

# Navigating Challenges in Implementing Constructivist Grounded Theory in Educational Research: A Constructivist Grounded Theory Systematic Review Approach

Junxiang Lian and Nor Junainah Mohd Isa

Faculty of Human Development, Sultan Idris Education University

Corresponding Author Email: p20232003082@siswa.upsi.edu.my

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## Abstract

This systematic review (SR) takes a Constructivist Grounded Theory (CGT) turn by modifying the conventional review to mimic the CGT research process—CGT-SR. With the flexibility embedded in CGT, this SR utilises the CGT data collection and analysis process to review the literature. By using initial and focused coding, together with Constant Comparison Analysis (CCA), this review allows the reviewer's subjectivity to be incorporated into the process through a controlled measure. While the debate over reductionism in education is ongoing, quantitative studies with empirical data and the ability to generalise through a positivist lens still dominate the field. Combining the SR with CGT also demonstrates the possibility of conducting a literature review using the GT methodology without compromising the core purposes of doing an SR. This CGT-SR aims to identify the challenges of implementing CGT in educational research by showcasing its potential as a review methodology. After an initial literature review in the ProQuest database,  $n = 64$  articles were identified; upon further inspection, the coding process began with the first article. Theoretical saturation was achieved after coding  $n = 14$  articles. The final constructed synthesis included *Primary Challenges (Methodological Trade-offs & Cogency)* and *Secondary Challenges (Structural Favouritism of Quantitative Measures, Compromises, and Countermeasures)*. This review also highlights the potential of using CGT as a systematic review framework.

**Keywords:** Systematic Review, Constructivist Grounded Theory, Educational Research, Challenges, Subjectivity

## Introduction

Qualitative research is often criticised for lacking rigour and credibility due to the significant influence of researchers' personal biases and idiosyncrasies (Anderson, 2010). Interviews and focus groups are the primary methodologies used in qualitative research, and such methods invite criticism, especially when the detailed descriptions that qualitative studies aim to provide are not thorough enough (Ochieng, 2009). Often overlooked is the role of the researcher in qualitative investigations, as the qualitative researcher serves as the primary instrument for data collection and analysis. Data are mediated through the principal

investigator's understanding of qualitative research, rather than through inventories, questionnaires, or machines. When qualitative researchers utilise their flexibility to understand phenomena in depth, high-quality discoveries of central themes and categories will result. As Mwita (2022) stated, subjectivity and generalizability can undermine research reliability, especially when researchers interpret a phenomenon by "scratching the surface." There will be no way to verify or generalise the findings because people provide subjective interpretations based on their perceptions of what they hear, see, taste, touch, and smell. However, this is where the Constructivist Grounded Theory methodology by Charmaz (2006, 2014) shines, as it incorporates the researcher's subjectivity and interpretation into the research to co-construct a grounded theory. To help navigate the challenges of utilising the Constructivist Grounded Theory (CGT) methodology, this review paper used CGT as a showcase of its potential to generate substantive theories and as a systematic review framework.

### Background of Review

The obsession with proving causation and correlation on regularities and repeated occurrences through the quantitative lens in education is often a misguided and wrong process because the purpose of experiments, especially in natural science, is to artificially simplify situations to make a particular relationship more visible (Sayer, 2000:14 as cited in Wrigley, 2009), but this is not particularly useful in the context of education. Since many countries have diverse, multicultural ethnic backgrounds, for instance, Malaysia, despite the unification of different education systems under the Education Act of 1961, it is almost impossible to implement a centralised, top-down administration to improve the overall quality of education. Wrigley (2009) criticised the fact that many countries utilised different paradigms of school effectiveness and School Improvement programs by emphasising ideological terms like "accountability," "effectiveness," "leadership," and "vision and mission," to quantify unquantifiable data and calculate the relative impact of a school on students' learning.

This is where Constructivist Grounded Theory (CGT) methodology shows its appeal, where the subjective perception of the researcher is taken into account in the research, together with the different worldviews, feelings, and interpretations of participants of any given system (Aslipour & Zargar, 2022), especially when the researcher of a particular study is actively involved in the field as well. While the primary education system in Malaysia (Malaysia, 1996) is unified under a standard curriculum, the medium of language across the national schools (National School/*Sekolah Kebangsaan* [SK] and National School for Indigenous/*Sekolah Kebangsaan Orang Asli* [SKOA], National-typed School/*Sekolah Jenis Kebangsaan* [SJK], which is divided into three; *Sekolah Jenis Kebangsaan Cina* [SJKC], *Sekolah Jenis Kebangsaan Tamil* [SJKT]). Multilingual speakers have been found to change their personalities as they co-switch between their two languages and/or cultures (Dylman & Zakrisson, 2023). With such complex systems operating simultaneously, each with its language and culture, the reduction method, as a quantitative measure, cannot approximate the truth, even when the research is completed (Heale & Twycross, 2015).

Thus, a CGT study that considers educators' perspectives through the co-construction of substantive theory with participants' in-depth descriptions of particular events is a good way to research such complex climates. However, it is not without challenges, as quantitative

research is more prevalent than qualitative studies in many fields (Thelwall & Nevill, 2021), a trend not limited to Malaysia. With the limited data available, compared to the data obtained from SCOPUS stating that most research in the educational sector in Malaysia happened in tertiary education (Che Daud, Husaini, & Mohd Arif, 2023), and despite a higher increase in preference for qualitative research, a conclusion can be made that quantitative research is still the preferred research methodology across the board. Together with the three significant variations of Grounded Theory (GT) methodology, which differ in their ontological and epistemological stances and proposed coding paradigms, this poses substantial challenges for implementing GT in the educational sector, given the confusion and misunderstandings surrounding Grounded Theory Methodology (GTM). This article is inspired by a grounded theory systematic review (SR) by Bowers and Creamer (2020), which aims to develop a theoretical model to address the challenges of implementing CGT research across diverse educational contexts. It achieves this by conducting an SR using a modified methodology that combines a bottom-up approach with CGT's coding procedure called CGT-SR.

### *Review Objective*

This SR adopts the CGT methodology instead of the conventional review synthesis method to synthesise and explore the challenges of conducting CGT research in education. Since the study aims to identify the obstacles to using CGT in educational research, the primary focus will be on the limitations sections of the articles. If there are no limitations segments in the articles, the methodology of CGT should then be scrutinised to identify any challenges the researchers encountered during the research. The review objective is stated as follows,

- Investigate and identify the limitations and challenges encountered when using CGT in educational research.
- Investigate the possibility of using CGT methodology as a review framework.

### *Review Question*

While conventional systematic reviews (SLR or SR) aim to provide comprehensive insights using frameworks such as PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) or SWiM (Synthesis Without meta-analysis), this version of systematic review, CGT-SR, enables a synthesis using the CGT coding process. With the review objective stated above, the review question is as follows,

- What limitations and challenges did the researchers encounter when using CGT in educational research?

### **Method**

This SR utilised CGT as its anchor to synthesise the challenges of implementing CGT in educational research. The conventional way to execute an SR is to start by gathering a set of articles within a specified boundary. From sifting through the articles, select those that meet the criteria and start synthesising them by examining their homogeneity and heterogeneity using charts or tables. As cited in Bowers and Creamer (2020), qualitative synthesis differs from its quantitative counterpart in a meta-analysis (Bearman & Dawson, 2013; Finlayson & Dixon, 2008; Schreiber et al., 1997). Rather than using statistics and numbers to aggregate findings, qualitative synthesis methods, such as PRISMA-SWiM, utilise narrative summarisation to conduct the systematic review (Kabir et al., 2024; Campbell et al., 2020). To perform this review, a CGT-SR takes the liberty of modifying the conventional SR by selecting only one article to initiate initial coding, thereby mimicking how CGT is conducted by starting

data analysis after the first data collection cycle (Bowers & Creamer, 2020; Charmaz, 2006, 2014).

### **Conceptual Framework of Sythensis Method (CGT-SR)**

This modified systematic review, using a CGT approach, aims to provide insights into how CGT can synthesise related articles and identify homogeneous and heterogeneous properties. By integrating CGT into the review process, the coding process enables the article to be analysed word-by-word, line-by-line, and article-by-article. The reviewer generates initial codes and categories using Constant Comparative Analysis (CCA), ultimately drawing connections between them to form focused codes (Charmaz, 2006; 2014). Using purposive sampling to identify the first article (the first participant in CGT research), the data analysis will be conducted immediately to generate initial codes. At the same time, to incorporate the researcher's perspectives and retain their subjectivity, memo writing—a form of CCA used to record the reviewer's or researcher's thoughts regarding a particular topic—can be conducted before, during, and after data collection. The final product of this review will be a substantive theoretical model that addresses the challenges of implementing CGT in the educational context. This helps keep the review aligned with the data.

In a systematic review, a reviewer will follow the steps outlined below to synthesise the articles: identify, search, ensure eligibility, and include the relevant articles (Campbell, 2020). Unlike PRISMA, which focuses on quantitative statistical data for aggregation, the SWiM (Synthesis Without Meta-Analysis) framework is suitable for synthesising articles that use qualitative research methodologies, as they lack statistical data. From PRISMA's 27-step guidelines (Page et al., 2020), Campbell and his team developed the SWiM framework, an updated guideline with nine steps, categorised into three processes: Methods, Results, and Discussion (Campbell et al., 2020). CGT possesses the same characteristics as other qualitative research, but it emphasises the importance of the researcher in co-constructing theory with the participants. From the ground up, the researcher actively participates in the interviews, employing intensive interviewing techniques to delve deeply into a particular phenomenon (Charmaz, 2006, 2014). With a reflexive perspective throughout the research, the researcher compares each article with the memo from the outset to the final product, thereby producing the substantive theory. Drawing on a bottom-up research approach, this SR was subsequently modified to align with the CGT methodology. Figure 1 shows the process of conducting CGT-SR.

