TECHNICAL COMMUNICATION IN ENGINEERING:
writing and oral presentation

LESSON 4

Oral presentation

4.1 Introduction

4.2 The process toward an effective oral presentation

    4.2.1 Planning

    4.2.2 Structure

    4.2.3 Design

    4.2.4 Oral presentation

4.3 Tips

Figure 1

4.1 INTRODUCTION

In lesson 4 of this course, guidelines are presented to improve the oral presentation in front of a technical audience. Throughout the topic, not only will it be indicated how to plan, structure and design a good presentation, but, in addition, there will be a series of tips that improve verbal and non-verbal communication, which help to convey the message effectively and maintain to the audience with the utmost attention. The topic is completed with some practical exercises.

LEARNING OUTCOMES

At the end of this lesson we expect the student to:

❑ Plan an oral presentation based on the target audience.

❑ Structure the ideas and contents the presentation.

❑ Prepare an attractive design of the available material.

❑ Use verbal and nonverbal language correctly.

❑ The **objective** of any oral presentation is **to communicate** or transmit a message to a specific audience. However, the **purpose** may be different: To inform, to teach, to convince, etc.

❑ Oral presentations are essential in technical and scientific careers for various reasons:

- An excellent technical professional who cannot communicate ideas may obscure his or her talents and fail to be taken seriously.

- Your speaking situations will trigger new discussions, new insights, new collaborations, and new friendships. You will become a communicator!

❑ Your peers will be much more influenced by your 20-minute description of your research than by your 20-page paper on the same subject.

❑ A good oral presentation is based on three pillars :
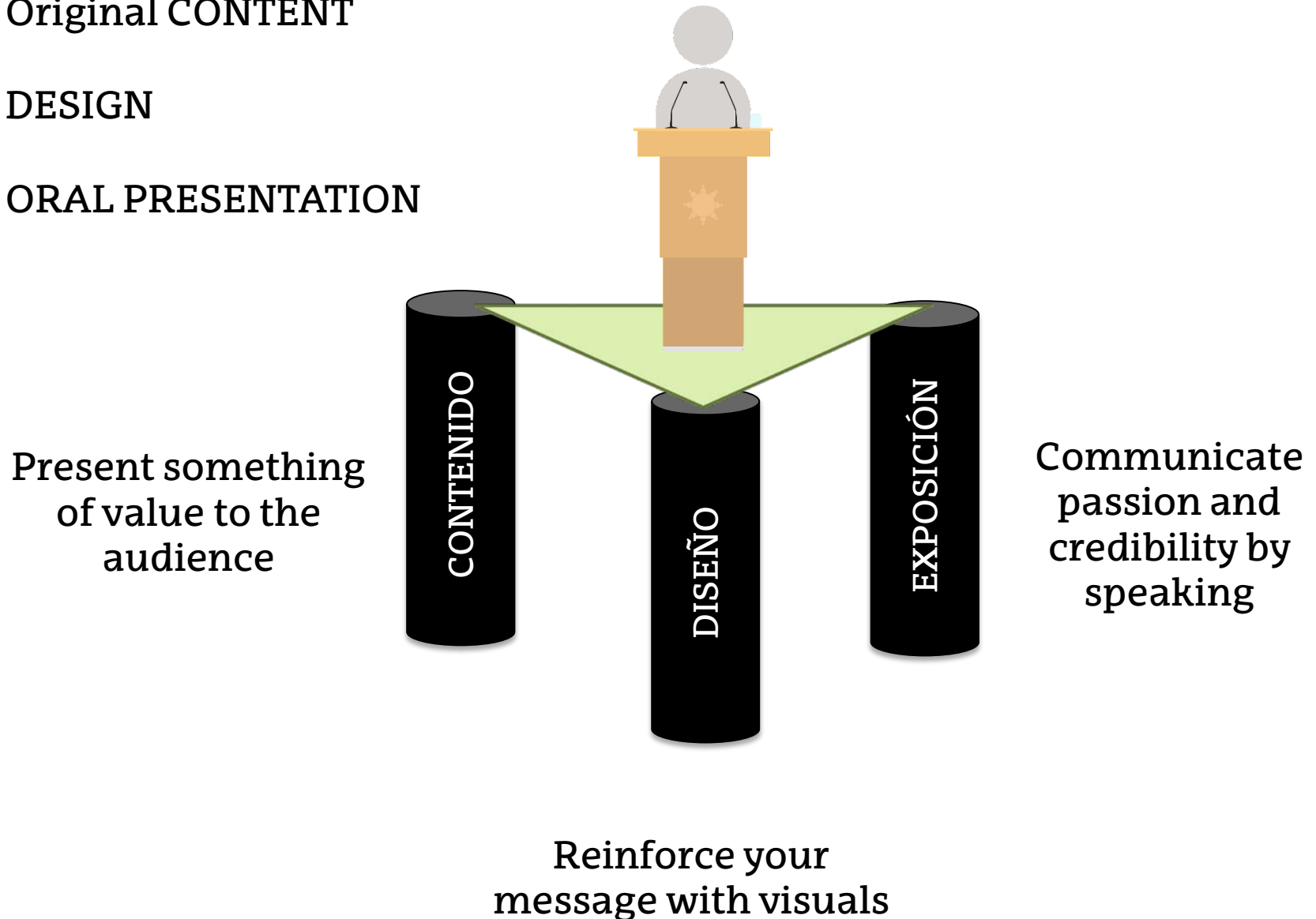
1. Original CONTENT

2. DESIGN

3. ORAL PRESENTATION

Present something of value to the audience

CONTENIDO

DISEÑO

EXPOSICIÓN

Communicate passion and credibility by speaking

Reinforce your message with visuals

Figure 2

❑ All presentation pursues 3 objectives:

To connect with the audience

To direct and mantain attention

To encourage comprehension

Connect with the objectives and interests of your audience on an intellectual, emotional and ethical level.
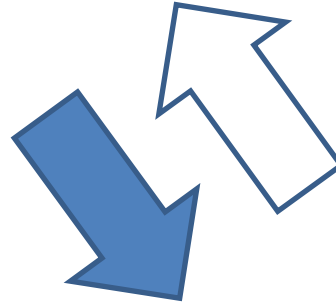
Include elements that capture attention and guide your audience to the most important.

The presentation should be easy to follow, understand and remember.

❑ REMEMBER THESE two PHRASES

*"**Knowing how to express an idea is as important as the idea itself**"*
"La habilidad de expresar una idea es tan importante como la idea en sí."

[Aristoteles]

*"**True eloquence consists in saying all that should be, not all that could be said.**"*
"La verdadera elocuencia consiste en decir todo lo debido y en no decir más de lo debido."

[François de la Rochefoucauld]

4.2 THE PROCESS TOWARDS AND EFFECTIVE ORAL PRESENTATION

❑ All the presentations follow the same creative process:

1. **PLANNING**: An oral presentation does not start when you start talking, but at the moment in which you are commissioned. Before the presentation you should know which is your target audience what will be the objective and message of your presentation as well as the time (how long) and place (where is going to take place).

Figure 6

2. **STRUCTURE**: oral presentations can be organized in different ways. The objective and message of the exhibition is the same, but the ideas are structured in a different way throughout the presentation. You have to think about the content of your presentation.
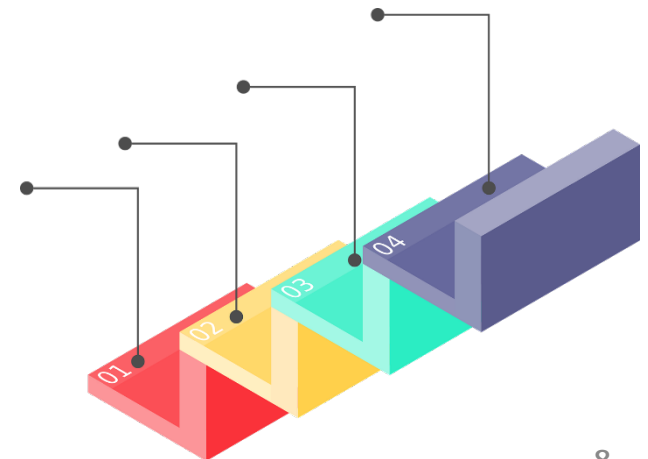
Figure 7

3. **DESIGN**: Once you have the raw material for your presentation, it is now about presenting it with an attractive and appropriate design. The slides used must have an appropriate aesthetic format that facilitates the reading and understanding of the message to be transmitted. This requires the proper use of visual resources, font, as well as some basic design knowledge.

