ARTIN FUTURE PROJECT

COURSE DETAILS

Developed by: BEST

BEST Institut für berufsbezogene Weiterbildung und
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A. Introduction

About this Toolkit

Artificial intelligence (AI) is not just any buzzword, but an essential part of our lives. When we look up something online, artificial intelligence provides us with relevant search results. Based on our preferences and previous activity, AI often recommends us what movies to watch or what to buy next. It even helps us communicate with each other by translating sentences and texts from one language to another. Even though AI makes our lives easier, many fear it will take our jobs, discriminate against us, or threaten our right to privacy. Some situations in the past have shown that there is a possibility to become a threat and awareness regarding ethics in AI should be raised. With this toolkit, we will explore 'the rights and wrongs' of AI, and learn more about main ethical issues in the use of AI.

Overview

In this document we provide an overview of the 'ArtIn Future – Ethics in Artificial Intelligence'– training material to "clean up" with AI myths, show AI differences and ethical principles and empower critical thinking like in a toolkit format. It contains main information about the project's target groups, goals, and objectives, and didactic information about learning methods, resources, and activities.

This document should support learning facilitators in implementing the learning material that supplement this document. It is designed in a manner to offer swift adaptations to individual learner groups, different knowledge/ competence levels even. It is part of three major project outputs and can be used independently or with the other two: ArtIn Future Digital skills – an experiential training course to develop digital skills for educators working particularly with young (adult) learners exploring "weak" AI (like algorithms that already today read patterns from data sets that humans could never recognise) and/ or the ArtIn Future - AI in the Business world, a OER HUB presenting AI show cases from companies, products designed applying AI, success stories of (female) entrepreneurs in this field to help better understand how companies use AI and which competences are needed to perform these tasks.

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Facebook page: facebook.com/artin-future
Learn more about the project also here:

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B. Toolkit information

Project (direct) target group: Teaching and training staff
Final beneficiaries: students of all ages, schools, entrepreneurs using AI in their work

Teaching goals:
- We want to debunk any myths about AI, so that the educators and learners know what AI actually is. We introduce the ethical problematic in the AI field, and finally equip them with a new skillset and knowledge to empower them in ethical assessment of artificial intelligence.

Teaching objectives:
- Following the completion of learning activities, the participants are able to demonstrate an understanding of ethics and AI, and analyse AI related issues from an ethical perspective.

Learning objectives:
- The learners gain insight into fundamentals of artificial intelligence – necessary terminology, types of artificial intelligence etc. They are aware how AI is all around us and how it influences our lives in positive and negative way – we point out the relevance of ethics in this domain. Finally, they are able to critically assess ethical implications of AI use in everyday life. More precisely, we support them in gauging online experiences which are based on AI (such as web searching, social media, stores and services) and offline experiences.

Knowledge	Skills	Responsibility and Autonomy
Comprehensive, specialised, factual, and theoretical knowledge of ethics and artificial intelligence and an awareness of the boundaries of that knowledge	A comprehensive r ange of cognitive skills required to develop solutions for ethical use of the artificial intelligence	Exercise management and supervision in contexts of study and work activities where there is unpredictable change; review and develop performance of self and others

Required skillset for learning facilitators: a certain set of hard and soft skills is required to transfer the knowledge on this topic to project beneficiaries from various age groups. Besides having tech-savviness and essential knowledge about artificial intelligence, learning facilitators should have good communication and organisational skills that will enable them to find optimal ways to explore the ethics of AI with the learners. To promote critical thinking among the learners, learning facilitators are also expected to have good critical thinking skills as well.

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Suggested teaching methodology:
-        Blended teaching; Flipped Classroom

Blended teaching in a nutshell

Blended teaching is a form of teaching and learning that turns a class into a combination of face-to-face and online sessions.
In face-to-face parts of the class, learning facilitators actively interact with the learners and encourage them to participate in discussions, practice hands-on tasks. In online phases, they use different multimedia materials to support learners in the learning process, making these phases as interactive as face-to-face sessions.

