Mind the gap: How to come up with interesting research questions

What’s your research question?

What makes for interesting question?

Why should we care about research questions?

• Lead to new insights and theories
• Lead to high impact research
• Attract talent and funding
• Dylon (1983): Types of questions posed in educational research
• More than 50% in his corpus did not contain a RQ
• Bordage (2001) has similar number for medicine
• White (2013) finds that not much has changed regarding the prevalence of RQs.
• Advise on how to create RQs, e.g. Andrews (2003)
• Analysis of researchers’ strategies to generate RQs:
  • Locke & Golden-Biddle (1997)
  • Alvesson & Sandberg (2013)

Who has cared about them?

A small content analysis: Corpus

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<th>JEP 10(2)</th>
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Basic question types

Confusion spotting: Looks for areas where previous research on the topic exists, but the available evidence is contradictory.

Neglect spotting: Looks for something that has not yet been considered in existing literature (not at all or not ‘appropriately’).

Application spotting: Looks for areas where there is not sufficient theory, or certain method problems, and suggests to apply a specific theory, a specific theoretical framework, or a specific method to remedy the state of affairs.

All are variants of gap spotting.

Main strategies based on literature review

Basic gap spotting modes Specific version Number of Reviewed articles
Confusion spotting – 5
Neglect spotting Overlooked area 16
Additional factors 9
Lack of empirical evidence 13
Application spotting Lack of empirical evidence 12
Other – 11

Basic question types

Confusion Neglect Application Other
“More specifically, the current study explores two potential explanations for the conflicting results reported (p.207). (…) Through this analysis, the current study contributes to the resolution of the controversy regarding the structure and coherence of students’ science knowledge by clarifying the role of methodological approaches and student population differences in the findings of researchers on opposing sides of the controversy.”

**Confusion spotting example**

- Overlooked area:
  - “However, little is known about how background information, particularly information about how scientists struggle, influences students’ learning in science.”

- Additional factor(s):
  - “While this body of research provides substantial evidence for the negative association between preschool underactive and overactive problem behavior on school readiness outcomes, further research is needed to examine whether at the classroom level, there is an additive risk to learning when children share a peer environment characterized by high levels of problem behavior.”

**Neglect spotting examples**

- Gap spotting
- Problematization
- Prescience
- Generative questions

**Question generation strategies**

- The “high road”
  - Studies show that influential theories and widely cited papers are usually *not* based on a gap spotting, but use problematization as the main strategy.
  - “A central goal in such problematization is to try to disrupt the reproduction and continuation of an institutionalized line of reasoning. It means taking something that is commonly seen as good or natural, and turning it into something problematic” (Sandberg & Alvesson, 2011, p. 32).
GENERATIVE QUESTIONS
Beyond “Does it work/have an effect?”

The experimental logic allows to determine if a causal relation between treatment and outcome exists.
What information do we loose with OXO?
Why is this a problem?
Is there an alternative?

The OXO Control Group Design

Gain scores:
Mean

CMOCs instead of OXO

Context-Mechanism-Outcome Configurations – CMOCs.
As apple consumption increases, health increases

Vitamin C

Replacement of junk food

Redness (Quercetin, an antioxidant)

Important: The “active ingredient” (e.g., Vitamin C) is not identical with the treatment/the intervention (the apple)!

We move from “explaining variance” ….

… to explanations in terms of entities having properties, which gives rise to mechanisms that produce activities and events, in the course of which (part of) the entities might get transformed.

The nature of explaining

Importantly, the “active ingredient” (e.g., Vitamin C) is not identical with the treatment/the intervention (the apple)!

We move from “explaining variance” …

… to explanations in terms of entities having properties, which gives rise to mechanisms that produce activities and events, in the course of which (part of) the entities might get transformed.

The nature of explaining

What do experiments do?

Experiment setup

Experimental production

Triggers the mechanism

Context (C)

Mechanism (M)

Outcome (O)

Experimental control

Other mechanisms

Blocks, disables

“What works for whom, in what contexts, in what respects and how?”

Outcome = Mechanism + Context

Mechanism = Reasoning + Resources

Basic question and answer format for “peopled” systems
As we move from OXO to CMOC

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<th>Pre-test</th>
<th>Treatment</th>
<th>Post-test</th>
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<tbody>
<tr>
<td>Experimental group</td>
<td>0.4</td>
<td>0.3</td>
<td>0.1</td>
</tr>
<tr>
<td>Control group</td>
<td>0.6</td>
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The comparison between treatment and control group gets replaced by *intra*-treatment (intervention program), *inter*-group (or inter-context) comparison.

**Summary**

- How & Why questions: Probing into mechanisms.
- For Whom questions: Probing into context.
- “Deep” questions: Observable events and activities are not identical with reasons and causes.
- Explanation seeking questions, not only descriptive questions.

**What makes for a good research question?**

- Instead of:
  - “What is the effect of teaching group facilitation skills on the amount of students’ exploratory talk?”
- Ask:
  - “Do the activities of a facilitator lead to more opportunities for quality contributions to group talk?” And,
  - “Are their group norms in place and at work that reinforce individual contributions?”

**Example**

- Don’t end with descriptive research, start from it.
- For an (expected) outcome or regularity, is it known what brings this outcome about? (Is the mechanism identified?)
- For an identified mechanism, is it known for whom it applies and it which respects?

**How to get to good questions?**

Theory will be your best friend!
• Falsifiable
• Generative
• Connected

What are good answers (hypotheses)?

Phenomenon (Regularity)
Explanation
Test (Evidence, data)

• Induction, deduction, abduction

Your Testing needs to address the Explanation!!

Think PET!

Further readings


Gain scores:
Mean