Figure 8

4. **ORAL PRESENTATION**: It's time to speak in front of the audience. We must take into account components of verbal and nonverbal language.
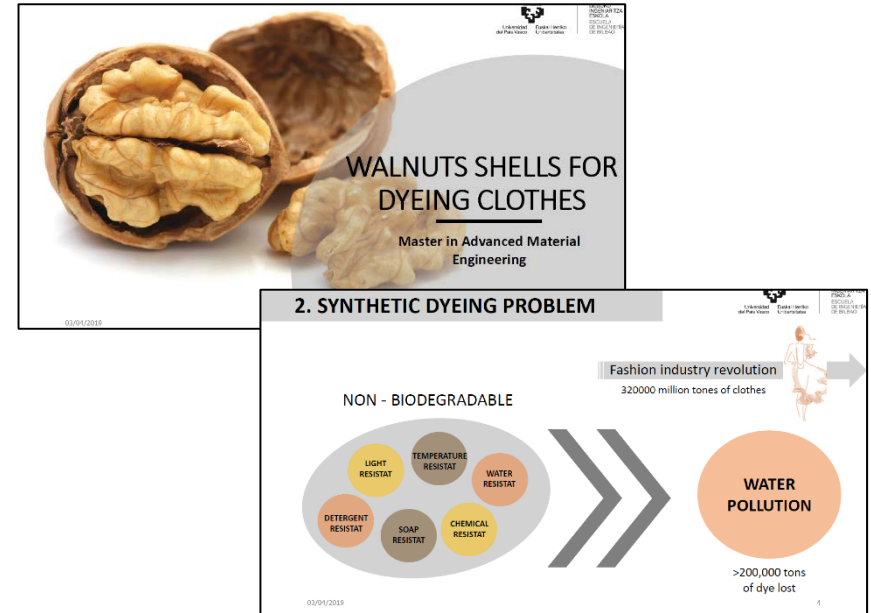

Figure 9

Planning	Structure	Design	Presentation
• Objective? • Audicience? • Time? • Place?	• Select the content of the presentation. • Organise ideas.	• Power point slides • Use of visual aids: Figures, tables, videos	• The good use of language. • Body language and gestures. • Voice quality • Face the questions of the audience.

"There is a difference between knowing the path and walking the path"
[Morfeo, The Matrix]

4.2.1 Planning

❑ If you are planning to give a talk, you have to determine some things beforehand:

1. Who is your audience?

2. What do you want to accomplish? What is your intended take home message for the audience?

3. How can you meet your listeners' needs and accomplish your goals?

Figure 10

AUDIENCE

❏ It is important to know the type of audience that you are going to face in order to oral communication to be more effective. The use of language as well as the visual resources must be adjust to the audience.

❏ To direct and structure your oral presentation properly ask yourself the following questions and focus all your efforts on building your presentation based on the answers achieved:

1. **What brings these people together in this place at this time? What common interests do they have?:** Answering these questions will help you to understand their needs and expectations.

2. **How technical is this audience? How much does your audience already know about your topic?:** These questions are important in targeting the technical level of your presentation. If it is too technical, you lose your audience immediately; if it is too simplistic, you risk sounding condescending.

3. **What does the audience want from this presentation?:** Understanding what your audience's expectations are may be helpful in structuring and designing your oral presentation.

- Does the audience just want to be informed?
- Does the audience expect results?
- Does the audience expect graphs or other special visual aids or a product demonstration?
- Does the audience expect a specific presentation or something more general?
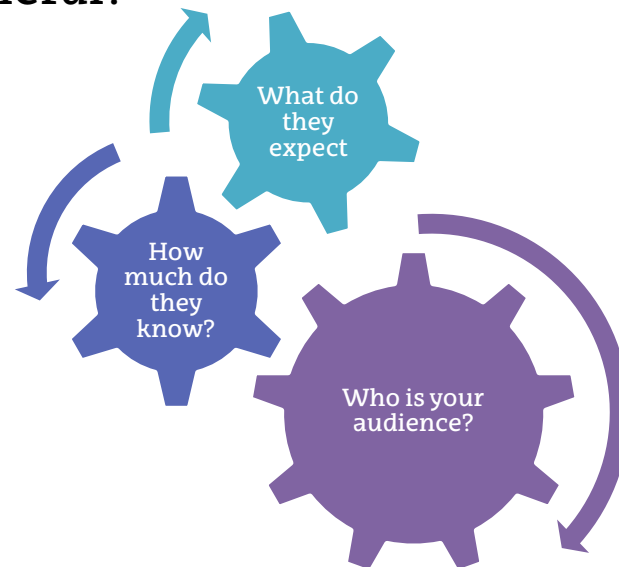

Figure 11

THE OBJECTIVE OF YOUR PRESENTATION: THE MESSAGE

❑ It is important to set the objective of your presentation. Identify your goals.

❑ The question you should ask yourself is: What do you expect to happen as a result of your presentation?

❑ Every presentation has a **message**. The message must be **clear and short.**

❑ Usually the topic of the presentation is often confused with the message. Two presentations may be focused on the same topic, but have different message.

Figure 12

THE SEVEN PROPERTIES OF A MESSAGE

UNIQUE   **UNAMBIGUOUS**   **SHORT**   **EMOTIONAL**

1   ?

BENEFICIAL   **PERSONALIZED**   **PROVOCATIVE**

€   YOU   GO!

Figure 13

HOW CAN YOU MEET YOUR LIS TENERS' NEEDS AND ACCOMPLIS H YOUR GOALS?

❑ The recipe for any successful presentation will need to include several ingredients.

1. A brief, dynamic introduction to your presentation.

2. Your regard for the audience.

3. Help the audience feel your excitement for all your dedicated work.

4. Emphasis on significant conclusions.

5. Words that reach every person in the audience.

6. Minimize details about techniques and methods.

7. A succinct, clear summary and reiteration of the take-home message.

8. Allow 5 to 10 minutes for questions.

ADAPT TO THE CIRCUMSTANCES

❑ Circumstances or context are decisive when presenting. Each presentation is unique and unrepeatable.

❑ Study the circumstances and adapt to them.

❑ Familiarize yourself with the place of presentation.

❑ Do not go beyond the established time. It ends before the permitted time.

Speak the 80% of the permitted time

BEFORE SPEAKING IN PUBLIC, THINK IN PRIVATE!

4.2.2 Structure

❑ Do not try to tell everything during the presentation. If you transmit a lot of information at the end the audience ends up disconnecting.

❑ To present is **to select** and **order ideas**.

- Select the most relevant material which best contributes to communicate your message for a specific audience, place, and time.
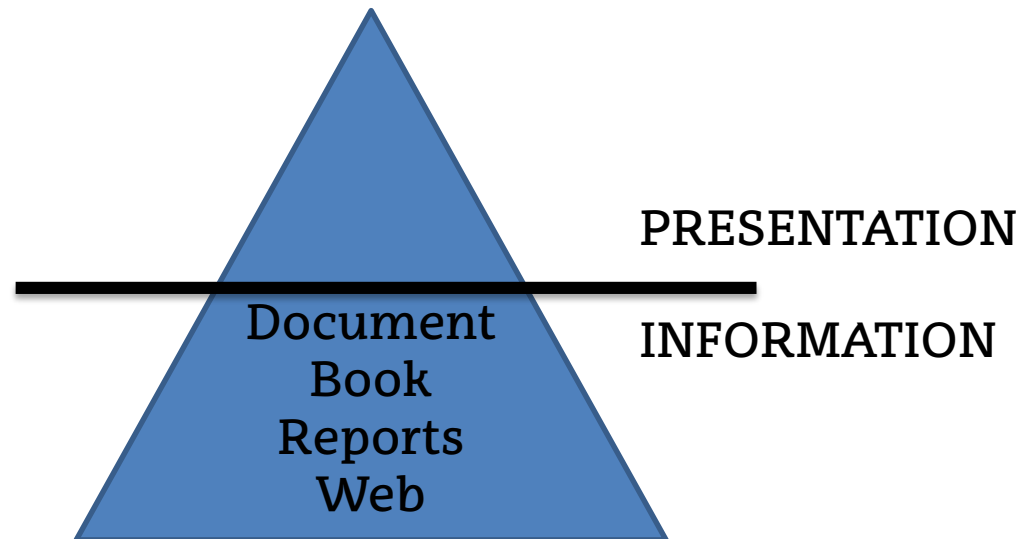
PRESENTATION

INFORMATION

Document
Book
Reports
Web

Figure 16

ORGANIZING IDEAS

❑ Use the **hierarchical organization** to sort your ideas: **from the most important to the least important.**

❑ This organization is very suitable for presentations whose purpose is to inform or teach.