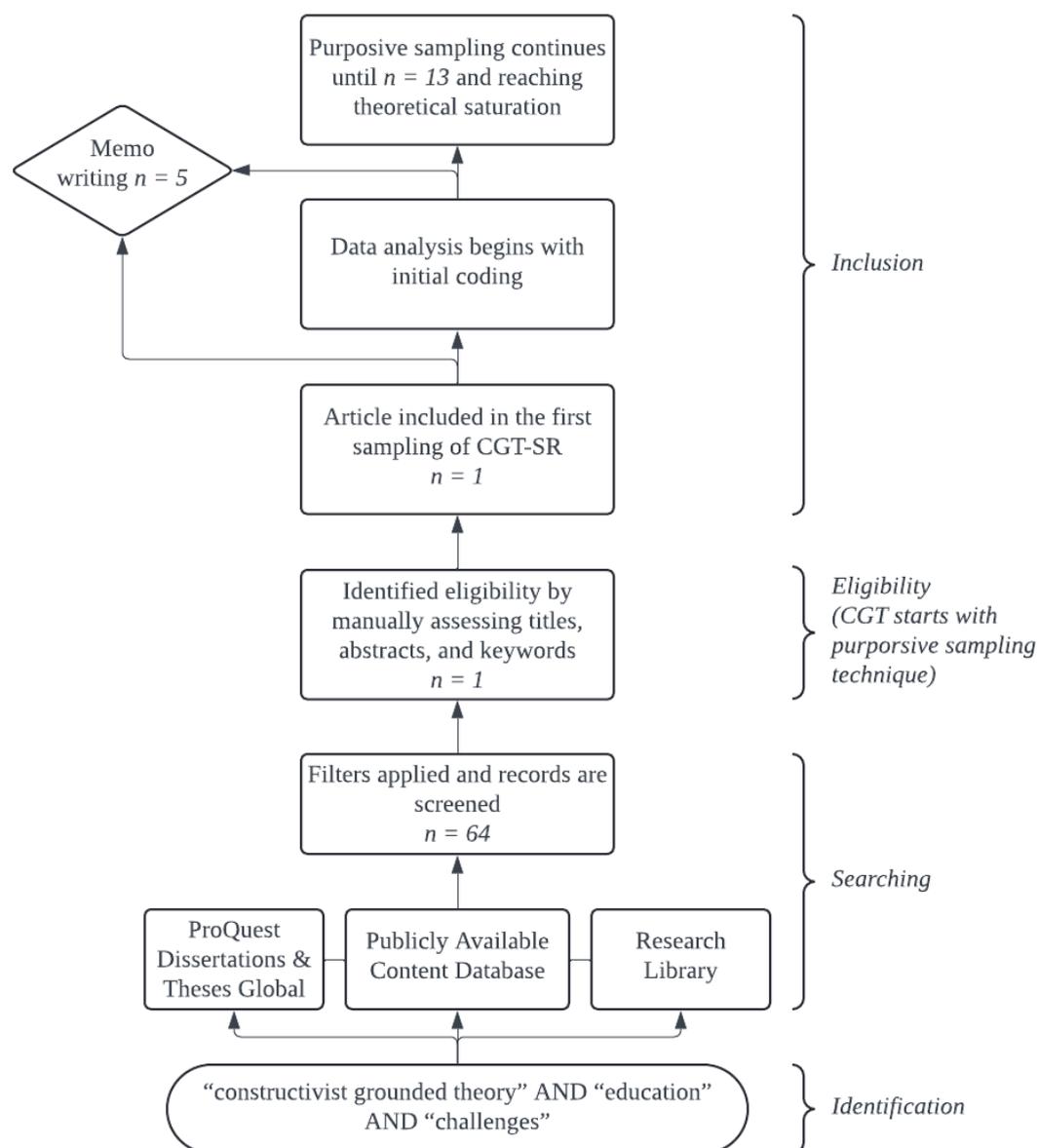


Figure 1. Identification, Searching, Eligibility, and Inclusion were used in the PRISMA-SWiM framework, which was adopted for the Constructivist Grounded Theory-Systematic Review (CGT-SR)

### Reviewer's Positionality

Upon a preliminary search into the implementation of CGT research in the educational context, it is noted that, without a centralised database and precise figures to work with, it is difficult to determine the prevalence of CGT use in academic research. However, as mentioned above, the prevailing perception in educational research is that it remains dominated by quantitative research rather than qualitative approaches (Heinrich, 2024). In terms of the ratio between quantitative and qualitative research, most fields are dominated by quantitative approaches; it is also impossible to comprehensively compare different databases. As a student of the CGT methodology and a novice researcher, this CGT-SR aims to identify the challenges of applying the Constructivist Grounded Theory methodology in

research through a modified Systematic Literature Review (SLR). After the review, the insights could be used in educational research to identify the challenges encountered in CGT research.

### Data Collection

Data collection begins with purposive sampling. Nyimbili and Nyimbili (2024) stated that a purposeful sampling technique selects information-rich cases for in-depth analysis. In total, they have identified sixteen purposive sampling techniques, which were first discussed by Patton (1990): extreme case sampling, deviant case sampling, intensity case sampling, maximum variation sampling, homogeneous sampling, typical case sampling, criterion sampling, theory-based sampling, opportunistic sampling, random purposeful sampling, sampling politically important cases, convenience sampling, and mixed purposeful sampling. Using the criterion-purposive sampling technique helps ensure a quality sample is obtained without biases; however, in CGT, biases and subjectivity are inevitable. Therefore, to help with trustworthiness rather than reliability and validity in quantitative research, the review process will be made as transparent as possible throughout the research. Starting with data collection, a CGT researcher, or, in this study, a reviewer, usually adopts a mixed purposive sampling technique, which involves combining the various sampling methods mentioned above to achieve the desired sample in line with the research objective (Nyimbili & Nyimbili, 2024). Criterion-purposive sampling was employed to select the initial article to begin this review. The criteria are as follows,

- The methodology used must be Constructivist Grounded Theory (CGT);
- The article contains the challenges, limitations, or difficulties faced when implementing Constructivist Grounded Theory (CGT) methodology;
- The article must be related to education.

With the criterion stated, a Boolean string for the first stage in the CGT-SR was established, identifying one single article: (“constructivist grounded theory” AND “education” AND “challenges”). The Boolean string would be used for searching in the ProQuest database, which comprises ProQuest Dissertations & Theses Global, the Publicly Available Content Database, and the Research Library. The database was chosen for its user-friendly interface and the ability to identify the necessary articles and their respective fields. Besides, with the latest research and premium content, and with easily identifiable open-access content via links to external open-access content in citation records (Roth, 2018), ProQuest became the choice of database for this review synthesis. Only the articles from the source types, conference papers & proceedings, dissertations & theses, and scholarly journals will be used for this review. The filters applied during the initial searching were: Source type: Scholarly Journals; Publication date: Last 5 Years; Subject: qualitative research, grounded theory, education, learning; and Document type: Article, Language: English, Publication title: The Qualitative Report, BMC Medical Education, Education Sciences, Forum: Qualitative Social Research, Perspectives on Medical Education, Cogent Education, Journal of Nursing Education, Higher Education, Medical Education Online. Sixty-four articles ( $n = 64$ ) were listed using the mentioned filters. The rationale for selecting only articles from the last five years was to ensure the literature reflects the most current research and development in the utilisation of CGT in educational research.

A careful examination was performed using the ProQuest interface with the Boolean string. Articles that contained words such as "constructivist grounded theory," "education," and "challenges" were highlighted. This mimics the purposive sampling process used in a CGT study. After selecting an article, data analysis began with initial coding and a focused coding process to identify the iterative codes and categories. At the same time, the reviewer engaged in memo writing to determine their train of thought and to recognise their subjectivity as a form of CCA (Charmaz, 2006, 2014). By establishing the first few iterative codes and categories, the process of theoretical sampling, combined with purposive sampling, was used to identify the following article to look for more homogeneity or heterogeneity in the construction of the theory (Glaser & Strauss, 1967; 2006; Strauss & Corbin, 1996; 2015, Charmaz, 2006; 2014). After completing the first coding cycle, the reviewer conducted further sampling, keeping the initial codes in mind. Many are confused about theoretical sampling as a sampling technique. Despite the similarity in the naming scheme, it should not be categorised the same as other sampling techniques, as theoretical sampling does not focus on numbers; instead, it is the de facto grounded theory strategy for obtaining further selective codes and categories to refine and expand the major categories. Theoretical sampling supports purposive and snowball sampling by gathering more data to develop more robust categories with related properties (Charmaz, 2006; 2014).

### Data Analysis

After obtaining the first article using the Boolean string and searching the ProQuest database, it would be used as the initial coding sample. The reviewer used Atlas.ti for coding due to its friendly user interface (Smit & Scherman, 2021) during the coding process. Line-by-line coding was used to identify the first few tentative codes. The process enabled the reviewer to select, separate, and sort data, initiating an analytical cycle to understand the first piece of data, which is the first section of the article. With initial coding, the reviewer defined what was happening in the data by grappling with the article's meaning throughout the coding process (Charmaz, 2006, 2014). After the line-by-line coding, some preliminary and tentative codes and categories were already established, and focused coding began to separate, sort, and synthesise the large amounts of data from the first article. Charmaz (2006; 2014) used the word 'crystallise' in its meaning, and the actions are well represented by the codes and categories used during the coding process. Sometimes, *in vivo* codes are chosen to better serve as symbolic markers of participants' meanings of their stories. Once all of these steps had been completed for the first article, the reviewer then proceeded to find the following article through purposive sampling, with theoretical sampling embedded in the process to either identify gaps or increase the overall robustness of the tentative codes and categories.

The process in CGT-SR differs from that in CGT research. In CGT research, snowball sampling could be used by asking the interviewee to recommend the next participant (Creswell, 2013). However, during the search for the following article in this SR, the reviewer must assess the article's suitability for inclusion in this review. In GTM, flexibility is a key component, as the constructed theory emerges from the data rather than being derived from predefined hypotheses. Following the initial data collection and analysis, the search continued using the first constructed iterative codes and categories to guide navigation. Here, the reviewer employed theoretical sampling to identify the next piece of data to include in the analysis. This is a crucial step in reaching theoretical saturation, as the grounded theory has been established through a comprehensive construction, and no new data streams are needed

(Glaser & Strauss, 1967; 2006; Strauss & Corbin, 1996; 2015; Charmaz, 2006; 2014). As stated by Charmaz (2006; 2014), the primary purpose of theoretical sampling is to elaborate and refine the categories constituting the theory with the properties of the codes and categories. The review process continued until the saturation point of theory was reached. Whilst quantitative research focuses on approximating the sample or subjects to generalise, GTM allows flexibility in selecting the number of participants needed to investigate and construct the theory from the data, grounded in participants' recollections. Theoretical sampling was employed extensively in this particular CGT-SR to identify gaps following the initial data collection and analysis. Since no intensive interviews were conducted in this review, the coding process started immediately after the reviewer identified the following article (Charmaz & Thornberg, 2020).

