3. SELECTING AND DEFINING A RESEARCH PROBLEM

3.1 Selecting a problem

The central element in any research is the problem.

Once the problem has been identified and adequately defined, the systematic and scientific process of making observations and collecting data can be more easily carried out.

From an analysis of the data collected, some significant results would be expected in anticipation of finding a solution to the problem
However, you could say that a large part of the solution to the problem lies in knowing precisely what the problem is in the first place.

After all, how can you solve a problem if you don’t know what the problem is?

The prior planning of a research study is an important phase.

Not only does a problem have to be identified, but before the research can begin to take shape, the problem has to be analysed and its exact dimensions specified.

This is not an easy task, especially for the inexperienced researcher.
3.2 Critical study of the literature

In preparing for a non-empirical research, general reading in your subject area or in any related area knowledge gaps in the literature may be identified.

Perhaps conflicting points of view have been presented and there is a need for more information to be provided to support one or the other.

Maybe there are deficiencies in the explanations given, or some questions may be raised that need answering.
3.3 Interaction with others

Conferences, meetings, workshops and in-service courses are usually designed for specific purpose, but often, during the course of the discussions, references are made to broader issues.

As well, informal discussions with colleagues and other interested members of the public can lead the keen researcher to problem areas that could provide the basis for research.

By being always eager to learn more about the educational process, by adopting a critical outlook and by taking every opportunity to be part of a research environment, it is more likely that you will be able to select a problem for research.
3.4 Criteria For Selecting a Research Problem

(1) Interest

If you are going to commit yourself to a piece of educational research, then it is important that you are interested in the topic you are researching.

By being interested, you are more likely to read widely on the topic and have a more thorough knowledge of the situation.

Background reading is an essential equipment for any person wanting to undertake a piece of research.
Although this is a necessary requirement, it is not a sufficient criterion for selecting research problem.

In fact, over-specialization can lead the researcher into investigating trivial problems that are of interest only to himself.

On the other hand, the issue does not have to be of concern to everyone, but the results should be communicable and of interest to someone.
(2) Size

Here is where you need to exercise some professional wisdom.

At the outset, problems are usually macro in size.

This means that they are often too large for satisfactory results to be obtained.

For example, a researcher wanting to investigate the quality of water in a certain area would be faced of determining the sample of water which is representative.

However, further analysis, reduces the problem into a smaller and manageable research.
(3) Economy

Research are often confronted with practical constraints, not the least of which are time and money.

What could have possibly been a worthwhile piece of research has often not been successfully completed because of the enormous personal sacrifice required on the part of the researcher in terms of the amount of time that can be devoted to the project and the amount of money required to carry it out.

Even at the initial planning stages, it is wise to think about the possibility of receiving some support, both financial and non-financial, either from within your institution or from outside sources.
Again, this may not be realised by direct monetary grants but could simply be in access to equipment-printing, stationery supplies, typing, etc.
(4) Researcher’s Capabilities and Limitations

A researcher must recognize his own capabilities and limitations.

If inexperienced in educational research, then it is highly likely that you will need some guidance.

By organising for an advisor or for others interested in research or on your area of study to monitor your progress, especially in the planning stages, then it is quite likely that some of the ensuing difficulties will be overcome.

It will be an advantage if you have people willing to support you throughout the research-to suggest alternative approaches, assist in clarification of issues, etc.
(5) Uniqueness

A researcher would not want to spend a lot of time and energy researching a problem if the answer to the problem already existed.

That is, you would not want to duplicate a study.

However, you may want to pursue a study similar to one already in existence but change the methods used, or modify the design, or use a different sample, or choose to perform different statistical analyses.

You would then be replicating an existing study, and the research would then be considered unique in that it is not exactly like any other piece of research.
A researcher has to think about a number of issues when planning a research project.

These *a priori* considerations are important for the future success of the project.

Whether anticipating using the results for a specific practical purpose or not, there are a number of questions that need answering once a problem situation has been selected, before progressing any further.
3.5 Identifying the variables

If your problem is too large (or global) you may have to eliminate some of the variables, or limit the size of the geographical area, or even the number of people involved. (At the same time it may be necessary to keep the purpose of the research in mind in case some basic necessary elements are eliminated.)
What is meant by a variable?

A variable is a word used to describe a particular characteristic which all members of a set have, e.g. hair colour, age, intelligence, etc.

These are human characteristics possessed by all.

