Research Methodology

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DEAN OF RESEARCH

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Course Objectives

At the end of this course, the students should be able to:

- understand some basic concepts of research and its methodologies
- identify appropriate research topics
- select and define appropriate research problem and parameters
- prepare a project proposal (to undertake a project)
- organize and conduct research (advanced project) in a more appropriate manner
- write a research report and thesis
- write a research proposal (grants)

1. INTRODUCTION
Overview of research and its methodologies

1.1: Concepts of research
1.2: The need for research
1.3: Types of research
1.4: Steps in conducting research
1.5: Some TIPS on conducting PhD research

What you will not get!

Instant Expertise!

" Expertise is earned – not given"

"Geniuses are made – not borne"

1.1 Concepts of Research

What is research?

Which of these can be classified as research?

[1] Encik Samad prepared a paper on "computer usage in secondary schools" after reviewing literature on the subject available in his university library and called it a piece of research.

[2] Encik Muthu says that he has researched and completed a document which gives information about the age of his students, their SPM results, their parents income and distance of their schools from the District Office.

[3] Encik Lim participated in a workshop on curriculum development and prepared what he calls, a research report on the curriculum for building technicians. He did this through a literature survey on the subject and by discussing with the participants of the workshop.

None of the above examples
can be classified under the name research.

WHY ?

You will know it when you have understood
the concept of the term ‘research’.

Consider the following case
which is an example of research:

Consider the following case which is an example of research:

- A general manager of a car producing company was concerned with the complaints received from the car users that the car they produce have some problems with rating sound at the dash board and the rear passenger seat after few thousand kilometers of driving.
- He obtained information from the company workers to identify the various factors influencing the problem.
- He then formulated the problem and generated guesses (hypotheses).
- He constructed a checklist and obtained requisite information from a representative sample of cars.
- He analyzed the data thus collected, interpreted the results in the light of his hypotheses and reached conclusions.

- You will notice in the example above that the researcher went through a sequence of steps which were in order and thus systematic.

- Secondly, the researcher did not just jump at the conclusions, but used a scientific method of inquiry in reaching at conclusions.

- The two important characteristics of research are : it is systematic and secondly it follows a scientific method of enquiry.

Definition of Research

- Hunting for facts or truth about a subject
- Organized scientific investigation to solve problems, test hypotheses, develop or invent new products

What is Research?

Research is systematic, because it follows certain steps that are logical in order. These steps are:

- Understanding the nature of problem to be studied and identifying the related area of knowledge.
- Reviewing literature to understand how others have approached or dealt with the problem.
- Collecting data in an organized and controlled manner so as to arrive at valid decisions.
- Analyzing data appropriate to the problem.
- Drawing conclusions and making generalizations.

High Quality Research!

