

# **Module 10.2 Information & Research**

## **Learning Unit 2 – Methodology**

Authors

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- The project is implemented within the framework of the **Cooperation for Innovation and the Exchange of Good Practices** Key Action and is funded by the **Erasmus+ Programme** of the **European Union**.

# Learning outcomes

- This module will enable you to:  
Understand the importance of materials and the connection between materials' properties and engineering technologies required to process them.
- Understand and critically evaluate aspects related to production organisation and optimisation
- Understand and critically evaluate aspects related to automation in furniture manufacturing
- Ability to understand and critically analyse the eco-sustainability aspects in furniture production

# How to learn?

- This course could be taken using a “self directed” learning approach.
- For those attending “full time” courses a lecturer will be directing your learning using the learning materials available.
- For those enrolled on a “part time” basis a mixed approach could be employed.
- Please see below recommendations for each of the situations:

# How to learn? Self directed approach

- We suggest the following sequence:
- Read the slides, watch the videos and reflect on the content.
- Read the additional text available where information is more detailed.
- If possible discuss with a colleague or register for a “Forum” and express your views.
- Test your understanding by taking the test at the end of the PowerPoint Presentation. Aim to score at least 70%
- If there are aspects that you find interesting and want to explore further access one of the texts recommended in the Bibliography

# How to learn? Full time approach

- Attend all classes and the lecturer will provide explanations while showing the slides.
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- The lecturer will present a task for you to complete that will enable you to better understand the topic. The nature of the task depends on particular circumstances.
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# How to learn? Mixed approach

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- Test your understanding by taking the test at the end of the PowerPoint Presentation. Aim to score at least 70%
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# Why study Information & Research?

- To learn the basic concepts and principles related to the information search and retrieval, because you will be able to identify, select and acquire bigger and better information in less time.
- To learn the basic concepts and principles related to the scientific research methodology, because you will know which research method fits with your investigation, the stages and ethics that it must follow, where to search and what to write in a paper.
- Because you will be able to research in any field of your specialization.



Erasmus+



## UNIT 2: Methodology

**MODULE 10:**

**SUBJECT 10.2: Research Methodology**



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of the European Union

## **TOPICS 2. Methodology**

- 1. Main aspects**
- 2. Stages of the investigation**
- 3. Research Methods**
- 4. Scientific language**
- 5. Questions**

## 2.1. Main aspects

- Science is not infallible.
  - Use of the scientific method.
- Scientific knowledge is also not infallible, it is susceptible to continuous review.
- Everything published is not Science.
- Prestigious journals and rankings have emerged for a long time, in order to detect authentic research and false.



*Early method for testing x-rays*

## 2.2. Stages of the investigation

### 1. Problem Statement

- This is the part that includes how an investigation arises or how it should arise. Initially, a problem or several will have to be considered. It must arise because:
  - a) There is an emptiness of knowledge of a phenomenon, historical fact, a discipline, a technique, etc.
  - b) After a check, or by chance, we have evidence of a contradiction with previous investigations.
  - c) We observe a new object, event, plant, animal, planet, language, etc.



## 2.2. Stages of the investigation

- Selected the problem that we are going to study, it must:
  - 1) Express the relationship between two or more variables; based on testable hypotheses.
  - 2) Have a clear approach.
  - 3) And allow for empirical verification.
- A project or research work must have the following characteristics:
  - a) To be relevant.
  - b) Be correct and precise.
  - c) Being resolvable.
  - d) Be repeatable.
  - e) Must be framed in a theory.



## 2.2. Stages of the investigation



There should be a question to solve to start an investigation



## 2.2. Stages of the investigation

### 2. State of the Art

- The analysis of the previous bibliography.
  - The available sources.
  - The origins of the problem.
  - The evolution of the problem.
  - The methods used.
  - The problems that have arisen.
  - The results obtained.
  - Any information that may help the researcher in all the phases of his work.





## 2.2. Stages of the investigation

- Not only locating the sources, nor reading them, but analysing them.

*An investigation must be started reading  
what others have write about the problem*



## 2.2. Stages of the investigation

### 3. Formulation of hypotheses and objectives

- Moment to affirm the need for the work based on what exists or the shortcomings of it and to define the topic of study. Examples:
  - Positivism has contributed to the technological development of society. The results of the investigation will confirm or disprove whether the statement (the hypothesis) is true.
  - Automatization leads to more efficient manufacturing processes.
  - Chair design responds to socio-economic situations of societies.



