Lectures Notes No. 2

Research Methodology in ICT

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Research Methodology in ICT
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Lecture-Notes No.2

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RESEARCH METHODS AND RESEARCH METHODOLOGY

❖ **Research Methods**

- **A Research Method is the specific technique, tool or procedure applied to achieve a given research objectives.**

- **It is what a researcher does in order to collect his data and carry out his investigations.**

- **It comprises of methods of performing the research, including survey, case study, interview, questionnaire, observation, , experiments, etc.**

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RESEARCH METHODS AND RESEARCH METHODOLOGY

❖ **Research Methods**

- ▪ **Research methods are identified into three categories:**

  - ➢ **1st Category: The methods relating to data collection. Such methods are used when the existing data are not sufficient, to reach the solution.**

  - ➢ **2nd Category: Incorporates the processes of analyzing data, i.e., to identify patterns and establish a relationship between data and unknowns.**

  - ➢ **3rd Category: Comprises of the methods which are used to check the accuracy of the results obtained.**

RESEARCH METHODS AND RESEARCH METHODOLOGY

❖ **Research Methods**

- ▪ **Choosing the research method depends on:**

  - ➢ **Research Goals**

  - ➢ **Research Questions**

  - ➢ **Researcher Beliefs and Values**

  - ➢ **Researcher Skills**

  - ➢ **Time and Funds**

  - ➢ **Population and Sample size**

RESEARCH METHODS AND RESEARCH METHODOLOGY

❖ Research Methods

- **Choosing the research method depends on:**

    - ➤ **Type of data you need to answer your question,**

        - ✓ **Qualitative vs. quantitative: in a form of words or numbers?**

        - ✓ **Primary vs. secondary: by yourself or by someone else?**

        - ✓ **Descriptive vs. experimental: measurements of something as it is, or will you perform an experiment?**

        - ✓ **Mixed Methods - drawn from either two of the above-mentioned.**

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RESEARCH METHODS AND RESEARCH METHODOLOGY

❖ Research Methodology

- **The research methodology refers to of all steps of doing research (research process), from the research proposal to writing the final report or publication paper.**

- **It shows the path through which researchers need to conduct their research, starting by formulating their problem and objective and ending with presenting their research result**

- **It is also defined as the study and analysis of the methods applied in the stream of research, to ensure that the conclusions drawn are valid, reliable and credible too.**

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RESEARCH METHODS AND RESEARCH METHODOLOGY

❖ **Importance of research methodology**

- **Research methodology helps in identifying the following aspects:**

  ➢ **What are the data collection methods?,**

  ➢ **What would different research methods mean and indicate and why?**

  ➢ **What assumptions underlying various techniques?**

  ➢ **Which of methods or techniques, are relevant to research topic and which are not?**

  ➢ **What the criteria by which a certain techniques / procedures will be applicable to certain problems and others will not.**

RESEARCH METHODS AND RESEARCH METHODOLOGY

❖ **Importance of research methodology**

- **Research methodology helps in identifying the following aspects:**

  ➢ **Why a particular research method is used for the research?**

  ➢ **How and in what order research methods were applied to get the results of the research.**

  ➢ **What are the data analysis procedures?**

- **So, it is necessary for the researcher to design his own research methodology for his problem since the methodology may differ from problem to problem.**

RESEARCH METHODS AND RESEARCH METHODOLOGY

❖ **Research Methods Vs Research Methodology**

- **Research methods constitute only one component of the multidimensional research methodology.**

- **Some key objectives of research methodology are as follows:**

  ➢ **Choose the suitable research methods for the research problem.**

  ➢ **Determine the accuracy of the outcome of opted research methods.**

  ➢ **And, finally, to make sure that research the methods are efficient enough.**

RESEARCH METHODS AND RESEARCH METHODOLOGY

❖ **Research Methods Vs Research Methodology**

- **In order to clarify the differences between research method and research methodology, we shall use a comparison chart to look at them with respect to their meaning; what each is; what they encompass; what they comprise of; and their objective.**

BASIS OF COMPARISON	RESEARCH METHOD	RESEARCH METHODOLOGY
Meaning	Research Method implies the methods employed by the researcher to collect data to conduct research.	A Research methodology is systematic approach to solve the research problem and to reach a new conclusion.

RESEARCH METHODS AND RESEARCH METHODOLOGY

❖ **Research Methods Vs Research Methodology**

What is it?	Behavior and instrument used in the selection and construction of the research technique.	Science of understanding, how research is performed methodically.
Objective	To discover solution to research problem.	To apply correct procedures so as to determine solutions.
Comprise of	Different investigation and data collection techniques	Entire/systematic strategy towards achieving objective.
Applied at	During the latter stage of the research process (data collection and analysis)	Form the initial stage of the research being conducted till the end
Size	Research methods are small part of research methodology.	A Research methodology is a multi-dimensional concept.

