EDUCATIONAL MATERIAL TO TEACH ABOUT AI IN HIGH SCHOOL

The following education material is separated into three sections: data, algorithms, and AI. It is possible to use each part by itself or specific assignments. The following is written as a guide to facilitate the workshops.
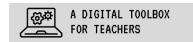

A.   DATA

This material is developed around what data is, how is it used, and discussions around bias and barriers in data collections.

Debate - How is data used?

This debate exercise is for students to reflect on some of their initial thoughts on sharing data online.

Make a line in the classroom where one end represents strongly agreeing and the other strongly disagrees. Ask the students the following questions and ask the students to place themselves on the line according to their beliefs. Talk to students during the exercise to explain their standpoint.

1. Is it okay for Instagram and tik tok to know your address, family members and who you are dating?
2. Is it okay for Instagram and tik tok to know your sexual orientation?

3. Is it okay for Instagram and tik tok to know what you think about equal pay for men and women? Or the right to change your legal gender as a kid?

4. What about the information you share with your doctor is that okay for your school and parents to know this?

5. Is it okay for our politicians to know this information?

6. Is it okay for google to know this information?

Assignment - What can data say about us?

This assignment is meant for the students to explore their own social media accounts like Instagram or TikTok to find out what ideas the apps have about them.

Data is according to Cambridge University Press:

*"Information, especially facts or numbers, collected to be examined and considered and used to help decision-making, or information in an electronic form that can be stored and used by a computer." (*Cambridge University Press & Assessment 2023*).*
But what data does social media have about you?

● Each student goes on their social media accounts like Instagram, TikTok, or youtube. Scroll through it for a while and note what kind of content is shown to them like dog videos, pranks, makeup tutorials etc.. Afterwards, they share it with another student and talk about what they think the media knows about them. Let them answer the following questions: If you could define yourself by

five words from your notes, what would it be? Does that feel like an accurate picture of you? What is missing and why could that be?

Assignment - How is data collected?

The following is an assignment to give the student an idea of who is represented in the data. This assignment can be expanded to a bigger project or it can be done just in the classroom, but the goal is to give students practical knowledge about data in a fun way.

Data is collected about us each time we open our phones and use any service. This knowledge is used in many different ways with AI technologies, but what picture does data create? How can it be helpful? and what is missing?

- Let the students go into smaller groups and create three yes/no questions about each of the subjects: hobbies, health, and friendship. Here is an example:
    - Do you like playing video games?
    - Do you eat meat?
    - Do you have a best friend?
- Make a survey using the form below with the three questions either in the classroom or with other students. It can be done with a simple setup like the following.

	Video games	Eat meat	Best friend
Student 1	Yes (y)	Y	N
Student 2	No (n)	N	Y
Student 3	Y	Y	N

- Look at the collected data and see how many people for example said yes to the two first questions and no to the last. What could you conclude from this? For example, a statement could be: people who do not eat meat are more likely to have a best friend.

Talk together about what conclusions you could make from your data. What could you say about youth in general? What was missing in your data set? Who was missing to be represented? If you were a company what could you use this information to?

B.   Algorithms

This part of the material is developed around three core questions: what are algorithms? How do they function? What is the impact of algorithms?

What are algorithms?

To begin talking about algorithms, this brainstorm is for students' to share their concerns, ideas, and knowledge about the subject, and for the teacher to add their inputs as well.

Common visual brainstorm: where have you heard the word algorithm before? What do you associate with the term? Who uses the word?

Assignment - make a step-by-step guide

In this part, the students will write down how to make a "leverpostej" sandwich to try to make an algorithm themselves. Leverpostej" sandwich is the equivalent of a peanut butter sandwich in Denmark, just savory with meat.

Algorithms are merely specific descriptions of step-by-step actions that need to happen to achieve a particular outcome. They are produced to solve a problem or perform a computation. Algorithms are used throughout many areas of IT (Gillis, Alexander S. 2023).

- Write down a recipe step by step of how to make the best "leverpostej" sandwich. First, write down the ingredients you need and then follow a step-by-step guide on how to make it.

When the students have finished their guide they will share it in smaller groups. Look at the directions together - how exact are they? Maybe a human could do it, but could a computer/robot do it? For example, a computer/robot might wonder some of these questions: how much bread? What should be used to spread out the meat? Where do I find the ingredients?

