

# Towards an ELSA curriculum for Data Scientists

Setting the program and learning  
objectives

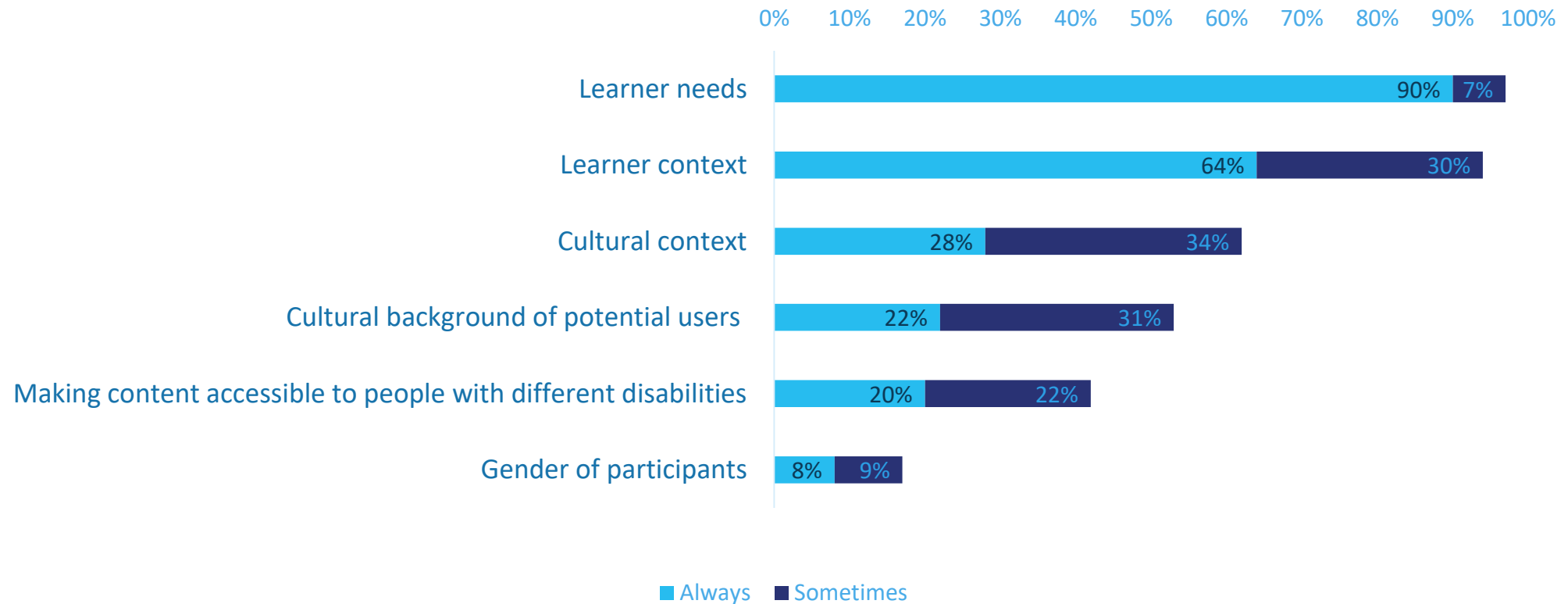
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FAIR DS-Workshop: Towards creating an ELSA Curriculum for Data Scientists  
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#FAIRDataSpaces

# Instructional design considerations

How often do you consider each of the following when you begin a new instructional design project?