ICT RESEARCH LIFE CYCLE

❖ **The Process of ICT Research**

- **The process of ICT Research consists of series of steps necessary to effectively carry out the research.**

- **Although the steps may overlap, the following order provides a useful procedural guideline regarding the research process:**

  ➢ **Formulating the Research Problem**

  ➢ **Extensive Literature Survey**

  ➢ **Developing the Research Hypothesis**

  ➢ **Preparing and Determining the Research Design**

ICT RESEARCH LIFE CYCLE

❖ **The Process of ICT Research**

> ➢ **Collecting the Research Data**
>
> ➢ **Analysis of the Data**
>
> ➢ **Hypothesis Testing**
>
> ➢ **Generalization and Interpretation**
>
> ➢ **Preparing of the Report**
>
> ➢ **Presentation of the Result.**

▪ **It should be noted that the various steps involved in the research process are not mutually exclusive. So, they are not quite separate and distinct.**

RESEARCH PROBLEM

❖ **What is a Research problem**

▪ **Generally, a problem is an obstacle or barrier in the path of satisfying our needs. This barrier needs to me removed.**

▪ **However, a research problem is defined as an area of concern that requires a meaningful understanding of a specific topic, a condition to be improved, a contradiction to be cleared, or a difficulty to be eliminated.**

▪ **Research problem means finding answers to questions or strengthening existing findings to bridge the knowledge gap to solve problems.**

RESEARCH PROBLEM

❖ **Examples of research problems/questions:**

- **What effect does daily use of Twitter and Facebook have on the attention span of under-16s?**

- **What impact does university monitoring system have on the behavior of the students inside campus?**

- **Why the mobile phone consumes more battery power when using WIFI?**

- **What the level of security we get when using Kaspersky comparing to McAfee security software?**

RESEARCH PROBLEM

❖ **Examples of research problems/questions:**

- **What are the similarities and differences in the experiences of students graduated from SUMAIT, SUZA, and ZU?**

- **How do the Zanzibar and the Dar es salaam be compared in terms of health services?**

- **. . .**

- **. . .**

RESEARCH PROBLEM

❖ **Impotent Points on formulating research problem**

- **As it's the first step in research, Selection of problem is governed by reflective thinking.**

- **Don't think that identification of a problem means to select a topic of a research or statement of the problem.**

- **It is necessary to review previous studies in order to determine just what has been already done and what is to be done.**

- **Specify it in detail and with precision each question and sub-question to be answered is to be specified, the limits of the investigation must be determined.**

RESEARCH PROBLEM

❖ **Steps for Identification of a Research Problem:**

- **Step I: Determining the field of research in which a researcher is keen to do the research work.**

- **Step II: The researcher should develop the mastery on the area or it should be the field of his specialization.**

- **Step III: He/she should review preliminary the research conducted in area to know the recent trend and studies are being done**

RESEARCH PROBLEM

❖ **Steps for Identification of a Research Problem:**

- **Step IV: On the basis of review, he/she should consider the priority field of the study.**

- **Step V: He/she should draw an insight in identifying the problem and the gap. Supervisor my help here.**

- **Step VI: He /she should pinpoint a specific aspect of the problem which is to be investigated.**

- **Step VII: Rephrasing the same into meaningful terms from an analytical point of view called research statement.**

RESEARCH PROBLEM

❖ **The Sources of the Problem:**

- **Classroom discussions, seminars and exchange of ideas with faculty members and fellow scholars and students will suggest many stimulating problems to be solved.**

- **Social developments and technological changes are constantly bringing forth new problems and opportunities for research.**

- **Record of previous research such specialized sources as the encyclopedias of educational, research abstracts, bulletins, reports, journals, dissertations and many similar publications are rich sources of research problems.**

RESEARCH PROBLEM

❖ **The Sources of the Problem:**

▪ **Text book assignments, special assignments, reports and term papers will suggest additional areas of needed research.**

▪ **Professional relationships, questioning attitude, academic discussions and constructive academic climate are especially advantageous opportunities.**

▪ **The most practical source of problem is to consult supervisor, experts of the field and most experienced persons of the field. They may suggest most significant problems of the area.**

RESEARCH PROBLEM

❖ **Research supervisor**

▪ **Although research problems should not be assigned or they should not be proposed and allotted by a guide but consultation with the more experienced faculty member or research worker is a desirable practice.**

▪ **One of the most important functions of the research guide is to help the student clarify his thinking, achieve a sense of focus and develop a manageable problem from one that may be vague and too complex.**

RESEARCH PROBLEM

❖ **Criteria of good research Problem:**

- **Kerlinger has identified following three criteria of good problem statements;**

  - ➤ **A problem should be concerned with relation between two or more variables.**

  - ➤ **It should be stated clearly and unambiguously similar to the question form.**

  - ➤ **It should be amenable to empirical testing.**

- **These will result, in a clear and concise idea of what the researcher wants to do, and sets the state for further planning**

RESEARCH PROBLEM

❖ **Evaluation of the Problem:**

- **Following questions must be answered affirmatively before the study is under Taken:**

  - ➤ **Is the Problem Researchable?**

  - ➤ **Is the Problem New?**

  - ➤ **Is the Problem Significant?**

  - ➤ **Is the Problem Feasible for the Particular Researcher? or for organization?**

RESEARCH PROBLEM

❖ **Feasibility of the Problem:**

  ▪ **In order to be feasible, a problem should agree with the following**

    ➢ **Research competencies of the Researcher**

    ➢ **Interest and eagerness of the Researcher**

    ➢ **Financial consideration in the Project**

    ➢ **Time requirement for the Project**

    ➢ **Administrative considerations in the Project.**

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Thank You