

CG1111 Engineering Principles and Practice I

Oral Presentation Skills

Embedded Communication Workshop 1
Centre for English Language Communication

AY2020/2021 Semester 1

Overview

- I. Workshop objectives
- II. Assessment
- III. IEEE Referencing
- IV. Preparing for oral presentations
- V. Tips for presenting online
- VI. Evaluation of sample presentations
- VII. Preparation for Workshop 2

I. Workshop objectives

By the end of the module, you will be able to deliver an effective oral presentation in your field of engineering by:

Workshop 1: Preparing for oral presentations

- structuring the content as messages and visual evidence
- using appropriate visual aid techniques to explain the information
- approaching/explaining the concepts/process logically and concisely

Workshop 2: Conducting oral presentations

- using verbal and non-verbal techniques for effective delivery
- interacting with the audience by responding to/asking questions and checking for understanding

II. Assessment

The assessed individual presentation must be strictly kept within **6 minutes**, followed by a **2-minute Q&A session**.

It accounts for **15% of the total course grade**.

Performance criteria*	Weightage	Graded by
Content clarity & organization	50%	CEG Instructors
Language use	10%	CELC Instructors
Delivery	20%	
Visual Aids: Design	10%	
Visual Aids: Technique	10%	

*Refer to the document *Feedback Form*.

Analyze your presentation topic carefully.

Presentation topics* will be released by CEG Instructors in advance of your scheduled presentation dates.

- What does the topic require you to do?
- Do you have to **describe how a principle/process works, compare/contrast two principles/ processes, or argue for a position?**

*Refer to email announcements.

III. IEEE Referencing

- acknowledge your sources and make sure you have **avoided plagiarism***
- demonstrate the depth and breadth of your research
- support and strengthen your argument
- allow researchers to locate your sources

*Read the information via the two links before completing the *plagiarism quiz* on LumiNUS:

[CELC's plagiarism policy](#) and
[NUS Library's website on plagiarism and academic dishonesty](#)

IEEE specifies a system of citation for authors in the field of engineering.

IEEE stands for the Institute of Electrical and Electronics Engineers.

IEEE citation style* is a numerical style where citations are numbered [1] in the order of appearance.

- **An in-text citation**

[1]

- **A complete reference list** giving the full citation details for all sources referred to in the slides

[1] Author Initials. Author Surname, *Title*. (Year, month day)

*Refer to the document *IEEE Referencing*.

IV. Preparation for oral presentations

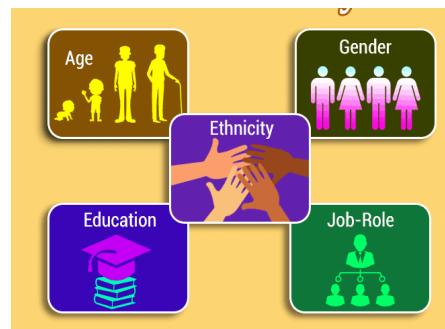
Effective technical presentations are marked by **content**, **passion**, and a keen sense of the audience.



Content worthy of
attention



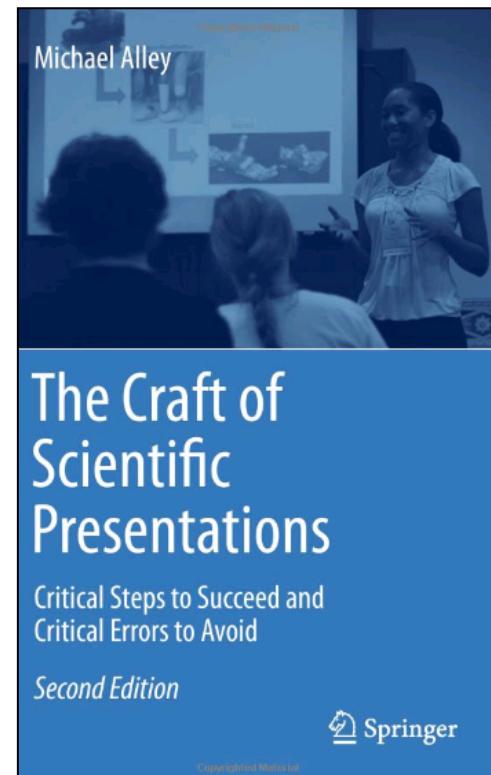
Speaker's passion



**Awareness of
the audience**

Alley (2013) identifies three key principles of assertion-evidence approach in technical presentations.

1. Build your content on messages, not topics.
2. Support the messages with visual evidence, not bulleted lists.
3. Explain this evidence by fashioning words on the spot.



Mayer (2005) advocates the multimedia principles in instructional design.

1. Individuals learn better when **words and pictures** are presented, rather than from words alone.
2. Audiences show superior comprehension and retention when **extraneous information is removed** from the presentation.
3. Signalling: useful presentations highlight the **relationships** that allow understanding of highly interactive information.
4. Principle of redundancy states that “people learn more deeply from **graphics and narration** than from graphics, narration, and online text”.