### *Memo writing*

Despite the many years since the first version of grounded theory (GT) was released by Glaser and Strauss (1967) and its widespread use in qualitative research, concerns persist about achieving quality in grounded theory development. One of the significant components of CCA is memo writing, which serves as a pivotal intermediate step between data collection and paper drafting (Charmaz, 2006, 2014). Memo writing is crucial for researchers and reviewers to capture analytical thoughts. CGT's ontological and epistemological stances enable the researcher or reviewer to acknowledge their constructivist subjectivity. Memo-writing provides a space, in Charmaz's words, to develop ideas, fine-tune the subsequent data-gathering process, and eventually, make comparisons between data and data, data and codes, codes of data and other codes, codes, and category, and category and concept, and for constructing meaningful articulations about the comparison (Charmaz, 2006; 2014). Memo-writing was an indispensable element in this CGT-SR because there were no participants to work with or follow up with in case of any confusion or clarification. There are a total of five memos that were written to jot down ideas and initial codes in [Atlas.ti](#). The data in this review consists of articles, and without the involvement of participants, memo-writing allows for deep reflection, enabling the reviewer's thoughts to be explored. Tentative codes and categories were established in the memo. As the data collection process progressed, memo-writing was increasingly used to define relationships among codes and categories, as well as among categories and subcategories (Charmaz, 2006, 2014).

### *Rigour*

Unlike quantitative research, qualitative research, such as grounded theory research, aims to achieve rigour by adhering to specific criteria. In CGT, Charmaz (2006, 2014) outlined four criteria that Constructivist Grounded Theory studies must fulfil: credibility, originality, resonance, and usefulness. When the research, or in this case, CGT-SR, has a potent combination of originality and credibility, allowing complete transparency, resonance, and usefulness, the subsequent quality is a byproduct of the research or review. With this modified CGT-SR and the transparency throughout the review, originality is the byproduct of this review due to the unconventional review and synthesis method used, although some studies did utilise grounded theory as the methodology for reviewing the literature: Wolfswinkel, Furtmueller, and Wildreom (2013); Hussein, Kennedy, and Oliver (2017), Eaves (2001), and Benoot, Bilsen, and Hannes (2016). However, using a replica of the CGT process in a systematic literature review, adopting the PRISMA-SWiM framework, and employing a bottom-up approach that starts with only one article might resonate with and be useful to

those who wish to adopt such a review methodology. To ensure rigour, as Charmaz and Thornberg (2020) emphasised, the pursuit of quality in grounded theory research, and in this particular review, the criteria for evaluating quality have been clearly outlined. They have offered a 13-step guideline to ensure the quality of this review. As mentioned, the CGT-SR review method was modified based on the PRISMA-SWiM framework, with flexibility embedded as a tenet of the CGT methodology. Charmaz and Thornberg (2020) emphasised that, regardless of the grounded theory version, the research should first strive to achieve methodological self-consciousness, meaning understanding the rationale behind the research.

Knowing the purpose of this review and how CGT is typically implemented in a study, as well as utilising this particular GTM to conduct a systematic literature review, helps increase this study's rigour. At the same time, being transparent about the data collection and analysis process will also help improve the study's robustness. The developing analysis will guide subsequent data collection to complete the emerging analytic categories by iteratively revisiting the data through CCA. While theoretical saturation is a difficult concept to grasp, unlike the counterpart of quantitative research, Charmaz and Thornberg (2020) again asserted that the utter importance of the role of the researcher in CGT research, the researcher or the reviewer has to keep on reflecting on its role and ask questions about the categories to look for provisional revision or even rejection in the light on new data and analysis. While a literature review is not typically encouraged before data collection and analysis begin in all grounded theory methods (GTM), once theoretical saturation is reached, relevant literature should be compared with the data to enhance the overall robustness of the grounded theory's properties. This provides an opportunity to demonstrate how the analysis aligns with, extends, or challenges the leading ideas in the field (Charmaz & Thornberg, 2020).

## Results

Theoretical saturation was reached when 14 of the 64 articles ( $n = 14$ ) underwent initial and focused coding. Charmaz (2006, 2014) emphasised that flexibility and reflexivity are paramount in conducting CGT research. When CGT was adopted into this SR, there were doubts about whether this synthesis could work. Still, during the review, apparent codes emerged from the manuscripts through initial coding. There was much ambiguity along the process. However, with the rich data from the articles about the implementation of CGT in their research, some provisional codes soon emerged from comparing the manuscripts. Charmaz and Thornberg (2021) emphasised that going back and forth with the data and developing an analysis can help focus on subsequent data. When the first article mentioned their personal challenging experience in publishing qualitative research, it was thought that there were way too many codes obtained from the first article. Initially, Article 1 (A1) [or Participant 1 in a CGT study] was screened, filtered, and included in the  $n = 64$  articles pool. Later, the keyword "constructivist" was used for manual screening, and this is how A1 was included in the article title, which caught the reviewer's attention.

Nevertheless, as soon as the second and subsequent analyses began, they aligned more closely with the conventional formats of CGT research; it suddenly felt underwhelming because most articles contained only a brief section on study limitations. Afraid that the perceivably wrong beginning might have caused the whole track to derail, the worrisome



*reinforce the hegemonic view that qualitative research is an opinion or anecdote that generates low-level knowledge...(7)This situation makes it very hard for university teachers in Education to obtain funding for research projects based on qualitative methods. It also makes it more difficult to publish them if such funding is awarded. (8)She explains how she had to “makeover” her (initially qualitative) project with quantitative aspects in order to make sure it would be awarded.” (A1)*

It was akin to finding a gold mine, as A1 mentioned numerous challenges they faced during their research. Facing criticism that qualitative research is not rigorous enough, publications favoured publishing quantitative research because of its generalizability, a significant disadvantage of qualitative research. The researchers felt discriminated against because the reviewers lacked a clear understanding of qualitative research. However, as soon as the sampling continued, the challenges and limitations were limited to only a small segment of the whole research. Only when categorisation of codes began did the data start to make sense; on the surface, they looked almost the same, repeating the challenges encountered during the implementation of CGT in the educational context. However, upon further careful examination of their words, through initial and focused coding of fourteen articles, meaningful codes and categories emerged. Four groups were categorised by where they conducted the CGT research: four in tertiary education, four in schools, two in nursing education, and four in medical education.

During this stage of the review, five memos were written. At the same time, this SR does not aim to construct an entirely new substantive theory about the challenges of implementing CGT in education, despite using the CGT methodology. It helps develop a novel method for synthesising literature using the CGT methodology. As mentioned above, memo writing helps keep the process in check and increases the level of abstraction of ideas. While the possible challenges of qualitative research, or in this SR, the limitations of CGT research are known roughly beforehand, judging from how human minds operate intuitively, the usual SLR frameworks like PRISMA (Page et al., 2020), or PRISMA-SWiM (Campbell et al., 2020) do not account for how non-linear human consciousness works. As Henri Poincaré said, “It is through science that we prove, but through intuition that we discover”. In PRISMA and PRISMA-SWiM framework, the transparency and replicability are by breaking down the synthesis process, but the linearity of the synthesis is a rigid and slow process while our human minds often act dynamically and jump between ideas while discovering patterns; thus, the modified CGT-SR imitates how our perceptions work to identify patterns adopting the CGT methodology (Page et al., 2020; Campbell et al., 2020; Kaku, 2014; Charmaz, 2006, 2014).

The first memo was done after the initial coding of A1. As stated earlier, A1 discussed their challenges and how some research participants incorporated quantitative elements into their qualitative study. The “cheating” part came after publications showed favouritism towards quantitative research. The quotations above demonstrate how the participants relentlessly compromised their stances and adopted quantitative measures in their qualitative study. However, such codes were not available in subsequent articles, as the researchers primarily discussed the limitations encountered when using CGT. The codes were nonetheless decided to be used and categorised in accordance with the extant literature review, as mentioned in the second and third memos. This demonstrated the reviewer's reflexivity and their

interaction with the data. As shown in Figure 3, the Sanky chart shows the five categories of codes: *Cogency*, *Methodological Trade-offs*, *Compromises*, *Countermeasures*, and *Structural Favouritism of Quantitative Measures*. From the chart, the first two categories, *Cogency* and *Methodological Trade-offs*, emerged from the articles from the four groups mentioned above; for the remaining categories: *Compromises*, *Countermeasures*, and *Structural Favouritism of Quantitative Measures*, it could be seen that the majority of the codes which were grouped under the *Secondary Challenges* were from A1. Still, it was later decided that the codes should be retained and compared with the delayed literature review to complete this CGT-SR's full dimensions.

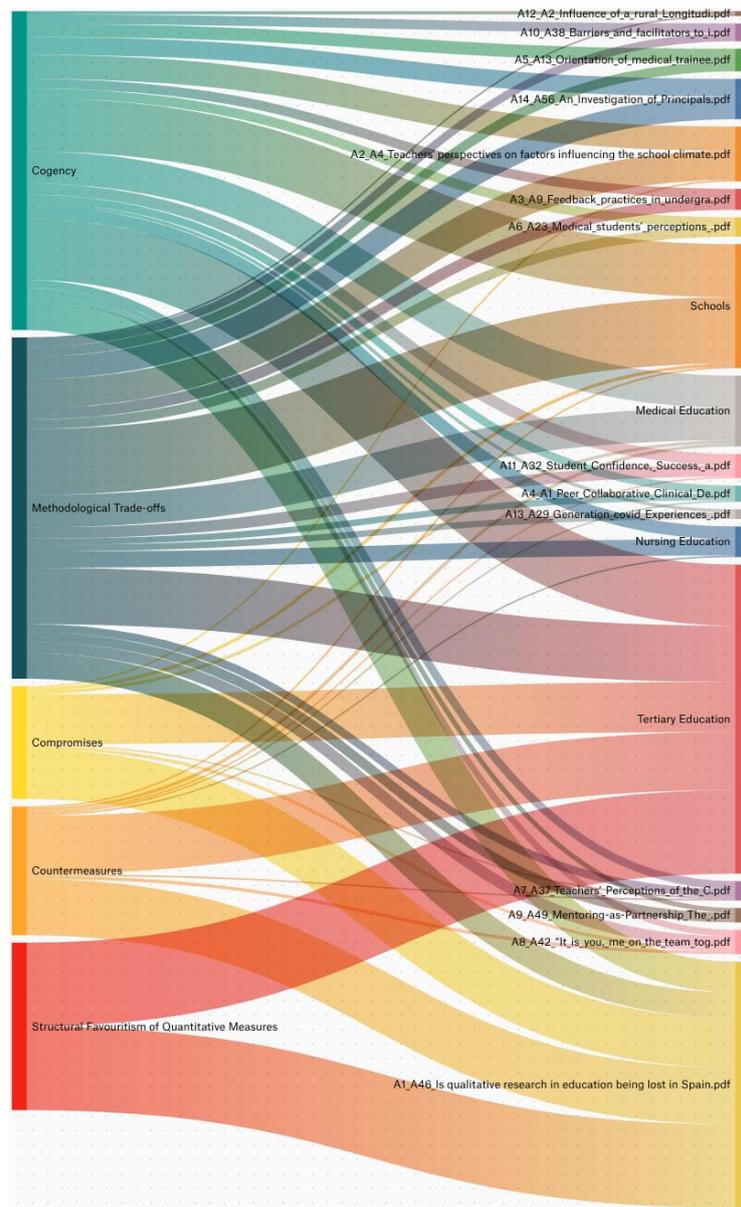


Figure 3. Sanky chart and tabulation containing the categories of codes

### Literature Review

To avoid contamination of the CGT research, this CGT-SR also included a delayed literature review section conducted after the coding processes (Charmaz, 2006, 2014) as a measure of CCA. Ring et al. (2021), as cited in Afshar and Hafez (2021), stated that qualitative research is

