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MD IFTAKHAR KABIR SAKUR

25th BATCH

COMPUTER AND COMMUNICATION ENGINEERING

International Islamic University Chittagong

COURSE CODE: CCE-4715

COURSE TITLE: Research Methodology

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CCE-4715 (Research Methodology)

VVIm

Difference between Research Methodology & Methods:

Research Methodology	Research Methods
1] The researcher's worldview assumptions & belief.	1] Collection of data through questions.
2] Overall framework, approach, strategy & guide.	2] The way researcher's gather datas.
3] Systematic & based on theory.	3] This method is practical
4] Encompasses underlying philosophy.	4] Chosen based on research objectives.
5] Works as blueprint for the research.	5] It is overall research design.
6] It takes ethical consideration.	6] It do analysis on content & statistic.

Philosophy of Science

→ Science is systematic observation of natural events & conditions in order to discover facts about them. and to formulate laws and principles based on these facts.

→ The organized body of knowledge verify & tests by further investigation.

→ General body like biology, physics, geology.

Richard Feynman said,

"Religion is a culture of faith,
Science is a culture of doubt."

VVIP

Various steps in Scientific ~~Method~~ Research

→ Research process consists of a number of closely related activities. But such activities overlap continuously rather than following strictly prescribed sequence. If subsequent procedures have not been taken into account in the early stages, serious difficulties may arise

which may arise which may even prevent the completion of the study.

→ In a research process, various steps they are not mutually related not distinct too. They don't follow each other in any specific order. And researcher has to be constantly anticipating at each step.

Steps :-

1. Formulating the research problem
2. Extensive literature survey.
3. Developing the Hypothesis.
4. preparing the research design
5. Determining the sample design.
6. Collecting data
7. Execution of the project.
8. Analysis of Data
9. Hypothesis testing
10. Generalization & Interpretation
11. Conclusion

Research problem & motivation

Research problem :-

→ Specific :- Focus on particular aspect

→ Measurable :- problem which can be investigated & evaluated.

→ Relevant :- Should be significant

→ Clear :- problem must be easy to understand.

Feasible : should be realistic.

Motivations :- Refers to the reasons / justification.

→ Practical Relevance :- A real world issue.

→ Theoretical Contribution :- Advancing existing theories.

→ Methodological Innovation :- Introducing new research methods.

Personal Interest :- passion of researcher

Social impact :- potential benefit for society.

Research Data Collection & Data Analysis

→ ~~Prim~~

Data Collection:-

→ Primary data through experiment or through survey.

→ By observation

→ Through potential interview.

→ " Telephone interview

→ By mailing questionaries

→ Through schedules.

Data Analysis:-

→ Requires a number of closely related operations.

→ A great deal of data computer is used which saves time

→ To analyze datas various formulas are used.

→ After ~~anyta~~ analyzing datas it helps to determine the validity of datas

Abstract writing system
or
How to write an Abstract

Steps of writing an abstract:-

1. Introduction
2. Drawback
3. Objective
4. Material
5. Result & Discussion
6. Conclusion (Feedback for আরো)
7. Recommendation (Can be followed by other researcher)

writing an abstract:-

Now a days paddy has become the most popular corn in our country. When we use Machine Learning & IoT it increased upto 95%. Then Now write an abstract.

=) paddy is the most important corn in our country. It is staple food for majority of the people in our country. But in recent years

insect's attack on paddy Field & irrigation system played bad role in the cultivation of paddy. So, using Machine Learning, IoT to Fight against that can be an option. To investigate IoT & Machine Learning in paddy farming, to asses the impact of these technologies on crop yields & risk of crop failure. Waste the main goals in here. A review of the literature on the use of machine Learning & IoT in paddy farming. ~~And it shows that it has pot~~ The main finding of the research which shows that the use of ML & IoT increased crop by 95% & reduced crop failure by 50%. So, It has good potential in using farming. Thats the government & & agricultural organization should invest in this & future researchers can take this research in their consideration for better results.

Research paper writing System

1] ~~Introduction~~ :-

1] Title page :→ A unique & very attractive
→ Name of the researchers
→ Affiliation of the researchers
→ Date of submission

2] Abstract :-
→ A summary of Research proposal
→ Is written ~~maintaing~~ maintaining proper guideline

3] Introduction :-
→ Background (ব্যাকগ্রাউন্ড)
→ Significance (গুরুত্ব)
→ Questions / Objective (কি নিয়ে কাজ করা হচ্ছে)
→ Objective (উদ্দেশ্য)

4] Literature Review :-
→ How ~~previo~~ previous people solved.
→ Identify gaps.

5] Research Methodology :-
→ How the process is designed
→ Which device we are going to use
→ Analysis the datas.
→ Ethical consideration.

6] Expected Results:-

→ Outcomes of the research
→ Potential contribution
→ Limitations of the study.

7] Timeline:-

⇒ proposed timeline or schedule for the research
→ Tasks & Milestones.

8] Budget:-

→ Funding sources (If needed)

9] Conclusion:-

→ Summary of the research

10] References:-

→ List of cited references.

Good Style for Abstract writing

→ Clarity & precision: clear & straightforward language.

2] Conciseness (संक्षिप्तता): Abstracts words are limited

3] Objective Tone:- Avoid personal opinion, subjective language.

4] Use Active voice:- Use A.V.

5] Key Info First:- Readers should understand the main point of it.

6] Avoid abbreviations:

7] Highlight significance:- why the research paper is important

8] No citation.

9] Keep editing

10] Maintain word limit

11] Get feedback,

Preparing the Research Design

The researcher needs to design a research design first. He should construct this.