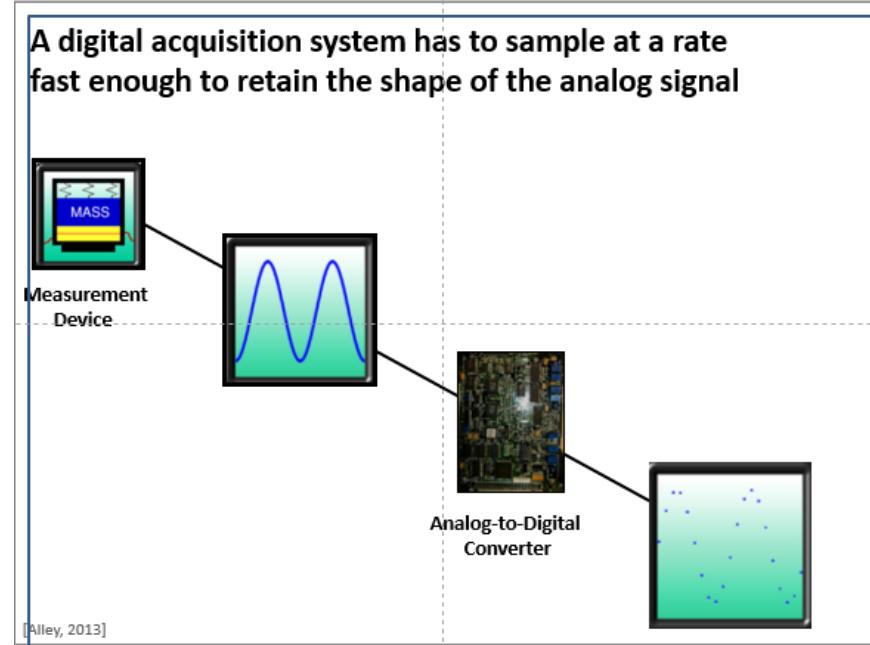
Build your **content** on messages, and not topics.

Digital Acquisition System Sampling

- Vibration measured by accelerometer
 - Analog voltage produced
 - Sinusoidal shape
- Analog signal converted to digital signal
- Signal sampled at a specific rate
- Rate → high enough to retain analog shape

[Alley, 2013]

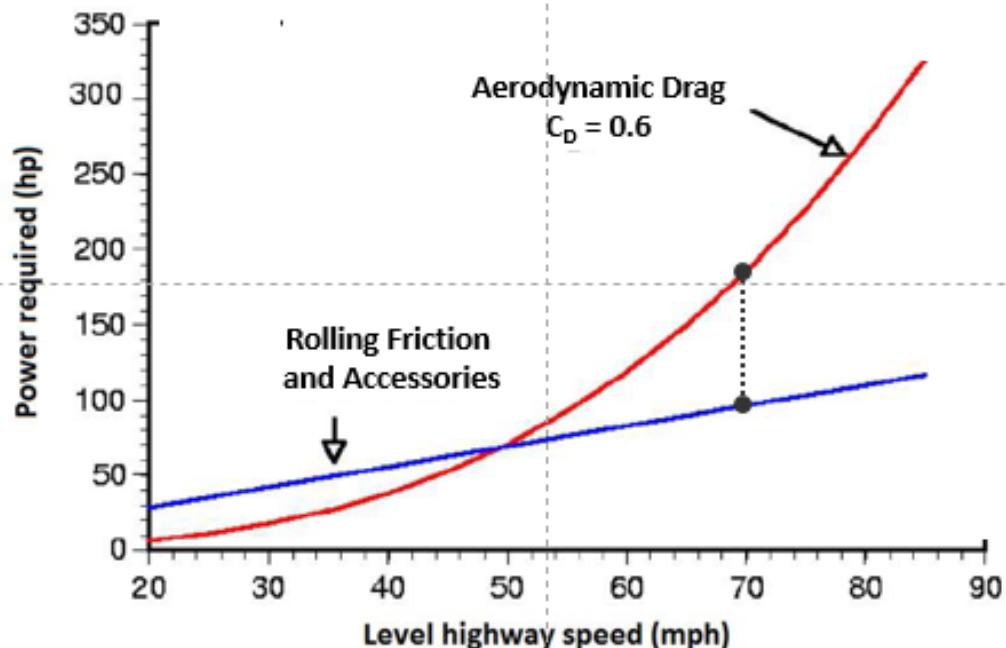
Default PowerPoint format:
A topic is used as the slide title.
Sub-topics are bulleted.



Assertion-evidence format:
A statement asserting a fact or opinion is used as the slide title.

Support the messages with visual evidence, not bulleted lists.

At typical highway speeds, overcoming drag requires about two-thirds of a truck engine's output



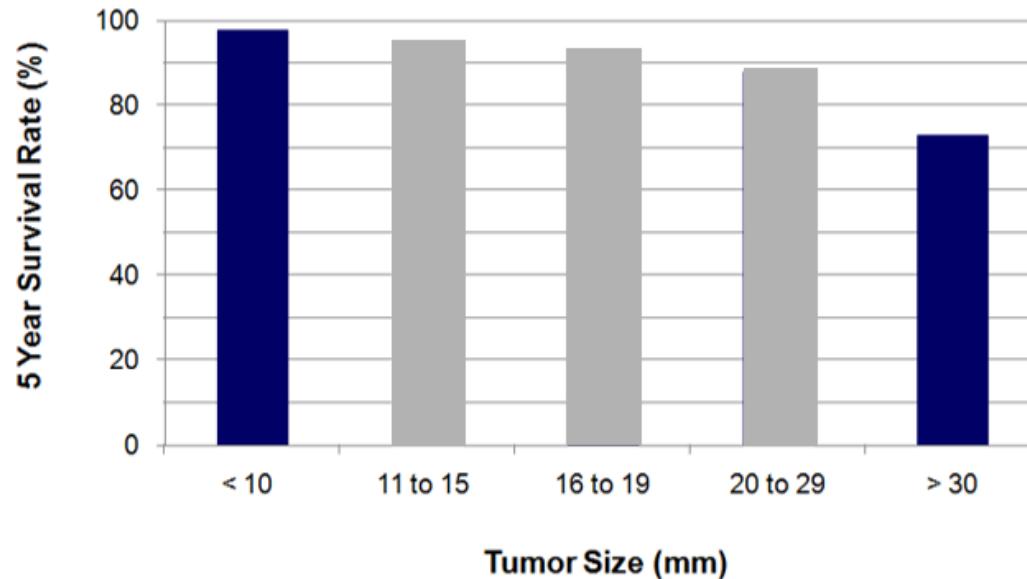
[Alley, 2013]