conducted to answer questions of “why” and “how” through interpretive, constructivist, or descriptivist perspectives. It constructs context-bound, time- and culture-specific realities and explores people’s experiences. While it specifically mentioned interacting with people to understand deeply social constructs in qualitative research, the proposed CGT-SR investigates the written articles as a form of systematic literature review for synthesis action, which is also a written construct to find out the gap and intended contributions to the overall body of knowledge (Boobink, Larkin, & Probst, 2024). As mentioned earlier, the GT methodology's pragmatist and interpretive nature has evoked suspicions about the validity and credibility of the GT construction or the overall qualitative research. This happened even as different whorls of GT developed, from Glaser's arguments to Strauss, Corbin, and Charmaz. Boje proposed a fourth whorl of grounded theory to embody and align the ontological and epistemological grounding (Boje, 2018). He argued that many who claimed to do GT did not clearly understand what GT is. He challenged the previous three waves of GT, stating that each has an epistemic fallacy. Researchers must exercise due diligence when adopting specific methodologies, ensuring they are understood and applied correctly. Timonen, Foley, and Conlon (2018) noted that most peer-reviewed articles on conducting GT are only available in textbooks, large methodological volumes, or journals with limited access due to restrictions on library resources, book availability, or online databases. To help ease the process of implementing CGT in research, their article aimed to clarify how to conduct the GT method without confusion or apprehension from ill-advised sources.

#### *Understanding the Historical Development of GTs*

Before engaging in grounded theory (GT) research, it is essential to understand the underlying development of GT, as Glaser and Strauss (1967, 2006) introduced Glaserian Grounded Theory (GGT) or Classical Grounded Theory (CGT) as improved methods for sociologists to gather accurate data in social research. While past methods focused on verifying existing theories, the grounded theory methodology enabled the generation or discovery of a theory rather than simply verifying social theories. In contrast to the logico-deductive method, Glaser and Strauss (1967, 2006) urged professionals outside of sociology and laypeople to participate in grounded theory discovery through a “general method of comparative analysis.” While this was the go-to book for grounded theory at that time, in their own words, Glaser and Strauss (1967; 2006) encouraged the sociologists or anyone interested at that time in trying out grounded theory research to “codify and publish their methods for generating theory”; here, it means that the methods and processes for discovering grounded theory discussed in the book were aimed to help to stimulate rather than freezing the thinking process with a rigid framework of methodology. There were some criticisms of the grounded theory methodology's usability; for example, the lack of concrete steps for conducting grounded theory research was fine for seasoned researchers. However, for novice researchers, the unclear instructions and lack of structure led Strauss and Corbin (1996, 2015) to develop their version of Straussian Grounded Theory (SGT), introducing structure to help fellow grounded theorists navigate the grounded theory research using the conditional matrix and systematic coding phases. Rather than “discovering” grounded theory, as GGT did, SGT's symbolic interactionism enables researchers to participate in grounded theory research through a series of procedures while maintaining the integrity of the method. With a worldview different from Glaser's, the pragmatist and interactionist philosophies enable the reconstruction of complex social phenomena as understood by both participants and the

researcher. At a later stage, Corbin agreed that researchers are involved in constructing concepts and theories during the research process.

Following the principles of interactionism, Charmaz (2006, 2014) questioned the rigid framework of the conditional or consequential matrix while maintaining her idea of the active role of the researcher within social phenomena. She proposed Constructivist Grounded Theory (CGT) as an alternative. Returning to what Glaser said in his book, GT is supposed to be flexible. Compared to SGT, the matrix reduced flexibility. Therefore, by allowing flexibility and reflexivity in CGT research, Charmaz argued that CGT retains the core of grounded theory, despite Glaser's criticisms stemming from differing ontological and epistemological stances. With the active role of researchers co-constructing the theory together, Charmaz (2006, 2014) aimed to highlight the differences between each version of the methods and how Grounded Theory (GT) evolved over the years, while providing sufficient guidelines for researchers to undertake GT research without being restricted by a rigid framework and processes. However, it is not without criticism; the excerpts below show how Boje (2018) criticised each version for its fallacies.

*“The fallacy of induction, is the black swan; you can keep collecting cases, assuming a generalization is valid (all swans are white), and then someone in Australia finds the black swan.”*

*“It applies existing theory frameworks, and then uses positivistic coding to fit in interview and observation content into abstract schemata, claiming it accomplishes deduction to cure the inductive fallacy.”*

*“3rd Wave GT grounded inductive observations in published work of authorities, rather than pursuing falsification.”*

*“We propose several ontological foundations to the 4th whorl. They share an intersubjectivity inquiry in which there is verification of propositions, and in some cases, falsification... In sum, we find that much of the existing research that claims to use GT is without ontological substantive ‘ground’ in its method, and thus lacks the substance needed to develop formal ‘theory’.”*

*(Boje, 2018)*

Boje essentially criticised the earlier GTS for ignoring the falsifiability of the GT methodology and proposed a fourth whorl of GT, which adopted the Deweyan ontological method to test the conclusion via a “double movement” of induction and deduction. He stated that the first three whorls missed the chance to identify a falsifiable GT via a correct ontology and epistemology. With his Narrative Interviewing of Dialectics method, participants are invited to tell their stories. At the same time, the researchers actively seek counter-narratives when possible to enhance the completeness of the narratives and antenarratives. The word antenarrative simply means the non-linear and fragmented snippets of the whole story. He summarised his method, titled the “Organisational Storytelling Scaling Manifesto” or “Storytelling in Action,” by presenting his arguments, such as the notion that GTs are too superficial. His method enables scalability beyond the narratives elucidated by the participants, encompassing the multifractality of narratives, counternarratives, and antenarratives, as well as untold stories, which help to complete the fourth whorl of grounded theory research.

### *Challenges of Adopting Grounded Theory Methodology*

The introduction to the third earlier editions of GTs and the fourth whorl of Ontological Storytelling GT by Boje (2018) may confuse many novice researchers. Without a clear understanding of a particular Grounded Theory (GT) methodology before using it, there is potential for methodological errors, such as reviewing the literature without developing assumptions or mixing and matching different GT approaches in research (El Hussein, Hirst, & Salyers, 2014). Most students began their research journey by reading Creswell's (2013) book, which comprehensively overviews qualitative, quantitative, and mixed-methods research. However, it does not thoroughly examine the ontological and epistemological development of various Grounded Theory (GT) versions. El Hussein et al. (2014) listed the advantages, disadvantages, and limitations of using GT as a method of inquiry; advantages (provides for intuitive appeal, fosters creativity, potential to conceptualise, systematic approach to data analysis, provides for data depth and richness), disadvantages and limitations (exhaustive process, potential for methodological errors, reviewing the literature without developing assumptions, multiple approaches to GT, limited generalizability).

This SR focuses on the challenges encountered when implementing CGT in educational research. The most common misconception about using GT in research is that it will be more exhaustive than its quantitative counterpart. Coding is time-consuming (Myers, 2009, as cited in El Hussein et al., 2014). However, the instrument-building process is equally time-consuming and labour-intensive in quantitative research, such as surveys or experiments. Nevertheless, the methodological error of applying GT without a deep understanding of its ontological and epistemological foundations is a major red flag, as it may compromise the overall quality of GT research. When CGT, compared to GGT and SGT, aims to generate theory through the living experience of the participants, reviewing the literature before conducting the research is a detachable issue as GGT and SGT wanted the researchers to enter the research in a *tabula rasa* state, meaning an empty slate without any preconceived notions or ideas, but Charmaz (2006; 2014) argued that it was impossible to do that. Instead, through the accumulation of knowledge since birth, subjectivity is inevitable; in fact, that is the fundamental premise of human consciousness (Kaku, 2014). She emphasised the importance of researchers' interpretive nature in a social setting; the observer's subjectivity (whether the researcher or reviewer in this CGT-SR) provides a unique perspective. The researchers can raise their main codes and categories to concepts.

Only after reaching theoretical saturation of the categories can one link with the delayed and extant literature. Although having no preconceived notions about something or anything is impossible, delaying literature is a good way to critically examine categories, present analysis, or even challenge the overall research with analytic arguments (Charmaz, 2006, 2014). Here, it also poses a question. Is generalizability needed for GT research? Or, is there a need for generalisability for research related to the humanities, i.e., education, history, cultural studies, psychology, etc.? Understandably, generalizability is essential in studying an objective reality or truth, such as the theory of gravity or the functioning of the cardiovascular system, because reality exists regardless of how we perceive or observe it. Moving into the realm of the humanities, subjectivity often plays a significant role across history, culture, and belief. While Harari's book *Sapiens* (Harari, 2014) is not without its oversimplified narrative of human history, his views on objectivity and intersubjectivity align with Charmaz's (2006, 2014). Subjectivity and intersubjectivity are formed within specific populations, and the shared

beliefs or perspectives within a given population might not be helpful to others on the other side of the world. Thus, by incorporating the researchers' interpretations into the research, looking through their lens and trying to understand what the participants have gone through, reflexivity in CGT through the memo-writing mechanism helps maintain the scale of subjectivity and minimises the projection of subjectivity into objectivity. Subsequently, does generalizability matter if the substantive area of the research is limited to a small population?

