**Homework 2**

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**Why we need to do literature review? (10 points)**

Literature reviews are important because, as researchers we need to be familiar with and knowledgeable about all the relevant domains regarding our topic. We need to know whether our proposed solutions and case studies are novel. Both to avoid plagiarism as well as to make meaningful contributions.

**What are the four steps of doing a literature review? (10 points)**

1. Searching for the existing literature in the area of interest

Begin looking for any academic information germane to the topic of research. This could include anything from academic books, conference papers, journals, or reliable sources from the internet. It is important that what is reviewed does not stray from the topic and furthers discussion.

2. Reviewing the selected literature

Examine the chosen materials closely to determine whether it is accurate beyond any doubt. We can do this by comparing reviewing their methodologies used, the sample sizes, sample characteristics, and methods used to derive conclusions from the gathered data. Assuming there are not any discrepancies like leaps in logic, unsubstantiated/uncited claims, or significant disagreement among other researchers, then the source should be safe to use.

3. Developing a theoretical framework

A theoretical framework describes whatever theories are the main focus of the research problem. They support the research by drawing from information already detailed in previous works.

4. Developing a conceptual framework

A conceptual framework is derived from a theoretical framework. It is like a guide for the research project by clearly defining key aspects and actions. Like, the relevant variables that need to be kept in mind and how they might relate to each other. In a quantitative study, a conceptual framework could be used to provide survey questions or data points, or to create hypotheses. For a qualitative study, they could be used to determine a working hypothesis or a set of research questions.

**How to write a literature review? (20 points)**

A good literature review will provide a summary of the relevant theories and their relation to the core theme of the research study. It should specify any gaps, recent advances, and/or current trends in the existing field of study. All the while keeping a logical order, making sure to use appropriate citations for data or quotes, and by maintaining the required academic referencing style.

**Please illustrate the research process. (20 points)**

The general research process has three phases and eight steps.

The phases are…

1) deciding what research to study,

2) planning said research study, and

3) conducting a research study.

And each of the steps are…

1. Formulating a research problem,
2. Conceptualizing a research design,
3. Construction of an instrument for data collection,
4. Selection of samples
5. Writing a proposal
6. Collection of data
7. Processing and displaying of data
8. Writing a research report

**Please illustrate the four different research processes in your own words. (20 points)**

The four different research processes are the sequential, generalized, circulatory, and evolutionary.

The sequential process is a series of activities performed one after the other as a “fixed, linear series of stages”, which consists of seven unique steps: area of study identification, research topic selection, approach decision, research performance plan, data gathering, data analysis, and presentation of findings.

The generalized process is similar to the sequential process; however, it recognizes that some stages may be omitted or performed differently.

The circulatory process says that any research is a part of a continuous cycle of discovery and investigation. As the study is performed and the results evaluated, new questions might occur and the process will begin anew in an attempt to find their answers. This could lead to previous research needing to be reevaluated as well, causing a never-ending process (which is recognized).

The evolutionary process continues from the circulatory process, but it says that research must evolve and change over time. Meaning, that the process does not need to behave in a cyclical pattern like the circulatory and can perform different analyses or processes as needed. Each outcome of the evolutionary process should then impact future ones, however great or small.

**Please illustrate the general structure of a research paper. (20 points)**

A research paper generally has five key parts that define its structure: the title, abstract, introduction, methods and materials, and results. Although it is not defined in the chapter description, I would add that academic styling could be considered a sixth part. A title should be simple, brief, and attentive to clearly convey the topic. It should also avoid overly vague descriptors and abbreviations or jargon to improve searchability of the paper. An abstract should summarize the purpose of the study, the models organism or system, experiment descriptions, results or specific data, and the final conclusions and/or questions following the experiment(s). The introduction is used to present the reasoning behind the research project within a theoretical context that allows the reader to understand the objectives. Materials and methods are meant to document the specific materials and the general procedures used to determine the results. It should be presented accurately in a way that the reader can easily judge the scientific merit of the work. This section should not be described in such extreme detail that it reads like a story, but it should enable readers to replicate the study, given the same processes and data. Results should be described concisely, only using as much detail needed to show the types and amounts of data being reported. The data should be presented effectively using whichever tables or figures most accurately and clearly convey information. It is important that this section of the paper be described as objectively as possible to allow the reader to make their own observations and judgements for discussion.