## 2.2. Stages of the investigation

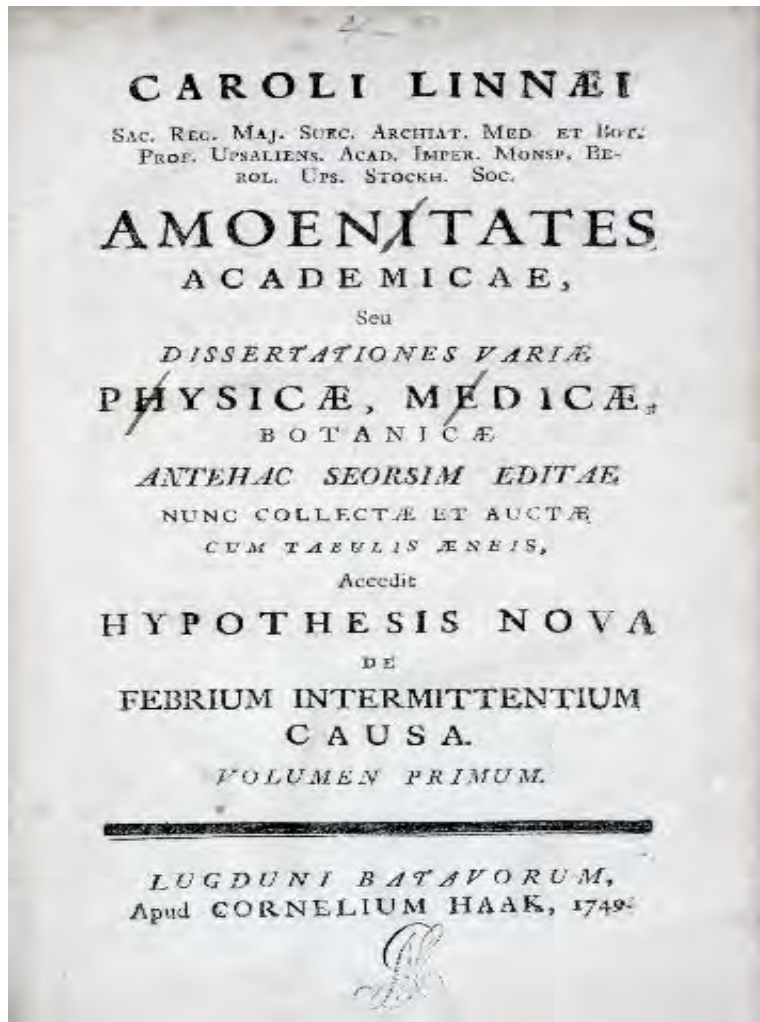
- Therefore, a hypothesis must:
  - Be verifiable or empirically demonstrable.
  - Comply with the principle of parsimony, i.e. between two or more possibilities to choose the simplest one.
  - Answer the problem or apply to it.
  - Be precise, specific and logical.
  - Be descriptive, to explain the phenomenon.
  - Be susceptible to quantification.
  - Be generalizable.
  - Have many consequences.



## 2.2. Stages of the investigation

- Objectives arise as ways of carrying out a work to achieve answers to the hypotheses launched. Examples:
  - Check if foreigners could reach boards of national furniture firms.
  - Discover if the alliances between design studios are positive for exchange of practices of their workers, or if there is another feature that is more positive for their knowledge acquirement.
  - Study the manufacture process of upholstery in Rumania during the last two decades.

## 2.2. Stages of the investigation



Carl Linnaeus proposed hypothesis about fever in 1749

## 2.2. Stages of the investigation

### 4. Data collection methods

- Once the hypothesis that gives rise to the research is established
- Collection of information and data with which to verify the authenticity of the hypotheses.
- Before proceeding to this it is necessary to choose which method will be used, which will depend a lot on the scientific discipline of the study.
- When methodology is determined, the work plan is established. For more qualitative research it is also necessary:
  - To sample the data that need to be studied and verified
  - The instruments or measurement or analysis techniques
  - The procedures to follow, assumptions and limitations.





## 2.2. Stages of the investigation



Is not always simple to analyse data

## 2.2. Stages of the investigation

### 5. Analysis of data and results

- Once the information of the previous stage is collected, it is available to process and analyse it.
- Veracity of the initial hypothesis can be contrasted, for which a rigorous work with the research data is necessary.



## 2.2. Stages of the investigation

### 6. Discussion

- Results and deductions obtained are compared with other previous ones on the subject.
- Small report is written on the validity of the research carried out, errors, or need for future work in some aspects.
- If the study is the first, it can be established relationships and comparisons with similar topics, clarifying the differences.

## 2.2. Stages of the investigation

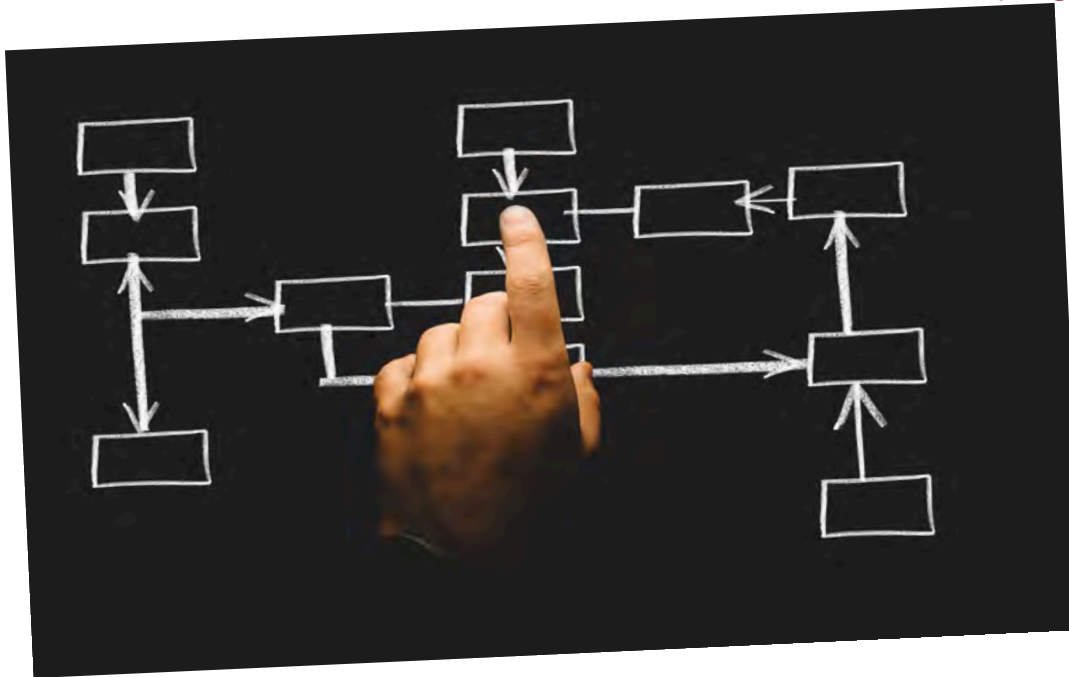
### 7. Conclusions

- Conclusions must be drawn from what has been investigated. To extract conclusions are used:
  - Analysis obtained in the previous phase is used.
  - The bibliography that exists on the subject.
  - The method of data collection.
  - The selection of the sample.
  - The instruments.
  - The design.
  - The procedure followed, etc.