### **Constructed Substantive Synthesis**

Combining the data from the CGT-SR and literature review, the codes are categorised into *Primary and Secondary Challenges* of implementing CGT in educational research: (i) *Methodological Trade-offs and Cogency*, and (ii) *Structural Favouritism of Quantitative Measures, Compromises, and Countermeasures*. Figure 3 shows the relationship between the categories. When researchers decide to use the CGT methodology, they are likely to encounter disadvantages in qualitative research. Regardless of how qualitative methods are often framed as lacking rigour or evidence (Anderson, 2010), this review refers to them as *Methodological Trade-offs* rather than using terms like disadvantages, weaknesses, or flaws to skew the biases from a methodological standpoint. Understanding that CGT has its trade-offs, a deep ontological and epistemological understanding enables the method to convey *Cogency*, meaning the methodology's clear, logical, and convincing quality. Strengths and advantages were the original thoughts during the coding phase. However, they were eventually replaced by cogency because the word means the quality of being powerful and expressed in a way that influences people's beliefs (Oxford University Press, n.d.).

#### *Primary Challenges of Implementing CGT: A Balance Between Methodological Trade-offs and Cogency*

For clarification, every research methodology has its trade-offs, and researchers must consider which methodology to use based on their strengths and weaknesses. This review suggests that *Methodological Trade-Offs* and *Cogency* should be regarded when employing CGT as the central methodology in educational research. Returning to the topic of science and research, Corrêa da Silva (2022) noted that scientific research is not a highly controlled production process with a set of rigid rules to guarantee its success; however, this does not mean that the foundation of organising scientific research should be forgone. The ontological and epistemological understandings form the fundamental basis of a research work's structure and analytical process, despite CGT permitting flexibility in research methods (Charmaz, 2006, 2014).

*"This flexibility of the interview process enabled us to capture the teachers' perspectives..." (A2)*

*"Grounded theory is also a highly flexible method. Because data collection and analysis take place at the same time, it allows us to reexamine earlier codes quickly and identify theoretical gaps for developing emerging ideas." (A11)*

*"Data were simultaneously collected and analyzed, and the resulting knowledge was used to inform the next cycle of data collection. Finally, while guidance was provided in developing and connecting the emerging theoretical categories, flexibility was afforded by having no preconceived destination in mind." (A14)*

Only by understanding the historical development of the GT methodology, flexibility then becomes an advantage; but at the same time, if the researchers do not put much effort into knowing the differences between each version of GT, regardless of which GT they decide to adopt, mixing and matching various GT methodologies without a central ontological and epistemological understanding of the chosen GT will eventually create a hot mess of Frankenstein. The table that follows discusses the interrelation between the two categories. Table 1 identifies the interrelation between *Methodological Trade-offs* and *Cogency*. The quotations from the participants were listed under their respective columns to illustrate how things can be interpreted as CGT's strengths or weaknesses, depending primarily on one's ontological and epistemological stance, worldview, and beliefs. From the participants' *in vivo* codes, the primary challenges of implementing CGT in educational research are understanding its distinctive features and balancing them.

Table 1.

*Interrelation between Methodological Trade-offs and Cogency*

<b>Methodological Trade-Offs</b>	<b>Interrelation</b>	<b>Cogency</b>
<p>...were collected in a group context, this could have <b>influenced</b> the data...(A2)</p> <p>As constructivists, we recognise that <b>our backgrounds, experiences, beliefs, and interests shape</b> our questions and interpretations of participants' experiences. (A5)</p> <p>In accordance with constructivist epistemology, our findings are specific to our particular context and <b>shaped by our subjective perspectives...</b> (A8)</p>	<p>Subjectivity</p>	<p>...in qualitative methods it is assumed that this <b>relationship depends on human reactions and interpretations</b> (A1)</p> <p>...<b>avoid pushing our personal assumptions and hypotheses</b> on them in order to remain open-minded, curious and sensitive as researchers... (A2)</p> <p>...considers knowledge to be <b>constructed through social interaction...</b> (A3)</p>
<p>..our findings are <b>partial, provisional and fallible interpretations.</b> (A2)</p> <p><b>It was not possible to determine</b> how different school curricula or cultures <b>might influence</b> students' collaborative processes... (A4)</p> <p>...<b>it could not be ascertained</b> whether the meaning of mentoring might differ among diverse groups. (A9)</p>	<p>Intuition</p>	<p>Human beings tend to have <b>causal thoughts</b> (attributing effects to specific causes) (Hume, 1988). In qualitative research we question whether these causes-effects are universal, and we affirm that they depend on the contexts, culture, and meanings we attribute to these causes-effects... (A1)</p> <p>...to engage her peers in a <b>casual but candid discussion</b></p>

		<p>about this topic. (A6)</p> <p>This methodology allowed us to <b>approach the uniqueness of the situation with an open mind</b> and meant that our investigation was led first and foremost by emergent concepts, inductively derived from the data. (A13)</p>
<p>In accordance with <b>constructivist epistemology</b>, our findings are specific to our particular context and shaped by our <b>subjective perspectives...</b> (A8)</p> <p>...as there is even less training in qualitative research, <b>researchers devoted to this field have less and less rigorous knowledge about the ontological and epistemological pillars</b> that this paradigm is based on... (A1)</p>	<p>Epistemological differences</p>	<p>...considers knowledge to be <b>constructed</b> through social interaction... (A3)</p> <p>Interpretivism subscribes to constructivism and the researchers ontological and epistemological stance comes from the <b>understanding that reality is subjective, uniquely individual, and socially constructed...</b> (A10)</p>
<p>Interview data can be <b>problematic in terms of ecological validity...</b> (A2)</p> <p><b>When generalising the findings, it is important to consider the study's limitations.</b> The study was conducted in areas known for their diverse populations, and the teachers who worked there had considerable experience with families from various backgrounds. (A7)</p> <p>...obviously means that <b>we cannot generalize the findings to the entire population of 2020 secondary school graduates in Ireland.</b> (A13)</p>	<p>Generalization</p>	<p>...generalization has been discussed in different terms. For example, Larsson (2009) discusses generalization through context similarity and generalization through recognition of patterns, in which <b>the reader, not the researcher, judges the generalisability.</b> (A2)</p> <p>...there is a <b>misunderstanding</b> with the terms "science" and "generalization..." (A1)</p> <p>...<b>we were not as concerned with generalization or replication</b> as we were the corroboration and substantiation of findings beyond the context of the study over time and across similar situations... (A14)</p>

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<p><i>In addition, <b>the sample included only protégés and not mentors.</b> To fully understand the meaning of mentoring among nurse faculty, additional research is needed that includes nurse faculty who serve as mentors in academia. (A9)</i></p> <p><i>While we did not notice significant differences in responses between groups, <b>we recognize that factors such as frequent moves within this population could affect participant expectations...</b> (A8)</i></p> <p><i>...all participants were <b>female and of similar ethnic origin...</b> (A10)</i></p>	<p><i>Small research population</i></p>	<p><i>...we <b>adjusted the interview language</b> according to the participants as ZS interviewed them <b>as a peer</b> to guarantee the interviews were conversational... (A6)</i></p> <p><i>...recruit participants from multiple sites to <b>compare and validate the findings...</b> (A4)</i></p> <p><i>We <b>purposively sampled</b> participants through... (A6)</i></p> <p><i>...the sample does reflect the <b>dominant trend for young people in Ireland</b> to progress to tertiary education... (A13)</i></p>
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Table 1 shows the interrelation between *Methodological Trade-offs* and *Cogency*. The table was chosen to represent and explain the relationship between the two categories, showing that the qualities extracted from the codes and categories could be either a trade-off or a source of cogency. Stemming from a logical investigation of methodological self-consciousness, understanding that subjectivity exists everywhere in our daily interactions solidifies the rationality of adopting the CGT methodology in educational research, as education is fundamentally about human interactions. The nature of human consciousness, whether entirely subjective or grounded in objectivity, remains a topic of debate today. In recent developments in neuroscience, Koch (2004) summarised that the Neural Correlates of Consciousness (NCC) is a process specifically designed to study subjective experiences in the human mind by empirically examining how brain activity corresponds to stimuli in our environment. With current technology, such as opto-fMRI, physiological functions can be mapped by identifying specific structure-function relationships in the brain (Snyder & Bauer, 2018). They have reviewed several forms of mapping brain connectivity derived from animal experiments, supporting rTMS (rapid Transcranial Magnetic Stimulation) as a treatment for depression by developing red-shifted opsin variants that allow deeper tissue penetration into different brain neurons. This is an example of objective experimentation on the brain, regardless of individual subjective thoughts or experiences. Generalising the findings of such experiments is excellent for medical advancement, with the basis of mammalian brain integrity looking remarkably similar in a vast population. Snyder and Bauer (2018) referred to this as “from man to mouse to man,” a process of iterating between preclinical and clinical findings. On the contrary, Yang, Huang, Gonzalez-Castillo, Dai, Northoff, and Bandettini (2014) combined objective experimentation using fMRI to decode true or dishonest “Yes/No” at a single-subject level. This demonstrates the potential to investigate subjective thoughts by observing the BOLD (Blood Oxygenation Level-Dependent) spatiotemporal response patterns. According to their study, the definition of “subjective” thoughts may not be objectively true,

as they may reflect individuals' inaccurate knowledge. Despite advancements in decoding thoughts through neuroimaging, the subjective nature of human cognition in social contexts will continue to be scientifically and systematically investigated through qualitative research. Therefore, before science reaches the day when cognitive science can identify every single variable that contributes to the formation of consciousness, or never; subjectivity is still likely to be rooted in explaining human consciousness, psychology, and collective social interaction.

With CGT, human thoughts, shaped by intuition, personal experiences, and individual choices (Kahneman, 2011), remain inherently complex and context-dependent, necessitating ongoing research into their subjective underpinnings. To better show the interrelationships between *Methodological Trade-offs* and *Cogency*, Table 1 was used to discuss the categories. When the codes were put side by side, the mentioned strengths of the methodology could also be seen as weaknesses, and vice versa. It largely depends on the researchers' perspectives, as they used CGT as their research methodology. Both categories were divided into five subcategories of *Interrelation: Subjectivity, Intuition, Esoteric differences, Generalisation, and Small research population*.

