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**(Course+ TD).**

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**THE OBJECTIVE**

The objective of this seminar is to prepare students for the work they will have to provide as part of their dissertation. It is made up of sessions of very different natures (ex-cathedra or not, in full groups or not), partly traditional and partly distance learning. These different elements address all the points that students must know to complete their dissertation: delimitation of a subject and problem, corpus and methodologies, time management and work planning, scientific and argumentative writing, citations of sources and bibliographies, documentary research and state of the art, empirical part, etc. Some of these subjects will be applied within the seminar, others will be theoretical. Students will sometimes be required to work on self-learning via E-Learning.

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**I — The Dissertation**

**DEFINITIONS**

We consider here the dissertation as a general type of applied research report and as the first step taken by the new and future researcher. The dissertation represents one of the first steps in so-called scientific works. We can wonder what exactly is its nature, role, scope...

„ It is not a story because we must demonstrate something, prove, argue, analyze, propose, recommend...

„ This It is not a report in the sense of reporting, because it supposes an effort of investigation and understanding behind the appearance of the observed facts. “This is not a description because, at best, we would only be doing superficial, journalistic work. In a dissertation, it is not a question of describing for the sake of describing, but of describing in order to move on to the bulk of the work which consists of analyzing, measuring, comparing, evaluating, interpreting...

„ It is not a thesis either because a thesis is an additional and original contribution to scientific knowledge in a particular discipline. This goes far beyond the pretensions of a dissertation or even, often, of any applied research. If it is not telling, reporting, describing, or writing a thesis, then what is a dissertation?

According to French language dictionaries, the dissertation is a scientific or literary “dissertation”. We can retain two essential terms in this definition: dissertation and scientific. Dissertation implies, as a literary genre:

\*to treat a specific subject,

\*to speak about it with knowledge of the facts (having a certain prior knowledge on the subject),

\*to apply knowledge to develop the subject treated and to emit original, personal, more “advanced” ideas...

Scientific, for its part, implies (still in the classic sense):

\* knowledge of scientific rules and standards,

\* application of these standards and rules to the subject treated,

\* rigor and accuracy in treatment,

\*evidence and demonstration of what is asserted or advanced... In short, we would say that the dissertation, while being a minor genre, is no less an integral part of the research work . It is, broadly speaking, an application of one or more fields of knowledge (for example, sociological science) to an aspect of reality (specific theme of the dissertation) to understand its mechanisms, characteristics, dysfunctions, difficulty... and suggest through analysis and demonstration one or more possibilities for improvement, correction, better use... depending on the nature of the subject treated.

**The final dissertation**

A final dissertation is written at the end of higher education to assess the ability to reflect on an issue raised by a subject. The student must demonstrate mastery of the subject and knowledge.

**The internship dissertation**

An internship dissertation is developed following an internship in a company and generally at the end of a university year. It highlights the student's activities during their internship, but it is not a simple internship report, because it demonstrates the student's analytical capacity.

**The master's thesis**

A master's thesis is written at the end of a master's level university course (Bac +5). It is similar to a research paper. Analytical skills and critical thinking are assessed. Formulating the problem is the basis for developing research questions and it is one of the most important steps. Developing a coherent thesis plan is also the key to a successful master's thesis, as well as the theoretical part and data collection.

**A university dissertation**

The university dissertation amounts to doing research. It is a stylistic exercise which consists of demonstrating the student's ability to provide elements of response using a scientific approach.

**The license thesis**

A license thesis highlights the student's ability to make their personal contribution to resolving a problem and contributing their knowledge. The elements judged are the editorial quality of the license thesis, the content and the form.

**1. Presentation of the research dissertation (see standard model)**

The dissertation must include the following different elements

**1) A cover on which must appear:**

\*Rectorate and the establishment: FSEG Nabeul –

\* the training followed (e.g.: Master of research in business economics);

\* the title of the dissertation

\* the last name, first name of the student;

\*the name of the educational supervisor

\*the current academic year; Please note the choice of the title of the dissertation is very important, it must have the following qualities:

\* clarity: avoid ambiguity

\* precision: avoid overly general formulations

\* accuracy: the title must correspond to the content of the dissertation

**2) the page of guard** A repeat of the cover

**3) The special mention:** In university institutions,

**4) A page for the dedication (optional)**

It is a mention of a personal nature but it must be dark

**5) A page for the thanks**

It is d It is customary to thank the establishment which hosted your internship. Other people can also be thanked by name if necessary. **6) A summary**

On one page it lists the main parts of the plan without page numbering (this will be included in the table of contents at the end of the report). References to the appendices, bibliography, index, etc. are not included either. Only the plan is presented here.

**7) A list of abbreviations**

If you use abbreviations, you must list them at the beginning of the work.

**8) An introduction**

In this introduction you must explain the choice of subject. You must then bring up the problem and justify your choice, show its interest and finally justify and announce your plan. The introduction generally includes the following elements:

\* Justification for the choice of the subject

\* The importance of the subject

\* The topicality of the subject

\* The different aspects of the subject

\* The definition of terms and concepts (possibly)

\* The problem (the objectives and hypotheses)

\* The methodology adopted

\* Justification and announcement of the plan

**9) The body of the dissertation**

You must write the body of your dissertation with an apparent plan. Be sure to use short, explicit titles for your games. Be rigorous in this writing. We advise you to have your dissertation reread by an outside person who will often point out points that the editor is no longer able to see.

