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Case studies

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Case studies: from theory to reality

CHAPTER 9

CASE STUDY METHODS

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INTRODUCTION: WHAT IS THE CASE STUDY METHOD AND WHY USE IT?

Case study research continues to be poorly understood. In psychology, as in sociology, anthropology, political science, and epidemiology, the strengths and weaknesses of case study research—much less how to practice it well—still need clarification.

To start, case study as a research method differs from case studies as a teaching tool[1] or from case records maintained by service agencies.[2] As a second broad distinction, especially pertinent to psychology, case study research differs from at least two other types of like-sounding research methods: (a) single-subject research, found both in neuropsychology (e.g., see Chapter 33 of this volume) and in behavioral research more generally (e.g., see Kratochwill, 1984; Morgan & Morgan, 2009; Tawney & Gast, 1984; see also Chapter 31 of this volume); and (b) case-control studies (e.g., see Schlesselman, 1982; see also Chapter 15 of this volume). Figure 9.1 explains the main differences and compares them to conventional experimental group designs. The four choices also can overlap, hence Figure 9.1 only depicts an ideal classification.

Figure 9.1 points to the two key dimensions in distinguishing among the four methods. For instance, between the two types of methods emphasizing individual data (Figure 9.1, Row 2), single-subject research calls for some formal manipulation, such as a repeated trial type of pattern. Conversely, between the two types of methods not involving any manipulation (Figure 9.1, Column 2), case-control studies usually collect data from groups of individuals who already have exhibited the condition of interest (e.g., tobacco users). The studies then proceed to estimate the differences between the group's mean and that of a retrospectively selected control group (e.g., nontobacco users). Given Figure 9.1's two dimensions, case study research focuses on individual-level data and is limited by the inability or unwillingness to manipulate any intervention.

Having differentiated case study research in this approximating manner, the following chapter reviews the main aspects of case study research—its definition, design, data collection procedures, and analytic techniques. The chapter serves readers who may want to refresh their understanding of case study research, but the chapter also informs those who might want to overcome their skepticism about the method.[3]

Case Studies: A Brief Definition

All case study research starts from the same compelling feature: the desire to derive a(n) (up)close or

[1]The teaching tools are invaluable, but a teaching case's data can be manipulated for instructional purposes, and the cases are not part of the research literature. In contrast, research cases must adhere strictly to methodological procedures, linking all findings to explicit evidence. For a broad discussion of teaching cases in business, law, and medicine, see Garvin (2003). For examples of teaching cases in psychology, see Dunbar (2005) and Golden (2004).

[2]Bromley (1986) noted that such records, although otherwise appearing to be case studies, can be influenced by "expectations regarding accountability rather than factual data" (p. 69) and are therefore "liable to a variety of accidental or deliberate omissions and distortions" (p. 90).

[3]For instance, even devoted supporters of *gold standard* research have found some benefit from doing their own published research using the case study method (e.g., Cook & Foray, 2007).

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APA Handbook of Research Methods in Psychology: Vol. 2. Research Designs, H. Cooper (Editor-in-Chief)

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Case studies

What constitutes a case study?

All case study research starts from the same compelling feature: the desire to derive a(n) (up)close or otherwise in-depth understanding of a single or small number of "cases," set in their real-world context (e.g., Bromley, 1986).

"In case studies, the number of variables of interest will far outstrip the number of available data points" (Yin, 2009, p. 18).

Case studies

Three conditions contribute to the large number of variables:

- conditions over time,
- in-depth inquiry,
- contextual conditions

Case studies

What constitutes a case study?

Case studies may rely primarily on quantitative or qualitative data (or a mix of both)

Motives for using the case study method

Exploration

Description (how?) and explanation (why)

Evaluation

Research design

Theory has a role to play

In design

In analysis
- in generalising from a case study
– analytic generalisations which require carefully constructed claims

Concerns about case study research

- Procedures used
- Subjectivity
- Qualitative data (measures) (Evidence trail)
- Lack of generalisability

A case study of case study development

Centres for Excellence in Mathematics programme

The research comprises two main strands:
- Running large-scale interventions to trial approaches to teaching mathematics **
- Advising on smaller-scale action research projects in participating colleges

The annual cycles of research trials fall into four main themes:

Mastery
Engagement and motivation
Contextualisation
Technology and data

Context

Further Education in the UK
GCSE mathematics in colleges

21 Centres for Excellence

- Action research
- Developing networks
- **Research trials**

Partner organisations

- Education and Training Foundation (ETF) - 3 regional mathematics leads (RMLs)
- Pearson
- White Rose, Eedi, Behavioural Insights Team *and others*

Research question

Does the CfEM <<theme>> intervention programme improve students' overall GCSE mathematics resit performance?

