com/document/d/16D3jRO2Q3KxM8FHvC8sdGLa19sxa5DGperetnX9gqcY/edit>
- AI Ethics Research Reflection from code.org:
<https://docs.google.com/document/d/19vF4UVAcJa6UsqkdKynWzSR80Mlnb2G3coBoWNxplYc/edit>
- AI Code of Ethics Slides from code.org:
https://docs.google.com/presentation/d/1SJEXpTCKwf5fbDy5GuDjDGAsuUrkl9QfxKF-1pMSndg/edit#slide=id.ga33378b3c1_0_47

Resources for students

- AI Ethics Research Areas from code.org:
<https://docs.google.com/document/d/16D3jRO2Q3KxM8FHvC8sdGLa19sxa5DGperetnX9ggcY/edit>
- AI Ethics Research Reflection from code.org:
<https://docs.google.com/document/d/19vF4UVAcJa6UsqkdKynWzSR80Mlnb2G3coBoWNxpIYc/edit>

EU strategy on Artificial Intelligence

- <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1623335154975&uri=CELEX%3A52021PC0206>
- <https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence>
- <https://datainnovation.org/2021/05/the-artificial-intelligence-act-a-quick-explainer/>

Activity 3.2.4 - Creating Ethical Matrices (Advanced level)

The teacher can introduce the idea of the ethical matrix (see MIT AI Ethics Education curriculum) and explain its constitution to students (still using the example of the best science lesson - or equivalent), recalling the concepts of stakeholders, values and goals. The teachers provide a list of AI applications and make students pick their preferred, forming groups around chosen issues. Students should list the interest groups (stakeholders) and fill the matrix based on group discussion. Devise a list of ethical principles relevant to each interest group. The teacher should be available for clarifying doubts regarding technical questions around AI. Furthermore, going through the groups to provide constructive advice and ensure the discussion is around the relevant theme. Students can then be asked to evaluate the impact of each specific principle with a scale from -2 (very negative) to +2 (very positive).

Assessment

DigComp 2.2. area	Definition	Assessment Indicators	Details
5.2 IDENTIFYING NEEDS AND TECHNOLOGICAL RESPONSES	<i>Able to identify some examples of AI systems: product recommenders (e.g. on online</i>	Can you describe one AI project for good?	The student explains project, effects and element of the system