**10) Footnotes**

All descriptions or findings based on data (statistics, opinions, studies) must be followed by a reference to footnotes (and not reference notes placed at the end of a chapter or work) which mention the sources of this data (which allows verification if necessary).

- Form: Times New Roman 10 in italics and Numbering: continues in the document or starts again at number 1 on each page)

- Presentation: there are at least two scenarios

**Explanatory Notes:**

These are your additional explanation of a description or finding.

**\* Bibliographic reference notes:** you present them according to the same rule of the Bibliography described below, except that you must indicate the page numbers of the work from which you took the data (statistics or opinions of the author) .

**11) A conclusion:** knowing how to conclude Generally speaking, a conclusion must be both a synthesis of key ideas in response to the proposed problem, and an opening onto other prospective research. Depending on the case, the conclusion must also recall the objectives, the operational results obtained and their implications for the company as well as possible extensions of the work carried out.

A conclusion generally includes:

\* Reminder of the problem, the objectives and the working methodology

\* The main results

\* The conceptual and managerial implications

\* The limits

\* The possible extensions of the dissertation and the research perspectives

**12) A bibliography**

The bibliography must be properly signed and must comply with the standards explained previously. The development of the bibliography is important. It constitutes part of the scientific exercise because its elements serve as a reference to confirm or refute ideas or facts, or allow the work to be placed in a broader spatial or chronological context; Additionally, the reader may need to track down the specific sources that were used by the author.

**\*In the text:** Any bibliographical reference is only mentioned in the text, in a parenthesis, then developed in the general bibliography at the end of the dissertation. In the text we present as follows: if it is an author: NAME of the author in capital letters, year of publication; if there are two authors: both names, year of publication; if there are more than two authors: the name of the first author then et al., year of publication Example: (Di Méo, 2003) or (Béguin and Pumain, 1994)

**13) Indexes, glossary and lexicon**

After the bibliography and before the appendices you can introduce:

**\* Indexes:** list of words, subjects and names with indication of the page. You can add an index of authors.

\*The glossary: ​​alphabetical list of technical terms (in italics in the text of the dissertation) with definition.

**\* The glossary: ​​**alphabetical list of terms in foreign languages ​​(in italics in the text.

**14) Appendices**

It is possible to insert in the annexes the equations and results of the model, tables, legal texts, printed matter, the texts of interviews with members of the host organization, the survey, etc. As in any academic report, the appendices may contain many other elements that the author considers necessary to produce to support his analysis. The annexes must obviously also be paginated, and must be the subject of a “table of annexes”. Appendices are often useful to complete the dissertation. They must be numbered and listed in order to be able to refer to them in the body of the text. Only useful and relevant documents should be attached. No need to attach easily accessible documents.

**15) The list of figures and tables**

It is always necessary to number and indicate the source of the tables and figures

**16) The table of contents**

This includes the entire plan with all its subdivisions with the numbering of the pages for allow the reader to find a title in the development.

The following numbering can be adopted: Part, chapter, section, I, A, 1, a etc. Chapter 1, 1.1….. 1.1.1….. chapter 2, 2.1., 2.1.1, 2.1.2 etc 17) The fourth cover Also hardback, it includes the summary of the work and the key words in French, English and Arabic. The choice of keywords is important because they will allow your work to be indexed in databases.

**2-The objective of a research dissertation**

A research dissertation is a written dissertation that presents a critical analysis of a topic by collecting, analyzing and interpreting relevant information from various sources. Research papers are used in a wide variety of academic disciplines as part of student assessment. Students are expected to use critical and analytical skills to evaluate and interpret information in order to reach a conclusion or recommendation on a particular topic based on the information gathered.

A research paper is different from a dissertation because a dissertation is generally a subjective interpretation of information while a research paper is a critical analysis of information. A research paper must be written following specific rules. It must contain sufficient information to allow the reader to clearly understand the subject studied and should ideally have the form of a scientific article. Below are some golden rules to scrupulously follow to ensure good writing of a research dissertation:

➢ You will avoid all personal opinions, you will remain objective.

➢ You will address the different sections of the dissertation in a very clear manner.

➢ In a coherent manner, the different parts must be linked.

➢ You will approach your writing concisely in order to give maximum information in a minimum of words. The research paper plan includes the following points: Title, Summary, Introduction, Experience, Discussion, References, Appendices.

**The title:** should allow the reader to have a precise idea of ​​the research and its most important aspects.

**3. The objectives of a research dissertation**

In the research dissertation, the student must show the implementation of reasoning, explain and; where appropriate, criticize the methodological choices. The process of producing a dissertation is real research work, which, remember, can be approached in two ways:

**A hypothetico-deductive approach,** the most common, which consists of validating hypotheses through observation.

**\*An inductive approach**

which starts from observation to formulate or specify hypotheses (examples of inductive method: survey techniques). Defining a problem therefore allows you to bring real added value to a written production. The success of the dissertation (and its defense) involves a methodology, the main points of which are:

\***Organize the work**

Define a problem as a framework for reflection and the main thread of the dissertation and Ensure consistency between title, problem and plan.

**The problematic approach:**

from a general questioning to a specific case. Formulating a problem is part of a method of reflection and argumentation and allows many intellectual challenges to be met. The problem is the common thread of the argumentation which makes it possible to induce in the corrector (or the listener), the feeling of a convincing argumentative logic in a determined and clearly delimited field of reflection.