[McCallen, 2004]



Support the messages with **visual evidence**, not bulleted lists.

Early detection methods can identify small tumors and therefore improve survival rates of patients



[Lai et al., 2007]



Support the messages with visual evidence, not bulleted lists.

Fragments quickly outpace the blast wave and become the primary hazard to personnel



Support the messages with visual evidence, not bulleted lists.

Normalized friction factors and Nusselt numbers correlated our data with the data of others

Pressure Taps



Venturi Meter



Voltmeter



Thermocouples



Pressure Drop

$$f = \frac{dP_{\text{tap}} \cdot D_k}{2 \cdot \Delta x \cdot \rho_{\text{air}} \cdot u_{\text{bulk}}^2}$$

Reynolds Number

$$f_0 = 0.046 \cdot Re^{-0.2}$$

$$Nu_0 = 0.023 \cdot Re^{0.8} \cdot Pr^{0.4}$$

10

Heat Flux, q''

T_{inlet}

T_{wall}

T_{bulk}

$$Nu = \frac{h \cdot D_k}{k_{\text{air}}}$$



Many engineers and scientists have had success using the assertion-evidence approach (Alley, 2013).



More examples and templates of the assertion-evidence approach:

[http://
writing.engr.psu.edu/
speaking.html](http://writing.engr.psu.edu/speaking.html)

Prepare your presentation in five steps.

1

Select your points carefully

2

Organize the points logically

3

Add an engaging introduction

4

Link your points effectively

5

End strong

Select your points carefully.



Purpose

Explain?

Compare/contrast?

Argue for a position?



Audience

Who are they?

What do they know?

What do they want to
know?



Time

How long is the
presentation?

Organize the points logically.

State what your topic is and how you have organized your presentation

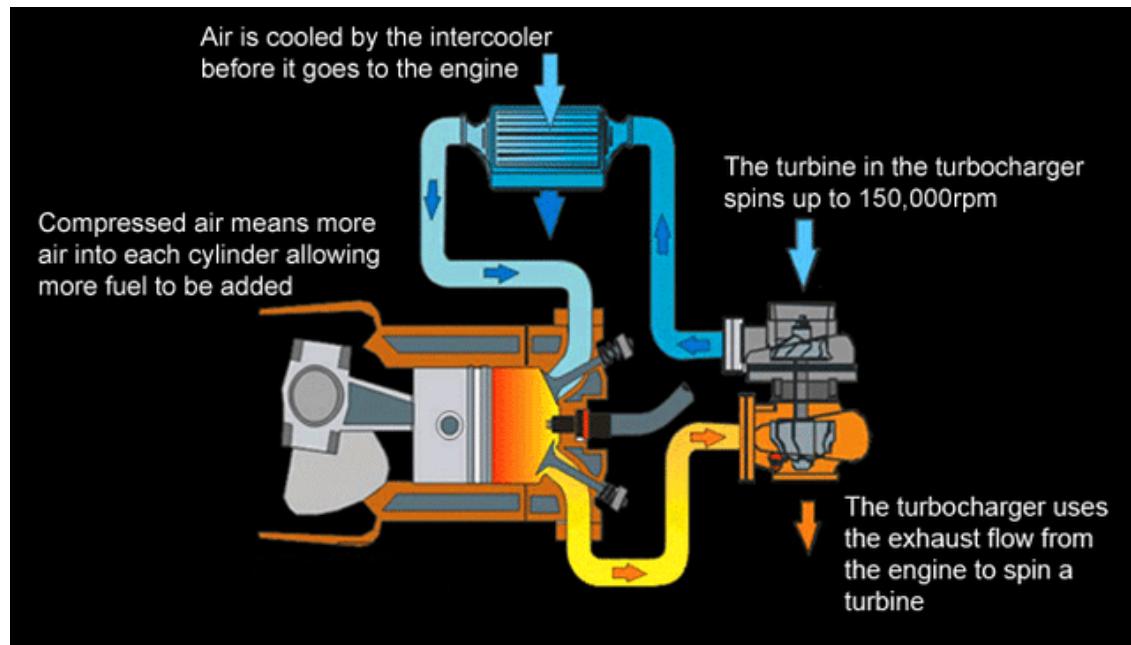
Explain and qualify the key points and provide supporting evidence

Summarize the key points and conclude with a main message

When explaining a process or how a device works, consider the **significance** of each stage.