Flipped Classroom in a nutshell

Flipped classroom is a type of blended learning which is even more learner-centred with more focus on the learners themselves. They are the ones that actively construct the body of knowledge on a certain topic and evaluate their progress in class. In flipped classroom, teaching staff only facilitates construction of knowledge and works together with the learners on questions and issues that can come along the way. Here, the learners are empowered and have a sense of ownership of the knowledge they acquire, as they read/ receive the material at home first like in didactic videos, online research or similar and come to the class prepared to discuss what they learnt before the class, to explore specific cases/ practices based on the more theoretic knowledge they have acquired before or to work in labs with their peers to solve specific challenges based on the current topic they had to think over.
Flipped classroom ensures that all participants learn in a safe, trustworthy, and free environment and show them why something they learn matters. When they are aware of the importance of one topic, they become more interested and involved in the learning process.

-   Teaching methods:
    Discussing ethics requires reflecting, debating, and analysing important issues and raising relevant questions. To improve these cognitive skills, we suggest the learning facilitator can organise the following teaching activities:

    - Open conversation in class – the trainer starts a conversation and observes how the learners interact among themselves based on that impulse.
    - Debate – gives learners an opportunity to present positive and negative sides of an issue
    - Advance organiser – good for visualising topic and main issues
      You can find more information about it here:
      http://www.projectlearnet.org/tutorials/advance_organizers.html

- Fishbowl – a good technique for the learners to listen and learn from what their peers have to say
  To read more about this method, click on the link below:
  https://www.facinghistory.org/resource-library/teaching-strategies/fishbowl
- Placemat – another exercise for learners to visualise and express their thought and opinions in writing

  A video and a .pdf document on the website below will give you more information about this method:
  https://jct.ie/jcis/strategies_result.php?strategy_id=18
- Jigsaw technique – enables the entire class of learners to come to a problem's solution; each team works on one part of the solution. When they present it together, they reach the final conclusion.
  More information about jigsaw technique on the link below:
  https://www.teachhub.com/teaching-strategies/2016/10/the-jigsaw-method-teaching-strategy/

The teaching methods mentioned above are fit for teaching both youth and adults.

Timeframe:
- The units will last for about 3 hours each (each unit consists of 3 classes; each class estimated to last for about 45-50 minutes; in addition time for homework and learning shall be added); there are 3 units foreseen

Educational resources:
- PC / tablet / laptop / smartphone, beamer, whiteboard / online whiteboard, markers, ArtIn Future PowerPoint presentations

Learning materials:
- ArtIn Future PowerPoint presentations, relevant audio-visual content (video links are to be found at the end of each lesson)
- N.B. Videos linked below briefly describe the main questions of one topic or briefly show relevant examples. Educators are invited to use the videos either as a reminder or at the beginning of a lesson e.g. to introduce the topic and/ or to refresh the learners' memory which should be based also on the learners' age group and group dynamics.
- ArtIn Future presentations are to be used both by the learners and learning facilitators. The learners will receive versions without tasks that will be done in the class. The learning facilitators should be able to see the hidden slides and use the whole presentations in the class.
- Handout for educators (*What is AI?*)
- Handouts for learners – questions to close each lesson and exercise handout unit 1.2.
NB: all developed learning material can be understood as a starter sample which can be further explored or adapted swiftly to also address other age groups of learners.

Assessment:
- Educators assess the learners based on their participation and individual work.
  For their final assessment, the learners choose an ethical dilemma related to one of the topics covered in the course. They submit their reasoning of the problem to the instructor. (Duration: 1 hour)

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C. Information about each unit

On the next pages, we present detailed information of each learning unit. That way, learning facilitators know how they can cover a lesson's topic and organise a class. We discuss the unit's teaching and learning objectives, activities, learning materials, and (suggested minimum) duration. At the end of each unit, there is a 'Further Reading' section where learning facilitators can get more information on the topic.

1. What is AI? (Weak AI, strong AI, artificial superintelligence - ASI)

1.1 Introduction to artificial intelligence
Course participants learn the basics of artificial intelligence – how is it defined, what types of AI exist, and the terminology around the AI concept

Teaching objectives:
- Discuss with learners the fundamentals of artificial intelligence
- Explore differences between weak AI, strong AI, and artificial superintelligence

Learning objectives:
- Have a sound theoretical basis of AI
- Ability to recognise various forms of AI

Teaching methodology:
- Blended learning
- Flipped classroom

Teaching activities:
- Discussion/ Open conversation and collaboration

Learning materials:
- ArtIn Future PowerPoint presentation, relevant audio-visual content
- Handout for the educators