**3-the stages of carrying out a research**

**\* The approach**

At the start of a research, it is absolutely necessary to avoid sinking into “original chaos” or what we call headlong flight. We must therefore avoid three commonly encountered pitfalls, namely:

- “bookish or statistical gluttony”: this is the act of reading numerous articles or books without prior selection and without really knowing what we are looking for. This pitfall should be avoided; it most often leads to discouragement. We must by far prefer "the law of least effort", an essential rule of research work

- "the impasse of hypotheses": it is the fact of rushing into the collection of data before having formulated hypotheses. This is also to be avoided in the context of research, where on the contrary, one must always carefully ensure each stage of the research before moving on to a next stage

- "obscuring emphasis": one must avoid expressing oneself in a pompous and unintelligible manner regarding one's research project because one loses oneself and loses the meaning of one's research. Furthermore, a process is a way of progressing towards a goal. So whatever the research, the approach must always be presented in the same way, that is to say in three acts, which are:

- rupture (breaking with our preconceived ideas)

- construction (building explanatory propositions of the phenomenon studied, plan the research plan, the operations to be carried out and the consequences to be expected)

- and experimentation (putting the research to the test, confronting it with reality) These three acts are themselves broken down into seven stages in total, which will constitute the architecture of the work. These steps are all essential and mutually dependent.

**1st step: the starting question**

The researcher must very quickly choose a first guideline that is as clear as possible, so that his work can begin without delay and be structured coherently. This starting point is only provisional, it is indeed likely to evolve subsequently since by definition, research is something that is sought. But formulating this initial question remains an obligatory step, which we must resign ourselves to accomplishing. This question must allow the researcher to express as precisely as possible what he or she is seeking to know, to elucidate, to better understand. However, translating a research project, in the form of an initial question, is only useful if this question meets three essential criteria which are:

**- Qualities of clarity:**

The question must be precise and not lead to confusion, each term must be clearly defined (carry out tests with those around you). Additionally, it should be as concise as possible.

**- Qualities of feasibility:**

The question must be realistic, from a personal, material and technical point of view.

**- Qualities of relevance:**

It must be a real question, without a presupposed answer and which has no moral connotation (we must not seek to judge but to understand well). In addition, it must approach the study of what exists or has existed and not that of what does not yet exist and finally, it must aim to better understand the phenomena studied.

**2nd stage: exploration**

The initial question constitutes the common thread of the research work and will therefore guide the exploratory stage.

The exploration is broken down into three parts, it includes:

- reading operations

- Exploratory interviews

- And complementary exploration methods.

The preparatory reading phase constitutes a “state of the art” and serves to learn about research already carried out on the working theme. For this reading phase, it involves very carefully selecting a small number of articles (or books) and organizing yourself to get maximum benefit from them. Thus, it is necessary to respect certain selection criteria, namely:

Ensuring the links of the chosen articles with the initial question, reasonably sizing the reading program, identifying elements of analysis and interpretation, and finally, choosing diversified approaches. In addition, it is strongly recommended to proceed in successive “bursts” in order to allow time for reflection and discussion between each reading phase. This method makes reading more profitable and allows you to better choose subsequent readings.

To know where to find these texts, it is necessary, **firstly,** to obtain information from teachers, researchers or specialists who can provide valuable assistance and **secondly**, to search for documents by exploiting the techniques of bibliographic research available in libraries (taking training with a librarian is recommended). For reading to be effective, it is also recommended to read methodically. For example, for each article read, it may involve establishing a reading grid which lists, on the one hand, the ideas contained in the text and on the other hand, their structuring (progression of the text) and then writing a summary using this grid.

The readings must be accompanied by exploratory interviews which have the main objective of highlighting aspects of the phenomenon studied which the researcher would not spontaneously think of himself and thus completing the avenues of work highlighted by his readings. . Exploratory interviews can only fulfill this function if they are very non-directive (semi-directive interviews, method highlighted by Carl Rogers) because the objective is not to validate the researcher's preconceived ideas but to imagine them. news. During the interview, this involves: - asking as few questions as possible - intervening as openly as possible - refraining from getting involved yourself - ensuring that the interview takes place in an appropriate environment and context - record the interviews to be as attentive as possible. Three categories of people are likely to be of interest to the researcher: scientific specialists in the subject of study, privileged witnesses and the public directly concerned by the study. The purpose of the exploration stage is to verify that the initial question is still adapted to the meaning of the research, and if not, it involves exploiting the lessons learned from this exploratory work to reformulate the initial question. .

**3rd step:** **The problem**

It is now a matter of taking a step back from the information collected to clarify the main directions of the research and define a problem directly related to the initial question. The problem is the theoretical approach that we decide to adopt to deal with the problem posed by the initial question. The authors use two examples of the conception of a problem (suicide and teaching) to highlight the method to use, which can be done in two stages.

**Firstly,** it is a question of taking stock of possible problems and comparing them using the results of the exploration. Then, using benchmarks such as intelligibility schemes and modes of explanation, it is necessary to highlight the theoretical perspectives resulting from the approaches encountered. **Secondly,** it is about choosing and explaining your own problem with full knowledge of the facts. Thus, it is necessary to choose a theoretical framework that is adapted to the problem and controllable. Then, to explain the problem, it is necessary to redefine the object of study as precisely as possible, specifying the angle of attack and reformulating the initial question so that it becomes the central research question. At the same time, it is necessary to adapt the theoretical perspective according to the object of study in order to create a harmonized system. Thus, we see that formulation of the initial question, exploration and finally explanation of the problem are in close interaction. There are feedback loops between these stages which constitute the foundations of the development of the analysis model which will make the chosen research perspective operational.

