

Possible issue	Possible solution
Dominant personalities in the group shifting the discussion to match their views.	Establishing turns to speak. Creation of a list of approaches instead of demanding for consensus inside the groups.
Irrelevant discussions to the scenario at-hand.	Constant verification by the teacher that the discussions are on track.
Lack of substance on their reasoning around the ethical problems presented.	Provide students with previous knowledge of ethical and moral theories to support their reasoning.

Resources for teachers

- Guide for the activity with examples and description of the facilitator role: https://schoolreforminitiative.org/doc/facilitation_scenarios.pdf
- European Parliament - The ethics of artificial intelligence: Issues and initiatives: [https://www.europarl.europa.eu/RegData/etudes/STUD/2020/634452/EPRS_STU\(2020\)634452_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2020/634452/EPRS_STU(2020)634452_EN.pdf)
- Automating Society Report 2020: <https://automatingsociety.algorithmwatch.org/>

More in-depth literature:

Eva Brandt, Thomas Binder, Elizabeth B.-N. Sanders. Tools and Techniques: Ways to engage telling, making, enacting. In Routledge International Handbook of Participatory Design. Routledge, New York, NY. 145–181.

Activity 3.2.2 - The role of stakeholders in AI

Estimated duration	40 minutes
Requirements	Modules 1 and 2.
Hardware and Software tools used	In-presence Large sheets of paper, and coloured pens/sticky notes. Remote Software - White canvas software with real time collaboration. Video-conferencing software. Hardware - Desktop/laptop computer with mouse, or tablet.
Type of assessment	Oral presentation of the work group. Students are assessed on the quality of ideas and diversity of issues presented.

Procedure (steps)

Anticipatory Set

1. The teacher reminds students of the idea of algorithm as an opinion or decision making process (Activity 3.1.2) providing examples of how stakeholders' interests/opinions are reflected in the outcome.

Direct Instruction

2. Then they should explain the concepts of stakeholders, values and goals with respect to algorithms.
3. Describe the activity objective, i.e. identifying key ethical claims, possible motivations for different stakeholders' goals and conflict/alignment between them.

Guided Practice

4. Students learn that algorithms are a set of instructions that modify an input to produce an output. Students are then asked to write a particular algorithm for a hypothetical robot teacher: i.e. the procedure for performing the "best" science lesson (SDG 4 - Quality Education).
5. Divided into groups, students identify the stakeholders who care about the science lesson (stakeholders) and are assigned different roles in each group (that of the student, teacher, parent, school headmaster, etc.). In the groups, students then explore the meaning of the 'best lesson' and see how their different opinions and interests are reflected in their algorithms.
6. Each group notes on a poster the questions and doubts that arise in their work and presents them to the class.

Check for Understanding

7. The teacher guides a collective comparison on the work done by the groups and recalls the objective of the activity emphasising how in the development of technology there are different interests at play and how it is difficult to make the 'best' choice without taking into account different perspectives.

Troubleshooting

Possible issue	Possible solution
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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.