

‘Reflexive Quantitative Methodologies’ (RQM): Providing a voice for marginalised groups

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This paper explores the view that all quantitative research should incorporate a reflexive component, by considering Reflexive Quantitative Methodology (RQM) as an approach. Not only can it do more, but it also pushes the limits of what quantitative research is capable of. This methodology enables quantitative research to provide a voice to marginalised groups, including racialised minorities, particularly considering the growing trend to ‘decolonise’ higher education. Within the research design, RQM offers a dedicated area for positionality and self-reflection. People, for example, reflect constantly in their daily lives. But when researchers deliberately engage in this technique, they can potentially achieve powerful results, including structural and cultural generational shifts, and have a significant impact on society as a whole.

Where we are now: Reviewing the advantages and limitations of quantitative methodology

We know and can attest to the many advantages and benefits of quantitative methodologies. They are extremely useful in providing a quick insightful snapshot of the research area, they are very efficient and provide statistical evidence, especially for impact research. They can be generalisable to the wider population and can demonstrate rigour in the research process, and essentially answer important

questions about society (Godwin et al, 2021). Ultimately, most quantitative researchers know how powerful this approach can be in providing evidence for policy and practice and bringing to light many issues in society. This is beneficial in all fields but especially for those in the Social Sciences. For instance, the author was investigating the inequalities in higher education faced by racially diverse students, specifically focussing on the differential awarding gap, the effects of socio-economic factors, as well as other structural factors for students from racially minoritized backgrounds. The current author initially developed the RQM model (Reflexive Quantitative Methodologies) to investigate and gain better depth of understanding of the awarding gap and why it disproportionately affects students from marginalised backgrounds more than their white, middle-class counterparts. It is currently under development and being theorised. It took inspiration from qualitative research, reflexivity, critical realism and quantcrit (Gillborn, Warmington and Demack, 2018), where acknowledging the researcher's own role within the research is important to consider and where the researcher is a part of the process.

Whilst acknowledging the many benefits of using quantitative methodology, the suggestion is to use reflexive quantitative methodologies instead, to consciously improve the current widely used quantitative methods. Despite the numbers and the statistics being central to these methodologies, it is crucial to note that they lack a human element, that the way we measure in research and the numbers they produce are not neutral. Often, objectivity is cited as being one of the central aims of scientific research, and that quantitative data enables more scientific research, but many social scientists have contested this view, that complete objectivity is not necessarily possible or desirable, as the numbers/statistics are real people with individual narratives (Bhaskar, 1989). This remains true even when using the frequentist approach, which is the most widely used approach in traditional quantitative social sciences (Pek & Zandt, 2020). It can be identified with the use of the Fisher, and the Neyman-Pearson approach to evaluating hypotheses, which improved on the Fisher null hypothesis by introducing an alternative hypothesis (Neyman-Pearson, 1928). This approach aims to establish

the truth in a particular experience and examines the probabilities of the observed data (Birkett, 2020). Whilst hypothesis testing allows the researcher to support or refute a theory and enables the research findings to be generalisable to the wider population, there is the issue of over focusing on p-values, hypothesis testing and its implied objectiveness.

Overfocusing on hypothesis testing can be problematic because significance frequently exceeds effect size, and sample size can have a large impact on p values, which are easily manipulated, (Matthews, 2021; Wasserstein and Lazar, 2016). This is especially true in the social sciences, where data analysis is frequently undertaken with an overemphasis on hypotheses and numerical summaries. John Tukey (1980), who created the concept of Exploratory Data Analysis (EDA), suggested that there is often an overemphasis on confirmatory research and insufficient focus on using the data itself to generate theories. When focusing solely on hypothesis testing and p-values, it is possible to overlook important information. Furthermore, it raises the issue of p-hacking, which is the manipulation of data analysis until statistically significant results are obtained (along with other variations of data manipulation such as cherry-picking - Andrade, 2021), calling into question the objectivity of quantitative data analysis.

Thus, despite the fact that many quantitative researchers still aim to be objective, there are still fundamental truths that are based on an individual's experience and perception of reality (Holmes, 2020), and we must consequently acknowledge that our understanding of the universe is constantly contingent upon who we are, what we are doing to get that understanding, and the environment, society, individual, or culture—a concept known as epistemic relativism (Seidal, 2021). Additionally, this comprehension of individual ontology is a crucial component of research as it informs every aspect of the research design process, conducting the research and then the interpretation and dissemination of the results. Therefore, this paper explores the approach of Reflexive Quantitative Methodologies (RQM).