❑ The inverted pyramid presents the information in descending order of importance: the most relevant at the beginning, followed by progressively less important information based on the previous one.
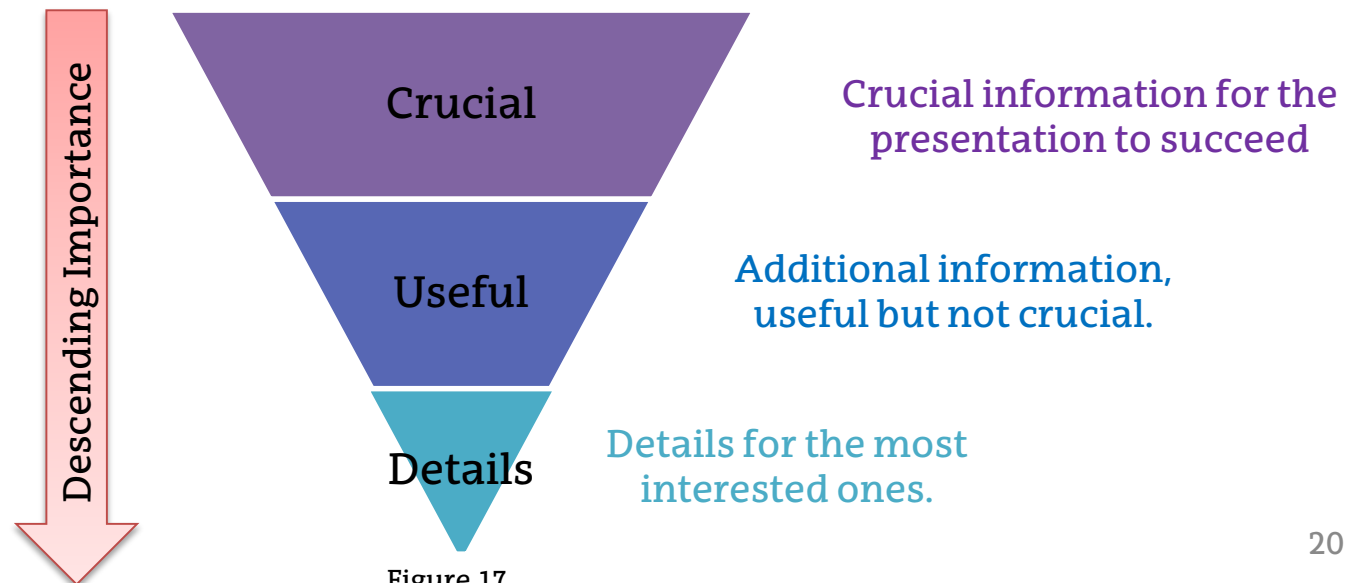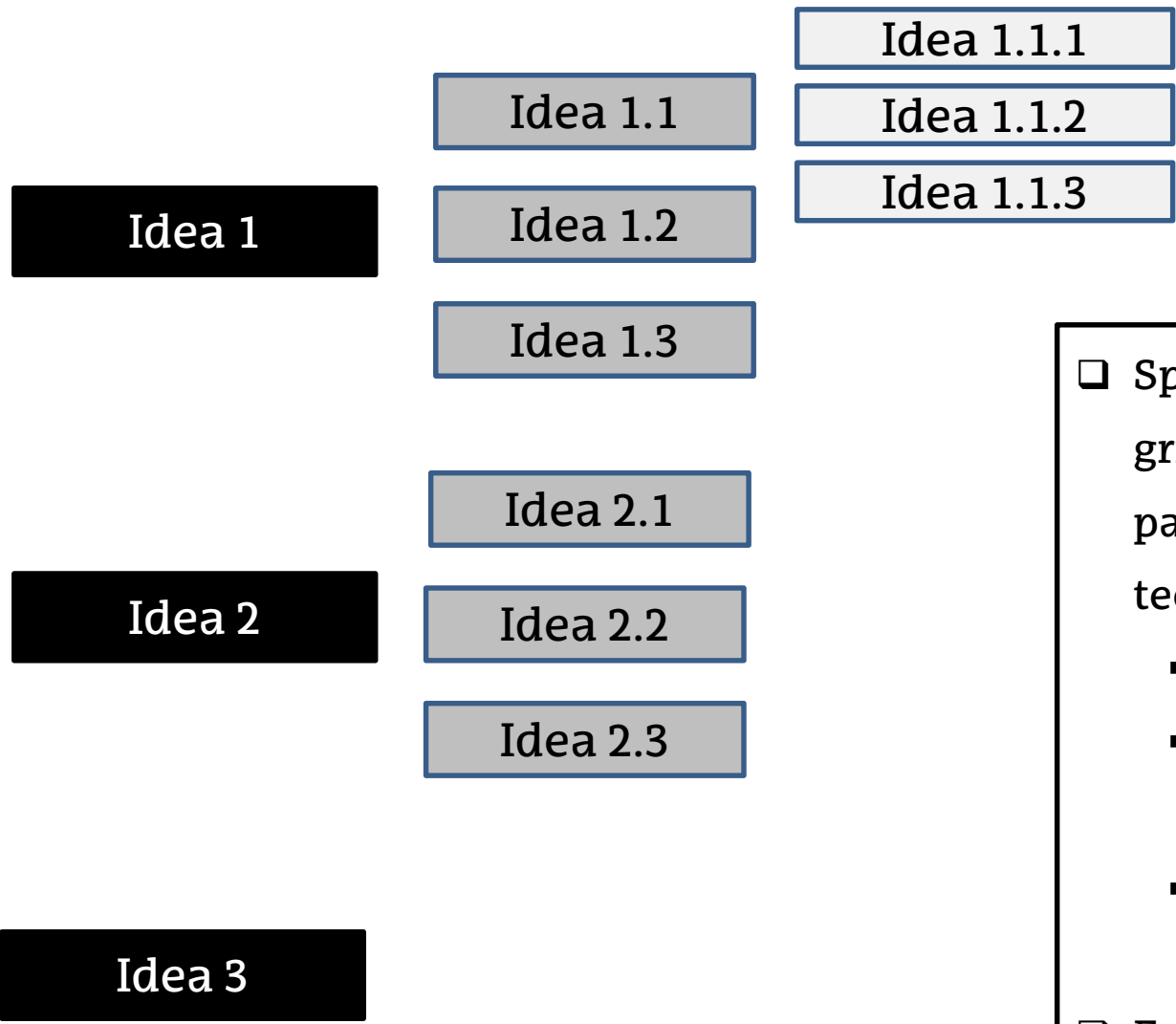
Descending Importance

Crucial — Crucial information for the presentation to succeed

Useful — Additional information, useful but not crucial.

Details — Details for the most interested ones.

Figure 17

❑ Pay attention to the **Rule of Four** or **Chunking** technique.

- Research in cognitive science reveals that the audience remembers lists of 2,3 and 4 elements. That is, the audience cannot retain more than 4 groups of information at a time.

- *Chunking:* If you necessarily need to present a list of more than 4 elements, then divide it into several lists (no more than 4) composed of a lower number of elements (no more than 4) and so on.

Idea 1.1.1

Idea 1.1.2

Idea 1.1.3

Idea 1.1

Idea 1.2

Idea 1.3

Idea 1

Idea 2.1

Idea 2.2

Idea 2

Idea 2.3

Idea 3

❑ Spatial arrangement of a grid of the hierarchical pattern using the chunking technique.
- 3 main ideas
- Each main idea has 3 secondary ideas.
- Each secondary idea has 3 tertiary ideas.

❑ Each idea is presented in a slide.

FORMULAS FOR STRUCTURING THE PRESENTATION

1. INTRODUTION-BODY-CONCLUSIONS

❑ The most common one.

❑ The key message should be in the introduction of your talk. The body of the talk should be built around that key message, and the conclusion should serve to reinforce the key message.

❑ The body can be arranged in different ways:

- ▪ <u>Logical or sequential order:</u> present the facts in the same order in which they happened. For example: describe the phases of a project.

- ▪ <u>Location order</u>: Organize ideas according to their physical location. Arrange the material according to its physical location in a plan or design. For example: organigram of an organization.

- ▪ <u>Problem/solution</u>: First, the problem is presented and then the solutions. It is widely used in the scientific field.

- ▪ <u>Thematic or hierarchical order:</u> it is used to group ideas on some topics logically from a central point. Especially useful for informative presentations.

❑ The conclusions:

- The closure is your chance to cement the key message in your lsteners' minds. It is often the only thing that is remembered.

- The slide of conclusions is the most important:

  ✓ Summarize your conclusions, results or findings and relate them to your key ideas.

  ✓ Project this slide as long as possible.

  ✓ Craft a final sentence that captures your real message.

  ✓ It must be remembered: enter your web address, email, Twitter user or other similar data.

- Do not cut any material from your conclusions. It is preferable to shorten the body and extend the conclusions.

2. **QUESTION AND ANSWER**

❑ Use the introduction to pose a question.

❑ The body of the talk consists of the gradual unfolding of the answer to that question. Very often a research question can be broken down into a series of smaller questions.

3. **AIDA (*Attention-Interest-Desire-Action*)**

❑ Gain the attention of your audience, attract their interest, create desire and call for action.

❑ It is particularly suited to speeches in which you want to convince an audience to do something specific.

4. **THE MOTIVATED SEQUENCE**

❑ Get attention, show a need or problema, present a solution, visualize the results, request action or approval.
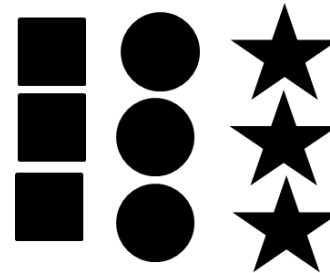
4.2.3 Design

❑ Design is necessary because it helps to organize information and to show it more clearly.

