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# The Case for Q-Methodology in Computing Education Research

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## ABSTRACT

Q-Methodology is a useful tool to help understand differing perspectives on a topic based on how people think, as opposed to via gender, role or ethnicity. However, Q-Methodology is seldom used in computing education research despite the importance of understanding perspectives on how educational initiatives are working in such an evolving subject area. This poster therefore provides an overview of the prevalence of Q-Methodology in existing literature, and details examples of where Q-Methodology has been used successfully in computing education research, and advocates for its use in future work.

## CCSCONCEPTS

- Social and professional topics → Computing education.

## KEYWORDS

Q-Methodology, Computing Education Research, Computing Education, Computer Science Education, Subjectivity

## 1 INTRODUCTION

Q-Methodology is a mixed methods research methodology that investigates the subjective and complex viewpoints of stakeholders. Q-Methodology focuses on viewpoints shared by groups of participants [6], where groups are divided by belief systems or value positions, irrespective of surface characteristics such as gender, ethnicity, education or job role [3]. Therefore, stakeholders in different roles (e.g. students, teachers, course leaders) could be grouped together within Q-Methodology. This could prove valuable when conducting computing education research, as due to the pace of change, initiatives to improve computing courses should involve teacher and student views [4]. Q-Methodology involves:

- Creating a concourse of statements: a comprehensive list of items reflecting the possible views on a topic.
- Creating the Q-Set: a representative sample of items from the concourse [6].
- Defining study participants (P-Sample).
- Conducting Q-Sorts: where participants rank each item of the Q-Set in a fixed quasi-normal distribution [6].
- Factor Analysis: Q-Sorts analysed to reveal patterns and to group similar views together, known as factors [3].

Q-Methodology can reduce the vast amount of qualitative variables into groups to better investigate research questions [3], and due to the variation in how Q-Sorts can be arranged, the probability of a pattern occurring is minimal. When one does occur, it indicates that participants are responding in a patterned way, suggesting distinct perspectives on a given topic. This can help group people together more effectively and better cater to their needs. Therefore, it is the responsibility of education researchers to learn more about Q-Methodology and implement it in future research [3].

## 2 Q-METHODOLOGY IN COMPUTING EDUCATION RESEARCH

Q-Methodology has been around since the 1930s, but it is only in the past decade it has been used more widely. A search of "Q-Methodology" on Web of Science, a publisher-independent global citation database, yielded 1511 results from 2000-2021, with eight papers in 2002 and a high of 200 papers in 2020. This reflected all papers that utilised Q-Methodology, and by combining other search terms with "Q-Methodology", such as "Education" (421 results), "Computing" (23 results), and "Computer Science" (7 results), it is evident how Q-Methodology is currently rarely used for computing education research. A search of "Q-Methodology" elsewhere yielded similar results with ACMs digital library yielding 39 results and IEEE Xplore yielding just 16 results. However, where Q-Methodology has been used in computing education research, it has been shown to provide detailed and useful insights into improving computing education and educational practice. For instance, see [1–5]. This poster will therefore explore the use of Q-Methodology within computing education research and identify how it can be used to aid researchers in future work.

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