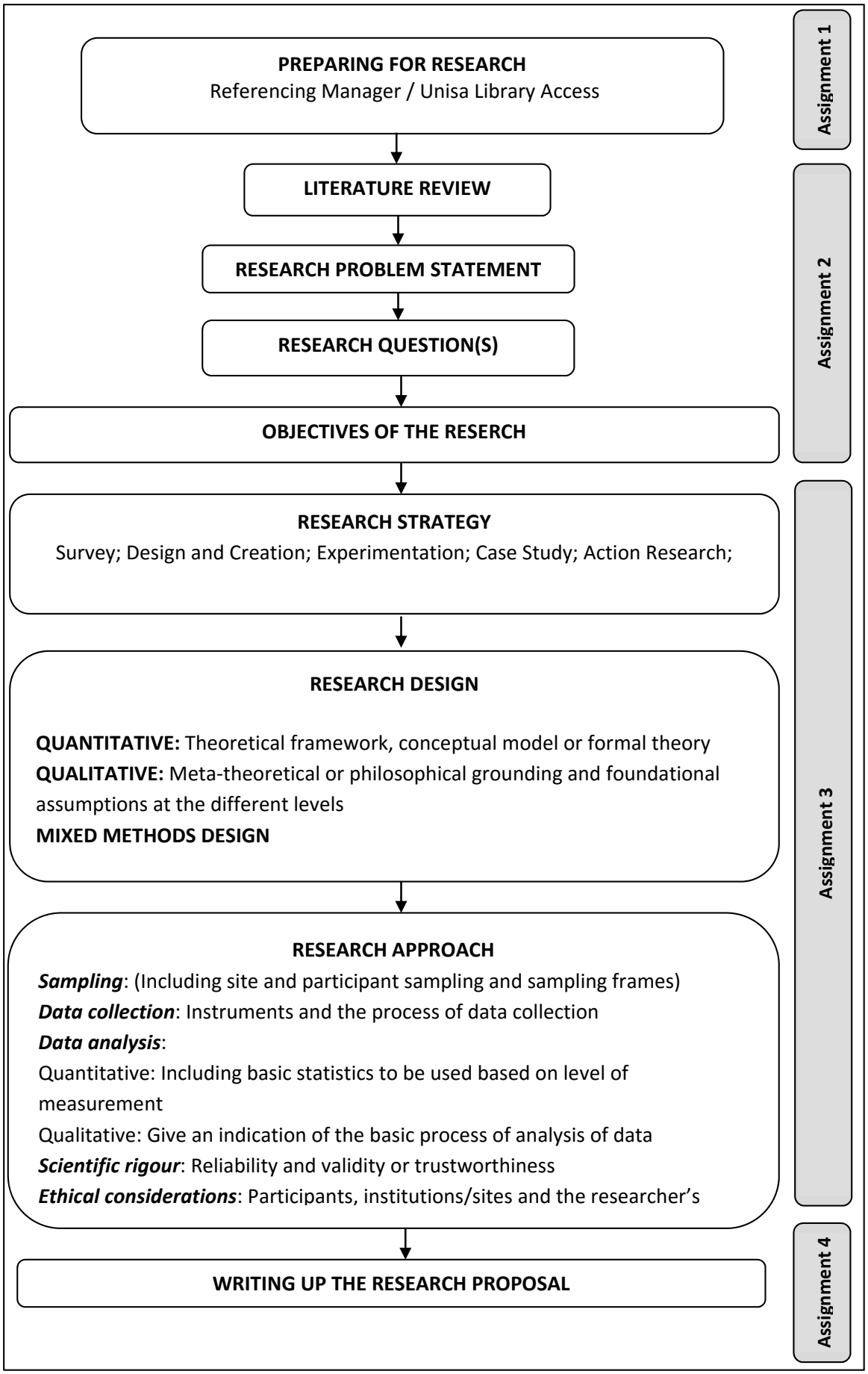
HPCOS81

Research Project for Honours

Learning Unit 3:


PREPARING FOR RESEARCH
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LITERATURE REVIEW
RESEARCH PROBLEM STATEMENT
RESEARCH QUESTION(S)
OBJECTIVES OF THE RESERCH
RESEARCH STRATEGY
Survey; Design and Creation; Experimentation; Case Study; Action Research;
RESEARCH DESIGN
QUANTITATIVE: Theoretical framework, conceptual model or formal theory
QUALITATIVE: Meta-theoretical or philosophical grounding and foundational assumptions at the different levels
MIXED METHODS DESIGN
RESEARCH APPROACH
Sampling: (Including site and participant sampling and sampling frames)
Data collection: Instruments and the process of data collection
Data analysis:
Quantitative: Including basic statistics to be used based on level of measurement
Qualitative: Give an indication of the basic process of analysis of data
Scientific rigour: Reliability and validity or trustworthiness
Ethical considerations: Participants, institutions/sites and the researcher's
WRITING UP THE RESEARCH PROPOSAL
Assignment 1
Assignment 2
Assignment 3
Assignment 4

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3.1. Conceptual framework informing the research

3.1.1 Research Strategy

Firstly, you should choose between a research strategy that will be used to gather data for your research. Some research designs include:

Strategy	Explanation
Survey	Focusses on obtaining the same kinds of data from a large group of people (or events), in a standardized and systematic way. You tend to look for patterns in the data using statistics so that you can generalize to a larger population than the group you targeted.
Design and Creation	Focuses on developing new IT products or artefacts. Often the new IT product is a computer-based system, but it can also be some element of the development process such as a new construct, model or method.
Experimentation	Focuses on investigating cause and effect relationships, testing hypothesis and seeking to prove or disprove a causal link between a factor and an observed outcome. There is a "before" and "after" measurement and all factors that might affect the results are carefully excluded form the study, other than the one factor that is thought will cause an "after" result.
Case Study	Focuses on one instance of the "thing" that is to be investigated: an organization, a department, an information system, a discussion forum, a systems developer, a development project, a decision and so on. The aim is to obtain a rich, detailed insight into the "life" of that case and its complex relationships and processes.
Action Research	Focusses on research into action. The researchers plan to do something in a real-world situation, do it, and then after reflect on what happened or was learned, and then begin another cycle of plan-act-reflect.