## 2.2. Stages of the investigation

- The conclusions of a work are especially relevant and useful for further studies thanks to the data and theories they offer, but especially thanks to the experience they provide, which is the basis for the progress of Science.

*The stages of the scientific investigation  
compose a recursive structure*



## 2.3. Research methods

## 2.3. Research methods

- The scientific method is one, which produces works that are based on a series of characteristics:
  - They demonstrate knowledge of the existing literature on the subject.
  - They have a systematic nature.
  - They start from a series of premises, research questions, hypotheses and/or objectives, that determine the development of the next stages of the work.
  - They have scientific validity.
- There are other specific methods used to respond to the research needs of the different areas of knowledge.
  - The most easily identifiable difference is that which distinguishes quantitative areas, in which the figures and data are easily identifiable (experimental sciences) from which it is not so easy to quantify variables and parameters, for what is called qualitative (many of the areas of the social, legal and humanities sciences).



## 2.3. Research methods



## Different problems, different methods



## 2.3. Research methods

### 1. Descriptive method

- The first method that appeared as a result of an investigation was the descriptive one.
- It starts with the description of the object, phenomenon, disease, language, fact, species or any other aspect.
- The stages are:
  - Definition of the problem, object, species or aspect of the one that is investigated.
  - Detailed description of it.
  - Detailed evaluation.
  - Interpretation.
- This way of research presents two problems:
  - The phenomenological reductionism.
  - The difficulty in finding valid control and evaluation methods.



## 2.3. Research methods

### 2. Historical method

- It is the one used to find out what happened in the past.
- Based on the interpretation of primary sources.
- Necessary to use it when a researcher goes into the history of a subject.
- Stages:
  - Definition of the problem.
  - Historical moment characterization.
  - Delimitation of the research scope.
  - State of the art.
- Identification and analysis of the sources.
- Formulation of research questions, hypotheses and/or objectives.
- Data Collect.
- Understanding and interpretation.
- Verification of hypotheses.
- Conclusions.
- The biggest problem with this method is that subjectivity can appear in the interpretation of sources and context.





## 2.3. Research methods



Primary documents are the basis of the Historical method. Rule of St. Benedict

## 2.3. Research methods

### 3. Comparative method

- In this method to compare is what is done.
- Interdisciplinarity is very necessary.
- Its fields of application are:
  - Geographical or spatial comparisons
  - Ethnography
  - Politics
  - Economics
  - Etc.
- A specific scope is exposed based on the comparison between two or more facts.

## 2.3. Research methods

- The stages of this method are:
  - Identification of the problem or object of study.
  - Delimitation of the investigation, object and method.
  - State of the art.
  - Descriptive study (descriptive and analytical phase).
  - Data collection.
  - Formal and material analysis of the data.
  - Explanatory analysis of the data.
  - Conclusions about the comparison system used.
  - Formulation of comparative hypotheses (synthetic phase). Selection of variables and parameters that can be compared.
  - Comparative study.
  - Selection of obtained data and extraction of conclusions from that comparative analysis.
  - Juxtaposition of conclusions and selected data.
  - Valuable and/or prospective comparison.
  - Comparative conclusions that verify or deny the hypothesis.



## 2.3. Research methods

- Problems that the application of this method presents are the subjectivity of the comparison criterion, difficulty in finding objective or psychological preferences.

## 2.3. Research methods

### 4. Experimental method

- It is the most used currently and is usually framed within the experimental areas of Science.



*The experimental method is the most used and which people usually associate with science*

## 2.3. Research methods

- Its stages are:
  - Definition of the problem.
  - State of the art.
  - Formulation of work hypotheses and/or objectives that are intended to be achieved.
  - Definition of parameters and variables that will be used for data collection.
  - Population and sample.
  - Instrumentation.
  - Design of data collection and established schedule.
  - Data Collect.
  - Qualitative and quantitative interpretation. Results and conclusions. Discussion.
  - Comparison of hypothesis and conclusions.



## 2.4. Scientific language

- Scientific language is a mechanism used for communication in Science areas, whether this communication occurs between specialists, or them and the public.
- Also called scientific terminology or scientific lexicon.
- Its characteristics are:
  - Accuracy.
  - Neutrality.
  - Stability.
  - Concision.
- Scientific language has two different functions:
  - Normative for each name to identify an object of study.
  - To allow us to communicate and refer to that object unequivocally.



## 2.4. Scientific language

- When new methods, techniques, etc. are discovered or invented it is necessary to identify them.
  - We must use scientific language.
- Many of the scientific discoveries are incorporated little by little into the habitual language. The stages of that are:
  - Previous scientific language that has become popular.
  - Specialized lexicon but common, managed by speakers as users of those terms.
  - Fundamental or basic specialized lexicon, which is learned at the bachelor level.
  - Specialized lexicon for communication between scientists of any area and another ultra-specialized use of professionals exclusively among researchers of the same.





## 2.4. Scientific language

### 1. Scientific nomenclatures

- The need to normalize and structure the terms used in the scientific language entails the creation of nomenclatures.