❑ The design is not to fill and decorate slides.

❑ Slides that are easy to process generate more positive feelings, which translate into a greater willingness to agree with the ideas.

❑ There are 4 basic design principles:
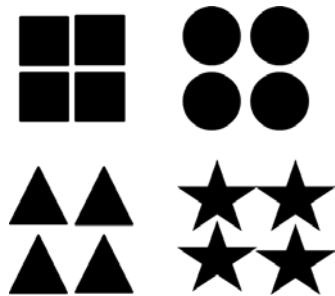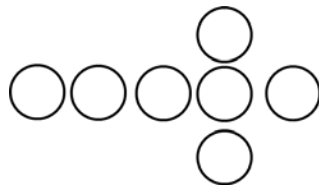
PROXIMITY   **ALINGMENT**   **REPETITION**   **CONTRAST**

Figure 18

THE 4 BASIC DESIGN PRINCIPLES

1.-PROXIMITY

❑ PRINCIPLE OF PROXIMITY

- Group related items together.

- When several elements are physically close, our brain tends to group them into a visual unit instead of perceiving them as separate units.

- Unrelated items should not appear next. Objects that are unrelated should be separated by a blank space.

❑ PRINCIPLE OF THE SIMILARITY

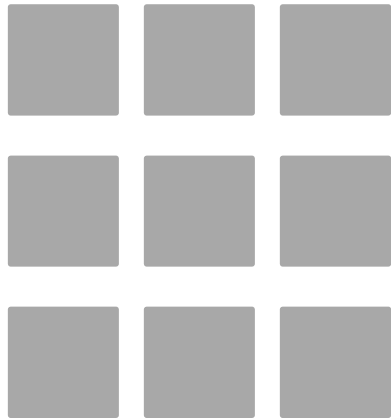- The mind groups similar elements into a visual unit.

- They depend on the shape, size, color and other visual aspects.

❑ PRINCIPLE OF THE CONNECTION

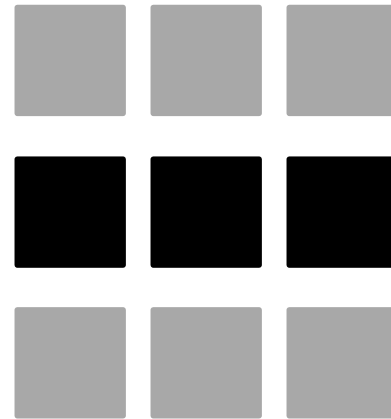- Elements connected with lines are perceived as being part of the same group.

❑ PRINCIPLE OF THE ENCLOSURE

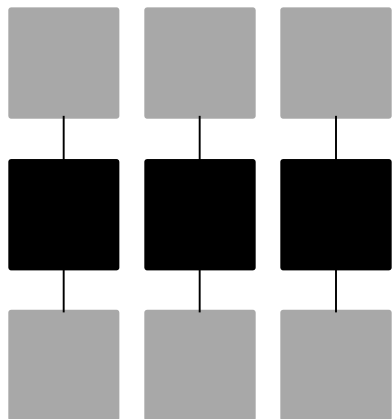- Items that are enclosed are seen as part of the same group.

PRINCIPLE OF PROXIMITY

PRINCIPLE OF THE SIMILARITY

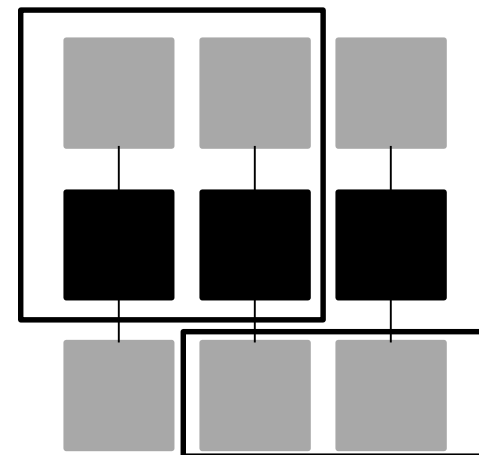# PRINCIPLE OF THE CONNECTION

PRINCIPLE OF THE ENCLOSURE

Figure 19

28

▪ EXAMPLES of the PRINCIPLE OF PROXIMITY:

A

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Figure 20

B

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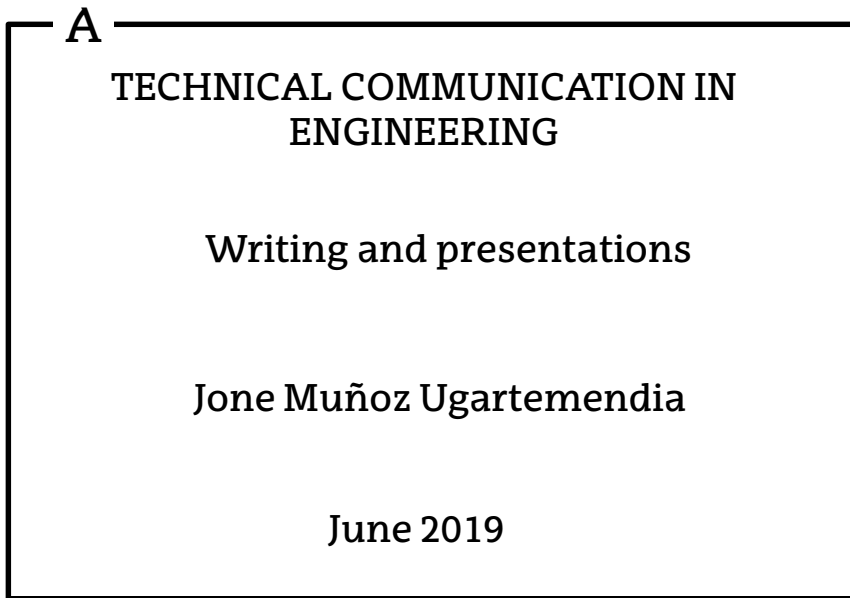
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June 2019

Figure 21

A. Slide centered, equally spaced to homogeneously fill in all transparency:

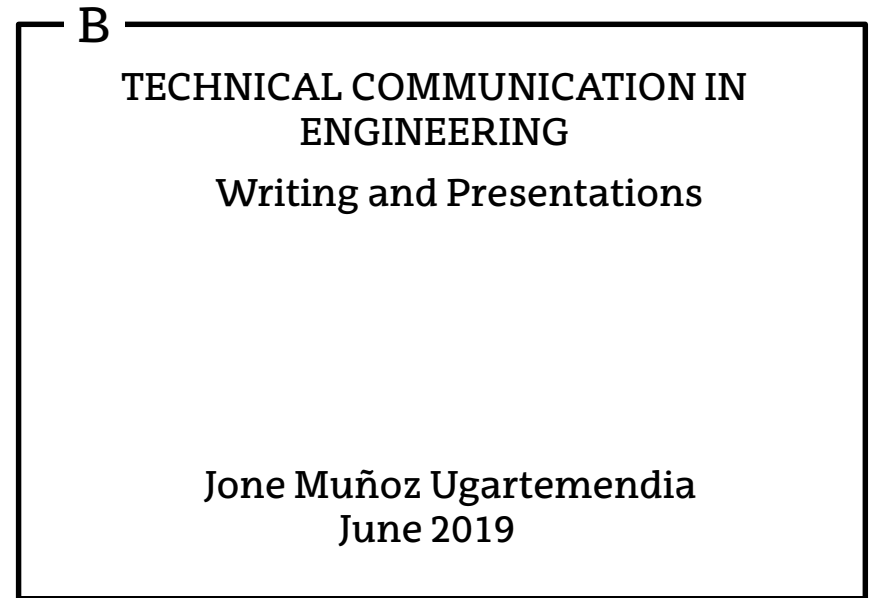- An element in itself appears on each line. It gives the impression of containing 4 independent information units.

B. Slide applying the principle of proximity.

- Two independent information units are clearly perceived: the title with the subtitle and the author's name with the date.

❏ The empty space between elements is as important as the elements themselves when organizing information in visual units. That facilitates assimilation.

❏ Example :

  ▪ On the left the original slide: very intrusive with little space between elements and redundant text that does not provide information to the graphic.