What is RQM? (Reflexive Quantitative Methodologies): An overview

Reflexive Quantitative Methodologies, RQM as a model, was developed experimentally through the author's doctoral research; through exploring their own positionality, reflexivity and how it became clear that despite trying to be objective, this is impossible for two reasons. First, we as the researchers, are more complex than what traditional quantitative methodologies allow us to acknowledge. And secondly, the people we study are complex too. Traditionally, the epistemological foundation of quantitative methodology has been based on (post)positivism that the researcher is separate from the research, they are on the outside of what they are investigating and cannot influence the results (Godwin et al, 2021). However, critical realists would argue that they do not adopt this position; similarly, RQM suggests that it is beneficial to recognise and acknowledge the researcher as part of the process. So, to assume that the researcher is void of all subjectivity, or to neglect the power dynamics involved in the research sample and the wider population would be remiss. For instance, traditional quantitative methodologies aim to be completely objective, however as this is not fully possible, the suggestion instead is that we acknowledge our individual perspectives that life experiences create, celebrate them, and use them to really understand our research and research population.

This concept is reiterated by Jamieson, Govaart and Pownall, (2023, 1) who state that *'reflexivity is the act of examining one's own assumption, belief, and judgement systems, and thinking carefully and critically about how these influence the research process'* and discuss the idea of using reflexivity in research in one of two ways: where subjectivity is acknowledged, centred, or acknowledged, confronted and challenged and/or a combination of both). The RQM model suggests doing both by embedding reflexivity at every stage of the research process. This allows for deeper, richer analysis and empowers the people we are studying by ensuring that the research population is central to the research, from concept, language used, what we choose to explore within the wider research area, how we

measure concepts, how we collect the data, and then analyse it. Research conducted in this way can play a crucial role in rectifying social injustices.

To continue with the example introduced earlier, of investigating the awarding gap using the RQM model; it allowed the researcher to take a step back and really assess the historical context and purpose of higher education, their own positionality within the context of the research, as well as the wider implications in society. Many higher education institutions, including the one used in the author's study, have a large proportion of widening participation students, students from racially minoritized backgrounds, (less so in Russell Group institutions), and an underrepresentation of the diverse student body within the faculty/academics. Therefore, it became crucial to be reflexive, to continue to challenge the status quo, and to create initiatives to empower marginalised students. Traditionally when the awarding gap is explored, it is very one dimensional with comparisons between White and BAME (Black, Asian, and other ethnic minority backgrounds), and whether they obtained a good honours degree (first class degree and second class-upper degree) or not. This is generally the way it is explored by the sector, however, the RQM model approached the issue in a much more nuanced way, understanding and acknowledging that there is much more to a final award obtained than superficial comparisons.

By being reflexive within the research process – considering which variables to select, what influences student decisions, and investigating how much agency and structure have an impact on students' final award - leads to significant change as the purpose of research is not knowledge for the sake of knowledge, but to make a positive impact for those involved. This is in line with Gillborn, Warmington and Demack (2018) and Demack (2023) who state that quantitative methods/analysis should play a critical role in rectifying social injustice, without this, there is no value to statistics on their own. Furthermore, that *'voice and insight are vital: data cannot 'speak for itself' and critical analyses should be informed by the experiential knowledge of marginalized groups'* (Demack 2023, 2).

At the time when the RQM model was developed and coined by this author, the researcher was exploring the awarding gap, the experience of 'non-traditional' students (Wong and Chiu, 2021) in higher education and consequently their final award classification. This focussed on students from racially minoritized backgrounds, students from working class backgrounds, and academically first-generation students. The 3 models represented the way people develop their identities, their confidence, their demeanour by internally synthesizing their experiences. Model 1, or the first layer, first explored students at the demographic level along with their final award (gender, age, ethnic background), then model 2, built on the first. This included the same demographics as well as pre university circumstances, such as neighbourhood affluence, polar, household income, socio-economic status, previous qualifications etc. and their final award and then model 3 built on the previous 2, along with engagement at university in lectures, extracurricular activities, participation in clubs and societies etc. to explore the effects of individual agency on the effects of institutional structures.