*There are specialized dictionaries for almost each of the areas of Science*

## 2.4. Scientific language

### 2. Taxonomies

- The need to structure the new knowledge and to include it or not in the already discovered makes it necessary to classify the terms.
- It must be classified to establish hierarchies and relationships between terms. In this sense, taxonomies are one of the ways to carry out this structured ordering of scientific vocabulary.
- The nomenclatures, for example, are a type of taxonomy.

## 2.4. Scientific language

### 3. Techniques and neologisms

- In research, it is necessary to include new terms to be able to refer to them. This process is called neology and the new words, neologisms.
- To generate new terms there are different ways and linguists have divided them into:
  - Neology of form.
  - Neology of meaning.
  - Neology of loan.

## 2.4. Scientific language

Neologies of form. As the name suggests, they are generated using terms or parts of them already existing. They are subdivided according to:

### 1. The origin of the elements

- Demiurgic creation.
- Eponymy.
- Compound term.
- Using a root, and then adding a suffix (and sometimes also prefixes).
- Shaping an onomatopoeia.
- These mechanisms make the language more complex.



## 2.4. Scientific language

1. The articulation mechanism that is used to generate them:

- Construction. They are formed by adding suffixes or prefixes to the root, or by mixing two roots. This can be done in several ways:

- By derivation.
- By a prefix.
- By a suffix.
- By composition.

- Complexification. Nested syntactic combination of words.

- Juxtaposition.
- Coordination.

- Reduction. Shortening existing terms.

- Through acronyms.
- Using abbreviations.
- Generating Symbols.
- Shortenings consisting in reducing the size of the voices, either in compound terms eliminating one or fusing them without established syntactic rule.



## 2.4. Scientific language

Neologies of meaning. This system has two forms:

1. The passage of a word from the common language to another from the scientist.
2. The passage of a word from one science to another.



## 2.4. Scientific language

Borrowed neologies. These involve enrichment and renewal, but they can also be negative.

- They are usually taken from English.
- This preponderance of English in Science generates a displacement of Spanish, Chinese and other languages of many speakers that are relegated to the local or regional level.
- Despite this pre-eminence of English there are terms from multiple languages.



## 2.4. Scientific language



“Kayak” model



## 2.5. Questions

- 1) Look for 3 examples of things, elements, events, etc. accepted by the society or the scientific community as good and changed later due to new studies.
- 2) Write 2 hypotheses and/or objectives for your research or for an invented one.
- 3) Which method are you using for that investigation?  
Why?

# Key references

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# **Module 10.2 Information & Research**

## **Learning Unit 3 – Ethics of Research**

Authors

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# Learning outcomes

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# How to learn?

- This course could be taken using a “self directed” learning approach.
- For those attending “full time” courses a lecturer will be directing your learning using the learning materials available.
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- Please see below recommendations for each of the situations:

# How to learn? Self directed approach

- We suggest the following sequence:
- Read the slides, watch the videos and reflect on the content.
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# How to learn? Full time approach

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# How to learn? Mixed approach

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# UNIT 3: Ethics of research

**MODULE 10:**

**SUBJECT 10.2: Research Methodology**



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# TOPICS 3. Ethics of research

1. The investigator

2. Ethics

3. Questions

## 3.1. The investigator

- The researchers that carry out investigations.
- Characteristics that are usually attributed to a researcher are the following.
  - Professionalism.
  - Creativity.
  - Ethics.
  - Autonomy (Self-management).

## 3.1. The investigator

- Researchers should have in mind some intellectual characteristics:
  - He/she is not satisfied with receiving existing knowledge.
  - Does not accept the authority as the only way to validate knowledge.
  - Understand that knowledge is a process.
  - He/she assumes the requirement as a commitment to life, as the opportunity to reach a high level of training.

## 3.1. The investigator

- There are some other skills required to achieve a researcher career:
  - Innovation.
  - Quickly assimilation of new information.
  - Be able of permanently update, or at least periodically.
  - Be capable of learn and relearn.
  - Be skilled at formulation and reformulation concepts, theories and proposals.
  - Observation.
  - Discrimination.
  - Hierarchization of knowledge.
  - Be talented at planning time and resources.
  - Analysation methods, techniques and ideas as quickly as possible to integrate them in your research.
  - Synthetisation of all the research to make it known to the scientific community and the public.





## 3.1. The investigator

- Other skills to develop research work properly:
  - To communicate and socialize knowledge.
  - To manage time.
  - Working in multidisciplinary groups.
  - To cross disciplinary borders.
  - Mastering knowledge technologies.
  - To know in depth the methods and techniques of research processes

## 3.1. The investigator

- Thus, which is exposed in the previous points allows researchers to:
  - Identify new problems and find possible solutions.
  - Develop new solution strategies for already known problems.
  - Select relevant material for research.
  - Analyse and interpret existing ideas.
  - Infer explanations of phenomena that are difficult to understand.
  - The exploration of the environment.
  - The recognition of a problematic situation.
  - The precise formulation of questions.
  - The implementation of a set of activities to answer these questions.
  - The restructuring of concepts.
  - The communication of the findings



## 3.2. Ethics

- History of research has been nuanced by events that obscure the wonderful scientific findings.
  - This situation was generated by investigations carried out at all costs and with the ignorance of the minimum rights of human beings.
  - Another type of study can be noticed: some that are poorly structured for other people's purposes or for the benefit of humanity.
  - All these problems have overflowed the capacity of management and monitoring of ethics.

## 3.2. Ethics

- The objective of research in general terms is not always to directly benefit the participants.
- We can mention the principles of:
  - Respect for people.
  - Beneficence.
  - Justice.
  - No maleficence.