  ▪ On the right: the final result after eliminating everything that does not contribute to transmitting the message. The white space highlights the positive elements and their relationship.
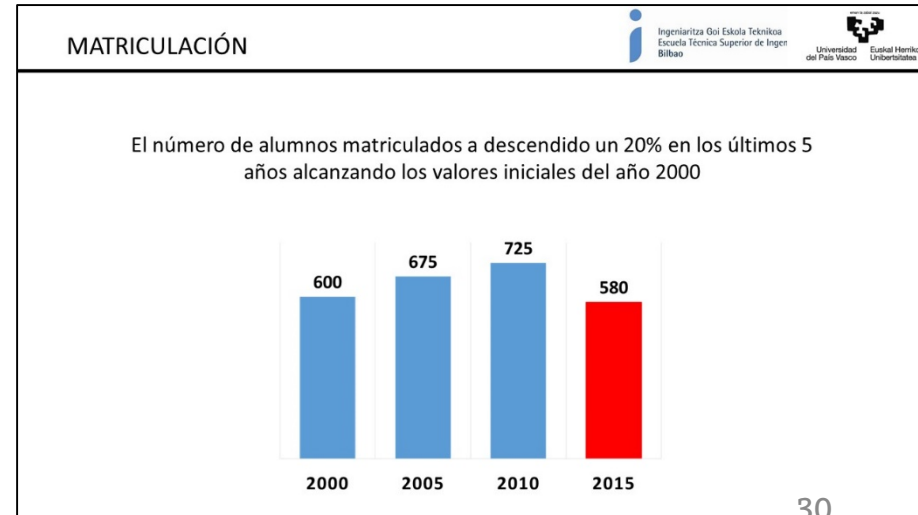

Figure 22

❑ Integrating text and images close to each other leads to a better understanding than when the text is far from the image.
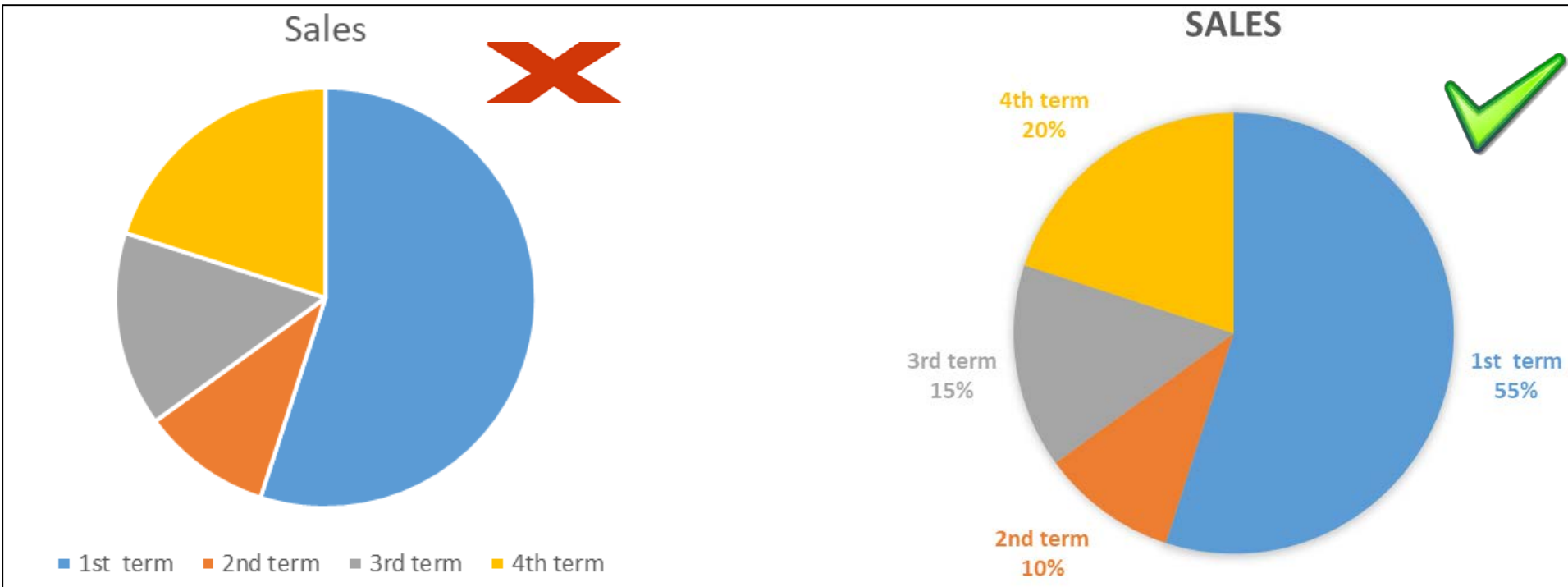

Figure 23

2.-ALINGMENT

❑ Do not place anything in transparency arbitrarily.

❑ Correct alignment of the elements within a transparency improves cognitive fluency and aesthetic impact.

**Which of the two slides
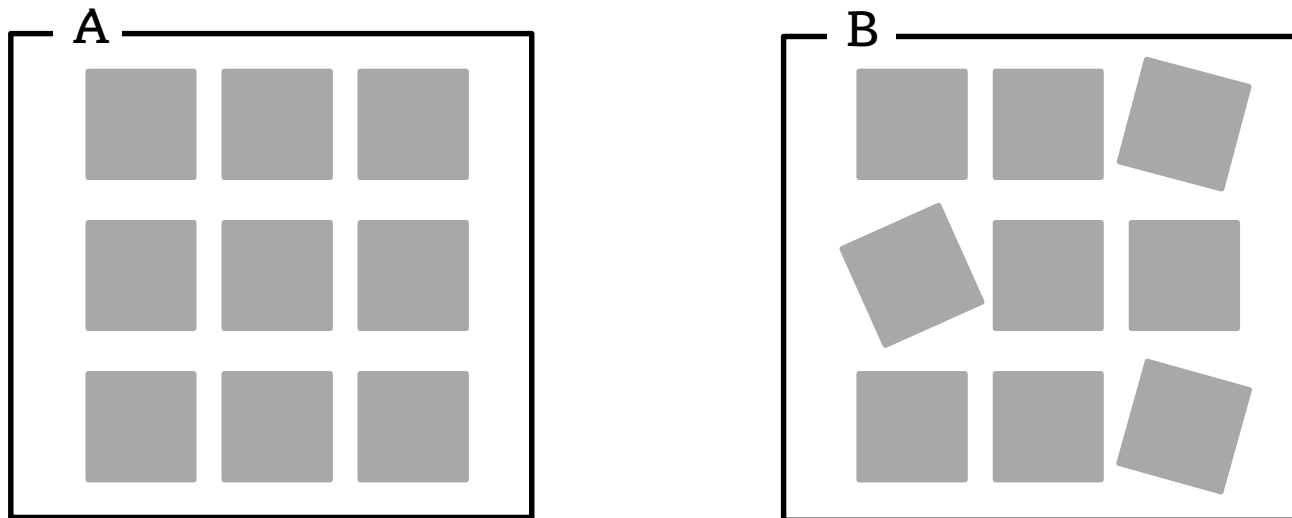it is easier to understand ?**

Figure 24

❑ Apply the rule of the thirds.

- The primary element within the design is then positioned at one of the four intersections of the grid.

Figure 25

❑ Place the different elements according to their importance.

- Western readers are used to reading from left to right and from top to bottom.

- Western readers process information from an image starting from top to left and moving down and to the right.

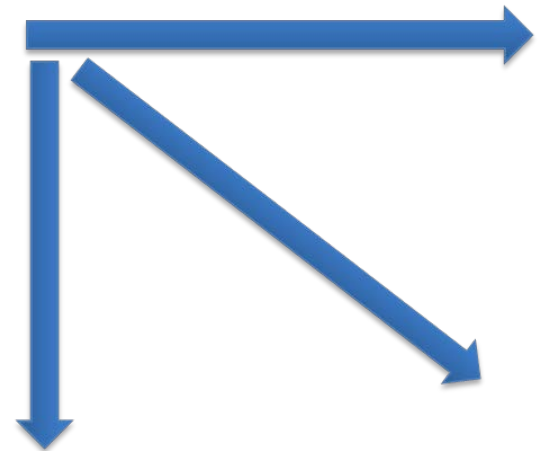- We capture before what is on the top and more to the left and we tend to consider it more important.
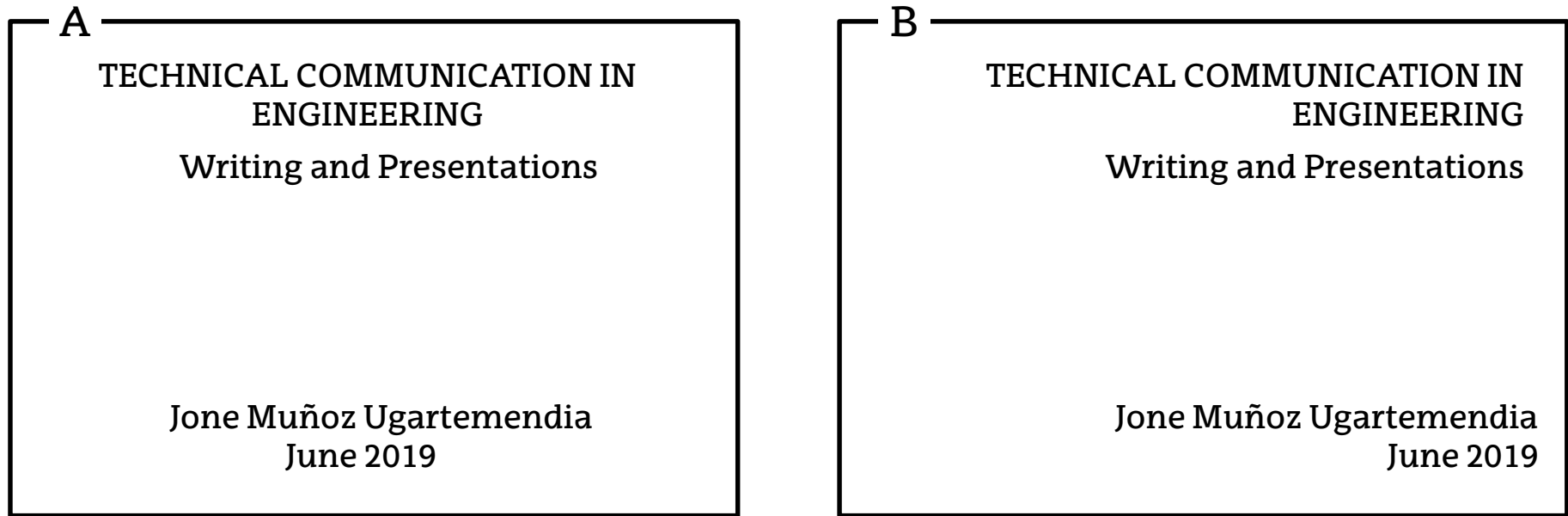