Finish with a plenum discussion of what is the <u>best</u> "leverpostej" sandwich. What does best mean? How did their ideas of the best shape the step-by-step guide differently?

Collect during the talk the different values they present like health, fast, tasty, cheap

etc.

Assignment - Make a matrix

Talk with the students about the actor/stakeholders when making a sandwich like

parents, kids, meat companies, supermarkets, etc. Present the students with the matrix

and ask them to fill out the values and who could be stakeholders. The actors in one

column and the values from the exercise earlier in another column. The idea is now they

can fill out the matrix (see the example in the following).

MATRIX	Healthy	Tasty	Fast	Cheap
Kids		x	x	
Parents	x			x
Supermarkets			x	x

How does an algorithm work?

In this part, students will get a better understanding of how algorithms are used in

digital technologies after making their own.

Show the students the small introduction video to algorithms (machine learning):

[Supervised vs. Unsupervised Machine Learning: What's the Difference?](#)

Let the students try a game developed by google to show them how an algorithm

learns more and more and therefore becomes better as its job:

https://quickdraw.withgoogle.com/

What is the impact of algorithms?

If you create videos on youtube you can earn money by getting a lot of views and by having a lot of subscribers. One way to get more people to watch your video is by being shown in their video feed as relevant. The algorithms of Google and youtube are designed to give the user the most "relevant" content. How do you become relevant to the algorithm? It is not exactly known how youtube has created its algorithm.

Assignment - make a video

Make a two-minute video on your phone of a "How to make the best leverpostej sandwich". Do it as a one-take with limited camera movement. The students should choose from what perspective they wish to create the video: is it the parent, the meat company, the kids etc.? And what values do they wish to focus on like health, taste/fun, cost etc.?

Consider these three areas before starting filming: what style do you wanna do it in, what language do you wanna use and what should your message be?

(if you wish to expand on this assignment you can incorporate talking about how to communicate to their target group like is it through pathos, logos, and ethos?)

End talk

Watch together the students' videos, and ask the students to write down who they think the video had as a targeting group and what values. Discuss how this influences our digital landscape? Who creates content on youtube? What other ways can you be shown as relevant (sponsors, commercials, etc.)? What are the main values of the company youtube?

C.   Artificial intelligence

This section of the educational material consists of themes around AI which combine the use of data and algorithms and encourage students and teachers to explore chatGPT together.

Case - Who uses AI today?

Today it is not only youtube using algorithms and data but AI is used in many different settings. As for now it gets incorporated into more and more everyday services and with the following case study, the students get to talk about the pros and cons of using AI in the health system.

CASE

- There are many advantages to using algorithms in the healthcare systems, for example, doctors have better knowledge on which to base their decisions. There are also some cons, for example, algorithms are made to predict the best treatment, and they are trained to reproduce the decisions contained in the data

it is trained on. Therefore if doctors tend to generally underdiagnosed men with

depression, while women have not, artificial intelligence will do the same when it

diagnoses depression. This means that prejudices and stereotypes that already

exist in society will be reflected in the algorithms and they will begin to be used

as decision-making tools (Ingemann, Christian, and Holstein, Nana 2023).

Discuss the case with the students. What are some ethical, social and legal aspects?

What do you think about the use of AI, data and algorithms?

Assignment - How does ChatGPT work?

Explore together with the students ChatGPT (https://openai.com/blog/chatgpt) by

asking them to explore the internet's knowledge about the students' everyday lives.

It could for example be:

- Who is (the student's name)?

- What kind of school is (school name)?

- What are the pros and cons of AI?

- Write me a joke for a kid, grandparent, etc.

- Who created ChatGPT and with what purpose?

Let them come up with more questions around the same themes.

What are the impacts of AI?

Let the students talk two and two facing each other. After each question, ask them to find a new partner to talk to about the next question. Follow up with making a pro and cons about ChatGPT/AI with the students.

- What does chatGPT know about you and your life?

- Where do you think it has its knowledge from?

- From whom could it be missing knowledge and inputs? Who is not present on the internet?

- What can ChatGPT be used for?

- On a scale from 1-10, how *accurate* do you think ChatGPT is and why?

- On a scale from 1-10, how useful do you think ChatGPT is and why?

End talk

End the workshop with a line in the classroom where one end agrees and the other disagrees, and ask the students to move according to the statement:

Do you think AI is good for our future?