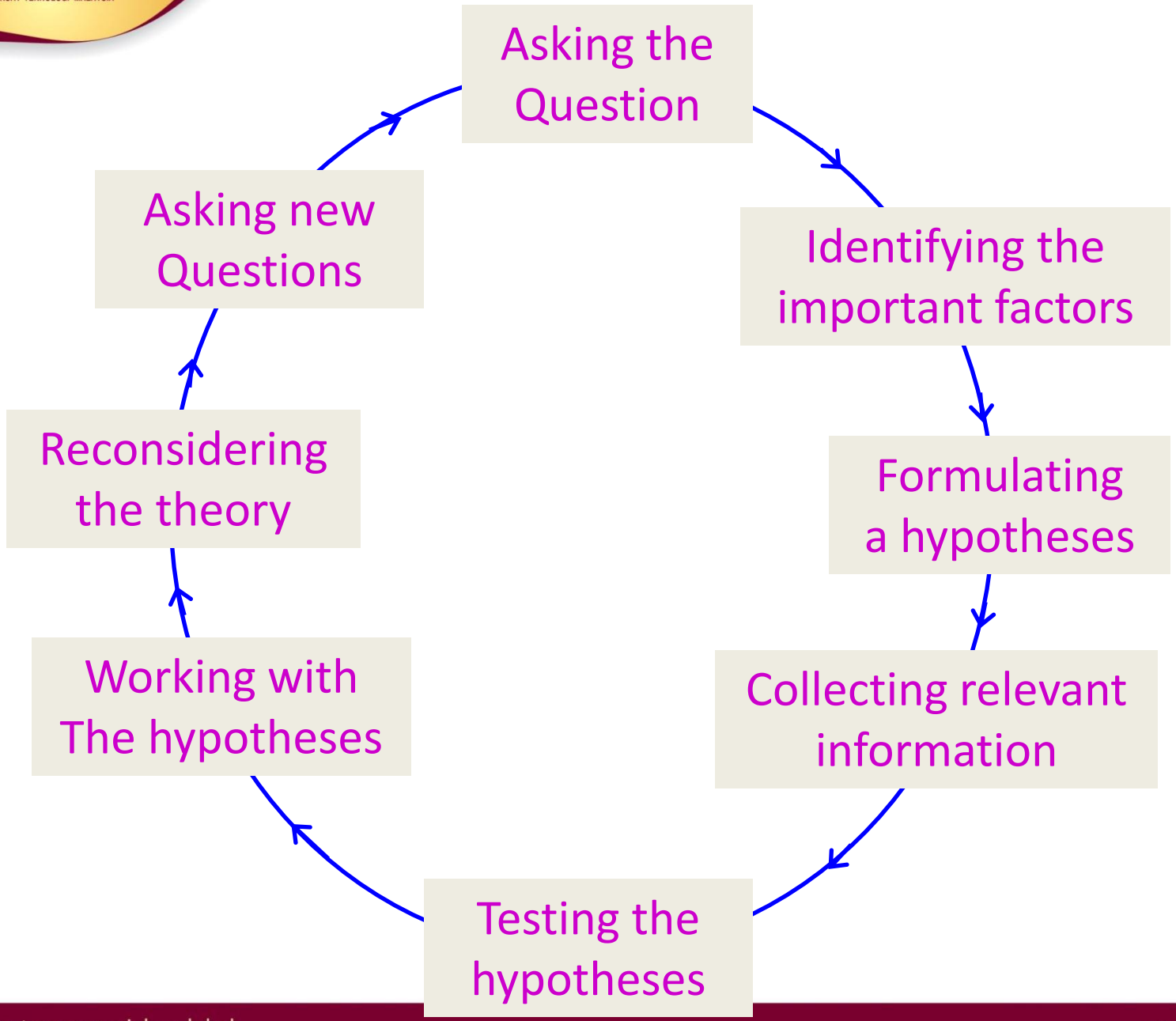
- It is based on the work of others.
- It can be replicated (duplicated).
- It is generalizable to other settings.
- It is based on some logical rationale and tied to theory.
- It is doable!
- It generates new questions or is cyclical in nature.
- It is incremental.