Timeframe:
- 45 minutes

Further reading:
Stanford Encyclopedia of Philosophy's detailed explanation of artificial intelligence:
https://plato.stanford.edu/entries/artificial-intelligence/
The Brookings Institution about AI: https://www.brookings.edu/research/what-is-artificial-intelligence/
An article about main differences between weak, strong, and artificial superintelligence:
https://medium.com/mapping-out-2050/distinguishing-between-narrow-ai-general-ai-and-super-ai-a4bc44172e22
Technopedia's definitions of weak and strong AI:
https://www.techopedia.com/definition/32874/narrow-artificial-intelligence-narrow-ai
https://www.techopedia.com/definition/31622/strong-artificial-intelligence-strong-ai
Common examples of AI we use in everyday life: https://medium.com/@the_manifest/16-examples-of-artificial-intelligence-ai-in-your-everyday-life-655b2e6a49de
The Wired magazine's archive of stories related to artificial intelligence:
https://www.wired.co.uk/search?q=AI&sort=score+desc
A YouTube video about AI: https://www.youtube.com/watch?v=nASDYRkbQIY
A Ted talk about getting empowered, not overpowered by the AI:
https://www.ted.com/talks/max_tegmark_how_to_get_empowered_not_overpowered_by_ai/transcript#t-220909

1.2 AI in more detail

In this unit part, the participants will take their time to research and write down the definitions of some of the most important terms around AI.

Teaching objectives:
- Expand the knowledge about artificial intelligence

Learning objectives:
- Creating a sound theoretical knowledge of AI

Teaching methodology:
- Blended learning
- Flipped classroom

Teaching activities:
- Research, Advance organiser, discussion

Learning materials:
- ArtIn Future PowerPoint presentation, ArtIn Future handout

Timeframe:
- 1.5 hours

Further reading:
AI glossary by Council of Europe: https://www.coe.int/en/web/artificial-intelligence/glossary
What is machine learning by IBM: https://www.ibm.com/cloud/learn/machine-learning
MIT article about neural networks and deep learning: https://news.mit.edu/2017/explained-neural-networks-deep-learning-0414
Supervised and unsupervised machine learning: https://www.bmc.com/blogs/supervised-vs-unsupervised-machine-learning/
Reinforcement learning: https://towardsdatascience.com/the-ultimate-beginners-guide-to-reinforcement-learning-588c071af1ec

1.3 Ethical principles and its relevance to ICT and AI

Participants discuss the progress and the presence of AI in everyday life and the ethical implications of such use.

Teaching objectives:
- Introduce the ethics problematic in the AI field

Learning objectives:
- Understand the need for ethical AI
- Incorporate ethical framework in discussions about AI
- Analyse application of artificial intelligence from an ethical perspective

Teaching methodology:
- Blended learning
  Flipped classroom

Teaching methods:
- Discussion and collaboration, Jigsaw technique

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Learning materials:
- ArtIn Future PowerPoint presentation, relevant audio-visual content

Timeframe:
- 45 minutes

Further reading:
The Wired magazine's brief overview of the problematic of AI ethics:
https://www.wired.co.uk/article/ai-ethics-law
EU approach to artificial intelligence: https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence
Ethical guidelines for trustworthy AI proposed by the EU: https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai
OECD main ethical AI principles: https://www.oecd.ai/ai-principles
The Alan Turing's Institute guideline for responsible and ethical AI:
https://www.turing.ac.uk/sites/default/files/2019-06/understanding_artificial_intelligence_ethics_and_safety.pdf
A YouTube video about ethics: https://www.youtube.com/watch?v=u399XmkjeXo
A TEDx Talk about AI and ethics: https://www.youtube.com/watch?v=HSsQApXQGsI
Accenture's video about ethics and AI: https://www.youtube.com/watch?v=x9gan8vOBJ8

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2. What does AI do?

