Hermeneutic phenomenology in computing education research:

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This presentation includes the slides used in the workshop and a summary of the feedback from the 12 participants
Research at the Raspberry Pi Foundation

- Part of the newly formed Raspberry Pi Computing Education Research Centre, University of Cambridge - joint initiative
- Our work seeks to increase understanding of what works in teaching and learning computing
- In particular, we focus on young people who come from backgrounds that are traditionally underrepresented in the field of computing or who experience educational disadvantage.
- Find out more at:
  - http://raspberrypi.org/research
  - http://computingeducationresearch.org
Overview of session

A: What is hermeneutic phenomenology
B: Designing a study
C. Examples from computing education
D. Wrap up

For each part we will break into small groups for discussion after a short presentation

Aims

(i) to give you an initial introduction to hermeneutic phenomenology as one approach to qualitative research

(ii) to support you in reviewing papers using this methodology
What is hermeneutic phenomenology?

herm-in-new-tick  fin-om-in-knowledge-i
Framing

The physical nature of being human; observing natural similarities and differences between people

Reality is factual, measurable and can be proven

 Ontology

 The meaning of being human, informed by temporality (time), culture and personal history (experience)

 Reality of being is a unique individual perception that cannot be measured or grown

 Epistemology
# Framing

<table>
<thead>
<tr>
<th>Paradigm</th>
<th>POSITIVIST</th>
<th>MIXED METHODS RESEARCH</th>
<th>POST-POSITIVIST RESEARCH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Scientific; quantitative</td>
<td>Quantitative and qualitative</td>
<td>Naturalistic; qualitative</td>
</tr>
<tr>
<td>Methodology</td>
<td>Randomised controlled trials</td>
<td>Interpretative phenomenological analysis</td>
<td>Social constructivism</td>
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<td></td>
<td>Systematic reviews</td>
<td>Grounded theory</td>
<td>Feminist research</td>
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<td></td>
<td>Cohort studies</td>
<td>Discourse analysis</td>
<td>Critical social theory</td>
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<td></td>
<td>Intervention study</td>
<td>Ethnography</td>
<td>Descriptive phenomenology</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hermeneutic phenomenology</td>
</tr>
<tr>
<td>Methods</td>
<td><strong>Sampling</strong>: random, cluster</td>
<td>As for positivistic research for quantitative components, plus:</td>
<td><strong>Sampling</strong>: purposive, convenience, maximum</td>
</tr>
<tr>
<td></td>
<td><strong>Data collection</strong>: physiological</td>
<td><strong>Sampling</strong>: purposive, convenience,</td>
<td>variation</td>
</tr>
<tr>
<td></td>
<td>measurement, biological substance</td>
<td>theoretical</td>
<td><strong>Data collection</strong>: focus groups,</td>
</tr>
<tr>
<td></td>
<td>samples, surveys, structured interviews</td>
<td></td>
<td>semi-structured interviews, unstructured</td>
</tr>
<tr>
<td></td>
<td><strong>Data analysis</strong>: inferential statistical analysis</td>
<td></td>
<td>interviews, image capture</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Data analysis</strong>: textual/narrative</td>
<td><strong>Data analysis</strong>: textual or image analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>language analysis</td>
<td></td>
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</tbody>
</table>

Adapted from Dibley et al. (2020) Doing hermeneutic phenomenological research
# Approaches to qualitative research

From Kucartz (2014)

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualitative</td>
<td>Quantitative</td>
</tr>
<tr>
<td>Interpretive text studies; hermeneutics; grounded theory</td>
<td>Search for and presentation of meaning in results of quantitative processing</td>
</tr>
<tr>
<td>Quantitative</td>
<td>Turning words into numbers. Classical content analysis, word counts, free lists, pile sorts etc.</td>
</tr>
</tbody>
</table>
The hermeneutic phenomenology philosophical tradition

- Phenomenology introduced by Edmund Husserl (1859-1938) - discovering the essence of a phenomenon by bracketing or reductionism. Sometimes called descriptive phenomenology or just phenomenology.