Figure 26

- EXAMPLE of the PRINCIPLE of the ALINGMENT:

A

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B

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Figure 27

A. Slide with a central alignment.

B. Slide with a right alignment.

- The right or left alignment provides a more professional finish than the central one.

3.-REPETITION

❑ Repeat some design aspect throughout your presentation:

❑ Use templates: the appearance will be consistent throughout all transparencies. The template consists of using the same font and sizes with identical colors in titles, bullet lists, tables, graphics, etc.
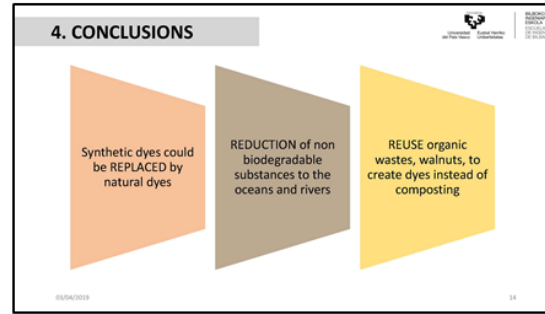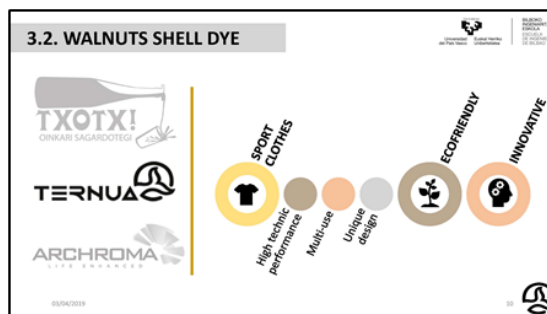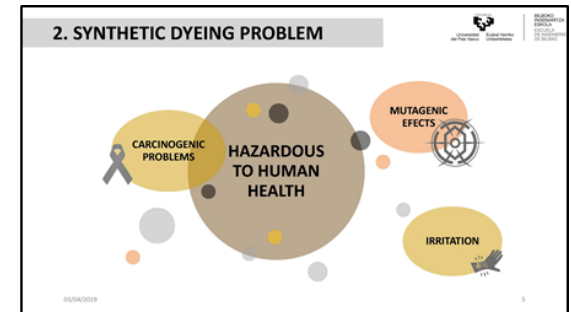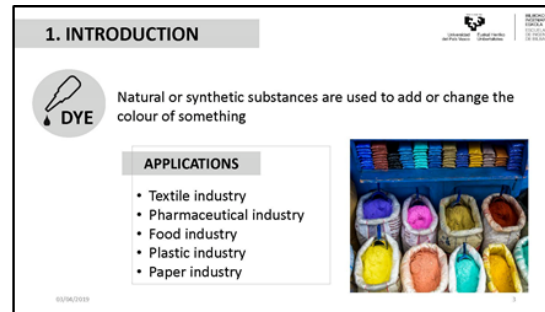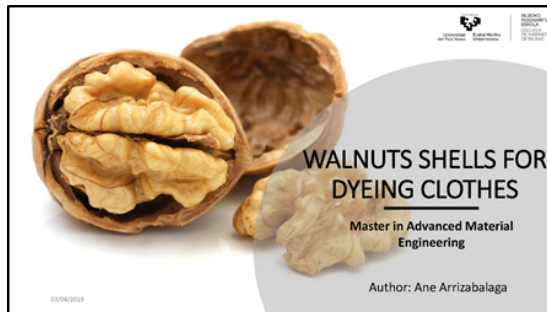

Figure 28

- E XAMPLE of the PRINCIPLE of REPETITION:

> ── A ──────────────────────
>
> **TECHNICAL COMMUNICATION IN ENGINEERING**
>
> Writing and Presentations
>
>
>
> **Jone Muñoz Ugartemendia**
>
> June 2019

Figure 29

A. Transparency with an alignment to the left and internal repetition.

- The type of source is repeated in the title and in the name of the author, which reinforces its connection even if they are very far from each other.

- Use bold to increase contrast and emphasize their relationship.

4.-CONTRAST

❑ Contrast means difference.

❑ The difference between the elements may consist of the following :

Size　　　**Shape**　　　**Tone/Colour**　　　**Orientation**　　　**Position**
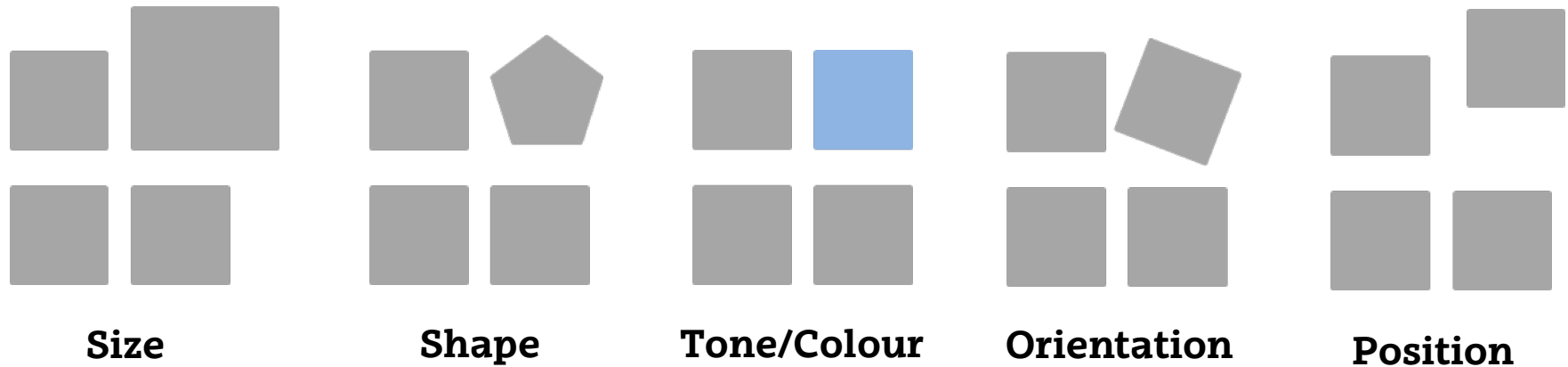
Figure 30

❑ We interpret larger elements as of greater importance; those who have a stronger or more vivid tone are considered more relevant; those above are understood to be more important.

- EXAMPLE of the PRINCIPLE of CONTRAST:

A

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B

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Figure 31

A. Slide with an alignment to the left and internal repetition.

B. Slide A with an increase in contrast by adding black boxes.

- EXAMPLE of the 4 BASIC PRINCIPLES:

Figure 32

DESIGN AND PREPARATION OF VISUALS

❑ Visual resources are essential in a presentation.

    1. Type of font.

    2. Use of table and figures.

❑ When designing visual resources consider: **present one idea per slide**..

❑ Visual resources should be used **to illustrate ideas** and as **reinforcement** of the presentation **message**. They should not be used as decorative elements or as padding.

1.-TYPE OF FONT

❑ What type of font do I use in my presentation? One that can be read easily and makes you and your audience comfortable.

❑ The size should be large enough to be read effortlessly from the back of the room.

❑ Avoid writing everything in capital letters, all in italics or all in bold.

❑ Never underline: the underline cuts the bottom of the letters of descending lines (j, g, q).

❑ Use different colors just to emphasize or to indicate different kinds of information.

❑ Use different fonts just to emphasize or to indicate different kinds of information.

- ❑ Use fonts that are easy to read: types without serif are best read on the screen.

- ❑ The text must be perfectly distinguished from the back of the room. Do not use capricious colors for the text, or exotic or degraded textures for the backgrounds.