- It is apolitical activity that should be undertaken for the betterment of society.

Then, what is bad research?

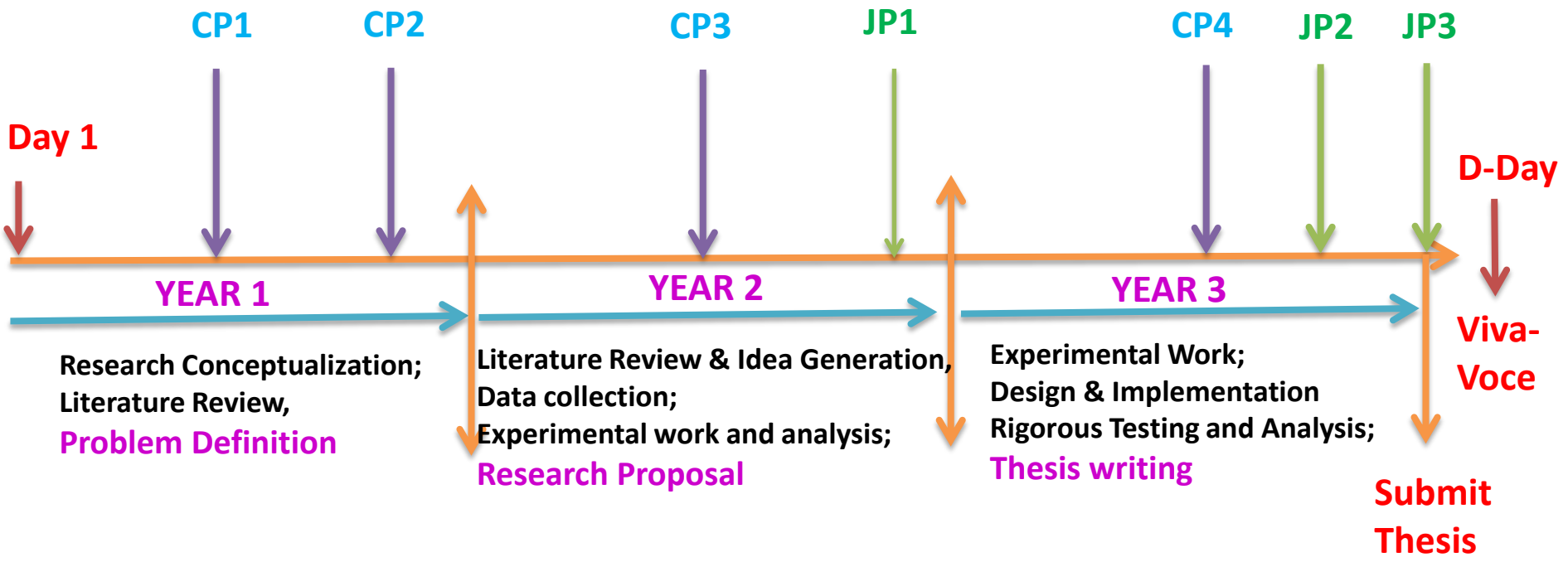
- The opposites of what have been discussed.
- Looking for something when it simply is not to be found.
- Plagiarizing other people's work.
- Falsifying data to prove a point.
- Misrepresenting information and misleading participants.