The purpose of these models was to acknowledge the cultural capital and habitus a person accrues prior to higher education and how they ultimately have an impact on individual decisions. For example, the models meant that the effects of different factors could be seen from a theoretical perspective as well as the statistics themselves – factors outside of their control such as demographics, model 2 considered the impact of dispositions/habitus and model 3 took into consideration individual agency acknowledging these structural factors. The models were created with the understanding that human beings do not act in a vacuum, there are other factors in play such as the theoretical work of Bourdieu (1984) via habitus, cultural/institutional habitus as well as the bioecological systems theory developed by Bronfenbrenner (1979) and how there is still agency despite structural barriers (Archer, 2010).

As this was insider research to an extent, having been a non-traditional student 12 years ago prior to the research and having gone through a similar process as them; by considering my own positionality, acknowledging it and being reflexive; I was able to

provide a voice to those who may not have had the opportunity to do so otherwise. Traditionally, 'voice' in research is associated to qualitative methods, however, this can be achieved in quantitative methodology too, via RQM. The impact of the research initially had a significant and direct impact on policy and practise within the department of Sociology and Criminology, as well as student experience, but went onto influence strategy of other faculties and the central university. Impact from this research included implementing anonymous marking as a required priority, considering intersectionality when comparing final award, focussing on commuting students especially when exploring the effects of belonging and community, ensuring student voice is heard and actioned on by the author creating student advisory boards to discuss education strategy amongst other topics, and essentially the curriculum. The author also created a series of training sessions for staff to raise awareness of the lack of diversity in the curriculum – in both the content of the programme as well as the recommended reading lists, in their capacity as the Equity, Diversity and Inclusivity Lead for the department where informal discussions of the issues, how it is everyone's collective responsibility and what support would be useful to achieve better belonging. This included diversifying resources, the authors, the format and most importantly, finding relevant sources from non-euro centric databases with support from the library. This was achievable by using RQM to really challenge the status quo, to rectify injustices that are experienced by racially minoritized students in higher education such as structural and institutional racism; by exploring my own positionality, taking the benefits of quantitative methods to provide evidence, and embedding reflexivity throughout the whole process.

RQM is useful for research led teaching and curriculum design but is useful for all research. It allows for researchers to acknowledge the continued effects of colonialism and euro-centric ideology in all aspects of research, especially when the research population includes people from a variety of backgrounds. Regarding researching the inequalities in higher education, it can help to decolonise the curriculum and other quantitative spaces within the sector. RQM allows space to consider your own positionality as this

helps with considering the power dynamics between the researcher and research population (Gillborn, Warmington & Demack, 2018), by interrogating the statistics to challenge the status quo. In surveys this can be lecturers and students, third sector organisations and service users, or other relationships that may influence responses to either answer in a way they think would be best received or to avoid answering truthfully. By the researcher acknowledging the power dynamics within the research, it allows for better transparency. RQM can also help with how marginalised groups are accessed, as often there is a need to build trust with the marginalised group that is being studied – by building networks with existing groups/organisation to better understand the research population. It can be more inclusive by considering language and cultural norms which fosters community and a better sense of belonging within student body, faculty, and society at large.

When researchers make decisions of what to research, what to ask in the survey, or what variables to pick, there are elements of us and our individual viewpoints in these decisions, so rather than ignore it, it would be more beneficial to acknowledge it, be transparent, reject the notion of complete objectivity and allow it to strengthen the research. Whilst this may sound radical, it's not; it should be the norm (Jamieson, Govaart and Pownall, 2023; Garcia, Lopez and Perez, 2017). Part of this includes to really examine measurement – what are we trying to measure, why do we want to measure it and how are we going to measure it, are important questions to consider during the research process as they underpin the data analysis and therefore results (Lazard and MacVoy, 2020). By researchers reflecting on their positionality when making design choices, it allows us to be more mindful and make conscious choices to include other voices, so all our students (or research population) can see themselves in the final output, rather than subjects discarded after data collection. Statistics must not simply further an agenda without considering the consequences on the research population (such as the higher education agenda of improving the awarding gap metrics) but make a positive impact towards a more equitable and diverse experience for racially diverse students, where all students can thrive. There must be some kind of mutual benefit to the researcher

(data collection) and to the participants (elevating their voice). Furthermore, statistics and numbers must be interrogated for the role they play in keeping the status quo unchallenged (Demack 2023; Gillborn, Warmington & Demack, 2018).