Serif
Las fuentes con serif se leen con dificultad
(Times New Roman, Garamond)

Serif
Utiliza fuentes sin serif
(Helvetica, Arial, Verdana)

Serif
Las fuentes con serif se leen con dificultad
(Times New Roman, Garamond)

Serif
Utiliza fuentes sin serif
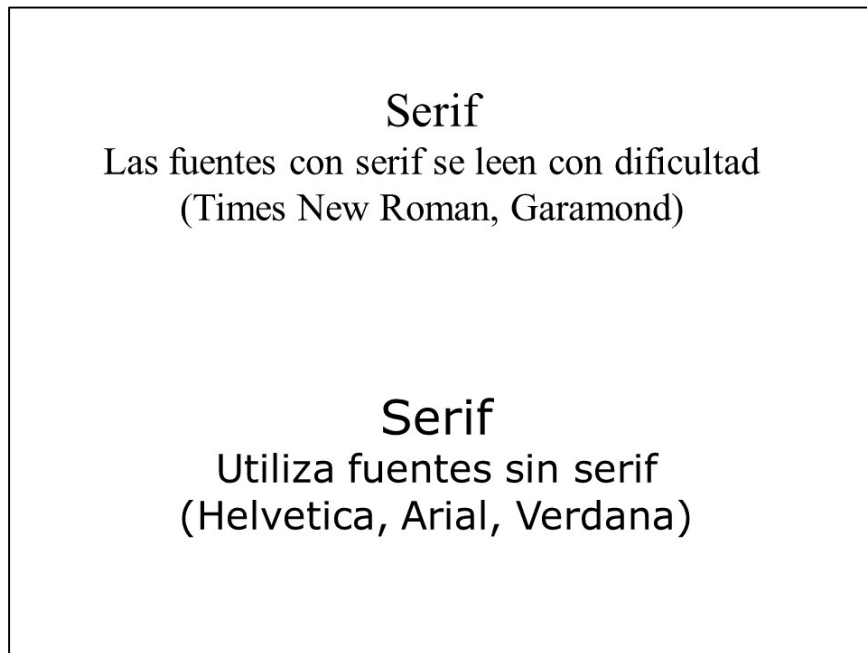(Helvetica, Arial, Verdana)

Figure 33

2.-USE OF TABLES AND FIGURES

❑ The reason for using tables and figures is to illustrate or clarify something. All figures and tables that appear in a presentation must be mentioned and explained.

❑ Make the following questions:

- Why is it there?

- What does it represent?

- Can you clearly see what it says from the last row?

- Does it reinforce the message?
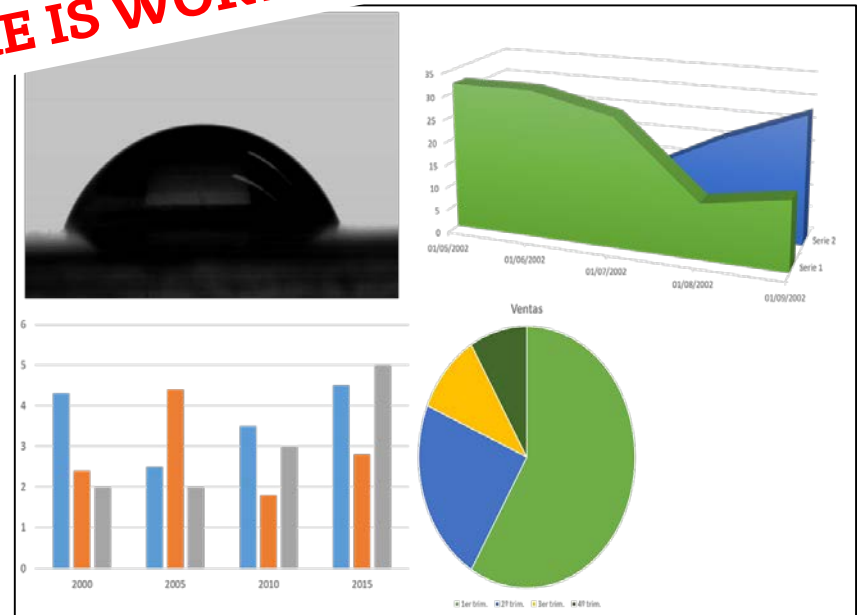
- Is it really necessary to be there?

Figure 34

❑ **TABLES**: They are used when the objective is to show exact individual values or when it is critical to accurately show quantitative values. As a general rule, its use in presentations is not highly recommended.

❑ **FIGURES**: They are used when the message you want to communicate lies in the shape of the data: patterns, trends and exceptions. It is more advisable to use figures in a presentation (photos, graphics, diagrams,charts, etc.)

Table 1

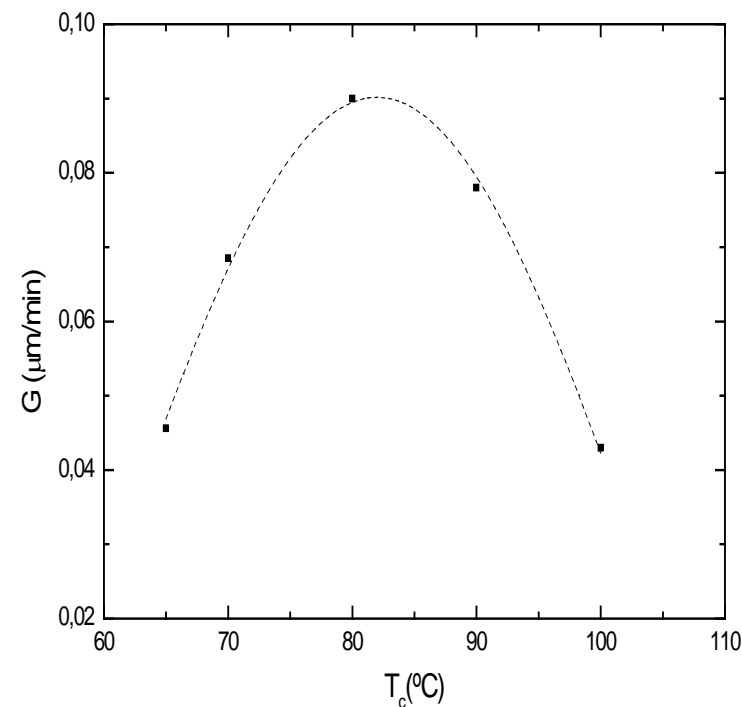| T_c	G (m/min)
65	0.0456
70	0.0685
80	0.09
90	0.078
100	0.043

Figure 35

44

❑ Tables and figures should be as simple as possible..
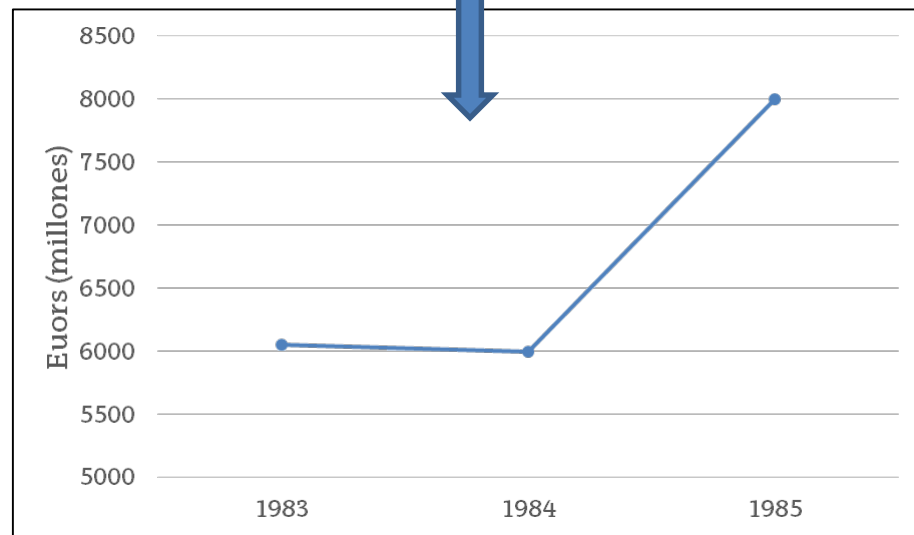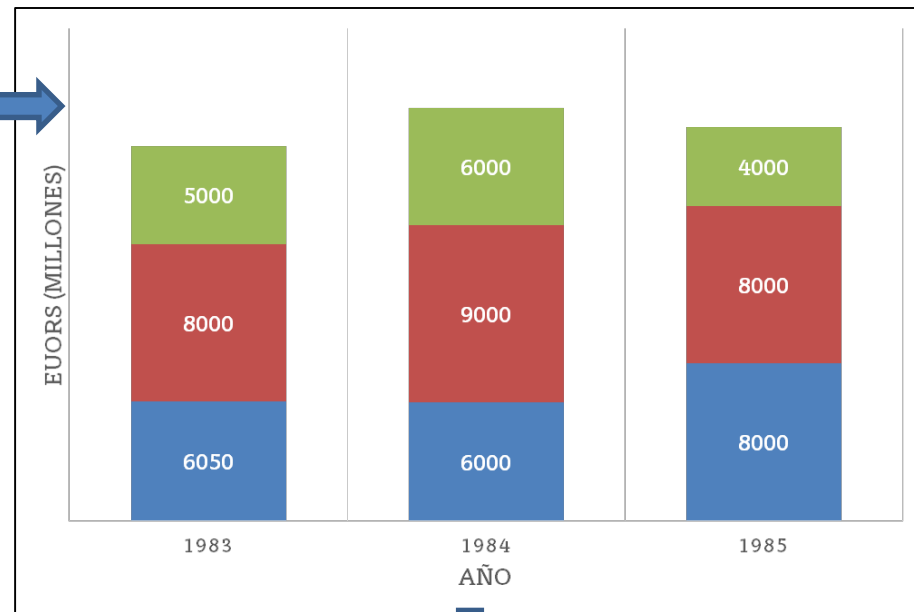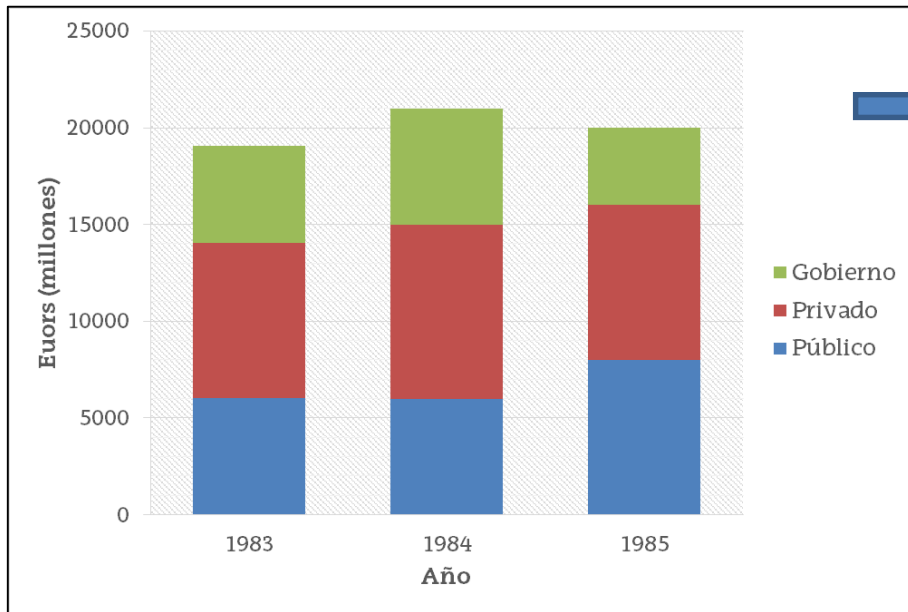
Figure 36