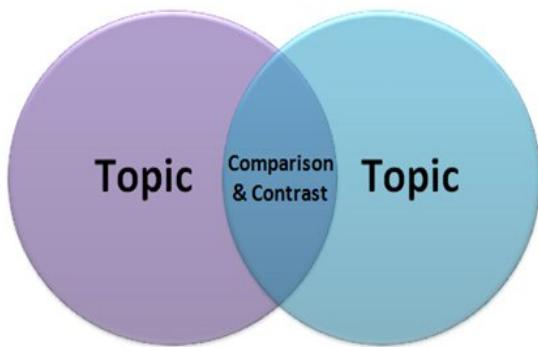
1. Provide background to identify and define the process. Explain why understanding this process is useful or important.

2. Describe the process in a logical order using diagrams and appropriate transition words/phrases.

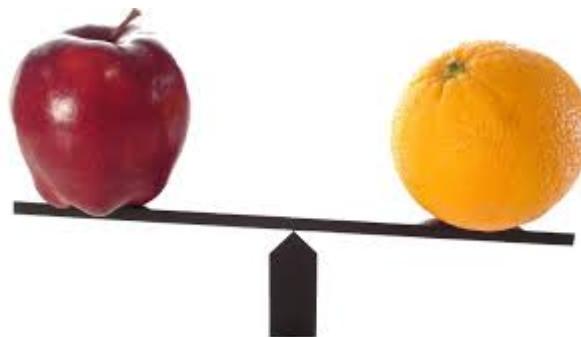


When comparing/contrasting, you need to develop a **thesis**.

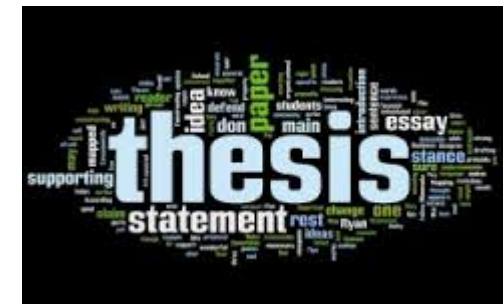
1. Identify and explain three or more key points of similarity or difference between the subjects.



2. Evaluate the strengths and weaknesses of comparisons based on the evidence.

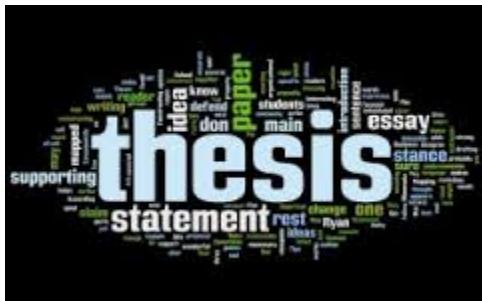


3. State your position, e.g. which is 'better', applications & implications.



When arguing for a position, you aim to persuade the audience to accept your argument.

1. State the significance of your topic. State your thesis, relate back to it periodically, and repeat it in your conclusion.



2. Present claims and evidence (cite sources!) to support your thesis. Start with strongest first. Include counter-arguments and rebuttal.

SCIENTIFIC EXPLANATIONS

CLAIM

Statement about the results of an investigation

- A one-sentence answer to the question you investigated.
- It answers **what can you conclude?**
- It should not start with **yes or no**.
- It should describe the relationship between **dependent** and **independent variables**.

EVIDENCE

Scientific data used to support the claim

Evidence must be:

- **Sufficient** — Use enough evidence to support the claim.
- **Appropriate** — Use data that support your claim. Leave out information that doesn't support the claim.
- **Qualitative** — (Using the senses), or **Quantitative** (numerical), or a combination of both.

REASONING

Ties together the claim and the evidence

- Shows **how** or **why** the data count as evidence to support the claim.
- Provides the justification for why **this** evidence is important to **this** claim.
- Includes one or more **scientific principles** that are important to the claim and evidence.

*Remember: Read what you've written to be sure it makes sense as a whole explanation.

Activate Learning
Educational Resources

www.activatelearning.com

3. Use signposts to help audience follow your argument.



Add an engaging introduction.

Who wants to double their commission this year? How many of you would like to be able to afford a two-week European vacation next June? Well, you are in the right place, because if you listen to what I've got to say about the new customer service programme, the profits will be rolling in and you will be the beneficiary. As you know, different companies in the group have different customer service policies. So, I want to start by looking at some of those differences to clarify what sort of a problem we're up against. Then, I'm going to show you how we're tackling the problem through the new customer service programme. And then I'll tell you where you come in; what the campaign means for our sales force.

Attention getter Statement of topic/purpose Motivation Outline of main points

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Attention getter Statement of topic/purpose Motivation **Outline of main points**

Use language to engage your audience.

Who wants to double their commission this year? How many of you would like to be able to afford a two-week European vacation next June? Well, you are in the right place, because if you listen to what I've got to say about the new customer service programme, the profits will be rolling in and you will be the beneficiary. As you know, different companies in the group have different customer service policies. So, I want to start by looking at some of those differences to clarify what sort of a problem we're up against. Then, I'm going to show you how we're tackling the problem through the new customer service programme. And then I'll tell you where you come in; what the campaign means for our sales force.

Rhetorical Question

Spoken Discourse Markers

Contracted forms

'You'

Link your points effectively.

