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Grounded Theory in Transportation Research

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INTRODUCTION

Backround information

- Grounded theory (GT), which emphasizes theory generation and descriptive qualities, is a leading qualitative methodology for social science research (Zamani and Babaei, 2021).
- Some researchers adopt the toolbox technique by employing GT approaches to explore a subject (Johnson-Glauch & Herman, 2019); others implement the method without asserting the formulation of an adaptable concept (McNeill et al., 2016).

Problem Statement

This variation illustrates the wide range of adaptations of GT research utilized in literature, yet uncertainties persist concerning the criteria that differentiate an outstanding study from a low-quality qualitative study masquerading as grounded theory (Suddaby, 2006). This ambiguity can be especially detrimental for inexperienced researchers and individuals unfamiliar with grounded theory, potentially constraining its use and theoretical contributions to our discipline.

Research Objectives

The aim of this study is to critically examine and synthesize the principles, variations, and methodologies of grounded theory, while assessing its applicability, challenges, and contributions to qualitative research across disciplines, particularly to engineering education. The study further seeks to provide a comprehensive understanding of the research quality and validity measures necessary for conducting robust GT research

RESULTS

Variations of Grounded Theory

Glaser and Strauss's Grounded Theory: Blends Glaser's objective perspective and Strauss's interactionism approach, focusing on symbolic interactionism and how individuals create meaning through social relationships.
Strauss and Corbin's Pragmatist GT: Incorporates a logical, interpretive approach for data analysis and allows researchers to adapt protocols based on study goals, emphasizing continuous self-reflection and analytic validation.
Charmaz's Constructivist GT: Emphasizes co-created knowledge, focusing on the subjective nature of reality and the interaction between researchers and participants in generating insights.

Fundamental Principles of Grounded Theory

Continuous Data Collection and Analysis: Data is collected, analyzed, and re-collected, refining understanding as new insights emerge.
Data Coding: Repeated open, axial, and selective coding processes help identify patterns, trends, and categories directly from the data.
Category Development: Organizing coded information into broader groups that highlight key themes and interconnections, contextualizing the data.
Comparative Approach: Constant comparisons of occurrences throughout the study to ensure consistency, reduce bias, and improve accuracy.
Memo Writing: Regular documentation of codes, evolving categories, and reflections that aid the analysis and uncover new ideas.
Theoretical Sampling and Saturation: Data collection directed by emerging theory to refine concepts and achieve saturation when no new insights emerge.

Research Quality and Validity

Accountability: Ensuring results reflect participants' perspectives through diverse data sources and engaging with various stakeholders
Transferability: Theoretical generalization, ensuring conclusions can be applied to different contexts through varied respondents and alignment with existing theory (Yin, 2003).
Dependability: Ensuring reproducibility by maintaining detailed data and rationale for methodological choices (Ward et al., 2016).
Confirmability: Ensuring findings are based solely on data, avoiding investigator bias (Wiesche et al., 2017).

Key benifits of Grounded Theory

Emerging Theory Development: Allows theories to emerge directly from empirical data rather than being based on pre-existing frameworks.
Versatility: Applicable across various domains, including transportation, management, and policy, providing valuable insights into complex phenomena.
Collaborative Knowledge Creation: Engages both researchers and participants in the co-construction of meaning, improving the quality and depth of findings.

CONCLUSION

Grounded theory is the cornerstone of qualitative research. It offers a structured yet flexible approach to generating theory from data; its fundamental principles and methodological variations make it adaptable across disciplines, including engineering education; it integrates processes such as continuous data collection, comparative analysis, and theoretical sampling to ensure that emergent theories are deeply rooted in empirical evidence; and it measures the accountability, transferability, dependability, and confirmability of the research. While debates surrounding the adaptations persist, these discussions reflect the dynamic evolution of GT in response to diverse research contexts. This study reaffirms the significance of grounded theory as a methodological framework that provides researchers with a robust toolkit for investigating complex phenomena that will contribute meaningful insights to their fields.

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