Lecture 7: Formatting, Ethics and Final Presentation

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Formatting and grammar using literature examples

Ethical considerations

Definitions

*The **moral** precepts and regulations that control the conduct of research involving human or animal subjects are referred to as research ethics.*

*Ensuring that research activities comply with **honesty, respect** for participants' rights, and **harm** avoidance is a crucial aspect of research ethics.*

*The **guidelines and practices** created to safeguard the well-being, confidentiality, and respect of study participants are collectively referred to as research ethics.*

*In the context of machine learning, research ethics involves considering the **societal implications**, **fairness, and accountability** of algorithms and models developed and deployed.*

*Machine learning research ethics focuses on **addressing biases, ensuring transparency**, and promoting **responsible use** of data and AI technologies to minimize harm and maximize benefits for individuals and society.*

Protection of Participants

Research ethics make sure that subjects aren't harmed or taken advantage of while doing research. This entails safeguarding their mental, emotional, and physical health.

Ethics mandate that researchers get participants' informed consent, making sure they are aware of the nature of the study, its advantages and disadvantages, and their rights as participants. People who give their informed consent are guaranteed to participate willingly and free from fraud or pressure.

Privacy and Confidentiality

Participants' privacy and confidentiality must be protected according to ethical research methods. This entails protecting private data and guaranteeing that participants' identities are kept secret unless they give their express consent.

Social Responsibility

Research that adheres to ethical standards takes into account how its methods and conclusions may affect society at large. It is the duty of researchers to minimize any possible harmful effects of their work and to make a constructive contribution to society.

Professional Standards

Upholding ethical standards is essential to keeping the research community's professional standards in place. In order to promote their profession, researchers are obliged to maintain the highest ethical standards in all facets of their job.

Ethics- Data sourced from the internet

Data Privacy and Consent

It's critical to make sure that the information gathered respects people's right to privacy while using data obtained from internet platforms. It is important to take into account the context in which the data was shared and if **explicit authorization was obtained** for its use in study or analysis, even though the data may be publicly accessible. Researchers must uphold people's rights and privacy because of ethical considerations, even while employing publicly accessible data.

Fairness and Bias in Data

Information gathered from online **sources may be biased or inaccurate by nature**. These biases may result from a number of things, including the demographics of users on a specific platform or the procedures used in the gathering and curation of data. For ethical data analysis to be conducted, researchers must identify and reduce biases in order to guarantee equity.

Beneficence and Social Good

The goal of ethical data analysis initiatives is to produce insights that minimize possible harm while making a positive contribution to society. When it comes to predicting the housing market, ethical analysis may help create more just and accurate housing laws or resources that assist people in making well-informed housing investment decisions.

Retaining Trust and Integrity

Retaining trust and integrity among the public and the research community depends on data analysis initiatives adhering to ethical standards. The acceptance and adoption of research findings depend heavily on the trust that ethical behavior develops in the dependability and trustworthiness of the analytical outcomes.

Special ethics for machine learning

Fairness and Bias

Are the training data and algorithms biased or discriminatory against certain demographic groups?
How do we mitigate biases in the data and algorithms to ensure fair outcomes for all individuals?
Are there potential unintended consequences or disparate impacts on different groups?

Openness and Definability

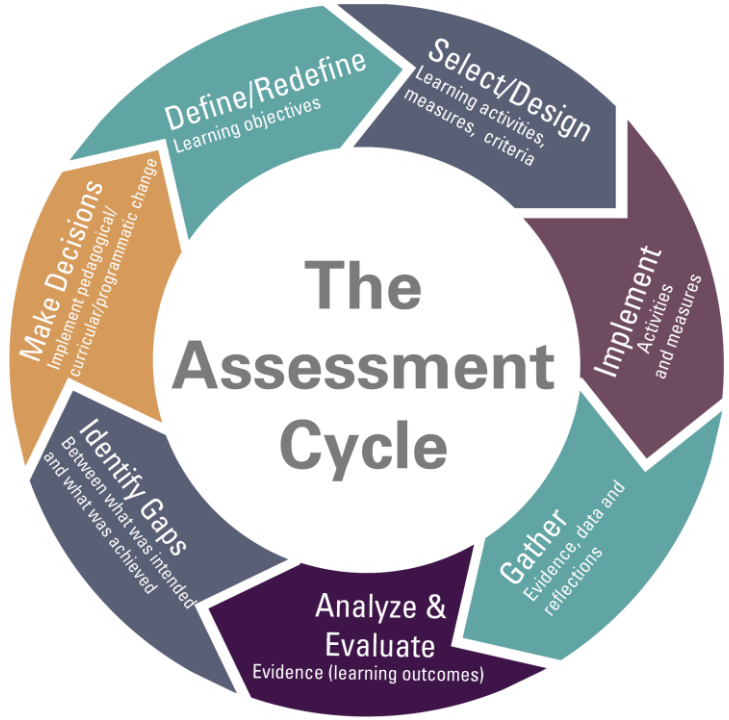
Can end users and regulators, among other stakeholders, comprehend and receive an explanation for the judgments made by the machine learning model?
Are the decision-making procedures and algorithms comprehensible and transparent?
How can we safeguard confidential information while maintaining transparency?

