EXPERIMENTAL RESEARCH

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INTRODUCTION

- Experimental research is a type of research in which the researcher manipulates one or more variables to test the effect on another variable.
- Experimental research is the most rigorous type of research design, and it is often used to establish cause-and-effect relationships.
- Experimental research can be used to study a wide range of phenomena, including human behavior, physical processes, and social interactions.

TYPES OF EXPERIMENTAL RESEARCH

- There are many different types of experimental research designs, but some of the most common include:

- **True experiments:** In a true experiment, the researcher randomly assigns participants to experimental and control groups.

- **Quasi-experiments:** In a quasi-experiment, the researcher does not have control over the assignment of participants to groups.

- **Single-case research:** In single-case research, the researcher studies the behavior of one individual over time.

TRUE EXPERIMENTAL DESIGN

- A true experimental design is a research method that is used to establish a cause-and-effect relationship between two variables. This type of design is considered to be the most accurate form of research because it eliminates the effects of confounding variables.

KEY COMPONENTS

- There are three key components of a true experimental design:

- **A control group:** The control group is a group of participants who do not receive the experimental treatment. This group provides a baseline against which to compare the results of the experimental group.

- **A researcher-manipulated variable:** The researcher-manipulated variable is the variable that is changed by the researcher. In other words, the researcher decides who receives the experimental treatment and who does not.

- **Random assignment:** Participants are randomly assigned to either the control group or the experimental group. This ensures that the two groups are equal on all variables except for the researcher-manipulated variable.

SOME EXAMPLES

- Here are some examples of true experimental designs:

- A study that compares the effectiveness of two different teaching methods by randomly assigning students to either method.

- A study that tests the effectiveness of a new drug by randomly assigning patients to either the drug or a placebo.

- A study that examines the effects of a new advertising campaign by randomly assigning consumers to either see the campaign or not see it.

QUASI-EXPERIMENTAL DESIGN

- A quasi-experiment is a research design that attempts to establish a cause-and-effect relationship between two variables, but does not use random assignment. This type of design is often used when random assignment is not possible or ethical.

TYPES OF QUASI-EXPERIMENTAL DESIGN

- There are several types of quasi-experimental designs, including:

- **Non-equivalent groups design:** In this design, participants are not randomly assigned to groups, but the groups are compared to see if there are any differences between them.

- **Time series design:** In this design, the dependent variable is measured over time for both the experimental and control groups. This allows the researcher to see if there is a change in the dependent variable after the independent variable is manipulated.

- **Interrupted time series design:** This design is similar to a time series design, but the independent variable is manipulated at a specific point in time. This allows the researcher to see if there is a causal relationship between the independent and dependent variables.

EXAMPLES

- Here are some examples of quasi-experimental designs:

- A study that compares the effectiveness of two different teaching methods by comparing the test scores of students who were taught using each method.

- A study that tests the effectiveness of a new drug by comparing the health outcomes of patients who took the drug to the health outcomes of patients who did not take the drug.

- A study that examines the effects of a new advertising campaign by comparing sales before and after the campaign was launched.

SINGLE-CASE RESEARCH DESIGN

- A single-case research design is a type of research design that is used to study the effects of an intervention on a single individual or small group of individuals. This type of design is often used in applied fields such as psychology, education, and behavior analysis.

EXAMPLES

- Single-case research designs are characterized by the following features:

- **Repeated measurement:** The dependent variable is measured repeatedly over time, both before and after the intervention is implemented. This allows the researcher to see if there is a change in the dependent variable that is associated with the intervention.

- **Visual analysis:** The data collected in a single-case research design is typically analyzed visually. This allows the researcher to see how the dependent variable changes over time and to identify any patterns in the data.

- **Replication:** Single-case research designs are often replicated multiple times. This helps to ensure that the results of the study are not due to chance.

TYPES OF SINGLE-CASE RESEARCH DESIGNS

- There are several different types of single-case research designs, including:

- **ABA design:** This design involves three phases: baseline, intervention, and follow-up. In the baseline phase, the dependent variable is measured repeatedly over time. In the intervention phase, the intervention is implemented and the dependent variable is measured repeatedly over time. In the follow-up phase, the intervention is removed and the dependent variable is measured repeatedly over time.

- **ABAB design:** This design is similar to the ABA design, but the intervention is withdrawn and reinstated at different points in time. This allows the researcher to see if the effects of the intervention are maintained after the intervention is removed.

- **Multiple baseline design:** This design involves multiple participants or multiple dependent variables. In this design, the intervention is implemented with one participant or one dependent variable at a time. This allows the researcher to see if the intervention has a similar effect on different participants or different dependent variables.

STEPS IN EXPERIMENTAL RESEARCH

- The steps in experimental research are as follows:
- **Define the research question.** What do you want to know?
- **Develop a hypothesis.** What do you think the answer to your research question is?
- **Select a research design.** What type of experimental research design will you use?
- **Recruit participants.** Who will you study?
- **Measure the variables.** How will you measure the variables of interest?
- **Manipulate the independent variable.** How will you manipulate the independent variable?
- **Collect data.** Collect data on the dependent variable.
- **Analyze the data.** Use statistical analysis to test your hypothesis.
- **Interpret the results.** What do your results mean?

ADVANTAGES OF EXPERIMENTAL RESEARCH

- Experimental research is the most rigorous type of research design.
- Experimental research can be used to establish cause-and-effect relationships.
- Experimental research can be used to study a wide range of phenomena.
- Experimental research can be used to test hypotheses, develop new theories, and improve our understanding of the world.

DISADVANTAGES OF EXPERIMENTAL RESEARCH

- Experimental research can be time-consuming and expensive.
- Experimental research can be difficult to conduct, especially if it involves human participants.
- Experimental research can be unethical if it involves harming participants.

ETHICAL CONSIDERATIONS IN EXPERIMENTAL RESEARCH

- When conducting experimental research, it is important to consider the ethical implications of your research. Some ethical considerations include:
- **Informed consent:** Participants must be told about the nature of the research and their rights as participants before they agree to participate.
- **Confidentiality:** Participants' data must be kept confidential.
- **Harm:** Participants must not be harmed by the research.