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Understanding Qualitative and Quantitative Research Paradigms in Academic Medicine

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Qualitative research is becoming more prominent in academic medicine and health care fields, and an increasing number of publications using qualitative methods are featured in prominent journals\(^1\)-\(^3\); thus, recognizing the different available approaches can benefit researchers of all types. While a debate may wage between proponents of qualitative versus quantitative research, both sets of methods—and often a blend of the two—offer important insights into the problems the academic medicine community faces.\(^4\)-\(^6\)

### Qualitative paradigm

- **How and why events or behaviors occur in complex settings where context is important to understanding:**
  - *Examples:* How do a diverse student body and faculty affect teaching and learning? How does a resident make the transition to attending physician? What characterizes the phenomenon of a mentor–mentee relationship?
- **Inductive by researchers (e.g., normative or transcribed text analyzed thematically for patterns):**
  - *Types of designs:
    - Case study: An in-depth study of a particular case, which can be descriptive, explanatory, or exploratory
    - Ethnography: Research intended to provide descriptions of systems, processes, or phenomena within their specific context; stems from anthropology
    - Grounded theory: A theory developed based on the examination of data (rather than applying a predetermined theory)
    - Historiography: Research directed at the study of a past event, issue, or problem that uses information from the past
    - Phenomenology: The study of individuals’ perspectives on particular phenomena
    - Action research: A reflective and team-based approach led by those involved in solving a particular problem
    - Mixed methods: A combination of quantitative and qualitative approaches including triangulation design, embedded design, explanatory design, and exploratory design

- **Normative data from interviews, documents, focus groups, and/or observations**

### Quantitative paradigm

- **Nature of the research question:**
  - *Examples:* What is the relationship between student grades and graduation rates? What type and amount of monetary incentive or financial reward affects a medical student’s specialty choice?
- **Deductive by statistics (e.g., data and patterns analyzed through statistical means):**
  - *Types of designs:
    - Experimental: The researcher manipulates all variables including the assignment to treatment and control groups in order to discern causality
    - Quasi-experimental: Research using an experimental variable with groups not formed through random assignment or selection
    - Surveys: Measurement procedures that involve asking questions of respondents
    - Mixed methods: A combination of quantitative and qualitative approaches including triangulation design, embedded design, explanatory design, and exploratory design

- **Data sources**
  - Ordinal or cardinal data from surveys, financial reporting, census reports, test scores, demographics, and/or observations

### Qualitative paradigm vs. Quantitative paradigm

<table>
<thead>
<tr>
<th>Nature of the research question</th>
<th>Nature of data and analysis</th>
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<tbody>
<tr>
<td>How many, how often, what level, and what direction of relationships between defined variables in settings that can be decontextualized: <em>Examples:</em> May be more difficult to test theories with large participant pools.</td>
<td>Deductive by statistics (e.g., data and patterns analyzed through statistical means): May be of limited scope due to the in-depth data-gathering approaches used.</td>
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<table>
<thead>
<tr>
<th>Data sources</th>
<th>Analytic techniques</th>
<th>Assessment of rigor</th>
<th>Strengths</th>
<th>Weaknesses</th>
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<tbody>
<tr>
<td>Ordinal or cardinal data from surveys, financial reporting, census reports, test scores, demographics, and/or observations</td>
<td><em>Descriptive statistics</em></td>
<td>Internal validity (e.g., through study design and procedures)</td>
<td><em>Delineates relationships among variables</em></td>
<td>Narrow variables might not be valid</td>
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<td><em>Regression</em></td>
<td>External validity (e.g., through criterion measurement)</td>
<td><em>Provides generalizable research findings when the data are based on sufficiently sized random samples</em></td>
<td>Knowledge produced might be too general for direct application to specific contexts or individuals</td>
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<td><em>Regression discontinuity</em></td>
<td>Reliability (e.g., through test–retest, internal consistency)</td>
<td><em>Provides generalizable results when research has been replicated in different populations/subpopulations</em></td>
<td>Phenomena may be missed if analysis focuses on hypothesis testing rather than hypothesis generation</td>
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<td><em>Hierarchical linear modeling</em></td>
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<td><em>Is useful for large populations</em></td>
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### References