The evaluation will also address the following questions as secondary objectives:

What is the impact of the CfEM <<theme>> intervention programme on GCSE mathematics resit pass-rates, as measured by the percentage of students achieving a grade 4 or above?

What is the impact of the CfEM <<theme>> intervention programme on students' mathematical self-efficacy and feelings towards mathematics?

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Theory of change

Activities (inputs)	Mediating mechanisms (Professional Development)	Mediating mechanisms (Classroom/student activity)	Outcomes
Professional development Teachers 4 days 'training' focus: teaching that provides insight into how to make connections between mathematics and context 3 collaborative meetings led by RMLs RMLS – 1 day PD led by Touch Consulting Teaching Units 5 units focused on 5 key conceptual areas taught in sequence in five windows throughout the year Encourage: Understanding through connections with context Collaborative activities	Teachers: - collaboratively explore each other's practice - improve their own knowledge of mathematics (or teaching) - improve their reflections on teaching - knowledge of students' learning improves - focus on deepening understanding in key conceptual areas - knowledge of use of context to teach mathematics improves - knowledge of students' likely misconceptions improves	Teacher-student exploration of mathematical structure through use of context Student-student exploration of mathematical structure structure through use of context Student use of contexts Student engagement with activities that probe understanding Student engagement with activities that develop fluency Students improved self-efficacy leads to greater levels of engagement and motivation Students facility with problem solving improves	Students Improved attainment Improved self-efficacy Improved confidence Teachers Improved knowledge for teaching Change in practice

construct validity

Moderating factors			Evaluation
Teachers: - workload - experience - qualifications & background - beliefs - teaching capability - intellectual capacity	Students: - prior attainment - rest of programme - relevance of maths to their overall programme - attendance - relationship of maths to aspirations erall commitment	Other: - type of institution - senior leadership support - scheduling of maths lessons - monitoring and support mechanisms	**Quantitative** Students: Student GCSE scores (including at item level) Student GCSE grades Student self-efficacy measure Teachers: Usual practice/pedagogy measure **Qualitative** Interviews of teachers and students Observations of teaching and learning Student work captured Videos of lessons Case studies at class/teacher level

internal validity

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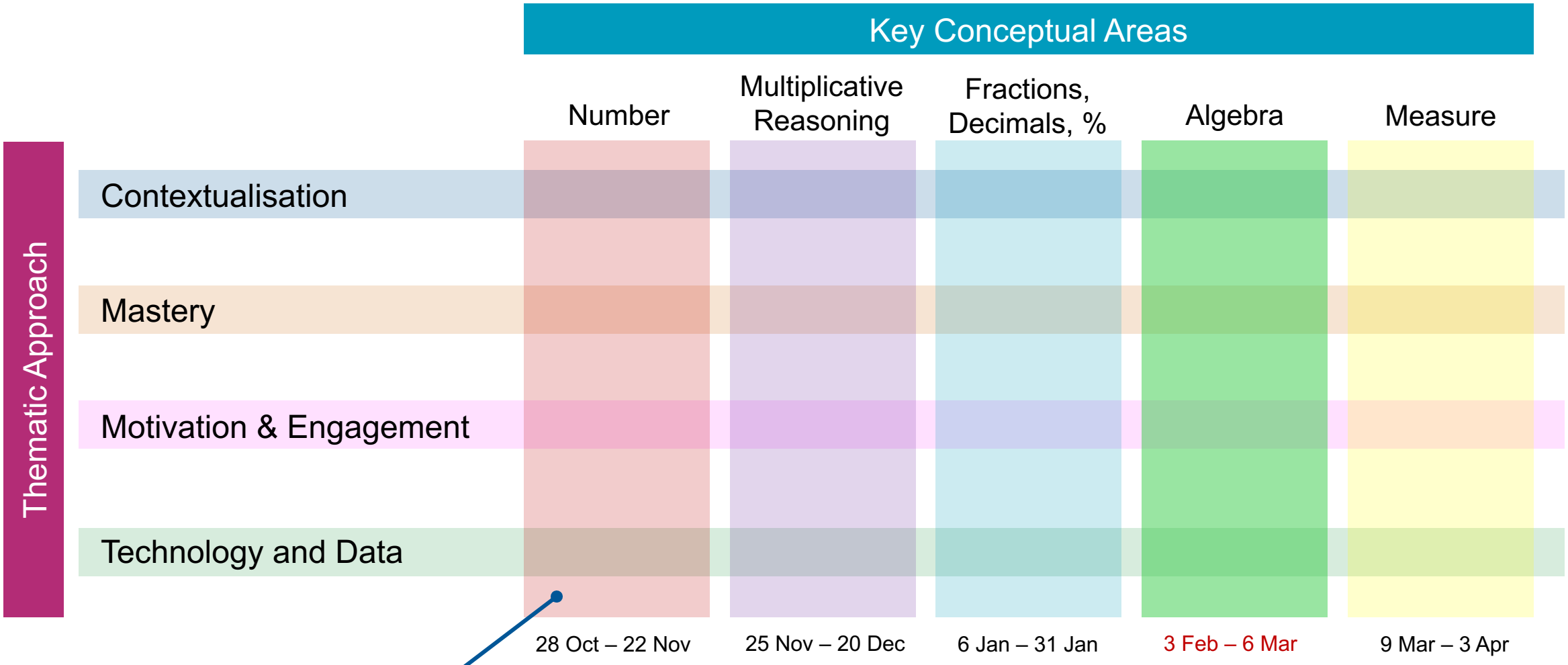
RESEARCH TRIALS