Security

How can we prevent malevolent exploitation or adversarial attacks on the machine learning system?
Exist any weaknesses in the system that could be used to rig results or jeopardize security?
What safeguards are in place to guarantee the accuracy and dependability of the predictions and choices made by the system?

Impact on the Social and Environmental Domains

What are the machine learning system's wider societal or environmental ramifications?
What impact might the system have on the environment, inequality, or employment?
Exist strategies to lessen adverse effects and encourage favorable social outcomes?



Ongoing Assessment and Development

How can the effectiveness and influence of the machine learning system be continuously assessed over time?
Exist procedures for taking criticism into account and refining things incrementally in order to address ethical issues?
What procedures are in place for retraining the model in response to novel data or evolving conditions?

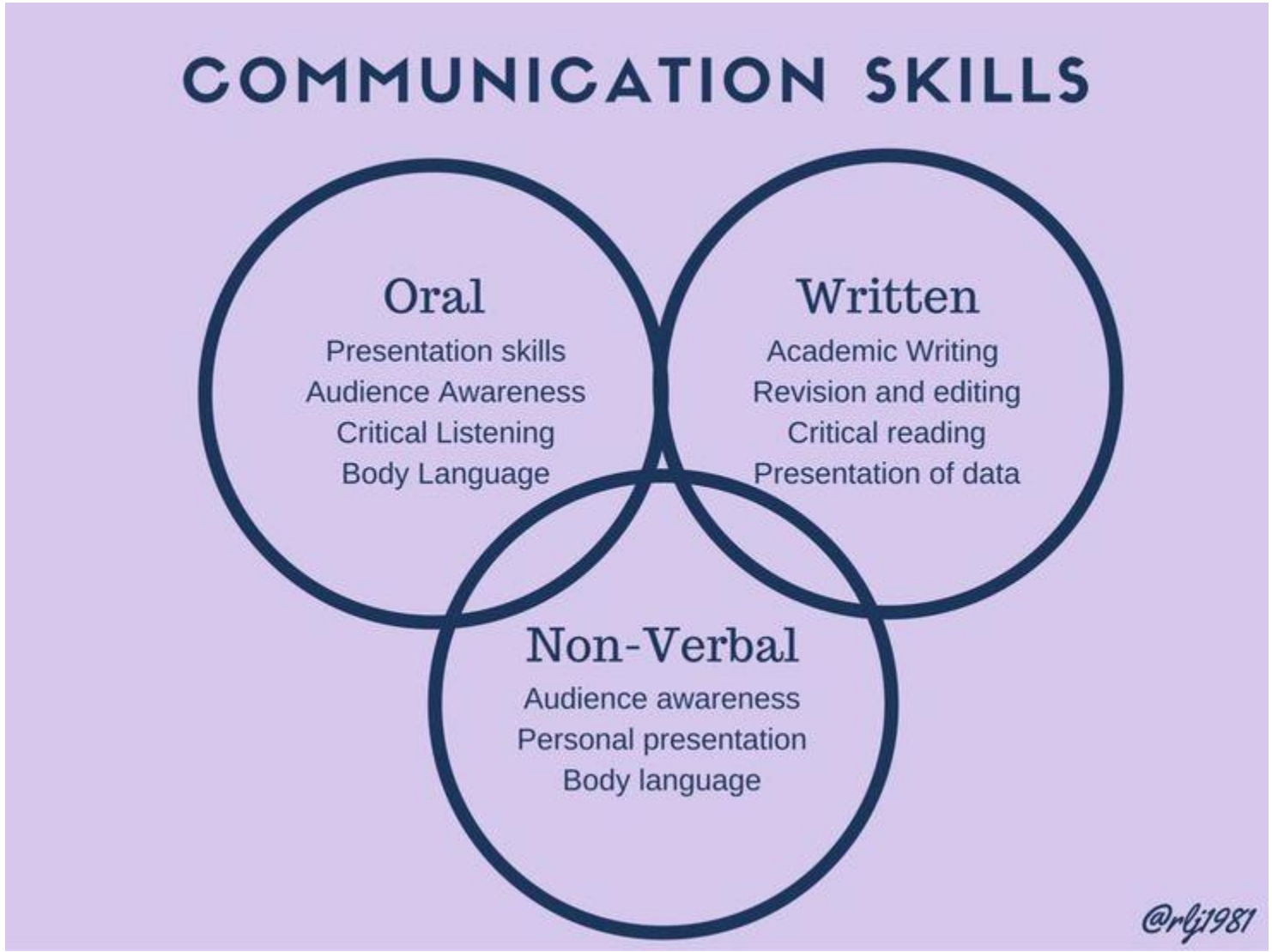
Story time

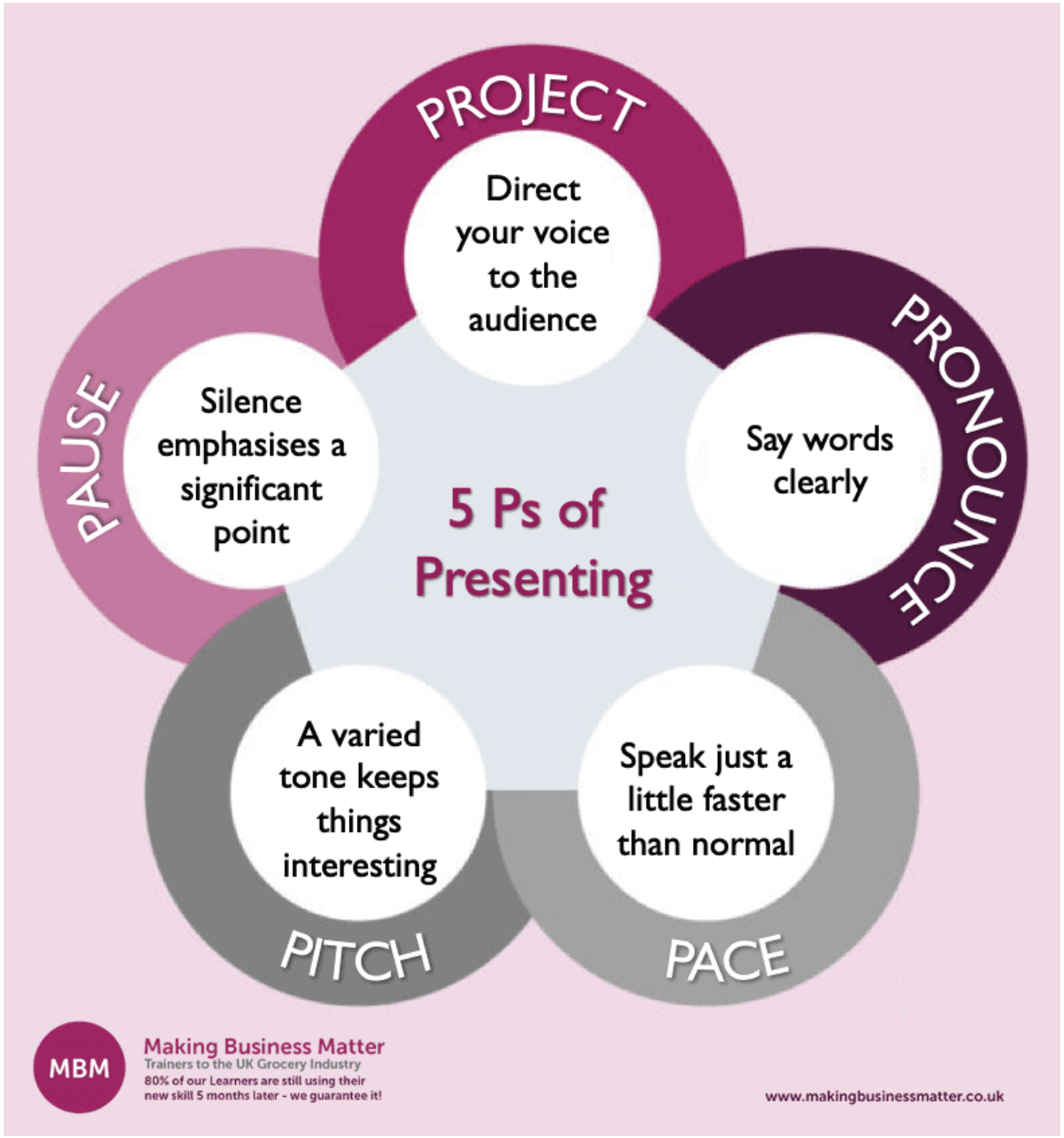
In the bustling city of Metropia, the local government embarked on an ambitious project to optimize public transportation routes using machine learning algorithms. The goal was to improve efficiency, reduce congestion, and provide equitable access to transportation for all residents. A team of data scientists eagerly gathered vast amounts of transportation data, including passenger demographics, traffic patterns, and route usage. They trained sophisticated machine learning models to predict optimal bus and train routes based on historical data and real-time information. Excited by the potential benefits, the team focused solely on maximizing efficiency metrics, such as minimizing travel time and maximizing passenger throughput. However, they overlooked critical ethical considerations, such as fairness and inclusivity.