## 3.2. Ethics

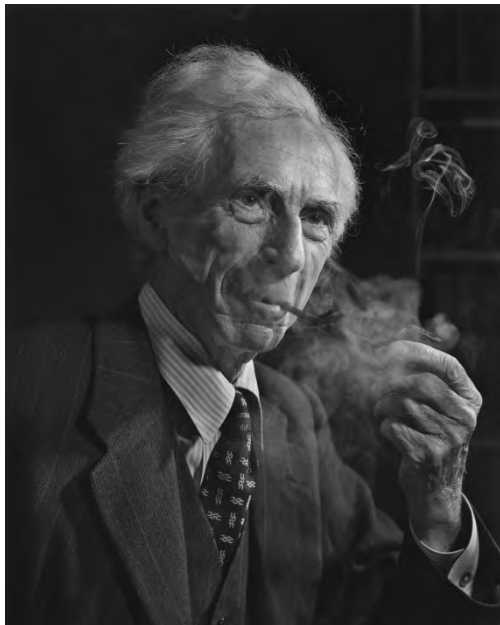
- Protocols that determine essential characteristics that must be observed and clearly described in research projects, seeking to guarantee ethical minimums:
  - Social value of the research.
  - Scientific validity.
  - Fair selection of subjects.
  - Favourable balance of risks and benefits.
  - Independent review through an ethics committee alien to the interests of the researcher.
  - Informed consent.
  - Respect for the participants.

## 3.2. Ethics

- Therefore, it is the researcher who must initially frame his/her project, using protocols that promote ethical guidelines.
  - It is also the responsibility of the research ethics committees.
- Any publication that claims to be scientific must demonstrate in its writings the recognition and importance of the ethical evaluation of the contents.
- Researchers should be reminded that an ethical and respectful management of the dignity of all human beings per se is expected of them.

## 3.2. Ethics

- How should an ethic research work be conducted?
  - Scientific method.
  - Completely transparent methodology
  - Avoid plagiarism and self-plagiarism.
  - Obligation to correspond to society taking care of what it provides.
  - Efficient and responsible use of the resources.



*The work of Bertrand Russell was basic  
for the philosophy of science*

### 3.3. Questions

- 1) Do you think ethics is a priority in the planning and development of your current or future research? Why?
- 2) Does your professional and personal profile fit with the investigator profile exposed here? What do you think you can improve?
- 3) Look for news about a case of self-plagiarism and comment if it could have been avoided.



# Key references

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# **Module 10.2 Information & Research**

## **Learning Unit 4 – Scientific publication**

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# How to learn? Mixed approach

- Read the additional text available before attending the face to face classes.
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# Why study Information & Research?

- To learn the basic concepts and principles related to the information search and retrieval, because you will be able to identify, select and acquire bigger and better information in less time.
- To learn the basic concepts and principles related to the scientific research methodology, because you will know which research method fits with your investigation, the stages and ethics that it must follow, where to search and what to write in a paper.
- Because you will be able to research in any field of your specialization.



Erasmus+



# UNIT 4: Scientific publication

**MODULE 10:**

**SUBJECT 10.2: Research Methodology**



Co-funded by the  
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# TOPICS 4. Scientific publication

1. Scientific papers
2. Publishing
3. Impact indexes
4. Questions

## 4. Scientific publication

- University is the main form of access to research.
  - It can be difficult to undertake a research career and start publishing.
- But why is publishing so important?
  - It is the reflection of the researcher's work.



## 4.1. Scientific papers

- Papers are:
  - Concise publications
  - Of around 20 pages
  - In which the results and conclusions of an investigation are concentrated.
  - They must pass through a process of peer review.
- The first thing that a paper should contain is the basic information about it:
  - Title.
  - Author or authors.
  - Filiation.
  - Contact information.

## 4.1. Scientific papers

### 1.Title

- First thing to be read.
- It must clearly represent what is being discussed in the article.
- It usually is the last thing to be written.

## 4.1. Scientific papers

### 2. Author

- Used to link information reflected in the article to our name.
- The order of the authors is important.
  - Need agreement in the order of signatures and the contact author.
- Problems of indexation in countries where compound names are common or there is more than one surname.
  - Thus, since the general scheme is that of a "Name" and a "Surname", the ideal is to get adapted to it. Let's see some examples >





## 4.1. Scientific papers

- In the case of a Norwegian named Harald (name) Nikolas (name) Dahl (surname), you can:
  - Eliminate one of the two names of the firm: Harald Dahl.
  - Use only the initial of the middle name: Harald N. Dahl.
  - Use a hyphen to join the names: Harald-Nikolas Dahl.
  
- For the Spanish Raquel (name) García (surname) Ros (surname) the options are similar:
  - Eliminate his second surname: Raquel García.
  - Join the surnames by means of a hyphen: Raquel García-Ros.

To solve possible misunderstandings it is advisable to create profiles in systems such as Google Scholar and obtain unique identification codes such as those provided by Scopus and ORCID.



## 4.1. Scientific papers

### 3. Affiliation

- The institution in which the researcher performs his work or the research group to which he belongs.

### 4. Financing

- One of the requirements when funds are given to research groups or individual researchers is that the published results include a mention to the project or funding entity.



**European Union**

European Structural  
and Investment Funds



## 4.1. Scientific papers

### 5. Abstract

- After the title, the abstract is the most important part of the paper.
  - Researchers are usually guided by the abstracts to know if the information in it is of interest for their research.
- If the paper is not in English, it is normal to include an abstract in the language which is written in and another in English.
- Although some journals indicate the extent they want, abstracts usually contain between 100 and 150 words. Similar structure to paper:
  - Introduction and/or Objectives
  - Methodology
  - Results
  - Conclusions
- The language used is very synthetic.