- Martin Heidegger (1889-1976) later introduced interpretivism to phenomenology in the form of hermeneutic phenomenology. The focus is on an understanding of “being human in a situated contextual world” and the ‘lived experience” of individuals. The researcher’s perspective is part of the understanding, not bracketed out.

- Gadamer (1900 to 2002) is another key theorist who developed the ideas introducing the idea of the “Other” and the way an individual will relate to them. Gadamer focuses on language and conversation as intertwined with understanding.

“In sum, the main objective of interpretive phenomenology is to uncover or disclose a phenomenon by pulling away layers of forgetfulness or hiddenness that are present in our everyday existence.” (Frechette, 2020)
Applying the philosophy to the methodology

- An interpretive approach to research - truth is uncovered in the disclosure and is not absolute
- A focus on “being-in-the-world” and what that means to individuals
- The methodology informs the whole research process not just the data analysis phase
- Data collection is usually through in-depth interviews accompanied by memos and journaling from the researcher
- The researcher is “always-already” - meaning the researcher has to understand their own pre-understanding of the context and acknowledge and use that in the research.
- Analysis involves a *hermeneutic circle* which means moving from the parts to the whole and back again.
## Comparison with generic qualitative research

<table>
<thead>
<tr>
<th>Research Process</th>
<th>Generic Qualitative Study</th>
<th>Interpretive Phenomenological Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disciplinary roots</td>
<td>None in particular</td>
<td>Interpretive phenomenology—philosophy</td>
</tr>
<tr>
<td>Research paradigm</td>
<td>Constructivist</td>
<td>Constructivist</td>
</tr>
<tr>
<td>Researcher’s stance</td>
<td>Reflexive</td>
<td>Unique understanding of being</td>
</tr>
<tr>
<td></td>
<td>Naturalistic</td>
<td>Reflexive—of one’s horizons of significance and being-in-the-world</td>
</tr>
<tr>
<td>Objective and</td>
<td>Oriented toward action—practice and policy</td>
<td>Embodiment epistemology</td>
</tr>
<tr>
<td>research question</td>
<td>Purposeful sampling—especially maximum variation</td>
<td>Oriented toward understanding/uncovering lived experience of individuals in constant being-with-others</td>
</tr>
<tr>
<td>Sampling and</td>
<td>Average of 20 participants</td>
<td>Purposeful sampling—especially maximum variation</td>
</tr>
<tr>
<td>recruitment</td>
<td>Target information-rich cases</td>
<td>Average of 10 participants</td>
</tr>
<tr>
<td>Data collection</td>
<td>Mainly interviews/focus groups</td>
<td>Target phenomenon-rich participants</td>
</tr>
<tr>
<td></td>
<td>Can have focused observations and document review</td>
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<tr>
<td></td>
<td>Aims to describe who, what, and where</td>
<td></td>
</tr>
<tr>
<td>Data analysis</td>
<td>Often content and thematic analysis</td>
<td>Hermeneutic analysis (hermeneutic circle with back-and-forth movement from part to the whole)</td>
</tr>
<tr>
<td></td>
<td>Low inference—descriptive (data-near)</td>
<td>Interpretive</td>
</tr>
<tr>
<td>References</td>
<td>Polit and Beck (2009, 2012, p. 505) and Sandelowski (2000, 2010)</td>
<td>See references for each section</td>
</tr>
</tbody>
</table>

Activity 1 - 10 minutes

In small groups, using the table from the previous slide (in this document), discuss the following in small groups:

What might be the advantages or disadvantages to using this interpretative approach?
Feedback from participants