10 college settings per theme
2 teachers per college setting

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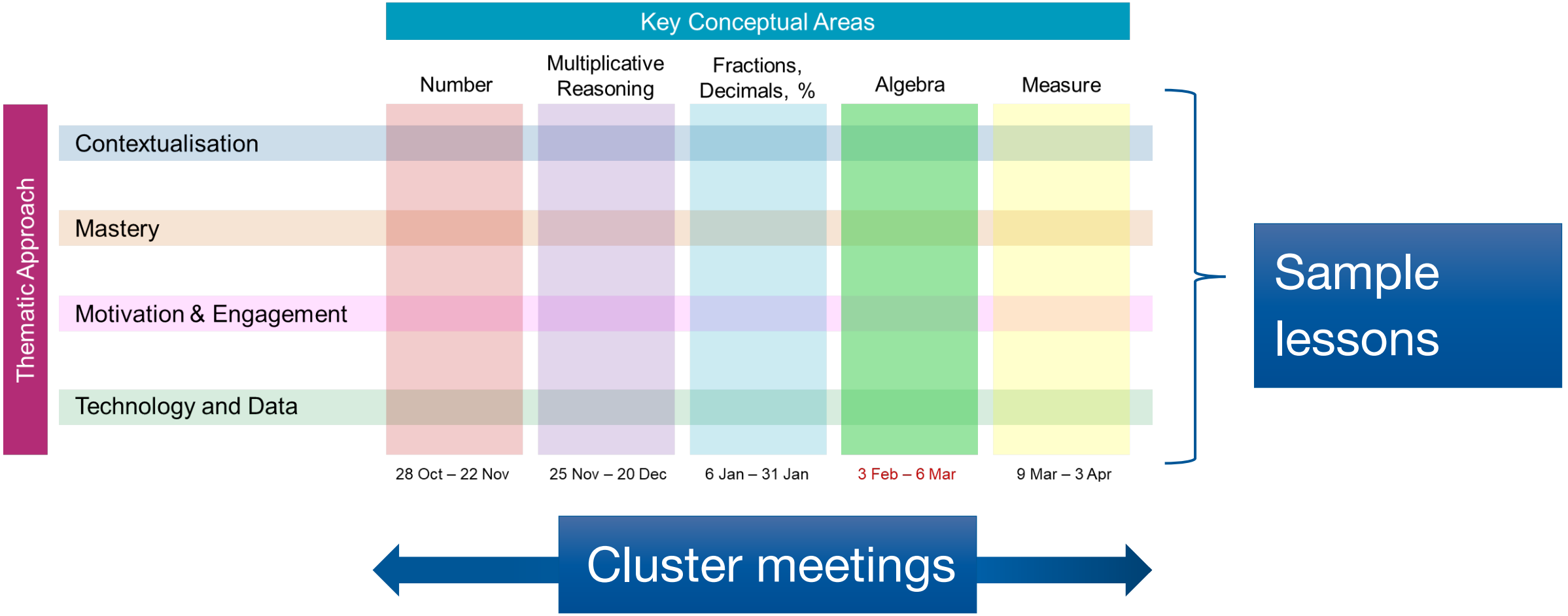
Research Trials: Two elements



Research design

Theory has a role to play

In design

- What is our theoretical stance in relation to professional development / learning?