2.1 The potential of AI
Here, participants learn about the positive impact of AI and what benefits it can offer.

Teaching objectives:
- Presenting the potential of AI from an economic, technical, and social perspective

Learning objectives:
- Recognise benefits of AI in everyday life

Teaching methodology:
- Blended learning
- Flipped classroom

Teaching activities:
- Discussion, collaboration

Learning materials:
- ArtIn Future PowerPoint presentation, relevant audio-visual content

Timeframe:
- 45 minutes

Further reading:
EU article about the benefits of AI: https://digital-strategy.ec.europa.eu/en/library/artificial-intelligence-real-benefits
A brief overview of potential benefits of AI for economy and society:
https://hackr.io/blog/benefits-of-artificial-intelligence
A YouTube video about 10 benefits of AI: https://www.youtube.com/watch?v=masnR4-vt3M

2.2 The risks of AI
In this unit part, negative impact and risks of using AI are discussed.

Teaching objectives:
- Presenting risks of AI

Learning objectives:
- Recognise disadvantages of AI in everyday life

Teaching methodology:
- Blended learning
- Flipped classroom

Teaching activities:
- Learning facilitation, collaboration

Learning materials:
- ArtIn Future PowerPoint presentation, relevant audio-visual content

Timeframe:
- 45 minutes

Further reading:
World Economic Forum's overview of potential risks of AI:
https://www.weforum.org/agenda/2016/10/top-10-ethical-issues-in-artificial-intelligence/
Future of Life's article about risks of common myths about AI:
https://futureoflife.org/background/benefits-risks-of-artificial-intelligence/
AI Incident database that collects all the mishaps that involved AI:
https://incidentdatabase.ai/summaries/incidents
A YouTube video about 10 risks of AI: https://www.youtube.com/watch?v=1oeoosMrJz4 +

2.3 A case study of the potential and risks of AI

In this practice-based unit part, the learners will be given the opportunity to choose an AI technology, and analyse it. They are expected to cover both potential and risks of the AI they chose and use the framework developed in the units 2.1 and 2.2. More precisely, they should present economic, technical, and social potential and risks of the AI.

Teaching objectives:
- Applying theoretical knowledge in practice

Learning objectives:
- Recognise the advantages and disadvantages of various AI technologies

Teaching methodology:
- Blended learning
- Flipped classroom

Teaching activities:
- Learning facilitation, group work, debate, reflection

Learning activity:
- Case study

Timeframe:
- 1.5 hours

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3.   What impact does AI have?

3.1 The effects of AI on future work and life and its ethical implications

After discussing the positive and negative aspects of the artificial intelligence in the previous units, the learners can focus in the following lessons on ethical implications of AI in work and life.

Teaching objectives:
-   Outline trends and forecasts in AI field
-   Present opportunities and drawbacks of AI in life

Learning objectives:
-   Develop critical thinking skills in learners based on AI solutions
-   Acquire knowledge about artificial intelligence in their (future) professional life

Teaching methodology:
-   Blended learning
-   Flipped classroom

Teaching activities:
-   Discussion, debate, reflection

Learning materials:
-   ArtIn Future PowerPoint presentation, relevant audio-visual content

Timeframe:
-   45 minutes

Further reading:
An article about the impact of artificial intelligence on everyday life:
https://towardsdatascience.com/how-artificial-intelligence-is-impacting-our-everyday-lives-eae3b63379e1
A list of examples of how we use AI in everyday life:
https://www.forbes.com/sites/bernardmarr/2019/12/16/the-10-best-examples-of-how-ai-is-already-used-in-our-everyday-life/
An article about AI's role in the workplace: https://fowmedia.com/future-work-ai-entered-workplace/
An article from Forbes about AI and its effects on employees' experience:
https://www.forbes.com/sites/bernardmarr/2019/05/29/artificial-intelligence-in-the-workplace-how-ai-is-transforming-your-employee-experience/
A YouTube video about the way we use AI in everyday life:
https://www.youtube.com/watch?v=MpR6JZdQ4B0
A YouTube video about the impact of AI on our lives: https://www.youtube.com/watch?v=-aNW08ahM68

3.2 The effects of AI on future work

After learning about the impact of AI on everyday life, the learners should think about the future and think about the effect AI will have when they start working. In another practice-based activity, the learner will discuss how AI will affect the workforce in the future.

Teaching objectives:
-   Applying theoretical knowledge on ethics in AI in practice

Learning objectives:
- Ability to predict the impact of AI on work and working life

Teaching methodology:
- Blended learning
- Flipped classroom

Teaching activity:
- Fishbowl discussion, reflection

Learning material:
- ArtIn Future PowerPoint presentation

Timeframe:
- 1.5 hours

3.3 Ethical skills and attitudes to prepare humans for life and work with AI technologies
In this unit part, the group develops their own ethical guideline for artificial intelligence.