The researcher's subjectivity will influence the data through personal interpretations and biases. Knowing that the researcher and participants co-constructed the theory is a double-edged sword if the subjectivity is not maintained in equilibrium. A balance is needed in CGT; it is a trade-off, but when used properly, it can be powerful in helping narrate the phenomenon with depth and nuance. A2 mentioned that the interviews conducted in a group setting might have influenced the data; this is true with the sociological observer effect (Baclawski, 2018) and the spotlight effect (Gilovich, Medvec, & Savitsky, 2000). Both effects occur in social settings and are therefore unavoidable. Numerous unobservable variables often influence human actions and reactions, unless one can account for every minute variable and exclude the observer (an impossible task, as observer effects are not exclusive to quantum mechanical problems but also affect classical systems, as stated by Baclawski [2018]). Thus, subjectivity is an element that should always be considered in research on human beings. Only by recognising that it is impossible to get rid of subjectivity, especially in the study of human-social-related activities, can one see through the veil of the actions and reactions of such. Quantitative advocates often criticise qualitative measures as provisional and prone to fallacies due to personal interpretations. They tend to want everything triangulated to reduce bias (Fusch, Fusch, & Ness, 2018), yet they propose that bias in qualitative research is unavoidable. This contradicts the previous statement, as standing on the sidelines as observers and using quantitative methodology does not eliminate biases, as the observer effect might also influence the results. Since triangulation is a quantitative concept, introducing it into qualitative research is a game-changer for reducing subjective bias. However, as A1 mentioned, the very nature of human beings is casual (Hume, 1988, as cited in A1), as we operate day-to-day without giving much thought to many things. While triangulation is a manageable step to enhance the rigour of qualitative research, a balance must be struck between acknowledging that subjectivity will influence the outcome of the CGT research, while understanding that reflexivity, rather than triangulation, will help maintain the quality of the CGT research. The participants' intuitions are analysed using a structured approach that combines delayed literature reviews with the researchers' insights to provide a constructivist lens for understanding specific topics. In the CGT process, the

findings are partial and provisional but not fallible (A2) because every situation is unique and deserves to be studied with an open mind.

Thus, to balance the methodological trade-offs and cogency of the CGT methodology, an ontological and epistemological understanding of CGT is crucial. Human interactions and interpretations are often co-constructed among two or more parties daily; while staying objective is vital, most opinions are formed subjectively. Although CGT takes a constructivist epistemological turn compared to previous versions, this does not mean the researchers let their personal views cloud their judgment. The co-construction of theory in CGT involves thoughtful, careful manoeuvring between researchers and participants, recognising that multifractality exists rather than a single, uniform body in the social setting (Charmaz, 2006, 2014). Too much subjectivity will skew the participants' underlying meaning. Without first attempting to understand the rationality of the authors of the various whorls of GT methodologies, engaging in research with GT will not yield meaningful, in-depth, and substantive exploratory theory about a particular social phenomenon. A8 stated that the findings are shaped explicitly by the researchers' subjective perspectives. From a positivistic standpoint, this would appear to be outraging because science is supposed to be empirical testing, quantitative methods, and universal laws (Hayek, 1952); often, this seems to be too oversimplifying as human behaviours are incredibly complex to be made into numbers and testing and come up with laws via reductionism (Slife & Williams, 1995; Hayek, 1952). In reductionism and quantitative methodology, the ability to generalise is often praised in scientific research; for example, the most famous scientific equation of all time,  $E=mc^2$ , simply yet beautifully captures the relationship between energy and mass in the Theory of Relativity.

On the other hand, the inability to generalise findings to a larger population is a weakness and disadvantage of qualitative research. With subjectivity as a central tenet in CGT, this inherently invites more criticisms because "science should be positivistic and objective". Reviewers in A1 rejected the researchers' qualitative submission for reasons such as the results not being generalisable, objective, or based on broad samples, thus rendering the work less rigorous. Therefore, some countermeasures, such as converting the qualitative research into mixed-methods research, yielded positive results for manuscript submission purposes. As one of the comments from the participants in A1 explicitly stated, in mixed-methodology research, the predominant logic is often quantitative first, followed by the qualitative component. Reviewing the articles revealed that the researchers approached the topic from different perspectives. A2, A7, and A13 viewed the inability to generalise as a limitation, whereas A1 and A14 did not consider their research a concern. Given the epistemological understanding of CGT's predisposition to multifractal-structured social settings, generalisation should not be a concern from the outset of the study, as multiple social bubbles coexist and form society. Following this logic, the generalization of human subject research is not a one-size-fits-all approach to legitimise the validity of scientific research; instead, there is an urgent need to steer away from this narrative that wants to emphasize the generalization of some particular fields of human study, i.e., psychology, sociology, and economics (Hayek, 1952; Friedmann, 1953, Kahneman, 2011; Charmaz, 2006, 2014).

Lastly, understanding that the inability to generalise is a feature, not a bug, of the CGT study, a small research population is not precisely a methodological trade-off, but a cogency. A logical induction via a bottom-up approach from a small research population will make sense to a particular group of readers who can relate to the substantive theory generated within the research area's boundaries. On the Methodological Trade-offs side, A9, A8, and A10 felt that the small population did not support the overall theory due to the supposed insufficiency of the sample. On a superficial level, it might seem so, especially when compared to the quantitative counterpart. However, this is undoubtedly an ungrounded argument because the in-depth investigation within a specified population is what gives the plenitude of the underlying grounded theory. Working with a small research population allows researchers to adjust specific components, such as interview questions, by developing alternative questions or purposively selecting participants through theoretical sampling (A6).

Charmaz (2006, 2014) also noted that CCA occurs when comparing dissimilar events to gain further insights. Although she did not label this particular CCA process as falsification, it does not mean that CGT has failed in its ontological and epistemological departments (Boje, 2018). With his example of the fallacy of induction in his article, if the swans are all white here and suddenly, there is a black swan in Australia, does this nullify the truth that swans are all white somewhere? Alternatively, further investigation is required because an odd one is out there. This is because Charmaz (2006, 2014) stated that results are iterative and provisional, and can be updated as new data become available. "It is of great value to acknowledge ignorance," Richard Feynman once said. This aligns with having an open mind in science and remaining open to new ideas, particularly when studying human interactions using the CGT methodology.

#### *Secondary Challenges of Implementing CGT: Structural Favouritism of Quantitative Measures, Compromises, and Countermeasures*

This CGT-SR decided to keep the codes despite most in vivo codes being solely from A1, which led to Structural Favouritism of Quantitative Measures, Compromises and Countermeasures, and eventually to the Secondary Challenges of implementing CGT in educational research, given how the codes aligned with the review scope of this study. From the sanky chart in Figure 3, the tremendous amount of usable codes contained in A1 helped to establish an understanding that qualitative research, even after years of published work to promote qualitative research, is still facing certain amount of discrimination compared to the quantitative counterpart (Afshar & Hafez, 2021; Anderson, 2010; Bobbink et al., 2024; El Hussein et al., 2014). While A1 did not conduct the research using the CGT methodology per se, it was more akin to a systematic review at the beginning, as it analysed two types of documents: research projects funded by the Ministry of Education and articles published in high-impact education journals, and bundled with interviews with researchers who engaged in qualitative research, the researchers from A1 did not explicitly develop a theory about the field of interest either. At the outset, the authors outlined their positionality and explained how readers can understand their work and its long-term significance. Understood that qualitative research is an umbrella term for all the other types of research designs, including case study, ethnography, phenomenology, and grounded theory; the flexibility of CGT-SR allows for slight modification without compromising the tenets of GTM, despite A1 technically violating the first selection criterion that the methodology used in the reviewed articles must be CGT. Precisely because of the permissible flexibility, the A1 codes were retained to form

the Secondary Challenges rather than the primary ones, thereby enhancing the overall completeness of the constructed synthesis. In short, grounded theory studies, like other qualitative research, face the same criticisms because they are qualitative methodologies.

As mentioned, qualitative research also encompasses the grounded theory approach. The anecdotal records about the multiple challenges encountered by qualitative researchers in A1 are extremely valuable because they were beyond the scope of methodological limitations. Therefore, the following codes extracted from A1 were deemed suitable, regardless of the supposed repetitive codes from the subsequent articles. They were kept in the final constructed substantive synthesis, informed by the extant literature review (Charmaz, 2006, 2014).

*"...qualitative research is not so rigorous..." (A1)*

*"...the default response to all qualitative articles is rejection..." (A1)*

*"For the academic and scientific world, it seems that evidence-based research has more solid and rigorous criteria than qualitative research." (A1)*

*"Their goal is to promote a much more technical neo-positivist paradigm and its quantitative methodologies..." (A1)*

*"It is not enough to simply submit research based on solid, founded qualitative criteria, as it would appear that such research is more difficult to sell due to a lack of understanding among evaluators." (A1)*

*"Qualitative research is therefore discarded because it is unscientific, as there is a misunderstanding with the terms 'science' and 'generalisation..." (A1)*

While qualitative research is criticised in A1 for being less rigorous than quantitative research and for lacking empirical evidence, this review argues that bias within institutions and publications stems from a misunderstanding and obsession with reductionism (Wrigley, 2019), which has helped shape these unjust criticisms. Having numbers, charts, and tables reduces the complexity of human interactions in social settings; such measures often lead to the loss of complexity, openness, and the values that underlie human society. The excerpts in A1 contained in the documents, and the interviewed participants stated that qualitative research is often labelled as not rigorous, and thus faced rejection during the submission of their research papers because quantitative measures appear to be more solid compared to their qualitative counterpart, also, it is more "scientific" with empirical evidence and the ability to be generalised. However, evaluating and judging qualitative research from a positivist perspective, and deeming it "unscientific" due to a lack of deep understanding of the methodology, is a subjective judgment.

Bock and Goode (1998) and Sayer (2010), as cited in Wrigley (2019), emphasised the importance of critiquing reductionism in education to protect it against misleading simplifications. With the one-sided preference for quantitative methodologies, such reductionism will also affect policy, administrative systems, and related research paradigms across many fields (Wrigley, 2019). The infiltration of obsession and favouritism for quantitative methods within education occurred for the same reason, as various reductionist models have contributed to an inadequate understanding of reality (Wrigley, 2019); hence, is it crucial to identify the need to attend to openness, stratification, and emergence of stronger foundations and methodologies to understand natural and social science better to

tackle the populist diatribe against “non-scientific” research in education by equating the education research that does not emulate laboratory experiments as quackery (Bennett, 2003, as cited in Wrigley, 2019).

*“This is especially true given the role of Psychology, which is striving to position itself as an exact science, and its influence on the educational field...” (A1)*

*“...qualitative research has given up its space and allowed its voice to go unheard, bringing the establishment of a hegemonic paradigm, neo-positivism, while putting qualitative research and qualitative researchers in a very delicate situation...” (A1)*

The obsession with the ability to generalise the findings and results to a larger population stems from the confusion of wanting human-related fields, such as psychology and education, to appear “scientific”. A1 stated that such hegemonic thinking was established through a complex network of ideologies, including accountability culture, neoliberalism, (post)positivism, capitalism, and ontological realism. Such thinking contributes to a narrow perspective, suggesting that there is only one valid and rigorous form of knowledge within the field. Therefore, over time, this hegemonic ideology would gradually infiltrate the structures of specific fields of study, including education, and eventually prioritise and offer more job opportunities that conform to this established thinking (A1).