Professional development key principles

Effective Professional Development is:

- **Experiential:** stimulating & drawing on teachers' experiences.
- **Sustained:** cycles of planning, predicting, enactment & reflection. **
- **Grounded:** practical, well-resourced; related to context & culture.
- **Safe:** teachers able to speak their minds, permission to take risks.
- **Collaborative:** involving networks of teachers & administrators.
- **Informed:** by outside expertise and research.
- **Provocative:** involving both pressure and support.
- **Focused:** attentive to the development of the mathematics itself.

(Guskey, 2002; Joubert and Sutherland, 2009; Villegas-Reimers, 2003; and many others…)

The case

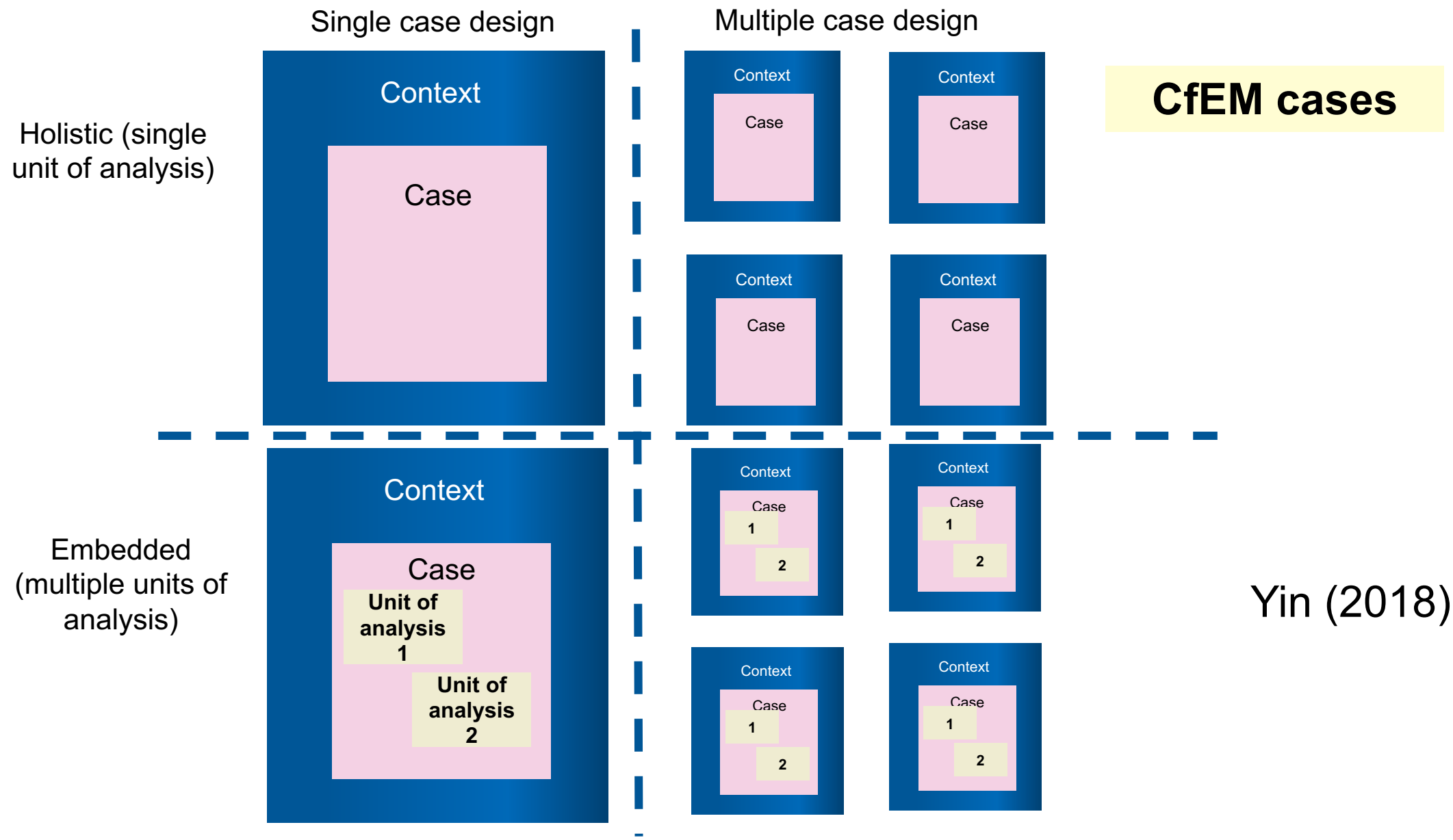
Defining the case

- **What is the main unit of analysis?**
  (a bounded entity (a person, organisation…..)
- **single case** or **multiple cases**

uniqueness

replication
direct
theoretical

Explanatory in relation to fidelity



CfEM cases

Yin (2018)