- Transition phrases
- Rhetorical questions
- Mini-summaries
 1. Review the previous point
 2. Introduce the new point

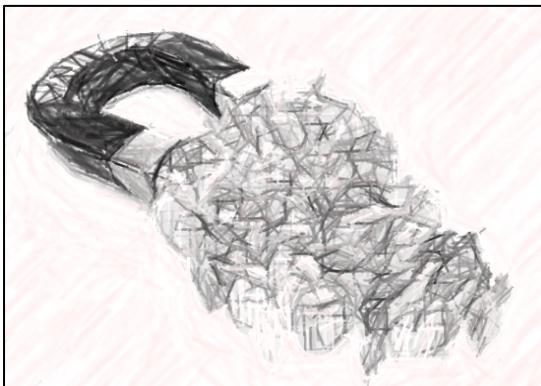


End strong.

- Summary
- Recommendation/call to action
- Closing courtesies



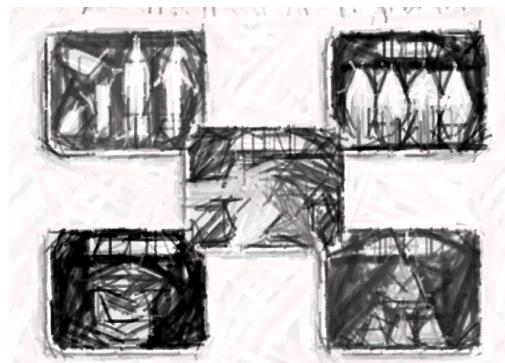
Effective technical presentations are marked by **content**, **passion**, and a keen sense of the **audience**.



Content worthy of
attention



Speaker's **passion**



Awareness of the
audience

Speaker's passion is achieved through four strategies.



- Vocal elements
- Extemporaneous style
- Clear and accurate language
- Visual elements

Convey passion using your voice.

VOICE – A TOOLBOX

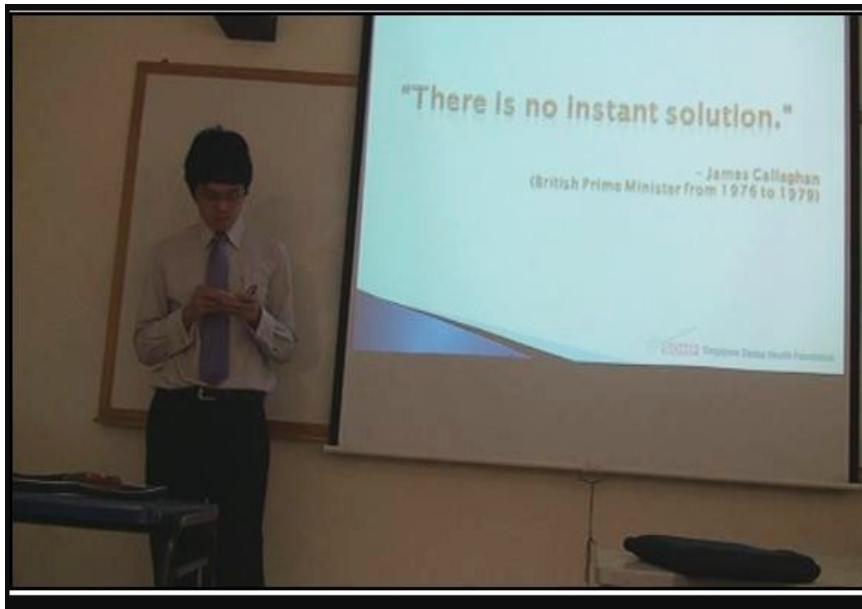


Watch a segment of Julian Treasure's TED talk on the toolbox:

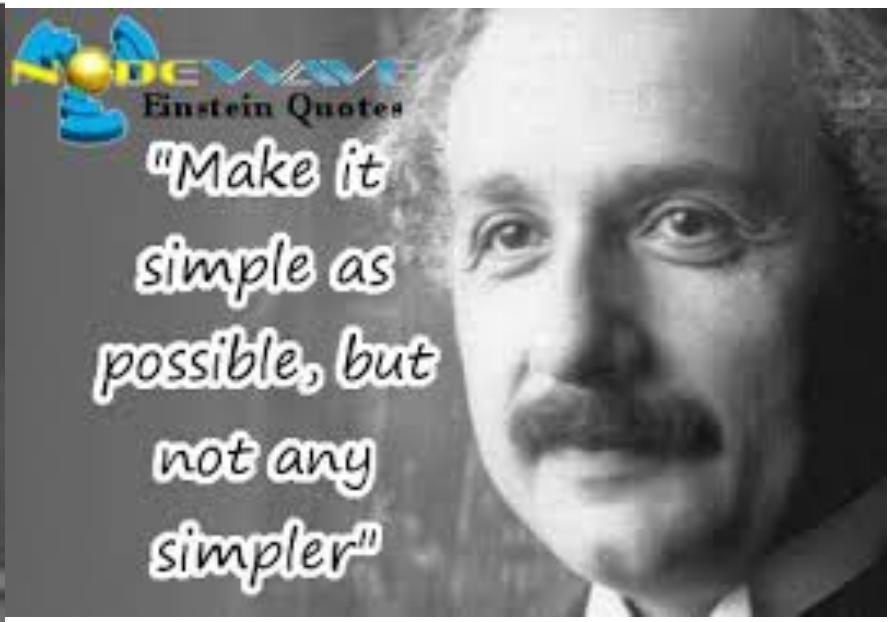
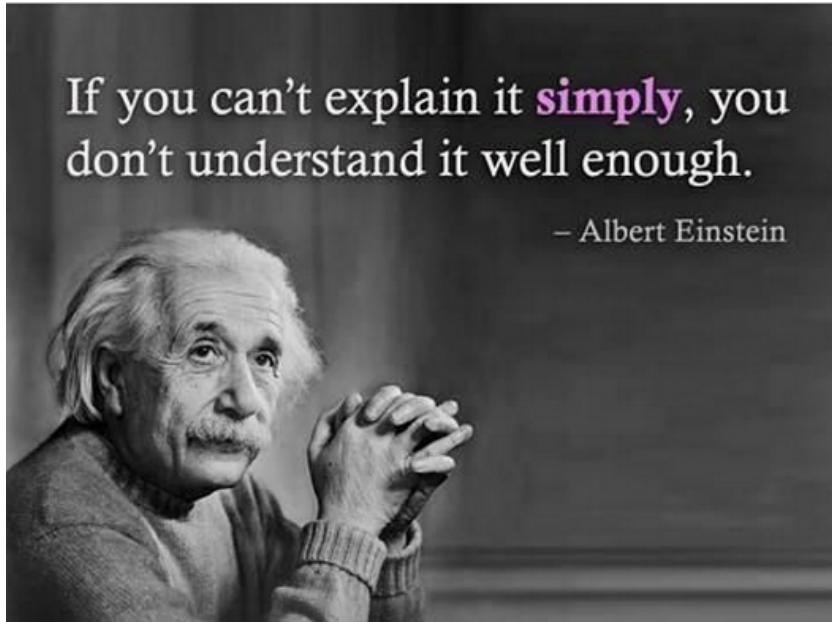
<https://www.ted.com/talks/>