Research

Where do I begin?


Asking the Question
Identifying the important factors
Formulating a hypotheses
Collecting relevant information
Testing the hypotheses
Working with The hypotheses
Reconsidering the theory
Asking new Questions

Journey to Graduation
Ensuring a positive experience:
Strengthening your strengths & weakening your weaknesses

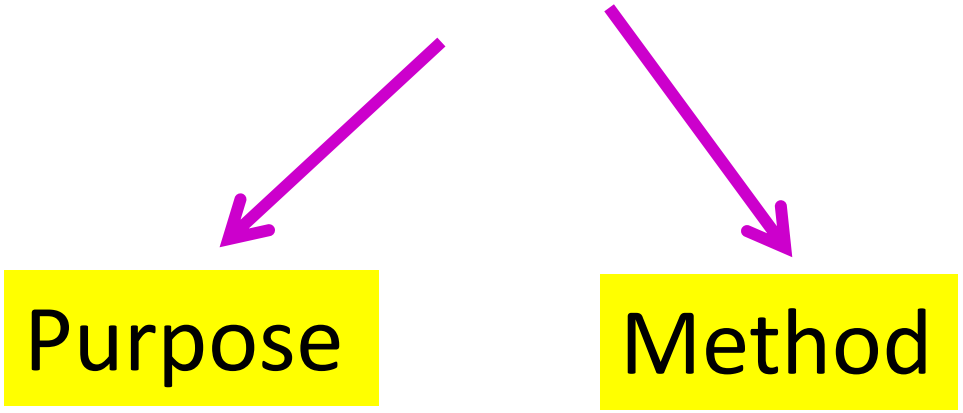


1.2 Why do we need research?

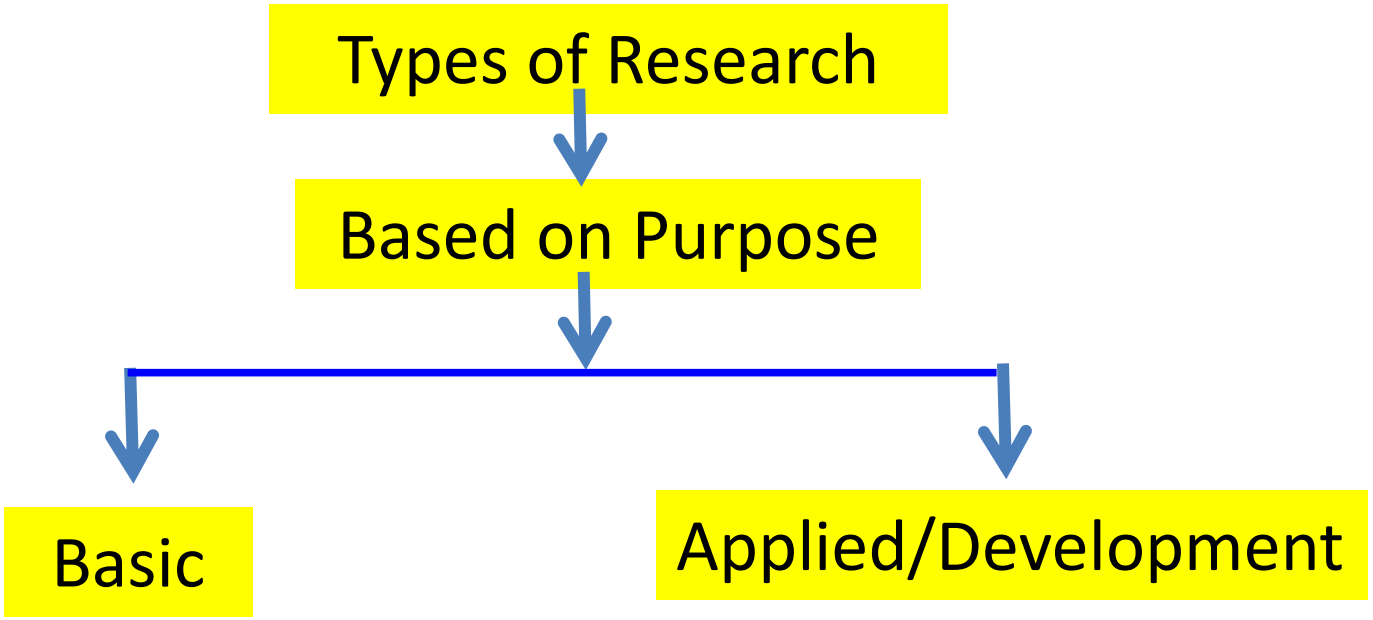
- To get PhDs, Masters and Bachelors??
- To provide solutions to complex problems
- To investigate laws of nature
- To make new discoveries
- To develop new products
- To save costs
- To improve our life
- Human desires