## 4.1. Scientific papers

### 6. Keywords

- The abstract is succeeded by a series of key words that identify the subjects submitted to study in the paper.
- Their number may be indicated by the journal, but they are usually between 5 and 10.
- The keywords are the most important element for the search engines.

## 4.1. Scientific papers



Open Journal of Geology, 2016, 6, 1032-1044  
<http://www.scirp.org/journal/ojg>  
ISSN Online: 2161-7589  
ISSN Print: 2161-7570

### Studying the Effect of Urban Furniture on Satisfaction of Domestic Tourists in Isfahan Bus Terminals

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#### Abstract

Terminals and stations as one of the most important parts of transportation systems and also as the arteries of the country's economy life undertake significant role in adjustment and regulation of the traffic pulse of cities and roads. Urban furniture is one of the components considered in urban designing and as a part of the whole city, it defines the urban identity and structure. In today's world, the importance of designing the urban equipment and furniture is to an extent that even active architects in the field of industrial designing are invited for designing and performing the urban furniture and equipment. Urban designing is a thing beyond making some flower box in squares and determining bus and taxi stations. Evidently, what gives identity to the city or according to the saying of "Sansovini", what has tranquility for the city's residents and creates attraction for foreigner tourists, not only include the mass buildings and streets traffic, but also include landscape, parks and furniture of the city. Standard designing of bus terminals like other urban furniture influences on urban face and it can have significant role in satisfaction of domestic tourists and increase and propagation of using of terminals. In this research, it has been attempted that the effect of furniture in the terminals of Isfahan city on domestic tourists should be studied that for this purpose, descriptive-analytic method has been used and data have been collected through field and library studies and secondary sources by using of SWOT model.

#### Keywords

Urban Furniture, Domestic Tourism, Bus Terminal

#### 1. Introduction

Today's urban human in order to satisfy social needs and play his social role, needs the

Nadim, Z., & Azani, M. (2016). Studying the Effect of Urban Furniture on Satisfaction of Domestic Tourists in Isfahan Bus Terminals. *Open Journal of Geology*, 6(09), 1032-1044.  
<https://doi.org/10.4236/ojg.2016.69077>



## 4.1. Scientific papers

### 7. Introduction

- In the introduction the paper is presented to the reader:
  - Motivation or context of the study.
  - State of the art.
  - Justification of the study regarding the state of the art.

### 8. Hypothesis and objectives

- The main issues to which we want to answer.
  - These questions must be written as objectives of the paper.
- Depending on whether the work is explanatory, descriptive or exploratory, these questions should also be written as hypotheses.



## 4.1. Scientific papers

### 9. Methodology / Methods and materials

- This section explains how the research has been developed, so other researchers know how the conclusions of the study have been reached and can replicate, verify or use a similar methodology in another analysis.
- Explanation of the method used.
- The materials, instruments and sample used must be described; together with the steps taken during the same.

## 4.1. Scientific papers

### 10. Results

- It is a common mistake to confuse results with conclusions.
  - Results are not interpreted.
- This section explains in detail the results derived from applying the methodology previously explained.
- The development of this section must respond to the hypotheses raised at the beginning.



## 4.1. Scientific papers

### 11. Discussion

- The analysis written in the discussion is the result of
  - The accumulation of knowledge of science, represented by the state of art.
  - And the new contribution from the results.
- It must be complete and at the same time synthetic.

### 12. Conclusions

- The conclusions are the synthesis in which the content of the paper is related to provide new ideas, a fundamental objective of the paper.
  - They should have the most important points previously treated, but not just repeating them.
- Synthesis and clarity of the exposition is valued, for which it is essential not to repeat concepts or data previously granted.



## 4.1. Scientific papers

### 13. Bibliography

- All citations and references made throughout the paper should be correctly indicated.
- The first thing to do is to read the citation rules of the journal to which the paper is going to be sent, to proceed as indicated.
- A simple way to keep track of jobs that require extensive use of bibliography is to use bibliographic managers.



*Getting a paper published can be very rewarding*

**imfuture**

## 4.1. Scientific papers

### 14. Reference normalization

- One of the most important aspects of standardization in its application to research is the control of the references made in the papers.
- There are international standards and most used rules:
  - ISO.
  - Vancouver.
  - Chicago.
  - APA.
  - MLA.
- There are also different ways to present them in papers:
  - Quotes at the footer.
  - Harvard style quotes, or author-date system.
  - Mixed between both.



## 4.2. Publishing

- From the first moment in which an investigation is undertaken, the objective of publishing it must be present.
- Why the need to publish in scientific journals?
  - Because the demands of curriculum.
  - Verification of the work.

## 4.2. Publishing

### 1. Choosing the correct journal

- We must try to know the quality of the work presented and choose a journal in which it can be accepted.
- It is useful to know the most relevant journals in the area in which it is going to be published.
- Their information also appears in the form of lists made by various institutions, generally associated with meters of their impact index.

### 4.3. Impact indexes

- The use of journals is now the standard of practically all the areas of the Science.
- Impact indexes are adapted as far as possible to almost every area from the qualitative science.
- Already entered the 21st century, national and international impact indices began to be used regularly for those who wanted to improve their curriculum.
- Most of the university libraries offer information on these tools on their websites, specifying their characteristics.

### 4.3. Impact indexes

- These ways of measuring the quality of publications based on their impact are not uniform, and there are several instruments for this.
- Some are only directories, which without providing an impact figure, analyse the publications using a series of criteria and include those that they consider to be of higher quality:
  - ERIH +, Art and Humanities Citation Index
  - FECYT quality seal.
- Others provide a figure that position the journal within a ranking:
  - Social Science Citation Index.
  - SCImago.
  - Journal Scholar Metrics.
  - Latindex.
  - CARHUSPlus.
  - CIRC.