Data collection

Protocol – guides data collection … Important to clarify research questions

reliability

Chain of evidence

Triangulation

Rival explanations

Research questions

Research Question
1. Classroom lessons
c. To what extent do trial colleges and teachers deliver the intervention to all designated students and classes? (dosage)
d. How do trial teachers implement the lessons? What changes do they make and why? (fidelity and adaptation)
e. What are the trial teacher experiences of teaching the lesson? What are the barriers to, and enablers of, delivering the units as intended?
f. How does the focus on contextualisation (technology, mastery, M&E) make a difference to trial teachers' students' learning and experiences?
g. How do students experience the lessons? How do the lessons differ from 'normal' lessons? How does the focus on contextualisation (technology, mastery, M&E) make a difference to trial teachers' learning and experiences?
h. What does teaching practice in mathematics lessons of trial teachers look like?

Research questions

2.	**Professional development (cluster meetings)**
a.	How do the cluster meetings support trial teachers to prepare them for delivering the lessons? How does the lesson study process, facilitated by the Regional Maths Leads (RMLs) support trial teachers to deliver the CfEM units as intended?
b.	How do trial teachers and RMLs perceive the usefulness of the cluster meetings? Do the trial teachers feel adequately prepared to teach the lessons as intended? Which resources or other supports do they think are particularly useful?
c.	How are the cluster meetings organised and what resources do they use?

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3.	**Contextual factors**
a.	What college and contextual factors (including college leadership, RML support, resourcing) support or constrain trial teachers in delivering the CfEM units as intended?

What constitutes data in case study research?

Data sources

Figure 4.1 Six Sources of Evidence: Strengths and Weaknesses

Source of Evidence	Strengths	Weaknesses
Documentation	• Stable—can be reviewed repeatedly • Unobtrusive—not created as a result of the case study • Specific—can contain the exact names, references, and details of an event • Broad—can cover a long span of time, many events, and many settings	• Retrievability—can be difficult to find • Biased selectivity, if collection is incomplete • Reporting bias—reflects (unknown) bias of any given document's author • Access—may be deliberately withheld
Archival records	• *[Same as those for documentation]* • Precise and usually quantitative	• *[Same as those for documentation]* • Accessibility due to privacy reasons
Interviews	• Targeted—can focus directly on case study topics	• Bias due to poorly articulated questions

Yin (2018)

Data sources

Interviews	• Targeted—can focus directly on case study topics • Insightful—provides explanations as well as personal views (e.g., perceptions, attitudes, and meanings)	• Bias due to poorly articulated questions • Response bias • Inaccuracies due to poor recall • Reflexivity—e.g., interviewee says what interviewer wants to hear
Direct observations	• Immediacy—covers actions in real time • Contextual—can cover the case's context	• Time-consuming • Selectivity—broad coverage difficult without a team of observers • Reflexivity—actions may proceed differently because participants know they are being observed • Cost—hours needed by human observers
Participant-observation	• *[Same as above for direct observations]* • Insightful into interpersonal behavior and motives	• *[Same as above for direct observations]* • Bias due to participant-observer's manipulation of events
Physical artifacts	• Insightful into cultural features • Insightful into technical operations	• Selectivity • Availability

Yin (2018)

Data

Interviews can especially help by suggesting explanations (i.e., the “hows” and “whys”) of key events, as well as the insights reflecting participants' relativist perspectives.

Case study interviews will resemble guided conversations rather than structured queries. Although you will be pursuing a consistent line of inquiry, your actual stream of questions in a case study interview is likely to be fluid rather than rigid (Rubin & Rubin, 2011). This type of interview has alternatively been called an “intensive interview,” “in-depth interview,” or “unstructured interview”

(Weiss, 1994, pp. 207–208).

Documentation

Our record-keeping society means that documentary information (whether paper or electronic) is likely to be relevant to every case study topic.