4.2.4 Oral Presentations

❑ It is the last step. The only way to improve your skills as a speaker is to practice. Practice as many times as necessary before the day of your oral presentation. It is advisable to practice out loud and not mentally.

❑ Rehearse in front of people and listen to their recommendations.

❑ It is advisable to record yourself on video and analyze the presentation before the big day.

❑ For an oral presentation to be successful there must be a balance between your **verbal messages** (what you say, the content), **paraverbal messages** (nuances of voice such as intonation, volume, etc.) and **nonverbal or body messages** (gestures, postures, movements, etc.).

THE VOICE

❑ In addition to what you say, it matters how you say it.

❑ The voice is the tool to communicate your message.

❑ You should pay attention to the following paraverbal elements:

- **The Volume:** if you are not heard, what are you presenting for? Speaking low often reveals shyness, while speaking in a powerful voice denotes confidence. You can play with volume changes to attract attention.

- **Articulation/vocalization:** articulate the sentences clearly. Vocalize correctly.

- **Pacing:** the changes of rhythm offer contrast to your talk giving more interest to your speech. Changing the rhythm helps to create a melody to your text, a presentation without changes in the rhythm can be very boring.

- **Intonation:** Vary the tone of your voice. Monotony is one of the greatest enemies of a presentation.

- **The use of Pet Words:** Avoid useing pet words (ehhhh, ummm, bueno, o sea, etc.)

- **Pauses:** Include pauses. Inserting a pause lends emphasis to what you have just said.

So...

O sea

eeehhh

uummm

bueno

Ok!

NON-VERBAL COMMUNICATION: Body language

❑ Your audience forms impression of you before you open yur mouth, You have no a second chance to impress them.

❑ You must know how to control your nonverbal language..

1. What to do with your hands.

2. Where and how to look

3. Where to locate yourself and how to move.

4. The enthusiasm.

1.-WHAT TO DO WITH HANDS AND ARMS

❑ Catalog of things not to do:

- Do not keep them in your pockets.Move them freely.

- Do not clasp hands in fig leaf position (in front of you) or in military at-ease position (behind your back).

- Do not grip immovable objects s uch as furniture or lectern.

- Don't pass your hands in front of your mouth when speaking.

- Do not have them hanging at your side, tensed in "gunfighter" position.

- Do not play with your hair, jewelry, necktie, or microphone cord.

- Do not occupy them with pointer waving, or coin and key jingling.

❑ Become aware of your bad gestural habits: repeatedly touching your face, hair, rubbing your chin, playing nervously with the ring, smoothing your clothes repeatedly, continuously adjusting the glasses, crossing and uncrossing your arms, sticking and taking your hands out of your pockets.
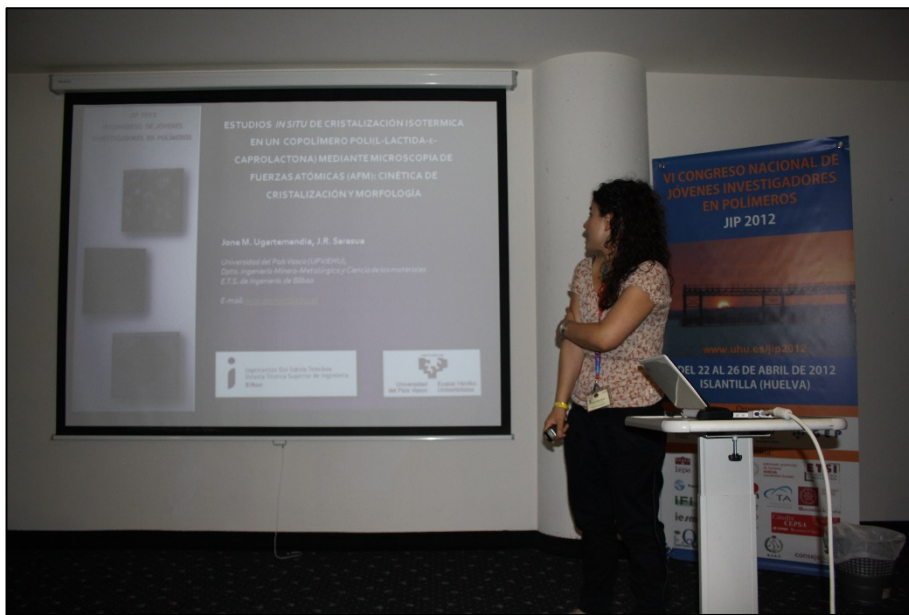
❑ Use the laser pointer with caution.

Figure 37

Figure 38

2.-WHERE AND HOW TO LOOK

❑ Look at your audience. Eye contact with your audience.

❑ Don't direct your talk to the ceiling, back wall or floor.

❑ Don't be all the time looking at the screen.

❑ Do not look only at an individual in the audience. Talk to everyone.

❑ Transmit confidence with your eyes.

3.-WHERE TO LOCATE YOURSELF AND HOW TO MOVE.

❑ Take a firm but comfortable posture.

❑ The movement must be firm and determined, never involuntary or nervous.

❑ It is not convenient to remain stacked in the same place all the time. Move around the stage while talking.

❑ Never turn your back on the public.

4.-THE ENTHUSIASM

❑ If you don't present yourself enthusiastically, why should your audience listen to you?

ENTHUSIASM

Figure 39

4.3 TIPS

❑ An oral presentation requires planning and a lot of practice.

❑ Leave your message clear at the beginning and end of the presentation. The elements presented at the beginning and end of a list are better remembered than those in the middle.

❑ You don't have a second chance to make a good impression.

❑ Explain how you have structured the presentation so that your audience knows at all times what your talk is about.

❑ You have 10 minutes to hook your audience.

▪ Memorize your input phrases.

▪ Introduce yourself if you have not been previously introduced.

▪ Create an attractive introduction.

❑ Conclude strongly your presentation.

❑ Simplicity is preferable to complexity.

❑ Do not write everything in the slides. If everything is in the slide, then what are you for?

❑ Show a positive attitude.

❑ Maintain eye contact with your audience.

❑ Make pauses between sentences. Facilitate understanding to your audience.

REFERENCES

[1] Walters D. Eric y. Walters Gale C. Scientists must speak. 2a ed. Boca Raton. Editorial CRC Press; 2011

[2] Álvarez Marañon G. El arte de presentar. 10a ed. Barcelona: editorial Gestión 2000; 2018.

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