julian treasure how to speak so that people want to listen (4:16-7:20)

Explain the evidence using your own words.



Use clear, accurate and accessible language*.



Language Practice 1

No	Grammar aspect	Example of error	Corrected version
1	Article (a, an, the)	Government needs to help us offset cost	
2	Subject-verb agreement	The process take just three minutes	
3	One of the ...	One of the machine is designed to ...	
4	Word form	We need to emphasis discipline	
5	Parallelism	The application is cheap, sensitive and many people find it easy to use	
6	Tense (present tense)	Most old people found it hard to call for help in crises	
7	Tense (past tense)	I have graduated in 2014	

No	Grammar aspect	Example of error	Corrected version
1	Article (a, an, the)	Government needs to help us offset cost	The government needs to help us offset cost
2	Subject-verb agreement	The process take just three minutes	The process takes just three minutes
3	One of the ...	One of the machine is designed to ...	One of the machines is designed to ...
4	Word form	We need to emphasis discipline	We need to emphasize discipline =>verb This needs special emphases. =>noun
5	Parallelism	The application is cheap, sensitive and many people find it easy to use	The application is cheap, sensitive and easy to use
6	Tense (present tense)	Most old people found it hard to call for help in crises	Most old people find it hard to call for help in crises
7	Tense (past tense)	I have graduated in 2014	I graduated in 2014

Language Practice 2

No	Error	Correct version
1	Jargons / knowledges / informations	
2	Body languages	
3	All these stress	
4	Let me show you how the product looks like	
5	I will pass on to xxx to talk about...	
6	Sentence: Look at how does it work	
7	Less people came	
8	Although it is expensive but it is beneficial	
9	It will be explained in details	
10	1. As we all know, Singapore has 4 taps. 2. We all know that Singapore ahs 4 taps but that will change	

No	Error	Correct version
1	Jargons / knowledges / informations	Jargon / knowledge / information (no matter how many!)
2	Body languages	Body language (no matter how many/much!)
3	All these stress	All this stress (no matter how much!)
4	Let me show you how the product looks like	Let me show you what the product looks like
5	I will pass on to xxx to talk about...	I will hand over to xxx who will speak on...
6	Sentence: Look at how does it work	Look at how it works
7	Less people came	Fewer people came
8	Although it is expensive but it is beneficial	Although it is expensive, it is beneficial
9	It will be explained in details	It will be explained in detail
10	<ul style="list-style-type: none"> 1. As we all know, Singapore has 4 taps. 2. We all know that Singapore has 4 taps but that will change 	Don't assume your audience knows

Convey passion using your facial expression.

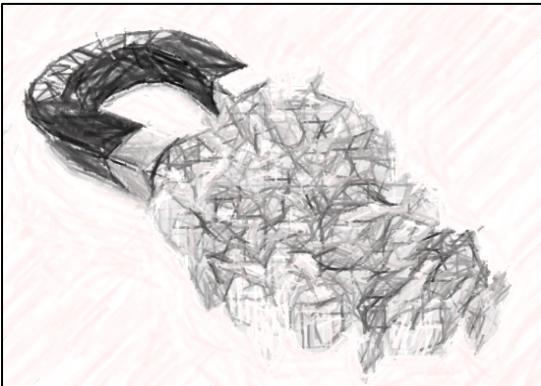


Convey passion using **non-verbal body language** that is **congruent** with your words.



