Research Experiments

March 2020

1 Introduction

Time is short. Time is the one commodity that is unobtainable. Humans must use the time they have efficiently, this extends to all domains of life. This is even more relevant when dealing with research work. Conducting meaningful research requires a large amount of time and effort. So, ensuring that researchers understand the different types of research is crucial. The following seeks to explain these different methods of conducting research.

2 Research Types

2.1 Descriptive Research

This method of research "focuses on presenting facts and details about the existence of objects and phenomena." This can include surveys and similar styles of obtaining and reporting data.[2] When conducting descriptive research, researchers usually do not have an influence on the results. The completed research is solely reporting data, therefore, descriptive research is typically involved with other research methods.[2]

A study conducted on the sleep patterns of students at a North Central public university is an example of descriptive research. In this study, a survey sent to 20,000 students was used to collect data, which was then reported in a research paper.[3] No subjects are specifically targeted in this method, and as shown in this example, a survey is released to a large number of candidates.

2.2 Case Study Research

Case studies are similar to descriptive research, but the main difference here is that case studies focus on the observation of a specific question, with a specific subject. Case studies are similar to descriptive research as they are usually not a research contribution on their own.[2]

An article published last month titled "Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China" is an example of case study research work.[4] In this style of research, the authors take advantage of graphs

and tables to represent the data for each case. Although the researchers did not conduct experiments, the article provides a better understanding of an unknown disease for many different subjects.

2.3 Empirical Research Studies

Unlike the previous two research methods, empirical research makes conclusions on the data that is observed. This may include observations of the following:

- Patterns
- Analysis of trends
- Data analysis techniques[2]

When Empirical research is conducted, it is a contribution in itself and the results serve a purpose.[2]

An example of empirical research can be found in Jong-Tae Lee and Joel Schwartz's (of the College of Medicine in Yonsei University, Seoul, Korea) research article on the effects of air pollution on daily mortality in Seoul, Korea. After observing data and conducting empirical analysis, Lee and Schwartz were able to make conclusions on the association between ambient air pollution and daily mortality.[5]

2.4 Observational/Social Research

Observational research is where the researcher is observing subjects in a specific situation, collecting data, and analysing to come to a conclusion with results. According to Dr. Rapos, some research only focuses on the social aspects of interaction and observation, meaning this method is used quite often in social sciences.[2]

Observing social environments with no influence can provide valuable data to analyze. In 2006, an observational study was conducted on children with attention-deficit hyperactivity (ADHD) in three different classroom settings. In this study, the researchers were able to draw quantitative conclusions from only observing.[6]

2.5 Tool Development and/or Evaluation

This research method revolves around an inventive approach, and focuses on creating a tool that "will bring a new way of completing an existing task; either a complex view on the topic, or some new take on an existing problem.""[2] This method can be combined with the other research methods listed, but tool development is considered the final step in most research.

Evaluating an existing tool is also considered a contribution to research. Such was proven by the extensive research paper on evaluating the performance of search engines. Which contributed research towards information about existing tools.[1]

2.6 Experimental Research

This method of research is the most well known, as it is the primary method taught in grade schools. Experimental research is where the researcher forms a hypothesis, performs an experiment, proves or disproves his/her hypothesis, and then reports the results.[2] In this method, the researcher will be interacting with independent and dependent variables and control groups.

3 Conclusion

When conducting research it is important that the right method is used. If a researcher chooses the wrong method, time, money, and the final result will suffer. This paper serves as a summary of the different types of research with real world examples. With a topic of research in mind, a researcher will have no trouble recognizing the proper research method(s) to conduct their work.

References

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