1.3: Types of research

Research can be classified into 2 types

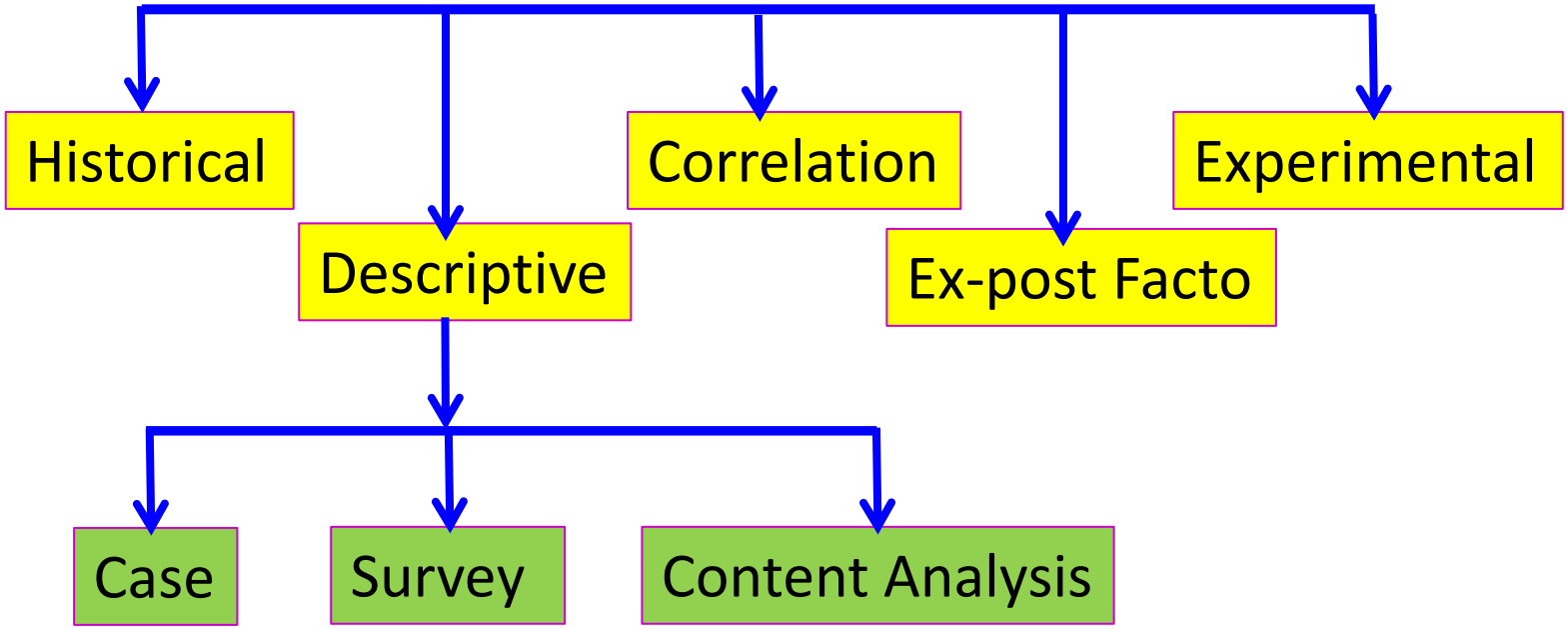


Taking purpose as the basis of classification, research is considered to be two types - Basic and Applied (including Developmental research).



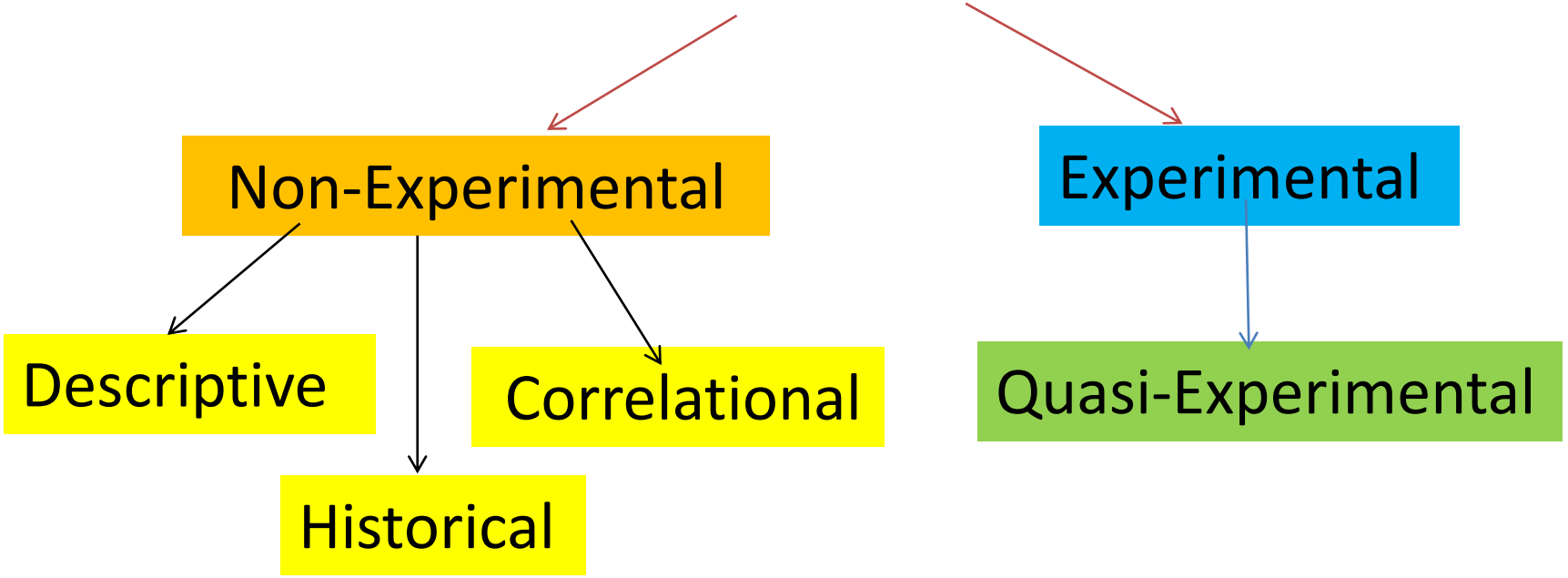
Classification of Research by Purpose

Types of Research Based on Methods



Classification of Research by Method

Different Types of Research (from Salkind)



An Example of Historical Research (from Salkind)

- Nancy Burton and Lyle Jones (1982) examined trends in achievement levels of African American versus White children.
- They examined high school graduation rates between these 2 ethnic groups who were born before 1913, between 1913 and 1922, between 1923 and 1932, etc.
- They also examined a variety of historical indicators in more recent groups of African American and White children.
- One of their conclusions is that differences in achievements between these groups are decreasing.