**4th step: construction of the analysis model**

This step constitutes the hinge between the problem identified by the researcher and the elucidation work carried out. Once again the authors use two examples of analytical model construction (suicide and marginality) to illustrate the method to be used. These examples show that the analysis model is made up of concepts and hypotheses that fit together to form a coherent framework. Conceptualization constitutes an abstract construction which aims to account for reality. But it does not take into account all aspects of the reality concerned, it only notes those which are essential from the point of view of the researcher. It is thus a design-selection where the construction consists of identifying the concept, designating the dimensions which constitute it and finally specifying the indicators for measuring these dimensions.

We distinguish two types of concepts:

- Isolated operational concepts (IOC), constructed empirically thanks to direct observation (hypothetico-inductive method)

- Systemic concepts, constructed by abstract reasoning and generally characterized by a higher degree of break with prejudices (hypothetico-deductive method). This conceptualization is accompanied by the establishment of hypotheses.

A hypothesis is a provisional proposition that anticipates a relationship between two terms (concepts or phenomena). It therefore requires verification and will subsequently have to be compared with observational data. Thus, to be empirically verifiable, a hypothesis must be falsifiable, that is to say, it must, on the one hand, be testable indefinitely and on the other hand, accept contrary statements which are theoretically capable of being verified. Only compliance with this methodology makes it possible to implement the research dynamic which is characterized by a permanent questioning of prior knowledge.

**5th step: observation**

Observation is the comparison of the analysis model with observable data. During this phase, a lot of data is therefore gathered in order to be systematically used in a later step. This involves answering the following three questions:

**- Observe what? :** it involves gathering the relevant data, that is to say, those which are useful for verifying the hypotheses and which are determined by the indicators of the variables.

**- Observe on whom?** : It is a question of delimiting the field of analysis in geographical and social space and in time. Depending on the case, this will involve studying either the entire population considered, or only or only a representative or characteristic sample of this population.

**- Observe how? :** this involves determining the observation instruments and the way of collecting the data. This step takes place in three stages:

• design the observation instrument

• test it

• and collect the relevant data In addition, there are different methods of data collection:

- The questionnaire survey

- The interview - the direct observation

- The collection of existing data: secondary data and documentary data. The choice of method depends on the working hypotheses and the definition of the relevant data. But we must also take into account the training requirements necessary for the effective application of each method. 6th step: analysis of the information It is now a matter of noting whether the observed results correspond to the results expected by the hypotheses. Once again, the authors use an example (the religious phenomenon) to highlight the three operations of information analysis, which are as follows:

**- describe the data and aggregate them:** this involves clearly highlighting the characteristics of the distribution of the variable and then groups them into subcategories or express them by new relevant data.

- analyze the relationships between variables

- compare the observed results with the results theoretically expected by hypothesis and interpret the differences. There are mainly two methods of analyzing information: - statistical analysis of data

- content analysis which itself presents different variants:

• thematic analysis

• formal analysis

• structural analysis. In addition, “field research” constitutes an example of complementary implementation of different methods of observation and information analysis.

**7th step: conclusions**

The conclusion of a work is the part generally read first by a reader and which will decide whether or not to read the entire research work, so it must be written as carefully as possible. It must consist of three parts:

- a reminder of the broad outlines of the approach followed

- a detailed presentation of the knowledge contributions (new knowledge relating to the object of analysis and new theoretical knowledge) of which the work is at the origin

- new research perspectives that can be developed (openness).

**An application of the approach**

The authors have chosen to present an example which is an imperfect application of the method in order to highlight the “problem situations” which may arise. They are thus interested in the problem of student absenteeism. The initial question that guides their research work is formulated as follows: “What are the causes of absenteeism among first-year university students? ". They will then apply the different stages of the recommended approach to this initial question.

**4-the choice of subject and the supervisor**

**I-The choice of subject**

The choice of a thesis subject must be carried out with the greatest seriousness in close collaboration with its research director. Given the very large number of themes, it may be difficult to find a completely blank research topic, but it is nevertheless important to avoid becoming attached to a subject that has already been covered.

1.1 The choice of the subject assumes:

\*Preliminary personal reflection.

\*Good adaptation to your personality and talents.

\* Inspiration from your personality, your intellectual interests and priorities.

\*A relationship with your tastes, your projects, the courses taken in previous years and which may have aroused particular interest (the student must make an inventory of his or her areas of interest). When the first idea is fixed, and before the meeting with the teacher in the field of specialty, the student must begin to put together a first bibliography. After this personal research phase, the choice of the subject of the requested work can then be determined.

**1.2. Topics can come from any source:**

\*Your teacher (tutor) may suggest something;

\* A friend could awaken a new area of ​​interest in you;

\*The internet is a mine of discoveries.