- Validity - is it representative, what about bias?
- Concerned about the interview reliance of the method
- CS relies on quantitative data
- The phenomenological side of HP is admitting the bias and taking it into account
- Different to ethnography - and not sure how this diversion occurred
- With quantitative - there is an outcome that can be implemented whereas with HP how is this implemented?
- We can use it if we have a good background in the context
- May be useful for gender/diversity as there is the lived experience of the researcher that can be brought in
- Because you are using a narrow or small group so it is not representative of the whole population - so may introduce bias (for example about gender and diversity)
- Addressing the issue of validity is therefore really important when writing papers
- Samples may not be representative in qualitative and quantitative
- Interviews and observations can also be used in HP (videos, images etc)
Designing a hermeneutic phenomenology study

With examples from our paper:

Teachers’ Perspectives on Talk in the Programming Classroom: Language as a Mediator

Abstract

The activities in the computer lab can be seen as activities for learning, teaching, or both. Teachers’ perspectives on talk in the classroom, in terms of learning and teaching, can enable them to overcome a possible misalignment between students’ learning and teachers’ teaching. This study employs a phenomenological approach to understand the language use in the programming classroom. The main aim of this study was to explore the teachers’ perspectives on talk in the programming classroom. This study focused on four aspects of talk in the programming classroom: the role of language use in the classroom, the teachers’ perspectives on talk in the classroom, and the potential implications for future research. The study also provided insights into the potential implications for future research.

Introduction

This study explores the role of language in the programming classroom. The focus is on the teachers’ perspectives on talk in the programming classroom. The study aims to understand how teachers perceive the role of language in the programming classroom. The study also provides insights into the potential implications for future research.

Keywords

This study focuses on four keywords: programming, teachers, talk, and language. These keywords were used to describe the focus of the study. The study explores the role of language in the programming classroom. The study also focuses on the teachers’ perspectives on talk in the programming classroom. These keywords were used to describe the focus of the study.

Conclusion

The study explored the role of language in the programming classroom. The study also focused on the teachers’ perspectives on talk in the programming classroom. The study provided insights into the potential implications for future research. These insights were used to describe the focus of the study.

References

This study references several sources to explore the role of language in the programming classroom. The focus is on the teachers’ perspectives on talk in the programming classroom. The study also focuses on the potential implications for future research. These references were used to describe the focus of the study.

CCS Concepts

This study focuses on four CCS concepts: programming, teachers, talk, and language. These concepts were used to describe the focus of the study. The study explores the role of language in the programming classroom. The study also focuses on the teachers’ perspectives on talk in the programming classroom. These concepts were used to describe the focus of the study.
Designing a hermeneutic study

Implications for each stage

Literature review
Research Question
Sampling
Data collection
Validity and reliability
Data analysis
Writing up

Can use SPIDER for establishing the search:
Sample
Phenomenon of Interest
Design
Evaluation
Research approach
Designing a hermeneutic study

Implications for each stage

Literature review
Research Question
Sampling
Data collection
Validity and reliability
Data analysis
Writing up

S: programming teachers in school
P: classroom talk
D: interviews
E: lived experience
R: hermeneutic phenomenology

RQ: “In what ways do teachers develop classroom talk to support the learning of programming?”
Designing a hermeneutic study

Implications for each stage

Literature review
Research Question
Sampling
Data collection
Validity and reliability
Data analysis
Writing up
Designing a hermeneutic study

**Implications for each stage**

- Literature review
- Research Question
- Sampling
- **Data collection**
- Validity and reliability
- Data analysis
- Writing up

Focus on “lived experience”
Open interviews
Dialogic
Designing a hermeneutic study

Implications for each stage

Literature review
Research Question
Sampling
Data collection
Validity and reliability
Data analysis
Writing up

<table>
<thead>
<tr>
<th>Quantitative</th>
<th>Quantitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal validity</td>
<td>Credibility</td>
</tr>
<tr>
<td>External validity</td>
<td>Transferability</td>
</tr>
<tr>
<td>Reliability</td>
<td>Dependability</td>
</tr>
<tr>
<td>Objectivity</td>
<td>Confirmability</td>
</tr>
</tbody>
</table>

Fom Guba and Lincoln (1985)
Designing a hermeneutic study

Implications for each stage

Literature review
Research Question
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Data collection
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Designing a hermeneutic study