An example of Descriptive Research

- Peter O. Peretti and Kris G. Majecen (1992) interviewed 58 elderly individuals, from 68 to 87 years of age, using a structured interview to investigate the variables that affect emotional abuse among the elderly.
- As a result of the interviews, they found 9 variables are common to elderly abuse, including lack of affection, threats of violence and confinement.

An Example of Correlational research

- In a study (by Vaughn et.al., 1989) of the relationship between temperament and attachment behavior in infants, the correlation among different types of attachment behaviors, how securely attached the infants were to their mothers, and the infant's general temperament were examined.

- The researchers found that an infant's temperament does not predict how securely attached the child is to his or her mother.

EX-POST FACTO STUDIES

- There is some research where both the effect and the alleged cause have already occurred and are studied by the researcher in retrospect.
- Such research is referred to as EX-POST FACTO (after the fact).
- Kerlinger (1973) defines Ex-post Facto research as :

"Systematic empirical inquiry in which the scientist does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulable".

- Thus, in ex-post facto research or causal-comparative research the researcher has no control on the variables or he cannot manipulate the variables (independent variables) which cause a certain effect (dependent variables) being measured.

An Example of Experimental Research

- Experimental research will always have two or more groups for comparison on the dependent variables.

- It is the only type of research which can establish truly the cause and effect relations.

- Consider an Example:
  - ✓ A researcher in technician education is interested in studying the effects of two methods of instruction-structured lecture method and programmed-instruction on the achievement of students in a course of one semester in Applied Mechanics.

  - ✓ Sixty students in the class are divided randomly into two groups of thirty each.

Applied Vs. Basic Research

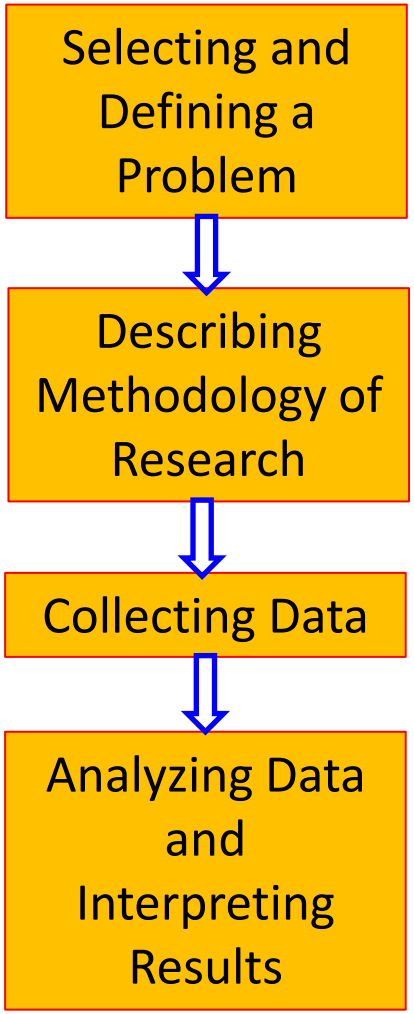
(ERGS,FRGS,PRGS)

- The most basic distinction between the two research is that basic research is research that has no immediate application, whereas applied research is research that does.

- However, such distinctions are somewhat ambiguous as almost all basic research eventually results in some worthwhile application in the long range

1.4 Steps in Conducting Research

Irrespective of the category of a research study, the steps followed in conducting it are the same. These steps are :



Steps in Conducting Research

1. Selecting and Defining a Problem

This marks the beginning of a research study and is the most difficult and important step. This involves :

(a) Identifying and stating the **problem** in specific terms;
(b) Identifying the **variables** in the problem situation and defining them adequately;
(c) Generating tentative guesses **(hypotheses**) about the relation of the variables or in other words the solution of the problem, or writing explicitly the questions (research questions) for which answers are sought.
(d) All this is not done in a **vacuum** (means with no interference, no influence, no disturbances etc)
(e) To achieve this, you **review the literature** related to the problem to know what other researchers have done and discovered and to identify the possible methodology for conducting the research.

Steps In Conducting Research

2. Describing Methodology of Research

You need to state the purpose of the study and to define the problem clearly. This guides you in deciding the methodology of research which involves :

(a) Identifying the **method** of research;
(b) Specifying the **subjects** of study (e.g. heat flow problem, etc.);
(c) Selecting an **adequate representative sample** of subjects;
(d) Selecting/constructing **valid and reliable instruments** for measuring the variables in the problem;
(e) Selecting a **research design** and describing the **procedure** to be employed for conducting the research study

Steps In Conducting Research

3. Collecting Data

(a) This step involves conducting the study as per the designed procedure (manipulating the experimental variables in the case of an experimental method), administering instruments for **measuring variables** and/or **gathering information** through observation.