ATD, IACET, and Rothwell & Associates. 2015. "SKILLS, CHALLENGES, AND TRENDS IN INSTRUCTIONAL DESIGN." Whitepaper. [https://www.iacet.org/default/assets/File/pdfs/2015%20ATD\\_Research\\_Skills\\_Challenges\\_and\\_Trends\\_in\\_Instructional\\_Design.pdf](https://www.iacet.org/default/assets/File/pdfs/2015%20ATD_Research_Skills_Challenges_and_Trends_in_Instructional_Design.pdf)

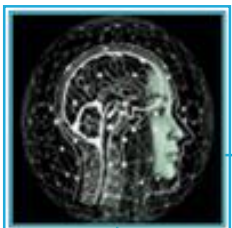
# The profile of the Data Scientist

- Mostly with tertiary education degrees
  - Probably it will change in the future due to high demand and automation
- Not all of Data Scientists have CS and relevant studies background
  - Probably will increase in the future due to high demand and since no specific credentials are required to enter the profession
- Few institutions offer ELSA courses for Data Scientists, and even fewer employers demand ELSA education/experience
  - Everybody agrees that it is very important

# Defining the Content

- What should a data scientist know after the end of the program?
- Examining the Teaching Scope of existing courses in Computer Science and related domains:
  - surveys of ethics curricula
  - pilot programs
  - graduate and undergraduate
  - standalone or integrated in courses

# Teaching Scope of existing courses



## Computer Science

- Privacy
- Security
- Algorithms and inequality/justice/fairness, bias
- Transparency, accountability and responsibility
- Data validity



## Professional and Business skills

- Code of Ethics from a professional body
- Codes of Conduct
- Professional Decision Processes Training
- Professional and leadership skills for computer science students, specifically in senior project classes



## Ethical and Legal topics

- Philosophical frameworks and moral theories
- Legal frameworks
- Human rights, risk and liabilities
- Privacy and civil liberties
- Work and labour
- Social responsibility
- Social context and stakeholders
- Ethics washing and environmental impact

# Determining Assessment Evidence

- How will we know if students have achieved the desired results?

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# Assessment methods

- Practical exercises adapted to include ELSA issues in assignments or lectures of common Data Science subjects
- Course related group projects
- Paper assignments

# Teaching Methods

- Lectures by faculty staff and guest speakers (either from the academia or the industry),
- Case or problem based studies
- Reflection
- Discussion
- Role-playing
- Hands-on activities:
  - code manipulation, simulation, practical exercises



# Towards a certification of Data Science professionals?

- Certification required for specific “sensitive” applications (e.g. health)
- Make Data Scientist a formal profession (like doctors, civil engineers, lawyers, etc.)

# Characteristics of a formal profession

## Specialised education and training

- Members are expected to have undertaken extensive specialised education and training, typically in accredited degree programmes

## Commitment to public service

- Professions involve a public declaration to provide a service to society or for the public good making use of specialised, often privileged expertise which takes precedence over individual gain

## Higher standard of care

- Professionals commit to upholding higher ethical standards than would normally be expected in business relationships in service to both the client and the public

## Enforcement and self-governance

- Often, these standards are recorded in an ethical code and enforced through a disciplinary system, administered by professional associations.

## Licensing

- Entry to the profession is restricted by (government sanctioned) licensure to highly skilled individuals as a means to protect the public

# Towards a curriculum-Open questions:

- What should students know, understand, and be able to do?
- How will we know if students have achieved the desired results?
- What teaching methods should be used?
- How we tackle challenges like
  - Variety in education level
  - Variety in background education
  - Cultural diversity
- Do we need to move towards the certification of Data scientist as a profession?
  - If yes, for which kind of applications?
  - What will that entail for the education and training of existing professionals?

# References and Image rights

- ATD, IACET, and Rothwell & Associates. 2015. "SKILLS, CHALLENGES, AND TRENDS IN INSTRUCTIONAL DESIGN." Whitepaper. [https://www.iacet.org/default/assets/File/pdfs/2015%20ATD Research Skills Challenges and Trends in Instructional Design.pdf](https://www.iacet.org/default/assets/File/pdfs/2015%20ATD%20Research%20Skills%20Challenges%20and%20Trends%20in%20Instructional%20Design.pdf)
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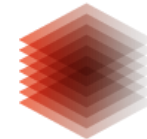


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# Thank you for your interest!

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