Attire
Posture
Position
Gestures
Use of space

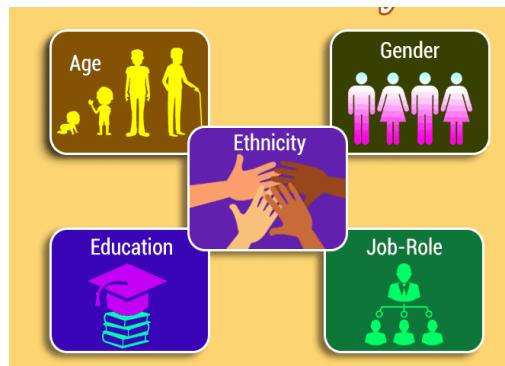
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Content worthy of attention

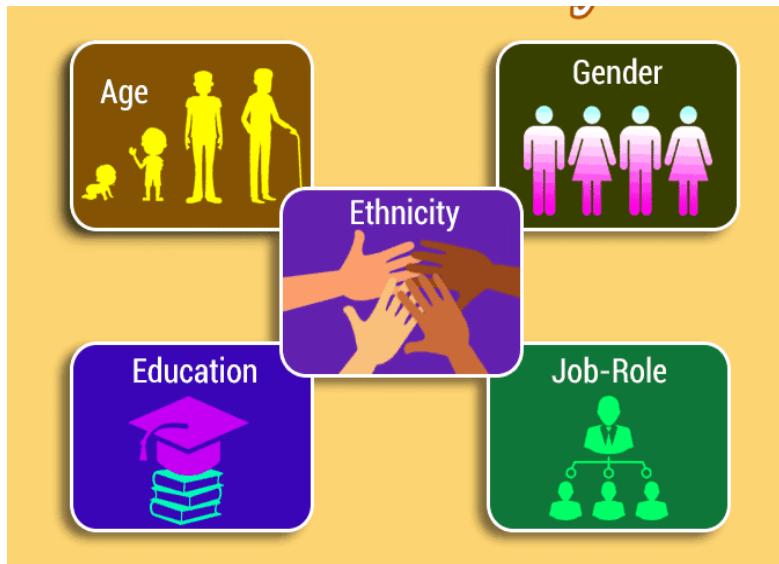


Speaker's passion



Awareness of the audience

Analyse your audience before and respond to your audience during the presentation.



1. Know about your audience and their needs



2. Respond to the audience as you speak

Before: Choose your content and words to match audience needs.



Put yourself in the shoes of the audience.

What do you want them to do/think at the end of your presentation?

During: Observe and respond to your audience's cues.

Confused/skeptical



'If you are perhaps feeling a little confused, let me put it another way...'

'If you are not entirely convinced, then let me explain/show you the statistics...'

During: Observe and respond to your audience's cues.



Bored



Ask a question.

Do a simple poll.

Change the pace, volume, position/posture.

Tell an anecdote or joke.

During: Observe and respond to your audience's cues.

Happy and smiling



**Smile back.
Laugh with them.
Enjoy it.**

Conclude your presentation by stating the main message.



To make an effective **technical** presentation, ensure that your **content** is noteworthy, deliver it with **passion**, and maintain a keen sense of the **audience**.

QUESTIONS?

50

Prepare to handle questions from the audience.

No.	Function	Example of reply
1	Thank the questioner.	Thank you for the question. That's a good question. Thank you for that.
2	Ensure everyone has heard the question. Paraphrase if necessary.	X has asked ...
3	Seek clarification from the questioner.	Could you repeat your question? Are you asking if... ?
4	Choose a strategy to give yourself time.	That's something I'd like to give some thought to. I'd like to think about that
5	Seek information from the audience and promote discussion.	That's an interesting point. Would anyone like to comment/take that up?
6	Deal with several people trying to speak at one time; nominate the first and tell the others you will get to them.	Thank you—this gentleman/lady first, and then your question next, and then...

V. Tips for presenting online

Conduct pre-performance checks.

- **Eliminate distractions:** silence your mobile, turn off desktop notifications and find a quiet place.
- Check the **internet connection and internet speed.**
- Test the **audio and video** systems.
- **Light yourself from the side** rather than behind
(Don't present with a window behind you.)

Conduct pre-performance checks.

- **Position your device** to allow your audience to see your head and the upper part of your body. (Show your wave hello, and your explanatory gestures.)
- **Record yourself** doing a presentation.
- **Watch it with the sound** on to get a sense of your voice.
- **Watch it again without the sound** to observe your body, facial expressions and gestures. (Check if you look at your audience into the eye)

Use signal tools to direct audience's attention.



Move your **pointer** on the screen to guide your audience's eyes to different areas on screen



Insert **arrows/circles** to emphasize numerical values



Use **colours** to contrast and compliment

VI. Evaluation of sample presentations

Evaluation of Andrew's presentation

Content

- What are his **assertions** (main points phrased as messages)?
- What **evidence** does he use to support his assertions?

Language use

- How does he use language to help audience follow his logic and emphasize key points?
- How does he use language to introduce visuals for his audience?

Delivery and audience awareness

- How does he use **his voice and body language**?
- How does he **connect with the audience** and/or adjust to audience feedback during the talk?

Visual aids

- What **visual evidence** does he use to support his assertions? (watch the slides carefully)
- What **visual aid technique(s)** does he use to direct audience's focus?



Andrew Getsy, Penn State University
Topic: New electric Tesla vehicles
<https://vimeo.com/189646998>

Evaluation of Amel's presentation

Content

- What are her **assertions** (main points phrased as messages)?
- What **evidence** does she use to support her assertions?