3.1.2 Research Design

You should read extensively about research design from several textbooks before selecting the one most appropriate to your study. The paradigm within which you work will give an initial indication of the research design that you will use. However, designs

should also be skilfully and creatively adapted and changed to fit your research problem. It is especially in qualitative research where an emergent design is called for.

First, you should decide on which research design (quantitative or qualitative) would be most appropriate to your research problem and purpose. A suitable research design should then be selected. Some of the main research designs according to paradigm are:

3.1.2.1 Quantitative:

Experimental – true experimental (controlled clinical trial) or quasi-experimental (non-experimental) – correlational (model-testing, predictive (case-control), descriptive); descriptive (classical descriptive or comparative descriptive).

3.1.2.2 Qualitative:

Generic qualitative design phenomenology; grounded theory; ethnography; qualitative research; concept analysis; participative action research; design science.

3.1.2.3 Mixed methods:

This is a specialised approach that you should only adopt in close consultation with your supervisor.

Before you select a design, you should read extensively about research as the more traditional designs listed above are further sub-divided in the research literature. The following is a useful structure for discussing your research design:

Describe the main characteristics of the selected design. Indicate how the chosen design will assist in attaining the set objectives of the study, answer the research questions and/or support or refute the stated hypotheses.

3.1.3 Data collection

NB: No existing data, or any data collected for some other, even broader study, may be presented as data for your research. Data must be newly collected under the supervision of your supervisor. Data collection can only commence once your supervisor has approved the project as well as the following sections of your dissertation/thesis: Chapter 1 (Introduction and orientation), Chapter 2 (Literature review), Chapter 3 (Methodology and research design), plus the data collection instrument you are going to use.

Explain which data collection approach, method(s) and instrument(s) you intend to use. Your choice must be in accordance with the research paradigm. This is mainly a choice between structured or unstructured data collection.

Indicate the following with regard to the chosen approach (structured or unstructured):

- definition of the chosen approach from the point of view of at least three authors main characteristics of the chosen approach
- advantages and disadvantages of the chosen approach
- the way in which the advantages of the approach will aid in attaining the set objectives of the research, answering the research question or support or refute the set hypotheses
- the way in which the disadvantages of the approach will be counteracted during the research

The reader must be informed about the data collection method(s) (e.g. interviews; observations) you intend to use. Indicate and explicate the following, keeping in mind the technical and standard requirements:

- definition of the chosen method
- main characteristics of the chosen method
- advantages and disadvantages of the chosen method
- the way in which the advantages will aid in attaining the research objectives, answer the research questions or support or refute the set hypotheses
- the way in which disadvantages will be counteracted during the research

Information is also required about the data collection instrument that you intend to use (especially in the case of quantitative research). Explicate the following:

- definition of the chosen instrument
- main characteristics of the chosen instrument
- advantages and disadvantages of the chosen instrument
- the way in which the advantages will aid in attaining the research objectives, answer the research questions or support or refute the set hypotheses
- the way in which the disadvantages be counteracted during the research

3.1.4 Data analysis

In the case of quantitative research, indicate which statistics you intend to use to analyse the data. Both descriptive and inferential statistics need to be referred to. You probably will not be able to name specific procedures. However, you need to give an indication of the basic statistics involved, based on whether you use of research objectives, questions and/or hypotheses as well as the type of design you propose to use. In conjunction with the items contained in your measurement instrument, indicate the levels of measurement at which you are going to measure variables. Substantiate possible statistical procedures that could be performed with the different levels of measurement as well as with the aim of achieving your research objectives.

If your proposed research is qualitative in nature, indicate which qualitative data analysis steps you would follow. Also substantiate way the specific steps. Also indicate whether data will be analysed manually or by means of computer software for qualitative data analysis. Again, substantiate your choice.

3.1.5 Data and design quality

Validity and reliability in quantitative research and trustworthiness in qualitative research relate to data quality and as such have vast ethical implications.

If your proposed research is quantitative in nature, you should give an indication of how you plan to enhance:

- external validity (especially important in descriptive and other non-hypothesis testing research)
- internal validity (especially important in hypothesis-testing research which is aimed at measuring the relationships between independent and dependent variables – of utmost importance in true experimental research to establish causal relationships).

If your proposed research is qualitative in nature, you should explain how you would enhance the trustworthiness of your research. This includes aspects such as credibility, transferability, dependability and conformability.

3.2. Ethical considerations

Indicate the ethical considerations for your proposed study under the following sub-headings:

- protecting the rights of the participants
- protecting the rights of the institution
- scientific integrity of the research (scientific honesty on the part of the researcher – that is yourself)

In addition, the research topic itself often poses special ethical considerations as is the case of, for instance, doing research on the impact of HIV/AIDS on aspects of

technology use. The ethics relating to these sometimes need to be explicated pertinently under a specific heading.

[Once you have passed the research project module, you will have to apply formally for ethical clearance for your project at the School of Computing Ethics sub-committee. Without a clearance certificate from this committee, you are not allowed to proceed with the actual research. Instructions on this process are contained in the other tutorial letters for this module.]

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