Implications for each stage

Literature review
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Sampling
Data collection
Validity and reliability
Data analysis
Writing up
## Data analysis

### Table 7.1  Enacting interpretation that is nonlinear, circular thinking

- Uncovering preunderstanding in ongoing reflective ways regarding the phenomenon of study
- Creating and maintaining a hermeneutic stance or attitude toward analysis that is open engagement in thinking and questioning
- Enacting the interpretation in an iterative way:
  - beginning phase of examining first text
  - writing interpretive summaries and identifying emergent themes
  - continuing on with each transcript, distilling themes and coalescing similarities in common themes and shared practices
  - dwelling in the data
  - reading along with the philosophy to aid thinking and questioning
  - thinking/analysing in a hermeneutic circle, examining the parts and whole of each text, back and forth, with the philosophical underpinnings
  - using meditative thinking regarding stories, questioning and thinking to provide a bubbling up of the patterns and themes that interpret the experience
  - rendering of an interpretation or fusion of horizons (participant and researchers).
Activity 2 - 8 minutes

In small groups, choose one research study that somebody in the group has been involved in and consider how you might have tackled that using a hermeneutic phenomenological way.
Feedback from participants

- Uncovering hidden meaning - work with focus groups (are they valid in HP?) FG gave people opportunity to reveal their understanding. So are FG ok for HP?
- Pair programming study observation, getting pair to watch it later and to reflect and talk about what was happening.
- Idea of getting participants to think more deeply - but is this HP?
- Warming to it. Interested to try it.
- May give deeper insights.
- Tend to think its about huge numbers.
- Moving to another level of understanding about our subject area.
Examples in computing education research
Some examples - studies


4. Sue Sentance and Jane Waite. 2021. Teachers’ Perspectives on Talk in the Programming Classroom: Language as a Mediator. [Link](https://doi.org/10.1145/3446871.3469751)
Some examples - PhD/ EdD


Experiences of computer science curriculum design: A phenomenological study (Sloan & Bowe, 2015)

- **Context:** CS course redesign of 12 CS lecturers at 1 university - long journal paper
- **Literature:** Several sections on hermeneutic phenomenology including references e.g. Max van Manen
- **Research questions:** Focus on experience and understanding of lecturers
- **Sampling:** Justification of participant sampling
- **Data Collection:** 12 x hour interviews
- **Data Analysis:** Description of each step including aspects of hermeneutic phenomenology
- **Writing up:**
  - Selected small number of themes to report on
  - Pattern of synthesis and rich/think quotes
  - Many quotes for 1 participant for first theme. Other themes had a spread of participants
- **Interpretivist reflections:** Limited information about the authors and their views
- **Overall:** Because of my lack of experience, I was not confident to say this is a good example of hermeneutic phenomenology in practice. However, there are certainly lots of something called hermeneutic phenomenology
Activity 3 - 10 minutes (if time)

In small groups, imagine you have been asked to review a paper that uses hermeneutic phenomenology.

What might you look for to satisfy yourself that it has been conducted rigorously and that is draws on the methodology? Make a list to feed back to the whole group.
Feedback from participants

- If the paper explains how they did it, then we could review it. But if they just reference it - it would be hard to review.
- There is more trust in the researcher
- I might think more about an agenda - or if they were biased
- I would look for a clear overview of the methodology
- Looking for trustworthiness
- Look for the author to situate themselves and to state their bias
- It will be hard to do all this in a 6 page paper
- The nature of CS Ed conference papers, the papers are not published in other fields. Therefore need to write this in journals. Is there a mismatch between CSEd and this philosophy.
- ICER allows 11,000 words as the longest. Maybe we publish in other fields.
- Maybe we need a special issue of CS Ed on this philosophy/method?
- Participant characteristics are important.
- Maybe we need a new conference?
- Need enough actual data
- I like the idea of returning the analysis to the participants for review
- Would be good to hook up with Education researchers
Recommended reading