**1.3-You must give yourself the time and means to choose the research topic:** Too many people rush into a theme without really seeing the reality of the problem they choose to address. Such a choice implies time to accomplish the actions that allow it. In this sense, you must:

\* Document yourself;

\* Make contacts;

\* Carry out an interim assessment;

\* Undertake multiple and diverse steps;

\* If you have deadlines to present your project, be careful, you will need to give yourself time to choose. In all situations, the choice of the research theme must take into account:

**\*History:** to recall what is known about the research subject.

**\*The situation of the research subject:** is it just beginning or we are well advanced. In other words, is it current or old?

**\*The problem and the working hypotheses:** that is to say that among the questions that have remained unanswered until now (all of the questions determine the problem), the student or researcher chooses a few. These will constitute its working hypotheses.

**\*Check the sources:** finally, before validating your choice and embarking on tedious research, check if your subject is being talked about. Your bibliography must be extensive and diversified, you must rely on press articles, works, specialized journals... so avoid getting involved in a little-known subject!

**2. Four indicative rules for choosing a research subject:**

Let us now propose four elementary rules for choosing a research subject:

**a)** The subject must interest the author;

**b)** Sources must be accessible

**c)** Sources must be treatable;

**d)** You must be able to master the methodology you choose.

**e)**The subject must be feasible. The choice of the subject is a determining stage of the project. In general, the most successful projects are the result of questioning by the student and not the submission of a question imposed by the teacher.

**5-Exploratory research**

Exploratory research is a method used to study problems that are not clearly defined or understood. It is important for researchers to clearly understand their research problem before attempting to answer it in order to determine whether the topic is worth studying. This helps ensure that time and resources will not be spent studying problems that are not relevant, valid, or feasible for research. Exploratory research is not used to obtain data to answer a research question, but rather to provide deeper context to a question. It can be seen as the foundation for other types of research.

**Exploratory Research Methods** There are two main methods of exploratory research: **primary methods and secondary methods.**

**Primary Research Methods**

This involves collecting data directly from subjects who may be individuals or a group of people.

Here are different primary research methods used in exploratory research: **Observations:** Observational research involves collecting data by observing subjects without doing anything to influence their behavior.

**Interviews:** One-on-one interviews between an interviewer and a subject can provide the researcher with in-depth qualitative information about the research problem.

**Focus groups:** A focus group is a small group of carefully selected participants who have certain common characteristics. Their reactions, responses and conversations are studied to gain an in-depth understanding of a research problem.

**Surveys:** Surveys consist of collecting information using questionnaires containing a set of questions concerning the subject studied.

**Secondary research methods**

This involves collecting information using already existing data. Here are different secondary research methods used in exploratory research:

**Case studies:**

A case study is a detailed examination of a particular case in a real-world setting. This secondary data source allows researchers to analyze existing cases regarding the research problem they are studying.

**Literature:** Literature research involves collecting data from sources such as newspapers, magazines, online sources, library books, government documents, articles, annual reports, public records, and statistics.

**Online Sources:** A large amount of information is available on the Internet on almost any subject. It is one of the fastest ways to gather information in a cost-effective manner. However, it may also contain a lot of unreliable information. Therefore, when using this method of data collection, researchers must verify the authenticity and reliability of the sources they refer to.

**Steps for Conducting Exploratory Research**

As exploratory research tends to be a flexible, unstructured form of research, there are no clearly defined steps for conducting it. The following steps simply describe the general approach taken during exploratory research

**Describe the problem:** The first step is to clearly identify the research problem. In this step, you need to study the relevant secondary data available on your problem. You can even collect primary data by conducting surveys or interviews to understand the relevance and validity of the topic.

**Create a hypothesis:** Use the research you have done so far to form a hypothesis.

**Conduct further research:** Exploratory research provides the ground for further research. In this step, you need to determine whether the research problem being studied is true. You also need to determine how feasible it is to investigate your research problem and whether the potential outcome of the study is worth the resources and time that will need to be invested.

**6-Bibliographic research.**

**\*A bibliography** is a directory of documents written on a subject or concerning a field, classified by theme and clearly referenced, the description of which often includes a summary or commentary.

A bibliography is presented in the form of a printed publication or in the form of a bibliographic data bank (on CD or on the Internet). You can also find lists of bibliographic references in a book, at the end of an article or on the Internet. \*Find documents related to your research topic:

- In a library catalog.

- In bibliographies (scientific articles, scientific journals, scientific journals, Internet sites...etc.

\* Evaluate the documents.

\* Analyze the documents.

\* Analyze the documents.

**2. Documentary supports (or the sources of documents):**

They are numerous and diverse. In addition, each scientific specialty has specialized documentation. The latter may be more or less easy to access. In our simplified presentation, the documentary supports are grouped into three categories:

**a) Works basic:** They are an undeniable necessity:

**- Dictionaries:** Bilingual or multilingual: French – French. French English. Arabic – French… And dictionaries of technical terms, according to the specialty (Biology, Ecology, Pharmacy, Geology, electronics, economics, law…).

**- Books** (and currently we can classify the Internet among the basic works).

**- Scientific encyclopedias:** Depending on the specialty too (example the E.M.C. for doctors: Encyclopedias Médico Chirurgicale) their content is a synthesis of all the knowledge of their specialties. These are updated twice a year.

**b) Doctoral theses and dissertations:**

They are listed, available on websites and therefore accessible even remotely.

**c) Scientific publications:** In the form of articles, conference reports or abstracts. They are published in various scientific journals, such as periodicals (pathology, biology, kidney, nature, etc.), bulletins (CNRS bulletins, biological abstracts, science citation index, etc.).

