SYSTEMATIC QUALITATIVE DATA MANAGEMENT (SQDM) DURING AN INTERPRETIVE ACTION RESEARCH

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ABSTRACT

This paper presents the systematic way of data management in an action research to explore the interplay of mathematical thinking processes and mathematical sense making experiences of first year engineering students. The transitional impact of future engineers from school mathematics to engineering mathematics is explored by collecting data through multiple techniques and methods. The interpretivist epistemology and constructivist theoretical perspective during this action research demanded a rigorous qualitative research process and extensive data collection using emergent methods and techniques. This paper would address the queries like what data to collect and manage and how to manage it during this research process. Data management became vital for securing and utilizing the data in a proper way throughout our research. Managing the data effectively also enabled us to risk free data, accuracy, verifiability, and improved productivity of the research. Properly managed data would easily be preserved and re-analyzed in future with new analysis techniques. During this research, the digital and non-digital data, documentation and meta-data were also collected. We used multiple softwares e.g. Microsoft Excel, Word and NVivo10 to manage the data. Documentation helped us to be precise and holistic to further utilize the data for interpretive analysis.

INTRODUCTION

Managing the qualitative data is an integral, important, time-consuming and challenging task but it is required to be done to make the qualitative research rigorous and coherent. Well managed qualitative data always help in better interpretation during the data analysis. In qualitative action research, data management and data analysis usually work in cyclic and iterative manner (Meadows, 2004).
Data management and organization is required during the following steps of qualitative research (Meadows, 2004; Willis, 2007)

- Conceptualizing the research project
- Knowing the researcher's Reflexivity
- Reviewing the Literature for
  - Selecting the epistemology
  - Selecting the theoretical perspective
  - Selecting or defining Theoretical framework, Conceptual framework and/or Operational framework
- Formulating the research questions
- Deciding the methodology
- Deciding the data collection techniques
- Deciding the data analysis approaches

Data sources should be well identified and data is required to be well documented. Some of the common data sources include audio and video recordings, transcription of audios, videos and interviews, Photographs, field notes, observation scripts, worksheets, artefacts, open-ended questionnaires and reflective journals. Periodic backing up all the data is a crucial part of qualitative research. Detailed and clear description of the pre-defined and/or emerging codes, categories, memos and themes are also important part of the qualitative research and help researcher to identify their trajectories from data description to data analysis and finally to interpret the results (Meadows, 2004) (Given, 2008).

Manual data management is replaced with electronic data management using different softwares that are required to help organize the qualitative data. Text searching, auto coding and framework matrices are the helpful tools for interpreting the results through the softwares like NVivo 10. Hard copies of the collected data should also be arranged in file folders, drawers, charts, models and tables for future references or to deal with some emergency but we only use the electronic data to proceed with data analysis (Meadows, 2004).

Ethical standards for data management include anonymizing the data, keeping privacy for the personal information of respondents and keeping all the data in secure custody (Meadows, 2004).

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