The prime reason of it is to do the entire work in a small amount of work.

Research Design:- (Need to take consideration of:-

(i) The means of obtaining the information.

(ii) Availability & skills of the researchers.

(iii) Explanation of the way in which selected means of obtaining information.

(iv) The time available for research.

(v) Cost to do the research.

Hypothesis Testing

→ Do the facts support Hypothesis or not?
And this question should be answered.

→ ~~Set~~ Statisticians have designed various test t-test, F-test, Chi square test for the purpose.

And the test must be chosen based on their characteristics & purpose.

→ If there is no Hypotheses tests match then the generalized data can be selected as Hypotheses to be tested by researches in times to come.

Various Steps In Research (Scientific)

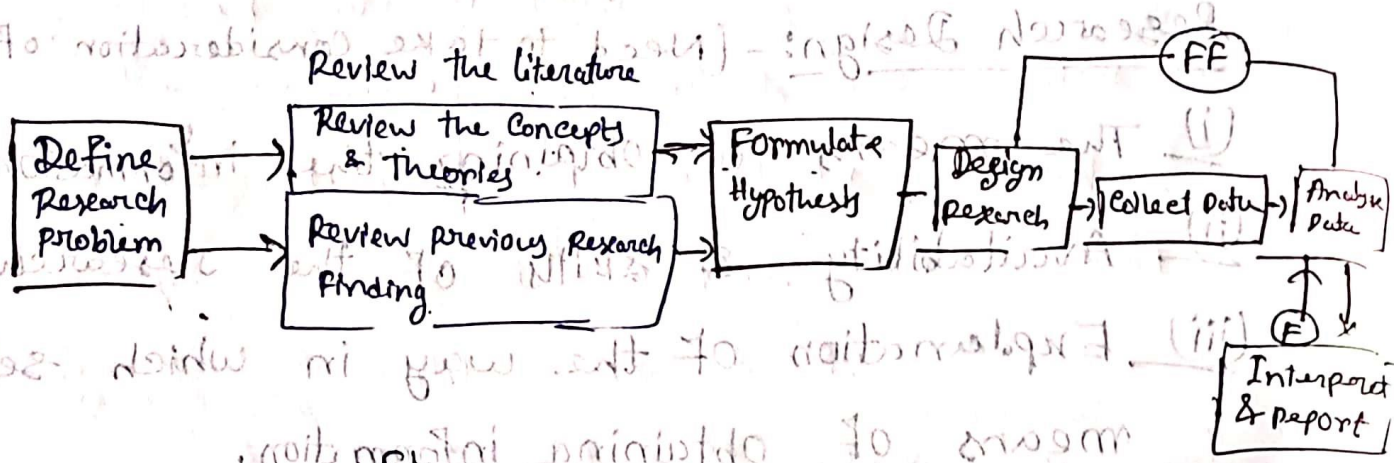

Fig:-

Guideline For Research:-

(1) Formulating the Research problem:-

→ A new question that is aroused by researcher & the answer can be given through old theories or old knowledge. If not that it is a new preliminary theory.

→ 2 types of research problems:-
- → Relate to state of nature
- → Relate to relationships.

⇒ Firstly, someone needs to select a topic, field in what he is interested in or in which he is going to inquiry.

Then should discuss about it with someone who has experience & better to discuss with guide in institution. who will give information regarding this.

→ Then should read papers. Two types of paper should read. (1) Conceptual and Theoratical

(2) The ~~empirie~~ empirical literature

(3) ⇒ what datas are available to understand the meaningful content.

⇒ Rephrase the problem into analytical or operational terms.

→ Statement of objective.

Extensive Literature Survey

=) Means the ~~sur~~ survey that will be done ~~based~~ on all literatures related to the topic.

=) Need to remember that one source will lead to another one.

The earlier study which are similar to the topics should read carefully. A good library might be helpful for this. Now, internet access have brought this closer.

Development of working Hypotheses

→ After the ~~sur~~ survey the next step is working Hypothesis.

→ This is the analysis of the datas, informations that was were collected earlier. And these datas are required for analysis.

→ It helps the researcher to keep in the right track. And helps to focus on the goal.

Preparing the research Design

=) The term & plan is made to work with efficiency & minimize time & money.

To design the research the things we need to Consider:-

(i) Obtaining informations.

(ii) Skills of the researchers.

(iii) Informations which will be selected.

(iv) The time available

(v) Cost

Determining Sample Design

→ Determined before any data actually collected or obtained.

→ Samples can be either probability or non probability samples.

Researcher determine probability samples.

→ Several methods of sampling can be used in a study which is called as mixed sampling.

→ Random sampling is used to eliminate biased sampling.

→ Researcher will choose based on inquiry.

Collecting data

→ Survey,
→ Phone call
→ Mailing
→ Online Form

→ Interview
→ Schedules
→ ~~meeting~~

Researcher select one of these which he thinks as the best for him.

Execution of project

→ Researcher should see if the project is executed in time.

→ & Questions as well as possible answers may be coded

→ To collect data the interviewers can be given training.

→ Steps should be taken to ensure survey.

→

Analysis of Data (prev)

Hypothesis Testing: (prev)

Generalisations & Interpretation

→ If researcher can test Hypothesis then still he can arrive in generalisation.

→ If he fails to get start with hypothesis the he might seek to explain his findings on the basis of some theory.

Criteria of a Good Research:-

→ purpose should be clear

→ Should have sufficient detail so that future researcher can get enough Info.

→ Procedural design should be carefully design

→ The validity & reliability of data should be checked

→ Greater confidence is a warrant if the researcher is experienced.