### 4.3. Impact indexes

- Each listing contains multiple publications, but they are not always the same, nor are they in the same positions.
  - Important journals are missing sometimes.
- The Journal Citation Report (JCR) is the most valued international list.
- And SCOPUS, which is its competence in Europe and Latin America.



## 4.4. Questions

- 1) Find 5 papers related to your investigation or an invented one. Do they fit in the structure proposed here?
- 2) Locate an appropriate journal to publish a hypothetical paper of your research and justify why it is the proper one.
- 3) Locate 3 high quality journals related with your field.

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# **Module 10.2 Information & Research**

## **Learning Unit 5 – Internet for updating knowledge**

Authors

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# Funding

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- The project is implemented within the framework of the **Cooperation for Innovation and the Exchange of Good Practices** Key Action and is funded by the **Erasmus+ Programme** of the **European Union**.

# Learning outcomes

- This module will enable you to:  
Understand the importance of materials and the connection between materials' properties and engineering technologies required to process them.
- Understand and critically evaluate aspects related to production organisation and optimisation
- Understand and critically evaluate aspects related to automation in furniture manufacturing
- Ability to understand and critically analyse the eco-sustainability aspects in furniture production

# How to learn?

- This course could be taken using a “self directed” learning approach.
- For those attending “full time” courses a lecturer will be directing your learning using the learning materials available.
- For those enrolled on a “part time” basis a mixed approach could be employed.
- Please see below recommendations for each of the situations:

# How to learn? Self directed approach

- We suggest the following sequence:
- Read the slides, watch the videos and reflect on the content.
- Read the additional text available where information is more detailed.
- If possible discuss with a colleague or register for a “Forum” and express your views.
- Test your understanding by taking the test at the end of the PowerPoint Presentation. Aim to score at least 70%
- If there are aspects that you find interesting and want to explore further access one of the texts recommended in the Bibliography



# How to learn? Full time approach

- Attend all classes and the lecturer will provide explanations while showing the slides.
- Read the additional text available where information is more detailed.
- The lecturer will organise opportunities for you to discuss the content of the course so that you understand.
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- Because you will be able to research in any field of your specialization.



Erasmus+



# UNIT 5: Internet for updating knowledge

**MODULE 10:**

**SUBJECT 10.2: Research Methodology**



Co-funded by the  
Erasmus+ Programme  
of the European Union

# TOPICS 5. Internet for updating knowledge

1. The role of the Internet in scientific research
2. Internet to make research easier
3. Questions

## 5.1. The role of the internet in scientific research

### 1. Advantages for the release, diffusion and access to scientific information

- Virtual universality.
- Access and publication speed.
- Ability to update information and data published on the network immediately.
- Maximization of the use of resources.
- Free and powerful marketing.
- Cheapness.
- Great ability to quantify the use of information.
- Greater employment opportunities.



## 5.1. The role of the internet in scientific research

### 2. Problems and disadvantages

- Relativity in the advantages.
- Search expectations usually frustrated.
- Different recovery capacity of search engines.
- Information and documentary standardization is almost non-existent.
- Preponderance of the English language.
- Excessive noise during information retrieval.
- To get lost in the virtual universe.
- Problems defining virtual documents.



## 5.1. The role of the internet in scientific research

### 3. The dissemination of scientific information on the Web

- The Internet has meant, in terms of the dissemination of information, the greatest change in Humanity
  - Instantaneous publication.
  - Quick update.
  - This has generated differences as well between researchers without access to it, but fortunately it tends to disappear.
- Internet may seem that the tool for gratuity, but it is a tool for business too.
  - Large companies doing so with scientific literature
- Scientific publications available on the web similar to the paper ones, but in digital format:
  - Monographs through formats such as pdf, html, epub or electronic book.
  - Electronic journals.
  - PhD theses.
  - Conference proceedings.





## 5.1. The role of the internet in scientific research



Google represents both advantages and disadvantages



## 5.2. Internet to make research easier

- Tools and services available to researchers to carry out their task more effectively and for keep their knowledge updated.
- Tools accessible from web browsers, Windows, Mac, Android, iOS, etc.



## 5.2. Internet to make research easier

### 1. Google Scholar

- Perhaps the most well-known of all of them because its agglutinating objective.
- It is a version of Google specialised in scientific literature.
- Access to different types of documents:
  - Papers.
  - Reports.
  - Thesis.
  - Monographs.
  - Reviews.
  - Communications in congresses, etc.
  - Also included certain web resources.



## 5.2. Internet to make research easier

- Most of researchers begin their searches by using it.
- The search allows to differentiate by language in its simple version, while the advanced one provides some filtering options for the required information:
  - To contain all the searched words
  - To contain the exact phrase.
  - To contain at least one of the written words.
  - Not to contain the written words.
  - That the words appear in the whole paper or only in the title of the same.
  - That the documents are written by a certain person or people.
  - That the documents are published in a specific publication.
  - That the documents are in the range of dates indicated.



## 5.2. Internet to make research easier

- It includes the option of saving results in a particular library.
- It recognizes the authorship of the documents.
- It offers the possibility of generating a researcher profile to which our publications will be incorporated
- It also presents some problems as its opacity, since it is not possible to know its algorithm, so it entails:
  - Lack of control over some of the sources included.
  - The concept of "relevance" in the ordering of search results.
  - The repetition of content.



## 5.2. Internet to make research easier

### 2. Scopus

- Scopus is an abstracts and citation database of approximately 13,000 scientific journals.
- The quality of the journals is reviewed every year to prepare the SCImago Journal Rank.
- Scopus, which belongs to Elsevier, is not open access, so it requires a subscription to access its contents.