**3. Search methods in the documentation:**

There are two methods: one manual “search by hand” and the other automated, using computer tools.

**a) Manual documentary research:**

This is work which consists of finding documents classified in directories (or “files”) by hand. So in a library, we can encounter at least 2 types of directories:

- Directory by author: the authors are classified in alphabetical order. In the case of a publication made by several authors, it is the first author who is listed etc.

**Systematic directory:**

Generally contains the titles of publications (articles, theses, dissertations) classified in alphabetical order. This method of classifying documents has several disadvantages. Indeed, if the title of a thesis, for example, has several key words, the student risks missing out on their research; An example: suppose that the student is looking in “Box S” for an article on blood and that the latter has the title: hematology, he will never have this reference.

**b) Automated documentary research:** Documents or bibliographic references classified by keywords are stored in databases. The references are stored in computer memory; These banks are located almost everywhere in the world and access is done directly or indirectly using a computer (it's like "money" banks, only the data banks store and provide information). scientific information). How to access it? Databases use the title and summary of an article to list it (the index), thus, to select this same article, or another that resembles it, in the bibliography, it is sometimes necessary to use several words- keys, therefore, to search for an article, you sometimes have to use several keywords and sometimes in several languages. Indeed, let's take a very simple example, an article published in French entitled: "le sang". This same item listed in an American or English bank (that is to say in English: “the blood”). The student will never have an answer using the key word “blood” alone.

**3- In summary:**

To facilitate automated bibliographic research, the student must respect three rules:

\*Know what he is looking for.

\*To formulate the question well by specifying the key words and the period.

\* Consult several banks. To do your bibliographic research, here is a source and a multidisciplinary bibliographic database called Sciverse **Scopus** (this is the name of the multidisciplinary database launched by the scientific publisher Elsevieren2004). www.scopus.com: web interface that allows you to analyze citations from a person, a group, an article or a newspaper. Scopus is the documentation source par excellence for finding a reference, abstract or article. It is a source used by professionals, especially reviewers, to verify the authenticity of a reference, to control scientific cheating, etc. Scopus is the largest database of citations and summaries resulting from bibliographic research and quality websites. It was designed to provide scientists with the information they are looking for. Fast, easy, complete and ultra-efficient, it simplifies bibliographic searches Updated every day

**7-The choice of methodological tools and data collection techniques**

Basing yourself on good data is essential for making strategic decisions. To obtain accurate and useful data, you need the right tools, as well as reliable and appropriate data collection methods. Field data collection consists of collecting information to assess the state of a situation through field visits. This is generally done using a pre-written survey questionnaire administered by prospect collection agents. Furthermore, this data collection process is very useful for identifying problems on the ground and implementing the right strategies and policies to resolve them. Different types of data Before talking about data collection methods, we will look at the two types of data.

These are:

**\* Qualitative data**

**\*Quantitative data**

To launch any data collection operation, you must first determine the type of data to be collected which is qualitative, quantitative or mixed. Collection of quantitative or qualitative data ;Quantitative data collection aims to collect quantifiable numerical data (quantities and types, etc.).

Qualitative inquiry, on the other hand, is most often done to obtain opinions on a certain topic or to provide additional clarification through open-ended questions.

**Data collection methods Qualitative research methods**

**\*IN-DEPTH INTERVIEWS** With these in-depth interviews, you collect as much information using open-ended questions asked directly to people. These face-to-face interviews are sometimes long and expensive, but you will have a very high response rate.

**\*ADVANCED OBSERVATIONS**

Sometimes, experts are called upon to make in-depth observations and provide comments based on their expertise.

**Example:** the condition of equipment, an expert will be able to give more details on the causes of the malfunction. Quantitative research methods

**\*SURVEYS WITH CLOSED QUESTIONS**

Well-structured and standardized questionnaires allow you to minimize the risk of inaccurate or unnecessary data by making it easier for respondents to respond. **TESTS OR EXPERIMENTS**

Measuring the number of people who passed a test or answered a question (or set of questions) adequately is another way of collecting quantitative data. You may collect information such as participants' age, employment status, education level, etc. when you conduct tests or experiments.

**SURVEYS**

Surveys are another effective method for collecting data. They can be conducted online, over the phone or in person. Telephone surveys are cost-effective and less time-consuming than face-to-face interviews. However, the response rate to telephone surveys is lower. Online surveys are less expensive and can be sent to large numbers of people.

**OBSERVING, COUNTING AND RECORDING WELL-DEFINED EVENTS**

Observing, counting and recording is another simple method used to determine the number of certain events or items. For example, counting the number of vehicles on a road. Data collection tools Data is collected in different ways. **PAPER FORMS**

The paper form is a physical questionnaire traditionally used for data collection. This method is still used, but it is gradually disappearing in favor of collections using digital tools. The response rate of the paper questionnaire and the accuracy of the data collected are relatively low compared to applications which generally have mandatory response fields with passing conditions and integrated controls.

**ONLINE QUESTIONNAIRES**

Online surveys are cheaper and faster data collection tools. They allow you to have real-time results for easy and quick analysis. On the other hand, even this method offers you the possibility of interacting directly with your target and has limits. Among other things, we can list that only people with access to computers and the Internet will be able to respond to the survey. Obviously, you can find tools like Survey Monkey, Google Form, etc.