Of course, members of a set are expected to vary (hence the name variable) on the possession of the particular characteristic:

- hair colour - blonde, dark, brown
- age - old, young, infant
- intelligence - high, low
Example:

HEIGHT - a continuous variable

It allows continuous measures or graduated measures from short to tall.

SEX - a two-category variables
It permits only two characteristics: male or female. This is also called a (di meaning ‘two’ in Greek) variable.

RELIGION - a multiple-category variable
Thus allows for classification into several different categories- Hindu, Christian, Muslim, Buddhist, etc.
The last two types of variables (dichotomous variables and multiplecategory variables) are called discrete variables.

Discrete variables enable you to distinguish between categories but it is not possible to distinguish between degrees of difference, nor can they be placed in any order.

In most research, it is often necessary to limit the size of the problem in terms of the number of variables involved.

When selecting a problem for study you need to look specifically at the relationship between variables.
3.6 Evaluating the problem

Having developed a well-constructed research question, it is important to consider:

a. Whether you think the research problem is FEASIBLE, and

b. Whether you feel the research problem is WORTHWHILE.
Is the Problem Feasible?

The primary evaluative source is yourself.

You should ask yourself a number of questions relating to the feasibility of the study – that is, whether it is possible for the problem to be solved.

Some of the questions you have asked previously when considering criteria for selecting a problem situation or similar questions can be applied to the specific problem.

You are seeking an answer to the question-,
Is the Problem Researchable?

1. Has the problem been specified?
2. Is the problem amenable to research?
3. Is the problem too large?
4. How available are the data?
5. Am I capable of solving the problem?
3.7 Consultation with others

Having considered these questions and others like them yourself, it is wise to consult others (who are either experienced researchers, interested colleagues or experts in the field) for their honest opinions.

Their evaluations, which would be based on the same foundations as yours, might focus on points that you have overlooked.

They might also make some valuable suggestions which, at this state in the research process, would be most beneficial. They might suggest alternative approaches or present a different viewpoint or simply help you clarify your thinking. It is important to consider as may alternative ways as possible of looking at the problem.
Is the Problem Worthwhile?

The relative worth of a research problem will vary from person to person.

The decision they make could depend on the usefulness of the research findings, or on the interest it holds for the readings or even on its contribution to the existing body of knowledge.

In order to judge whether you research problem is worthwhile, you should ask yourself the question.
Will the Results be Significant?

In answering this question you are concerned with what are called social factors (or social considerations).

When looking at the problem feasibility issue, you were mostly focusing on personal factors (whether you could cope with the research, whether the problem was too large for you to handle, etc.)

To evaluate the worthwhileness of your research problem, you would need to ask questions such as:
1. Will the results advance knowledge?
2. Will the research have some value?
3. Will the results be of interest to others?
3.8 Function of a hypothesis

Once a problem situation has been located and a problem refined to a researchable form, the researcher’s task is to find an answer to the problem.

If the answer to the question cannot be found from within the body of knowledge already in existence, it is necessary for the researcher to develop a hypothesis.
What is meant by a Hypothesis?

A hypothesis is an educated guess.

It is an attempt to explain the nature of the relationship between the variables identified in the problem.

If you like, a hypothesis is an attempt to suggest a possible answer to the problem based on available facts or information that the researcher already knows.

Hypothesis are constructed in everyday life, e.g. when items are lost, when an unusual happening occurs or when something does not act in the normal way.
In trying to find an answer to a problem situation, people construct hypothesis that direct them to finding the solution to a question.

Where did I leave the scooter key?  
What is that rumbling noise?  
Why didn’t the mail arrive?

Perhaps you are familiar with questions of this kind and maybe there are many more that you can add to the list that are more pertinent to your situation.

In order to solve the problem, you attempt to link what is known and what is not known and suggest a possible reason or solution.

In this way you are hypothesising.
3.9 Definition of a hypothesis

A hypothesis can be defined as the tentative proposition suggested as a solution to a problem or an explanation of some observed state of affairs.

It is a statement of the problem solver’s expectations about a relationship between variables within a problem.

A hypothesis can be used to solve simple or complex problems and is said to be the most powerful tool that a researcher has at his disposal.
It gives the research a direction that the problem definition fails to give in that it indicates exactly which variables to examine and what relationship to look for.

A research problem cannot itself be tested-it must be tested through the hypothesis that it generates.