The implications will increase the likelihood of a total wipeout of qualitative research if a longer timeframe is given, especially when researchers in A1 also hear from their international colleagues that the paradigm of obtaining teaching positions via direct accreditation also prevails in their respective higher education institutions. Moving up the ladder is equivalent to “finishing the obstacle course”. Since the obstacle courses involve publishing in journals with higher impact indices, this can lead to securing a position as an Associate Professor, continuing to publish more in an environment where quantitative methodologies are more prevalent, until one achieves an indefinite contract or a civil servant position (A1). An example in A1 stated that the journal’s editors will not publish work based on small or incidental samples with little possibility of generalisation; together with another example, despite saying that “both research articles and educational experiences” would be accepted, the answer to whether a case study on an educational innovation experience could be submitted was no.

*“No, we do not publish this type of work (despite what is stated on the journal's website). Please feel free to send it, but we are sure that the evaluators will reject it, as we are not currently publishing research articles.” (A1)*

*“...conserving our pure ideology and not submitting to the rankings came at the cost of the ideology of future generations looking to make their way in the university career.” (A1)*

With encounters like this, A1 concluded that the paradigm war from the 1970s to the 1990s did not end. Gage (1989) stated that the paradigm war, which began in the 1980s, had led to the demise of objectivity-seeking quantitative research on teaching. In his 1989 article, he

proposed three versions of criticism and effects by looking back hypothetically from 2009, a decade after the turn of the millennium. He wanted to evaluate the devastation of the aftermath of such a paradigm war by postulating that the objectivistic-seeking positivists had led nowhere and achieved nothing significant in improving classrooms and teaching. In light of antinaturalist critiques, the term “social science” is considered an oxymoron, and the scientific study of human affairs is deemed impossible, including in teaching and learning, because the processes are inextricably intertwined with the intentions, goals, and purposes that give them meaning (Gage, 1989).

*“...a science is involved with direct one-way causal links, but there are no such 'billiard-ball' causal connections between teacher behaviour and student learning.” - The Antinaturalist Critique.*

*“Because causation in human affairs is determined by interpretive symbols, the kinds of prediction and control that can be achieved in the natural sciences are not possible in human affairs.” - The Interpretivist Critique.*

*“...we should have been looking at the relationship of schools and teaching to society-the political and economic foundations of our constructions of knowledge, curriculum, and teaching... emphasized the importance of power in society and the function of schools in defining social reality.” - The Critical Theorists' Critique.*

*(Gage, 1989)*

In hindsight, some of the mentioned versions of criticisms sounded sarcastic looking from 2025, what Gage wished for did not come to fruition; instead, we are now in an era where qualitative education research is viewed as not scientific enough, as qualitative researchers are worried about “generalization”, the need of a “make-over” to be marked as one of the limitations because in comparison, large sample size with the ability of generalization looks more convincing compared to “simple” case studies. Gage observed that the criticisms mentioned from the three different standpoints had prevailed in 1989. The almost non-existent use of statistical tools to measure the reliability and interrelationships of structured classroom observations, achievement tests, and attitude inventories was a success. He also mentioned that research grants from foundations and government agencies became unobtainable for objective-quantitative educational researchers, together with the shrinking of membership in the Division of Educational Psychology of the American Psychological Association during the 1980s; the Division of Teaching and Teacher Education in the American Educational Research Association also saw its membership become exclusively comprised of interpretive-qualitative and critical-theoretical researchers. However, what Gage calls “an alternative effect of criticisms” in his article has become a reality rather than an alternative to what we have now.

The so-called positivistic or mainstream research on teaching (Gage, 1989) does not decline as he envisioned. A simple search with the ProQuest database using Boolean strings (“quantitative” AND “education” - 1,755,293 results; “qualitative” AND “education” - 1,684,882 results; “mixed-method” AND “education” - 139,392 results) has shown that both quantitative and qualitative research in education are comparable in amount in the database. There is no demise of positivism in education research. The current circumstances suggest that both worldviews continue to flourish in educational research. However, this superficial

search cannot prove anything about the methodologies used in the studies, especially regarding the value of the data. Perhaps the fundamental changes the three critiques demanded were partially successful from what have been observed in the classrooms as what the examples given in the articles: less research grants for the objective positivists–antinaturalists, classroom activities by the teachers that were aware of small changes in teaching that made a significant difference in student achievement which were culturally appropriate for the majorities and minorities–interpretivists; changes in the classrooms knowing that pupils could investigate sensitive topics during learning without neglecting them–critical theorists. The provided examples materialised in 1989, but in hindsight, his view of the alternative effect of the criticisms is much better suited to 2025. Interpretivists continue to dominate the classroom, while positivists remain relevant in mainstream education research. A1 expressed their frustration with the establishment's privileging of quantitative methodologies and with the structural bias against publishing qualitative research, which forced them to compromise their stances.

*“feel obliged to include something you had not initially envisaged in order to make sure the project is approved” (A1)*

*“This is what led us to give our work a “make-over,” in order to ensure it was more scientific in character [...] In this case the 'make-over' worked and we were awarded the project.” (A1)*

*“a technification, an instrumentation of the qualitative as if it were a mere technique for collecting information.” (A1)*

*“The first one is related to the category “projected as qualitative, when in fact it is quantitative,” which represents 17 articles (4%)...” (A1)*

Qualitative education research will face more challenges over time, as it is currently perceived as “not rigorous” and “not scientific enough.” Replicating the same prioritisation process for quantitative studies across different layers within institutions will exacerbate the problem. Reductionism began with Galilean and Newtonian mechanics, with the assumption that they are going to work and be applied across the board, including human-related fields, is simply an unintended and glorifying mistake due to “engineering envy”, a desperation among educational statisticians and policymakers chasing efficiency and certainty in an uncertain and complex labyrinth of human minds and interactions (Rose, 2005: 9, as cited in Wrigley, 2019). Therefore, with the intensifying and repetitive efforts to secure a tenured professorial position in universities, methodological *Compromises* must be made, as fellow researchers mentioned in A1.

Anecdotal records from the interviewed qualitative researchers in A1 indicated that modifications to their qualitative research were required to secure grants or publication. When the research began with a qualitative perspective, a later makeover incorporated more scientific elements, including specific quantitative measures, to strengthen the research. A1 stated that some researchers felt obliged and succumbed to the structural pressure to include something not planned initially, just to fulfil the requisites of high-impact journals. There was no mixed-methods research included in A1 because the logic required at the start of each study is complicated to maintain a balance; in fact, the two paradigms are in contradiction (Smith & Hodkinson, 2005; Teddlie & Tashakkori, 2003, as cited in A1). Secondly, most mixed-methods research typically emphasises the quantitative logic over the qualitative one

(Denzin, 2012; Hesse-Biber, 2010, as mentioned in A1). In comparison, the examples provided initiated qualitative studies. Still, they ultimately expanded the original research by incorporating quantitative data, thereby enhancing or modifying the articles to meet the requirements of the establishments, despite the logic of both paradigms not being entirely compatible.

*“2. Literature Review” (A7)*

*“All three authors have previously researched this topic as part of a scoping literature review.” (A8)*

*“Prior literature has described factors that promote or inhibit patient ownership...” (A8)*

As A1 pointed out, technification is disguising qualitative research as quantitative research. No obvious technification was evident in the 14 articles during the ongoing data analysis. However, two articles included an early literature review. Understanding that subjectivity within the researchers is unavoidable, regardless of whether an early literature review is included in the research, might not significantly impact the overall process. Nonetheless, conducting a literature review before data collection and analysis will only reinforce preconceived notions or subjective views about specific topics (Charmaz, 2006; 2014). There were no explanations for why the literature review was included in A7 and A8. Speculative explanations, such as meeting the requirements of educational institutions or a lack of ontological and epistemological understanding among the researchers, could have contributed to the compromise of the CGT methodology.

Deliberately masking the papers with quantitative measures to increase the possibility of acceptance of the submitted manuscripts via instrumentalisation or technification is very common, according to A1. For instance, an original action research documented in the format of eight case studies was removed and amended by transforming the research questions into hypotheses on how to transform practical educational knowledge, leaving the case studies and the data; after that, forcefully adding in the pre- and post-questionnaires to be filled out before and after the experiences to obtain the quantitative data for further analysis so that it would increase the likelihood of it being accepted in journals. Such modifications indicated that the pressure from publications is primarily to discard the basis of qualitative research as “unscientific.” Misunderstanding the essence of qualitative research is a massive blow to the field as a whole, as the overemphasis on measuring complex human behaviours compromises the completeness of the analysis. As mentioned above, reductionism in fields like education and psychology does not enhance understanding of human-related actions, behaviours, and rationales. A1 provided insights to steer the course via suggestions from the researchers, or as this review calls them, *Countermeasures*. The *Secondary Challenges* surround the Primary Challenges within the compound, as understanding and differentiating CGT's Methodological Trade-offs and Cogency are the first hurdles to be overcome. Once one takes the initiative to understand the historical, ontological, and epistemological development of GT, one might still face the *Secondary Challenges* as depicted in Figure 4.

