

SOLIDWORKS 2022 and Engineering Graphics: An Integrated Approach

While quantitative research is based on numbers and mathematical calculations (aka quantitative data), qualitative research is based on written or spoken narratives (or qualitative data). Qualitative and quantitative research techniques are used in marketing , sociology , psychology , public health and various other disciplines.

Type of data

Qualitative research gathers data that is free-form and non-numerical, such as diaries, open-ended questionnaires, interviews and observations that are not coded using a numerical system.

On the other hand, quantitative research gathers data that can be coded in a numerical form. Examples of quantitative research include experiments or interviews/questionnaires that used closed questions or rating scales to collect information.

Applications of Quantitative and Qualitative Data

Qualitative data and research is used to study individual cases and to find out how people think or feel in detail. It is a major feature of case studies.

Quantitative data and research is used to study trends across large groups in a precise way. Examples include clinical trials or censuses.

When to use qualitative vs. quantitative research?

Quantitative and qualitative research techniques are each suitable in specific scenarios. For example, quantitative research has the advantage of scale. It allows for vast amounts of data to be collected -- and analyzed -- from a large number of people or sources. Qualitative research, on the other hand, usually does not scale as well. It is hard, for example, to conduct in-depth interviews with thousands of people or to analyze their responses to open-ended questions. But it is relatively easier to analyze survey responses from thousands of people if the questions are closed-ended and responses can be mathematically encoded in, say, rating scales or preference ranks.

Conversely, qualitative research shines when it is not possible to come up with closed-ended questions. For example, marketers often use focus groups of potential customers to try and gauge what influences brand perception, product purchase decisions, feelings and emotions. In such cases, researchers are usually at very early stages of forming their hypotheses and do not want to limit themselves to their initial understanding. Qualitative research often opens up new options and ideas that quantitative research cannot due to its closed-ended nature.

Analysis of data

Qualitative data can be difficult to analyze, especially at scale, as it cannot

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be reduced to numbers or used in calculations. Responses may be sorted into themes, and require an expert to analyze. Different researchers may draw different conclusions from the same qualitative material.

Quantitative data can be ranked or put into graphs and tables to make it easier to analyze.

Data Explosion

Data is being generated at an increasing rate because of the expansion in the number of computing devices and the growth of the Internet. Most of this data is quantitative and special tools and techniques are evolving to analyze this "big data".

Effects of Feedback

The following diagram illustrates the effects of positive and negative feedback on Qualitative vs Quantitative research:

References

Reference

[Modern Control Engineering](#)

[How to Use Engineering Equation Solver \(EES\): Refrigeration and Heat Transfer Applications](#)