This type of information should be the object of explicit data collection plans. For instance, consider the following variety of documentation: Emails, memoranda, letters, and other personal documents, such as diaries, calendars, and notes; Agendas, announcements and minutes of meetings, and other reports of events; Administrative documents, such as proposals, progress reports, and other internal records; Formal studies or evaluations related to the case that you are studying; and News clippings and other articles appearing in the mass media or in community newspapers.

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CfEM observation protocol: cluster meetings

College:			Date:	
Theme:			RML:	
Lesson:			Observer:	

Present:

Q	Observation areas and questions	IPE
1	Organisation of the cluster meeting	
	What worked well in the organisation of the cluster meeting? What might have worked better? How well did the schedule work and the time allocated to each section?	2c

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2	Post-lesson discussion	
	In what way was the discussion structured? How did the RML facilitate discussion and the teachers respond? What were the main observations made by the teachers? How did they engage with the research questions? How were they supported and guided by the RML?	2a/2b
3	Preparation for the next trial lesson	
	What approach did the RML take? How did they facilitate discussion and the teachers respond? In what ways did the cluster meeting help the teachers prepare to teach the next lesson? What aspects of the lesson did the teachers find most difficult? How were they supported and guided by RML?	2a/2b

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Questions 1, 2 and 9 only need to be asked in full at the first interview. In the following interviews please check for any changes in the classes taught and updates on professional development.

Q	Main questions and prompts	IPE
1	Could we start by you telling me a little bit about yourself and how you got to this point as a teacher of students resitting GCSE Maths? Prompt to get some details of history: - Education - Employment prior to teaching - Past employment as a teacher - Roles and responsibilities in teaching - Potentially appropriate experience outside of teaching	
2	Please could you give me a brief overview of *(or update on)* the mathematics classes that you are you teaching this year? • How many GCSE, Functional Skills or other maths classes are you teaching? • How much of your maths teaching is for 16-19 year olds? • How are these GCSE classes arranged? (e.g. mixed vocational areas, single vocational area, streamed) • What class sizes are involved? (e.g. average class size <10, 10-20, >20 and any variations between classes) • Where are you located in the college? (e.g. site, building) • How much travel across or between sites does your teaching involve?	1c

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3	What observations do you have about how the trial lesson affected *students' understanding* of concepts? • In what ways did student *understanding* improve? • What features of the lesson were most effective? • Were there any points at which students made particularly good progress? • Why do you think this happened? • Were there any points at which students struggled? • What caused them to struggle at this point?	1e/1f

Data analysis

The analysis of case study evidence is one of the least developed aspects of doing case studies. Too many times, researchers start case studies without having the foggiest notion about how the evidence is to be analyzed.

Case analysis

Four General Strategies

returning to theory and RQs

Relying on theoretical propositions

Working your data from the “ground up.”

Inductive approach see, grounded theory (Glaser and Strauss, 1967)

Developing a case description

Examining plausible rival explanations

Moderating factors		
Teachers: - workload - experience - qualifications & background - beliefs - teaching capability - intellectual capacity	Students: - prior attainment - rest of programme - relevance of maths to their overall programme - attendance - relationship of maths to aspirations - overall commitment	Other: - type of institution - senior leadership support - scheduling of maths lessons - monitoring and support mechanisms

case analysis

The best preparation for conducting case study analysis is to have a general analytic strategy.
The purpose of the analytic strategy is to link your case study data to important concepts of interest, and then to have the concepts give you a sense of direction in analyzing the data.
You can develop your own strategy but also can consider the four just described: relying on theoretical propositions, working your data from the ground up, developing case descriptions, and examining rival explanations.

Case analysis – analytical statements…

Case study work usually produces a great deal of raw data, and a useful way of handling and trying to make sense of the data is analysis which seeks to condense them into meaningful statements. These analytical statements need to be firmly based on the raw data and may suggest the need for more specific data to be collected.

As a first stage, analytical statements may to be generated which give concise answers to the research questions.

Bassey
(1999)

Research questions

Research Question
1. Classroom lessons
c. To what extent do trial colleges and teachers deliver the intervention to all designated students and classes? (dosage)
d. How do trial teachers implement the lessons? What changes do they make and why? (fidelity and adaptation)
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The case study

Writing up

The Case Study Must Be Significant

The Case Study Must Be “Complete”

The Case Study Must Consider Alternative Perspectives

The Case Study Must Display Sufficient Evidence

The Case Study Must Be Composed in an Engaging Manner

Questions /Discussion