How to use Reflexive Quantitative Methodologies (RQM) in research

The research design from the moment of conception must begin to embed the RQM model which can begin reflecting on questions of why this topic and not another, and when making decisions of specifics, why are those groups being researched, and why the method that's been selected. All these earlier stage decisions must be considered, recorded, and reflected on. These are the cornerstones of the research, and as such must be given the same weight of importance as the data collection or data analysis stages. This can begin with a positionality statement. There are no prescribed methods of how to do this, but instead in whatever way feels natural; for some this will be writing with paper and pen, for some using reflective models for guidance, such as Bourdieu's (1992) three forms of reflexivity; social positionality, disciplinary positionality (field), and theoretical bias; and for others it will mean something else. However, the key thing is to make a commitment to reflect on your positionality and where you are situated within the context of the research. It is worth doing a full positionality statement and perhaps redacting elements before publishing, so the researcher's thought process is recorded internally, whilst taking efforts to protect one's identity too. This connection between the researcher's positionality with the research design is crucial to recognise that the decision process is intimately connected to the researcher.

When designing the research, whether it is primary or secondary in nature, taking field notes and reflecting regularly at each stage of the research design will be an important aspect to both make conscious decisions, as well as a providing written records to look back on when

at a later stage. Inevitably, things change during the research process, what one initially intended, may become outside of the scope of the project, and then these field notes become an extremely valuable source to look back on to readjust and calibrate to work towards the overall goals of the project. When taking regular field notes, consider what decisions are being made, and why, from the outset (Willig 2013), how things may change over time, other decisions that are made and then retrospectively at the end to turn those reflections into actions. As a reflexive quantitative researcher, it is important to really engage with where you are situated in that research design, similarly to qualitative researchers, however, by implanting and embedding the most beneficial aspects of the two methodologies, i.e., RQM, will mean a much more nuanced method of reflexive research and consequent impact. Where RQM could be the catalyst for a more in-depth, detailed focus on reflexivity, during the process of research design, actively conducting the research and learning from it when interpreting and disseminating it.

Being reflexive by reflecting both at the beginning, during, and at the end of the project allows the research to really make an impact, by creating action points beyond how to conduct the research differently. Being reflexive throughout ensures key points to feed into policy and practise to be implemented in a practical sense and shared widely to ensure maximum impact. By researching a specific group, especially those from a marginalised background, the researcher has a certain amount of responsibility to them, to improve their experiences or situation, to balance the inequalities they face and generally reduce social injustice. However, whilst these are specific steps research can take, it should not only be up to the individual researcher to implement this in their own work, but RQM as a concept must be taken up by the sector more widely. For reflexivity to really make a positive impact in eradicating social injustice, and in social science research in particular, journals and editors must value reflexivity in quantitative research, encourage for it be integrated into methodologies and facilitate positionality statements in publications (Jamieson, Govaart and Pownall, 2023).

Concluding remarks

This paper has outlined what RQM (reflexive quantitative methodologies) is, why it is important for all researchers to embed within their practise and has provided some examples of how to do this in a practical sense. As RQM and being reflexive in research becomes more widely practised, other ways to incorporate it will become known. These must be continued to be shared to continue improving the way quantitative research is conducted and interpreted. In the case of the current author, RQM was first used in their doctoral research beginning in 2017, which was investigating the awarding gap in higher education. RQM influenced every stage of the research from conception, research design, selecting variables, creating the model, data analysis and interpretation to recommendations. The results and consequent recommendations were affected by reflexivity too, because rather than just report the differences, it enabled research led teaching. But more importantly, it enabled racially minoritised and other marginalised students to be considered beyond surface level comparisons. The concept of RQM and its core elements have been received well by students, who perceive this level of deep thought to be empowering. Similarly, the sector both in terms of higher education and the social sciences, must take reflexivity seriously, reject the notion of complete objectivity in social science research, be very transparent regarding the decision process in research design and avoid the qualitative and quantitative divide. By taking on RQM in all aspects of research, it can only enhance and improve the quality of what is produced.

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