Teaching objectives:
- Summarise relevant ethical principles for AI that can benefit society

Learning objectives:
- Understand relevant principles related to ethics and AI
- Develop own ethical attitudes towards AI

Teaching methodology:
- Blended learning
- Flipped classroom

Teaching activities:
- Learning facilitation, Placemat, reflection

Learning materials:
- ArtIn Future PowerPoint presentation

Timeframe:
- 45 minutes

Further reading:
An article from Harvard Data Science Review about the ethical framework for AI:
https://hdsr.mitpress.mit.edu/pub/l0jsh9d1/release/7
Asilomar ethical framework for AI: https://futureoflife.org/ai-principles/
IEEE's standards for ethical artificial intelligence: https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/ead1e_general_principles.pdf?utm_medium=undefined&utm_source=undefined&utm_campaign=undefined&utm_content=undefined&utm_term=undefined
EU statement on artificial intelligence and an ethical framework proposal:
https://op.europa.eu/en/publication-detail/-/publication/dfebe62e-4ce9-11e8-be1d-01aa75ed71a1/language-en/format-PDF/source-78120382
EU guidelines for ethical artificial intelligence: https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai

4. Assessment

Educators should assess the learners based on their participation and individual work as ongoing activity. Questions raised in the ArtIn Future presentations may help to see learning progress related to the understanding of AI and ethical principles they should be able to consider when it comes to AI implication. There is also a handout sample provided covering all three units which can be used – asked at the end of each lesson or handed out to learners bit by bit.

For their final assessment, the learners are expected to give their opinion on an ethical dilemma. An ethical dilemma is a situation with many difficult 'solutions' – the options the person have are often difficult and do not solve the problem at all. Think about the famous trolley problem: On two railway tracks there are people tied up. On the first track, there is one person tied up. On the second – five people are laying on the track. None of them can move, and the person needs to choose who should be sacrificed with the train in arrival sight. Should the trolley kill five people to save one person, or vice versa?

In our case, the learners are expected to solve a similar ethical dilemma connected to AI. As the example mentioned above shows, the trolley could be replaced with a self-driving car. Provide the learners with a scenario in which a self-driving car suddenly fails to break and the learner has to choose whom will the car hit. For example, they could choose between an aged pedestrian crossing on a red signal and a child crossing the zebra legally, on the green signal. The learner should explain their choice. Would their suggestions differ if it was a young woman with a baby and a group of undefined people? Another example which might not appear so dramatic is also to see ethics when it comes to e.g. chat bots mimicking your late beloved ones in the communication with you (online/ in text messages on smart phones,…), or a dating website communication handled by chat bots without letting users know there is no human behind it.

MIT Moral Machine website offers several examples that the educators can offer to the learners to assess. Here, the educators can also design their own AI dilemmas. More information can be found at: https://www.moralmachine.net/

UNESCO also offers examples of relevant ethical dilemmas, which should help educators in the implementation of the assessment. More information can be found here: https://en.unesco.org/artificial-intelligence/ethics/cases

This final assessment could be implemented as a group work or individually. It would be important to judge the result based on the ability of implementing and applying what has been learnt related to ethics and AI in the three units. An assessment rubric is suggested to help in the assessment task.

Duration of the assessment: 1 hour

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4.1 Assessment rubric for the learning facilitators

Below you will find a rubric that will help you conduct assessment of the task. The rubric can be modified and used to assess not just this assignment, but the overall performance of the learner.

Pass	Satisfactory	Good	Very good	Excellent
The learner demonstrates basic of AI and ethics. The learner answers the dilemma without detailed explanation.	The learner's understanding of the dilemma is higher. S/He understand s the risks AI might carry, and recognise s the need for ethical AI, but to a limited extent .	The learner is able to recognise that both solutions for the dilemma are conflicting and answer s the question more clearly, recognising the dangers of choosing one option.	The learner can not only demonstrate that the options are conflicting, but can also recognise that ethics is often conflicting and the need for clearer principles is needed.	The learner presents in her/his answer the conflicting nature of ethical principles and AI, indicates that these should be created to benefit all humans, and not certain groups, and suggests new rules or present new ways of rethinking the rules.

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