(b) It also involves **tabulating** the data thus collected for the purpose of **analysis.**

Steps In Conducting Research

4. Analysing and Interpreting Results

(a) The results of the study are generated at this stage.

(b) The data are summarized, in other words **analysed** to provide information for testing the hypotheses.

(c) Appropriate statistical methods of analysis are used to test the hypotheses.

(d) You can perform the analysis manually, by using a hand calculator or a computer as per the demands of the problem, and the available facilities.

(e) After completing the analysis results are **tied together** or **summarized.**

(f) The results are **interpreted** in the light of the hypotheses and/or the research problem.

(g) These are then discussed in relation to : the existing body of knowledge, **consistencies and inconsistencies with the results of other research studies,** and then the conclusions are drawn.

(h) This is followed by **writing** the research report.

1.5 Some TIPS of Conducting PhD Research

Before you start…prepare your mind

More Questions:

Can I do it? Am I good enough? Do I know enough?

Believe that:

THERE *ALWAYS EXISTS*

A BETTER SOLUTION THAN THE PRESENT ONE

AND *WE WILL BE ABLE TO FIND IT!*

But

THERE ALWAYS EXISTS A BETTER SOLUTION

THAN WHAT WE CAN THINK OF!

Believe you can do it !

In the beginning …So you begin by asking questions…Learn to ask the right question…

" To ask a Q, you have to know the A."

(" To ask to a good question you have to know part of the answer")

"A Problem well stated is a problem half-solved"

1) A.S.K. (Attract, Simplify, Know-it-really)
2) Formulate problem & hypothesize

You are not going to solve the problem, if you don't identify the problem properly.

How to generate a new idea ?

A.S.K.

Get attracted to the problem at hand (study with persistence), Strategize & simplify, (while discussing with another person), and develop a dissatisfaction that gives you a need to know the answer.

Once you are aware of the problem and the need of the solution,
get away from problem for a while,
"sleep on it", attend to something else…
stop thinking directly about problem…

Let your Subconscious (imaginative mind) work on it, to reveal an insight (*ilham).*

In the “middle years”

Staying motivated, focused, disciplined

YOU love to work

- **Be consistent - have a will to be productive (show this positive attitude),**
- but **be realistic about time you are willing to commit to the research**
- draft some kind of timeline.
- Organize activities to force you to **structure your time**
- Remember, every **task you complete gets you closer to finishing**…even it appears you have not make progress you have **learned something**

In the “middle years”

Staying motivated, focused, disciplined

- **YOU hold fast to ethics,**
  - have integrity and a sense of **responsibility,**
  - and respect rules and regulations.
- **YOU must plan your meetings with your supervisor well**
  - make sure you are always **prepared;**
  - accept punctuality as a virtue
- **YOU realize that your supervisor is your ally**
  - your teacher-mentor-inspiration-friend
  - do whatever… so that he/she is always supportive of you.
  - **Never hide from your mentor/supervisor**

In the “middle years”

Do not be discouraged ….Start small, think big, keep **focus** on the ultimate goal, should not just go through the process, **enjoy** yourself, be young, make progress what to do with your life after this, **Learn** something in the process…

“Man, as the creation of God, being the servant and interpreter of nature, can do and understand so much and so much only as he has observed in fact or in the course of nature – beyond this he neither knows anything nor can do anything”

In the “middle years”

S.P.I.C.E is the spice of life.

So balanced it always.

- **Spiritual**
- **Physical**
- **Intellectual**
- **Civil**
- **Emotional**

Nearing the end…

We often come up with "great" and well-thought ideas but fall short in the implementation.

The Bottom-line is ….

It does not quite matter how we **PLAN**,
and how hard we **WORK,**
what really matters is what we **ACHIEVE,**
and we cannot achieve, unless we **IMPLEMENT.**

So just go and do it !
Believe you can do it !

In the final analysis…

On completion of your studies,

1. You have grown and have strength in **character,**
2. Your **mind is enlightened, become open & broad-minded,**
3. You realize your **potential and you have the need to fulfill your live goals.**

……"Genius is nothing more than Perseverance and Persistence disguised"

THANK YOU