## 5.2. Internet to make research easier

### 3. Web of Science

- The Web of Science (WOS) offers the references of scientific publications from different disciplines.
- It is also a private initiative, in this case owned by Thompson Reuters, so it requires a subscription to access its contents.
- It is integrated into the ISI Web of Knowledge and allows access to the texts contained in its bibliographic databases through citations and references.
- Like Scopus, it produces its own impact indexes, such as the Science Citation Index or the Social Sciences Citation Index.



## 5.2. Internet to make research easier

### 4. Sci-Hub

- There are other resources belonging to large publishers or universities, such as JSTOR, ProQuest or EBSCO.
- Science is largely dependent on the services that these publishers offer.
- It is a situation that has been criticized, so that alternatives have emerged
  - Sci-Hub.
- Created in 2011.
- Its objective is to provide free access to the databases of these institutions through the access that the researchers whose centres have assigned.





## 5.2. Internet to make research easier

- When someone uses the Sci-Hub aggregator, it performs a search in LibGen and if the paper is in that repository, it returns it.
- Otherwise, Sci-Hub use the credentials of a researcher to return it into full text to the researcher who has no access.
- It is illegal in some countries.
- It is an alternative for those researchers without access to these digital objects.

## 5.2. Internet to make research easier

### 5. Scholarly collaboration networks

- Legal alternatives for free-access:
- ResearchGate
  - Social network of scientists
  - Search engine for its own resources and others such as PubMed or arXiv.
  - It allows to follow other researchers and the creation of working groups.
- Academia.edu
  - Similar characteristics and purposes that ResearchGate.
  - It does not guarantee open access to collections.
- Mendeley
  - Tool that has generated a social network over the years,
  - Another main objective.



## 5.2. Internet to make research easier



ResearchGate



## 5.2. Internet to make research easier

### 6. Academic identifications

- A common problem to all tools is to correct indexing and acknowledging responsibility.
- Several initiatives have arisen to control the authorship in a universal way.
- There are identifiers granted by international recognition and which the journals themselves request to authors to publish their papers.
- The most recognized is the Open Researcher and Contributor ID (ORCID).
- Researcher ID (Thompson Reuters)
- Scopus Author ID (Elsevier).



## 5.2. Internet to make research easier

### 7. Bibliography management

- A bibliographic manager is a tool that allows the storage of bibliographic references in an organized and controlled manner.
- Mendeley was created as a bibliographic manager.
  - It can be used from the web and at the same time has Windows, Mac, Linux, Android and iOS applications.
  - It allows the creation of bibliographies and citations in any style.
  - It also lets to import and export these bibliographies in different extensions.

## 5.2. Internet to make research easier

- Zotero is a similar tool that also has a web and a standalone version. They have some other functions useful for researchers:
  - Creation of bibliographies.
  - Possibility of creating different folders in which to organize documents.
  - Automatic import and update metadata of documents.
  - Edition of document metadata.
- In addition to the Google Scholar, Mendeley and Zotero, there are other initiatives related to bibliographic management:
  - BibTeX.
  - EndNote.
  - RefMan.
  - RefWorks.
  - NoodleTools.
  - EasyBib.
  - RefDot.
  - Bibme.
  - Citation Machine
  - Citelighter.



## 5.2. Internet to make research easier

### 8. Digital repositories

- Those that contain the complete texts, although we focus on those that offer relevant information for research and innovation.
- A permanent repository of documents in digital version of an institution that are accessible free of charge and in full text for all citizens from Internet.

## 5.2. Internet to make research easier

- Their main features are:

- Their intention of permanence.
- Institutions are "owners" of these digital documents.
- They allow self-archiving.
- The inclusion of documents is voluntary.
- They use common international standards.
- They use a specific software with free access.
- They offer the option of a basic type of search and an advanced one.
- They allow the user to search in different ways according to the contents included.
- They are very similar, easy to use and free.
- They contain links to other repositories, collectors and directories.
- They comply with the international regulations issued in this regard.
- They allow the quantification of the archived information.
- They contain a huge and heterogeneous number of documents from multiple disciplines, full text.





## 5.2. Internet to make research easier



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Rijksstudio is de digital repository of the  
Rijksmuseum of Netherlands



## 5.2. Internet to make research easier

- One of the best lists of digital repositories is Webometrics. In its ranking, the first ones that appear are four American repositories: Social Sciences, Experimental Sciences of Cornell, a system of astrophysical data Smithsonian / NASA and CiteSeerX.
- The option of free access multiplies the visibility, so facilitates the impact. As researchers, we are interested in having our works consulted and cited.
  - An article published in a digital repository (or in an electronic journal contained there) has between 4 and 10 times more chance of being read, and therefore cited.



## 5.2. Internet to make research easier



**Digital repositories made possible  
worldwide access**

## 5.2. Internet to make research easier

### 9. Aggregators

- The difference between a digital repository and an aggregator is that the first has the "property" of the documents.
- The control of the file represents the capacity to offer it over time.
- Collectors / aggregators only direct to the file and indicate which institution has it.
- The great advantages of aggregators are that they allow access to a greater number of documents and that they are much quicker to search for information.
- But they cannot guarantee the permanence of the documents to which they give access.



## 5.2. Internet to make research easier



**Europeana is the European Union aggregator which aims to collect all the digital collections of European institutions**



### 5.3. Questions

- 1) Create a Google Scholar profile of yourself and save 10 works into your personal library. Do you find the tool useful?
- 2) In 500 words, justify why or why not Sci-Hub should be a model and a common tool for Science.
- 3) What are the differences between digital repositories and aggregators? Compare three pairs of examples.

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