**DATA COLLECTION ON MOBILE APPLICATIONS**

This method has become increasingly popular in recent years. Mobile apps are more popular because they offer innovative ways to collect and manage data. You will spend less time collecting data using mobile data collection apps. Additionally, errors will be significantly reduced and you will be able to collect rich data types such as photos, videos, GPS coordinates, etc. Compared to online surveys, mobile surveys are also easier to manage and more versatile, as they allow respondents to use their smartphone to send photos, audio recordings or take notes.

**8-field research**

Once the theme or the research subject has been chosen and the hypotheses identified, all that remains for the student is to verify their research in the field (laboratory, construction site, etc.). The practical part will be conducted under the watchful eye of the supervisor or research project manager. The latter must “guide” the student throughout their project; it must be clarified that the responsibility for the failure or success of the research falls squarely on them. Thus, we think that it is not useless to give some advice to follow before starting the practical part; the student must:

1- Create a clear and detailed plan for the practical work.

2- Choose the parameters to be determined.

3- Prepare the equipment (and chemicals) on which he will work:

\*Laboratory animals if it is experimental work.

\* Patients in the case of a clinical study.

\*The site for architects, geologists, etc.

4- Provide a sufficient number of patients or animals: Minimum “6” per group (except in special cases). These groups must be homogeneous (distribution according to sex, age, pathology, etc.). For experimental and clinical biological research, it is always necessary to work in relation to controls (control batches). Example: If we want to evaluate the renal toxicity of an antibiotic, the study must be carried out on at least two groups (patients or animals); the first receives the antibiotic, the second without treatment (control).

5- The student may find it useful to fine-tune the methods (zero session) before starting their work.

6- Finally, you must accept all the results obtained. In research, a result obtained, positive or negative, is always positive, thanks to its proper exploitation and interpretation.

**9-collection and processing of research**

Data Many students need to collect data to construct the empirical part of their dissertation or thesis. This is the most important part of the study! The data collected makes it possible, after their use, to provide answers to the investigator regarding his problem and his hypotheses.

**Data collection** is an essential phase of an empirical study or research work during which the student collects information which will be analyzed to confirm (or not) initial hypotheses, and respond to a problem.

**Data collection: how to go about it?** To collect data in an empirical study, there are two types of studies:

**\*Qualitative study.**

**\*Quantitative study.**

Data collection can be carried out using several techniques and helps the researcher understand the phenomenon, fact, or subject he is studying.

**Summary Table**

The following table summarizes the 5 main techniques for collecting data in an empirical study.

|  |  |  |
| --- | --- | --- |
| Type of study | Technics | Advantage in data collection |
| Qualitative study | Interview | The interview allows you to collect precise data from an expert on a very technical subject. |
| Qualitative study | Observation | Observation is useful for analyzing a real phenomenon, such as working conditions, a social conflict, a political situation or for carrying out a sociological study. |
| Qualitative study | Focus group | The focus group proves effective when it comes to collecting data to understand a phenomenon affecting a group of people or on a social subject where everyone can give their opinion. |
| Quantitative study | questionnary | Le questionnaire permet d’interroger un ensemble de citoyens, afin de collecter diverses informations exploitables statistiquement pour avoir des informations sur un sujet donné. |
| Quantitative study | Survey | The survey collects data around a general question. This technique allows you to know a general opinion on a given subject. |

**II-Data analysis and processing**

Despite its notoriety and ease of implementation, Excel has had its day when it comes to data analysis and processing. Technology today offers much less vulnerable solutions that guarantee speed and power of processing, precision, reproducibility and reliability of results, richness and relevance of explorations. Qualitative analysis, Machine and Deep Learning, assisted design with experimental plans and the creation of complex statistical models are all avenues to explore together.

**III-data processing and visualization**

Among the wide variety of software available, we highlight tools favored by a large community of users, whose robustness and quality are well established, and among which we will help you navigate based on your specific needs. These integrated tools do not require specific integration into your Information systems or major modifications to your processes, a priori. However, mastering them and exploiting their full potential requires technical and professional skills: learning to use the tool, consolidating your knowledge to teach it what and how to process your data. We have put together a wide range of training on each of them to help you.

**Statistics**

Statistics is a complex field where many methods come together. It is not always easy to choose the right approach, and to understand the steps clearly and precisely. However, it is essential, whether you work in epidemiology, behavioral sciences, medicine, biostatistics or engineering.

**NVivo** is qualitative data analysis software designed to provide you with a work and reflection space where you can organize, visualize, and analyze your unstructured and qualitative data. NVivo manages multiple data sources and formats such as interviews, survey results, images, audio or video interviews, newspaper articles, web page content and social networks.

**Image processing**

Image analysis and processing represent a major challenge in generating precise results in laboratories. There are new innovative tools, using artificial intelligence and in particular Deep Learning, allowing the implementation of template databases.

**Mipar** is a powerful tool for analyzing images captured from numerous devices (optical, confocal, electronic, two-photon, radiography, etc. microscopes), suitable for life and materials sciences. Designed to address productivity concerns, Mipar is more powerful and faster than manual image analysis software. The integration of innovative tools such as “Recipies” (pre-configured sheets) saves time and increases precision in easy-to-value image analysis.

**10-writing and finalizing the dissertation**

To succeed in writing, you must remember two essential rules: Sincerity and truth. Sincerity: means that the data is reproduced while avoiding “Scientific Fraud”, what we call “Scientific Piracy”. The latter consists of not citing one or more references to work carried out by other authors. The truth: is the rigorous verification of this sincerity.