As the newly optimized transportation system was rolled out, residents quickly noticed disparities in service quality across different neighborhoods. It became evident that the algorithms were favoring affluent areas with higher demand while neglecting marginalized communities with fewer resources. Complaints flooded in from residents of underserved neighborhoods, who struggled to access essential services and employment opportunities due to unreliable and infrequent transportation options. The unintended consequences of the algorithmic decisions exacerbated existing inequalities and social divisions within the city. Furthermore, investigations revealed inherent biases in the training data used to develop the machine learning models. Historical patterns of transportation usage reflected systemic inequalities and discriminatory practices, leading to biased recommendations that perpetuated disparities. The public outcry prompted widespread scrutiny of the transportation project, sparking debates about the ethical implications of algorithmic decision-making. Advocacy groups demanded transparency, accountability, and the prioritization of community needs in future iterations of the transportation system.

In the aftermath of the controversy, the government faced mounting pressure to address the ethical shortcomings of the machine learning project. They established a task force dedicated to reviewing algorithmic decision-making processes, ensuring diversity and inclusivity in data collection, and implementing mechanisms for community engagement and feedback. The incident served as a sobering reminder of the importance of integrating ethics into machine learning projects from the outset. While technological advancements offer immense potential for societal benefit, ethical considerations must remain central to the development and deployment of AI systems to avoid unintended harm and promote fairness and equity for all.

Communication skills




PROJECT
Direct your voice to the audience
PRONOUNCE
Say words clearly
PACE
Speak just a little faster than normal
PITCH
A varied tone keeps things interesting
PAUSE
Silence emphasises a significant point
5 Ps of Presenting
MBM
Making Business Matter
Trainers to the UK Grocery Industry
80% of our Learners are still using their new skill 5 months later - we guarantee it!
www.makingbusinessmatter.co.uk

Why is presentation important, especially these days?

A note about timing!

Structuring a presentation

1-minute rule (1 minute per slide = ten slides)
A ten-minute presentation cannot have 20 slides!!

Therefore, you need to sell your work in about 10 slides!

Explain the problem, motivation, solution and conclusion in the first minute as concisely and high level as possible. Similar to an opening statement in acourt case
How to allocate the time → Explain the **problem** well and why it is necessary to solve it, and remind the audience if needed throughout the presentation (this is called the “hook”) 80% of the people mis underestimate this and fail.

Establish literature backing, but just one example and quickly, you don’t have time! Less than 30 sec talk about the literature

Talk about the methods→ again this should be shorter than the results and discussion

Next talk about the results and discussion together.

The preentatio must be mostly composed of figures and tables not text, remember its not a lecture!

Conclusion is important, convince the public that you presented what you said you were going to present during your opening statement.

Write up a reflection 100-200 words based on this class

Box 1.4 Checklist of questions to ask yourself when making reflective diary entries

In relation to each experience. . .

- ✔ What has gone well?
  - Why has it gone well?
  - So what does this mean in relation to my research?
- ✔ What has not gone so well?
  - Why has it not gone so well?
  - So what does this mean in relation to my research?
- ✔ What adjustments will/did I make to my research following my reflection?

Looking back. . .

- ✔ How could I have improved on the adjustments made?
  - Why?
- ✔ What key themes have emerged over several entries?
- ✔ How will I apply what I have learnt from each experience to new situations?