Language use

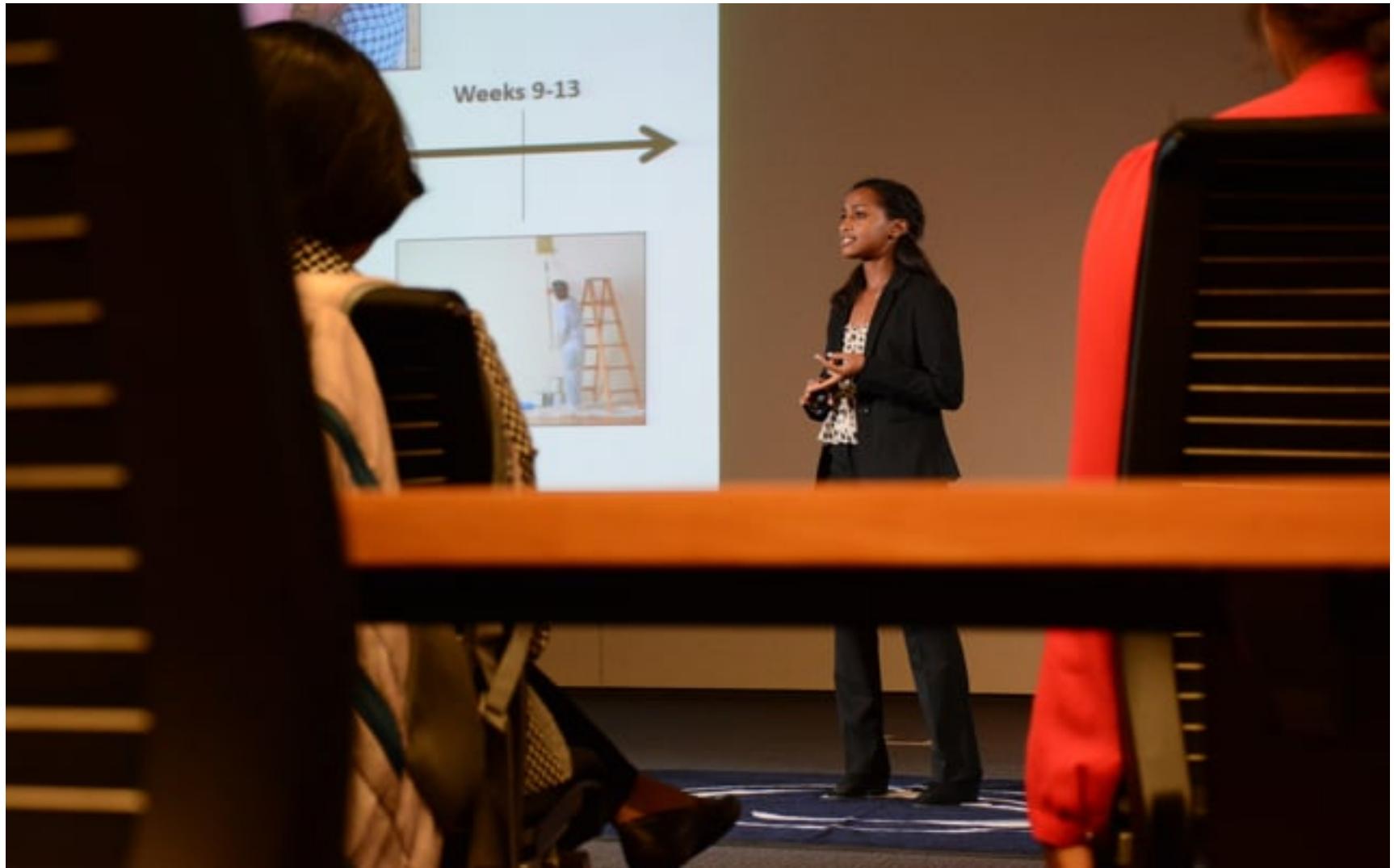
- How does she use language to help audience follow her logic and emphasize key points?
- How does she use language to introduce visuals for her audience?

Delivery and audience awareness

- How does she use **her voice and body language**?
- How does she **connect with the audience** and/or adjust to audience feedback during the talk?

Visual aids

- What **visual evidence** does she use to support her assertions? (watch the slides carefully)
- What **visual aid techniques** does she use to direct audience's focus?



Amel Awadelkarim, Penn State University
Topic: Additive Manufacturing in Construction
<https://vimeo.com/192160660>

VII. Preparation for Workshop 2

Prepare well for the practice task.

Practice Task:

- Conduct a **3-minute individual presentation** on a topic that involves an engineering principle or process
- Participate in the **one-minute Q&A session** at the end of your presentation

Preparation

- State your topic and your name clearly on the cover slide
- Describe and explain the engineering principle or process
- Use the assertion-evidence approach
- Anticipate questions that may arise during the Q&A session
- Log in to *Zoom* at least 5 minutes before the scheduled time and wait patiently in the waiting room

You will be assigned to one of the practice sessions.

Practice Sessions	AM Groups (1a/b and 2a/b)	PM Groups (3a/b and 4a/b)
1	10:00-10:20	2:00-2:20
2	10:20-10:40	2:20-2:40
3	10:40-11:00	2:40-3:00
4	11:05-11:25	3:05-3:25
5	11:25-11:45	3:25-3:45

Self-reflection and feedback

Self-reflection*

You are encouraged to evaluate and reflect on your performance based on the practice task.

Your CELC instructor will share a link so that you can view your recorded presentation.

*Refer to the document *Self-reflection*.

Conferencing session

Arrange a one-to-one conferencing session to discuss your strengths and areas for improvement with your CELC instructor.