1- The written presentation: The presentation is the method of communicating research results on one of the themes linked to biology, for example. The presentation (or thesis), produced using the computer tool, must contain the following elements: It includes, in order:

\* A title (on the cover page);

\* Thanks ;

\* A table of contents;

\* \* An introduction ;

\* One chapter (or several):

Bibliographic research;

\* A chapter: material and methods;

\* A results and discussion chapter;

\* A conclusion ; \* A summary (and key words);

\* Annexes ;

\* A list of bibliographic references.

**WHAT WILL BE THE CONTENT OF EACH CHAPTER?**

**1.1. The title:**

It must meet the requirements of your theme and be able to best convey the essence of the message; it is written in the middle of the first page (the cover page).

**1.2. Acknowledgments:**

This section includes the names of the people who helped the candidate write the dissertation (do not forget to thank the supervisor and the jury members).

**1.3. The table of contents:**

It must include each of the titled parts of the work as follows:

- Introduction;

- Chapter titles;

- Conclusion ;

- Summary (and key words);

- Appendices (lexicons, tables, figures, etc.).

- Bibliographic references

**1.4. Introduction:**

the introduction must be able to answer the question

Why? It is essential because it represents the first contact with the reader; It presents:

- The work objective;

- The justification for the work;

- A global problem of the question which is discussed. This must present the main idea of ​​the presentation;

- The different parts (chapters) of development. This part (the introduction) is not long - about 10% of the text.

**1.5. Bibliographic research:**

This is a great paragraph that must be separated into several parts (or chapters). This paragraph consists of providing a complete and detailed history on the research subject that is often useless for publication (article in a journal); On the other hand, it consists of a good part of an end-of-study dissertation or a thesis.

**1.6. Material and methods:**

In this chapter, the author (the researcher) presents the practical part of his work. This involves making known in detail the approach adopted and the parameters determined, see further the experiments which will be carried out in a logical and sincere order. Logical in properly ordering the work (methods, work protocols), and sincere in faithfully respecting the steps of the methods and protocols. This part must be able to answer the question How? With what means do you plan to verify your hypothesis?

- It must be clarified whether this is an experimental or theoretical study. (you must describe the sampling mode you used);

- You must specify the material on which you will work: blood, urine, organs, as well as the collection and storage conditions;

- To give all information concerning the products used (medications, chemicals, solvents, etc.);

- We describe the progress of the experiment step by step (the experimental protocol).

**1.7. Results:**

This part must be able to answer the question What? In this part, do not start directly talking about figures, first introduce the results; Then calculate the mean and standard deviation of each group.

**1.8. Discussion:** The discussion therefore consists of commenting on the results obtained, How?

1- First, we must identify the main results obtained;

2- It is in the discussion that the student will try to provide the elements of response to his working hypothesis. (Do the results answer the initial question?, Was the hypothesis refuted or confirmed?);

3- This is the time to compare your results with the data obtained by other researchers (and with the standards too);

4- Without being too long, the discussion should not be a summary of the results, but a commentary on them

5- To have a good discussion, you must first identify (draw) the right elements for discussion from the results and the bibliography.

**1.9. Conclusion:**

I recall the main idea. I summarize the development. These are the facts that confirm or contradict your main idea. Example: It is now clear that evolution... I take a stand. Example: We cannot contradict... that... I highlight avenues for future research (perspectives) Example: Soon, disease screening tools will be... **1.10. Summary and key words:**

The summary quickly sets out the objective of the work, resumes briefly the main points that emerged from the discussion and repeats the main point of the conclusion. It should not exceed a hundred words. It is given either at the beginning of the article (in the case of a publication), or on the “back” of the cover (in the case of a dissertation or thesis). The summary is in French, English and Arabic. Following the summary, make a list of the different keywords of the study.

**1.11. Appendices:** It is appropriate to append long, useful documents (support documents, tables, graphs, software, etc.) which allow the demonstration that is being made to be explained. The appendix must be referenced in the text.

**1.12. Bibliographic references:** Any original information from an article or other work must be referenced in the text. The reference allows the reader to trace the source of information.

**2. Presentation standards:**

**-Scientific writing** is a communication tool: you must therefore write clearly and precisely to communicate your ideas correctly.

Work must be presented on standard sized paper.

- The work must be stapled (bound); or in bindings.

- Names in foreign languages, including scientific names in Latin, and names of works must be italicized or, failing that, underlined.

-The cover page, the table of contents, the list of tables, the list of photos, the conclusion, the summary and the bibliographic reference pages are not numbered.

**a) The Layout:**

- Theme font: Times New Roman;

- Character size for body text: 12 point;

- Character size for notes at the bottom or top of the page: 10 points;

- **Text alignment:** justified;

**- Line spacing:** 1 cm or 1.5 cm; - Margins: 2.5 cm everywhere + 1cm for the left binding;

- Page numbering: centered or right, bottom;

-Printing: single-sided;

-No single line at the beginning or end of the page.

**b) The first page of the presentation must contain:**

- The name of the establishment;

-The title of the license concerned;

-Full title of the presentation (memory);

-Name and surname of the author (the student), address (electronic, preferably); -Name of the supervisor (grade);

-The names and ranks of the jury members;

-The academic year (month, year).

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