**Lesson 05 : The Question Problem in scientific research**

**1-Before the formulation of a question Problem:**

* Observe the world around you
  + Using observations, identify a problem you would like to solve
    - Example: Why do termites follow the ink line?
* This is a question you DO NOT know the answer to and can’t look up.
* “Why” and “What would happen if..” are good beginnings of scientific questions. [[1]](#footnote-2)

**Developing Your Question:**

* Start with a clear purpose
* Know your literature
* Be iterative in your approach
* Try to specify the who, what, where and when of your purpose
* Ask yourself “What would the answer to this question add to the literature?” [[2]](#footnote-3)

**2-Formulate Research question Problem :**

* This is the most important step in research !
* Often comes from the thought:
* “What we have now is not quite right/good enough – we can do better ...”
* The research question defines the “area of interest” but it is not a declarative statement like a hypothesis.
* The central research question may be complemented by
* a few secondary questions to narrow the focus.
* Research question must be capable of being confirmed or refuted.
* The study must be feasible. [[3]](#footnote-4)

• There are two types of research problems, viz., those which relate to states of nature and those which relate to relationships between variables.

• Researcher must decide the general area of interest.

• Ambiguities relating to the problem should be resolved.

• Feasibility of a particular solution has to be considered before a working formulation of the problem can be set up.

• The formulation of a general topic into a specific research problem, thus, constitutes the first step in a scientific enquiry.

* Formulating the Research Problem continued…

• Way of understanding the problem- 1) discuss it with colleagues orexperts.

* Examine all available literature concerning the concepts and theories, and similar such studies.

• After this the researcher rephrases the problem into analytical or operational terms i.e., to put the problem in as specific terms as possible.

• This task of formulating, or defining, a research problem is a step of greatest importance in the entire research process.

• The problem to be investigated must be defined unambiguously for that will help discriminating relevant data from irrelevant ones.[[4]](#footnote-5)

**3-Tips on Formulating a Problem:**

* Select a topic you are interested in
  + You want to be fascinated throughout the process and less likely to lose motivation.
* Choose a topic with a feasible focus.
  + Keep the focus clear and defined and it will be easier to complete than something huge like "headaches“
* Get Help - get it early and often.
  + Solicit opinions before you begin, review drafts once start them
  + You may want to start out with a general idea, review the literature of that area, and then refine your problem based on what you have found.[[5]](#footnote-6)
  + A single question clearly stated with adequate evidence for the answer.
  + Try stating the question and its answer in one simple sentence.[[6]](#footnote-7)

**4-Background / Observation :**

How has the work been done previously?

What similar work has been leading up to

this point?

Study state of the art (literature review, projects, informal discussions, etc).

Optional realization of preliminary experiments.

What distinguishes previous work from what you want to do?

Who / What will be impacted by this research? [[7]](#footnote-8)

**5- Gather Information:**

* **Use references to do background research**
  + Books
  + Journals
  + Magazines
  + Internet
  + TV
  + Videos
  + Interview Experts
* Example: Termites
  + Live underground
  + Don’t have compound eyes (can only see light and dark). [[8]](#footnote-9)

**6-Extensive Literature Survey:**

• Once the problem is formulated, a brief summary of it should be written

down.

• At this juncture the researcher should undertake extensive literature survey

connected with the problem.

• For this purpose, the abstracting and indexing journals and published or

unpublished bibliographies are the first place to go to.

• Academic journals, conference proceedings, government reports, books etc.,

must be tapped depending on the nature of the problem.

• One source leads to another.

• The earlier studies, if any, which are similar to the study in hand should be

carefully studied.

• A good library will be a great help to the researcher at this stage.

• By using Google, Google Scholar and Google Books; articles and reference

books can be searched.[[9]](#footnote-10)

1. Steps of the Scientific Process: SPICE – University of Florida [↑](#footnote-ref-2)
2. John B. Schorling: **Primary Care Research: An Introduction (To Some Really Important Concepts)**, University of Medicine and Public Heath Sciences [↑](#footnote-ref-3)
3. Luis M. Camarinha-Matos : SCIENTIFIC RESEARCH METHODOLOGIES AND TECHNIQUES, Camarinha-Matos, 2009-2012 [↑](#footnote-ref-4)
4. • Kothari, C. R., and Gaurav Garg. Research Methodology: Methods and Techniques. New Delhi: New Age International Publishers, 2019. Print [↑](#footnote-ref-5)
5. Green, B. N., Johnson, C. D., & Adams, A. (2006). Writing narrative literature reviews for peer-reviewed journals: Secrets of the trade. Journal of Chiropractic Medicine, 5(3), 101-117. [↑](#footnote-ref-6)
6. David T. Felson: **How to Write a Scientific Paper**, Boston University Medical Center, p02 [↑](#footnote-ref-7)
7. Luis M. Camarinha-Matos : SCIENTIFIC RESEARCH METHODOLOGIES AND TECHNIQUES, Camarinha-Matos, 2009-2012 [↑](#footnote-ref-8)
8. Steps of the Scientific Process: SPICE – University of Florida [↑](#footnote-ref-9)
9. Kumar, Ranjit. Research Methodology: A Step by Step Guide for

   Beginners. Noida: Pearson India Education Services Pvt Ltd, 2007.

   Print. [↑](#footnote-ref-10)