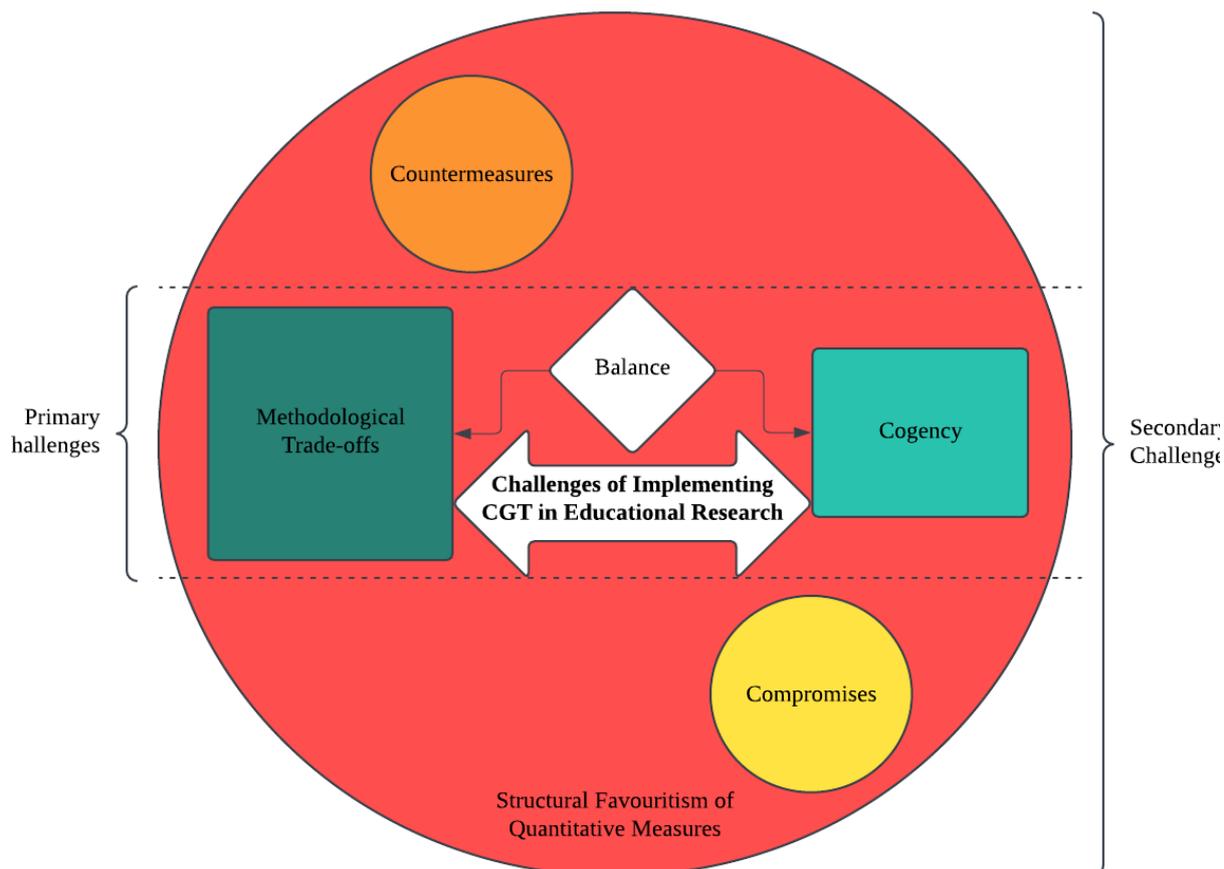


Figure 4. Primary and secondary challenges of implementing CGT in educational research

To overcome the challenges, A1 offered some suggestions.

*“It is imperative that we regain these spaces and make efforts to counter the hegemonic logic that reigns in them...” (A1)*

*“...it is mandatory to improve training, so researchers (particularly novel ones) can actually empower themselves when answering editors or standing by their principles in decision-making spaces.” (A1)*

*“We must therefore strive to adapt our language to make it as simple and direct as possible in all communications and productions aimed at the general public, in order to ensure our position reaches others as relevantly as possible...” (A1)*

*“...being aware of the problem in order to make appropriate decisions. It is not about standard recipes to follow step-by-step (indeed, qualitative research has never been about that) but that qualitative researchers think autonomously and elaborate our own decisions...” (A1)*

How can the importance of qualitative research be preserved? A1 suggested that efforts are needed to counter the prevalence of hegemonic logic in the establishments. Berthelsen, Grimshaw-Aagaard, and Hansen (2018) stated that specific criteria are required for reporting and evaluating the quality of grounded theory research, as qualitative research is not a homogeneous field. Understanding that GTM is sort of standing on its own within a fork of

the umbrella term of qualitative research, Berthelsen et al. (2018), and Charmaz and Thornberg (2020) proposed guidelines to help researchers stick to GTM with its ontological and epistemological components and further enhance the trustworthiness, rigour, quality, legitimacy, and recognition of grounded theory research. Charmaraz and Thornberg (2020) noted that one should first strive to achieve methodological self-consciousness through their 13-step flexible guidelines when conducting a qualitative study in general or when constructing grounded theory research.

In comparison, the Guideline for Reporting and Evaluating Grounded Theory Research Studies (GUREGT), developed by Berthelsen et al. (2018), consists of 25 items, and each GTM has its own specified reflexive questions to help the researchers. Only with proper methodological training can the GT researchers fend for themselves by deeply understanding their choices of GT and its philosophical standpoint. Despite the complexity and variance among the three GTs, the guidelines and checklists should be treated only as guidelines and checklists, or risk becoming a methodological crutch that provides a superficial, rigid framework that limits deep engagement with the method (Charmaz & Thornberg, 2020). A1 suggested that the education of qualitative research towards the general public via straightforward language is a way to move forward to reinforce the idea that qualitative research is a legitimate contribution to the development of human knowledge. However, this can only be done through a deep understanding of ontology, epistemology, methodology, and methods, and of how each philosophical and application component connects with and complements the others. It is also imperative for qualitative researchers to think autonomously and make their own decisions throughout the research process, as there is no step-by-step process in qualitative research, especially in GTM. For example, Jamie and Rathbone (2022) argued that even in medicine, existing research on medication adherence has highlighted that around 50% of patients do not take their prescribed medication, with much emphasis on the identification of barriers like age, sex, ethnicity, and cognitive impairment; however, no concrete correlations have been made. They stated that the study failed to address the complex social worlds where the decision to take or not to take the medication is up to the patient.

This case study's purpose and rationale were aligned with the problem of reductionism in education mentioned by Wrigley (2019). Meyer and Ward (cited in Jamie & Rathbone, 2022) continued suggesting that the theory, which was constructed using smaller sample sizes to obtain rich data in their illustrative exemplar case study, transcended the simplistic correlational study of variables, barriers, and facilitators because of the existing social dimension within the paradigm. Given that "theory" seems ubiquitous in qualitative research, grounded theorists must explain and differentiate among them, even though pinning down an exact definition of "theory" is challenging. Thus, A1 explained that qualitative researchers must do extra work, as Jamie and Rathbone (2022) did in their exemplar case study and in disseminating the research process, which often includes transparency in decision-making throughout the study.

*"...qualitative researchers must do double work: on the one hand, writing rigorously quality educational research written in a professional and academic language, and on the other hand, the dissemination of that research." (A1)*

Unlike most empirical studies, qualitative researchers, especially grounded theory researchers, must dig deep into the historical development of the full grounded theory. Understanding the ontological and epistemological underpinnings is crucial for researchers, not only for themselves in a reflexive attitude, but also to equip them to defend their GT studies. Their positionality will affect the chosen methodology, the angle of investigation, the methods used to collect and analyse the data, the writing of findings, and, eventually, the framing and communication of the results to the public, contributing to the body of knowledge.

The research's influence extends to every stage of the research process (Jamie & Rathbone, 2022); thus, pursuing objectivity in qualitative medical and health sciences research is naive. This includes education. With reflexivity in mind, GT researchers should constantly be mindful of and conscious of intrinsic subjectivity. Simply put, the researchers must know themselves and their practices by maintaining an honest and open attitude towards the *Structural Favouritism of Quantitative Measures*. The GT research process must be laid out in plain sight, and more explanation about each decision and its rationale must also be disseminated. As Jamie and Rathbone (2022) put it, the academic world has become increasingly globalised and interdisciplinary, and quantitative and qualitative researchers have to rummage through a toolbox to find tools they can use in their areas, quoting French philosopher Michel Foucault.

### Conclusion

This CGT-SR aims to identify the challenges CGT researchers might encounter when utilising the CGT methodology. By using the CGT methodology as a review framework, the researcher's subjectivity is incorporated into the review to co-construct the substantive synthesis theory. Figure 4 illustrates the constructed synthesis of this CGT-SR. The *Primary Challenges* are the main focus of this review, as those who chose CGT as their methodology must take the initiative to understand the different epochs of GT and how they intertwine in terms of ontological and epistemological stances. CGT is different from SGT and GGT. Only by thoroughly studying each version of GT can one understand why and how to implement CGT in the research. Without a deep understanding of the distinct differences between the GTs, there will be significant confusion about the Methodological Trade-offs and the Cogency of the method. The GT researchers must actively build their ontological and epistemological beliefs by studying the historical development of Glaser, Strauss, and Charmaz's version and interpretation of GT. This allows the build-up of methodological self-consciousness (Charmaz & Thornberg, 2020), and it should always be pursued regardless of the methodology. The strengths and weaknesses of a particular method must be differentiated via a precise dissection of knowledge, biases, and subjectivities within and outside the researchers' discipline. Moreover, the participants of the body of knowledge who try to understand particular phenomenon within our social interactions in the world through different ontological and epistemological lens of perspectives should also understand that human behaviours are complicated because the human brain, body, language, society, and culture consist of vast numbers of components, bundled with the degrees of freedom in behavior, cognition, and experiences (Orsucci & Tschacher, 2022); this makes the study of human behaviors a humongous task and must not be investigated through a narrow lens of perspectives.

Yet, with the influence of natural science and the two legendary physicists, Albert Einstein and Stephen Hawking, wanting to figure out an all-encompassing theory, the Theory of Everything (TOE) or Grand Unified Theory (GUT) to explain the entire universe in a single equation, this marked the emphasis of empirical science. The grand theory should be able to explain the large-scale cosmological structure of the universe while also defining the quantum world of the subatomic particles (Pultrarova, 2022) in a single equation—a perfect example of reductionism. Still, to this day, the theory has not been discovered. A significant breakthrough in the 1980s, in the form of String Theory, occurred, but the journey has yielded nothing so far. What natural science does with objectivity and positivism cannot be transferred directly into the study of human-related fields of study, and therefore, consideration must be given accordingly. Although some human research can be done in an empirical sense, like what Tomashin et al. suggested as cited in Orsucci and Tschacher (2022), some quantifiable fractal properties can be researched using empirical time-series data using recurrence-based analysis in medical studies; this does not mean that such a stance should be “generalised” because empirical studies are “scientific”. As aforementioned, this makes the *Secondary Challenges* of implementing CGT in educational research a consideration before engaging in CGT or qualitative research. However, suppose the researchers have taken the necessary initiatives to understand the development of each GT throughout history by understanding the nuances of Glaser’s, Strauss and Corbin’s, and Charmaz’s GT, learn everything about the qualitative inquiry, taking an analytic view of existing literature, being transparent while gathering data, and engaging in CCA while tolerating ambiguity. In that case, utilising CGT in educational research will benefit readers who feel connected to the studied circumstances despite the challenges and scrutiny from institutions. *Countermeasures* and *Compromises* should not be adopted, such as forcing quantitative elements into qualitative research or using makeovers via “technification” techniques. Instead, knowing the *Primary Challenges–Methodological Trade-offs* and *Cogency* of CGT by heart, being transparent about the data collection and analysis, and the process will eventually pay off despite the *Secondary Challenges* of implementing CGT in educational research. Alas, this review also shows that CGT methodology has the potential to serve as a review framework by leveraging its strength in recognising the researcher’s subjectivity.

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