Questions and Ethical Dilemmas within a Design-Based Research Project

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Abstract: This paper outlines ethical issues surrounding a Design-based Research (DBR) project to explore the value of questions in digital environments. The context dictates a broad yet defined approach which is not confined to a single entity. Striking a balance between scope and focus has been problematic as the variables are too complex to justify a scientific analytical methodology. We discuss implications for the selection of our research question as well as consequences for our implementation strategies. The humanist foundation underpinning DBR provides inclusiveness together with the required rigor. The ethical dilemmas outlined provide a critique for determining the authenticity of our project.

Keywords: Questions, ethical, dilemmas, digital, scientific, humanist, GGQ

1. Introduction

We are engaged in an interdisciplinary design-based research project (Herrington et al, 2011; Anderson & Shattuck, 2012) to explore the potential of generic generative questions (GGQs) to direct, shape and open-up inquiries in digital environments. A group of twelve GGQs (see Table 1) have been described together with an indicative range of 'curious relations' embedded within each of them (Eris, 2003; IBO, 2000; Freestone, 2018). Taken as a whole, they potentially encompass the gamut of human knowledge, experience and enterprise. Yet they have little meaning until translated into the context and content of particular situations; in the case of this study – climate change.

Table 1

Generic Generative Questions (GGQs) - modified from Freestone, 2018

Generative question	Label	Description
What is it like?	FORM	Everything has a form with recognizable features which can be observed, identified and categorized.
How does it work?	FUNCTION	Everything has a purpose, a role or a way of behaving which can be investigated, described, and trialed.
Why is it like it is?	CAUSATION	Things do not just happen. There are causal relationships at work and actions have consequences.
How is it connected to other things?	CONNECTION	We live in a connected world of interacting systems in which the actions of any individual element affect others.
How is it changing?	CHANGE	Change is a process of moving from one state to another. It is universal and inevitable.
What is the role of place here?	PLACE	Time, space, location, situation, circumstance, and environment affect the ways people and communities can live and work.
Who might be responsible?	RESPONSIBILITY	People are not passive observers. They make choices and assume roles, which affect their lives and that of others.
How might people care for each other?	CARE	Caring for others is a key aspect of healthy communities. It draws on a sense of empathy, understanding and appreciation.
Where is the ethical reasoning?	ETHICAL	Ethical consideration is concerned with moral values and beliefs held and enacted by individuals, communities, and societies.
How is aesthetic sense manifest?	AESTHETIC	Aesthetic sense cultivates and values refinement, expression, sweetness, beauty, flexibility, design, and appeal.
How is the thinking evolving?	THINKING	Thinking is how people make sense of experience as well as create new ideas and ways of doing things. It is seldom static.
What might innovation add?	INNOVATION	To address challenges new or different ideas and ways of acting may be needed. Creativity and imagination are central.

To give online conversations focus, participants are asked to engage in investigations designed to – generate 'question threads' that open-up issues and innovative solutions, reveal possibilities for action around 'question threads', identify resources for particular 'question threads' that add depth to online conversations, and develop networks of people concerned to face up to the responsibility of caring for our world. The process is one of co-construction among participants as well as between participants and the researchers. Co-construction is a typical feature of design-based research as a result of collaboration between practitioners and researchers on all aspects of the iterative processes involved – analysis, design, and implementation (Wang & Hannafin, 2005).

2. Research Question

People who engage in online digital conversations exhibit a diverse range of values, backgrounds. needs, talents, motivations, predilections, capabilities and social practices. To reduce these to a question focused on a single or limited number of variables would be misleading, some might say impossible, and slant the study towards the mind of the researcher instead of the context being explored. Instead, we have identified the question:

> *Could generic generative questions (GGQs) help to promote deep online conversations around climate change?*

We have defined the parameters of this question by expansion not reduction as follows. In what ways might GGQs stimulate consequent questions at different stages in inquiries and enhance the personalisation of investigations, help scaffold dialogues across digital environments and facilitate creative insights for further exploration? Such parameters require discipline. The elaboration is consistent with the growth implicit in the four stages of a DBR project through which research strategies evolve in an iterative way over time (Reeves, Herrington, & Oliver, 2005; Dede 2004).
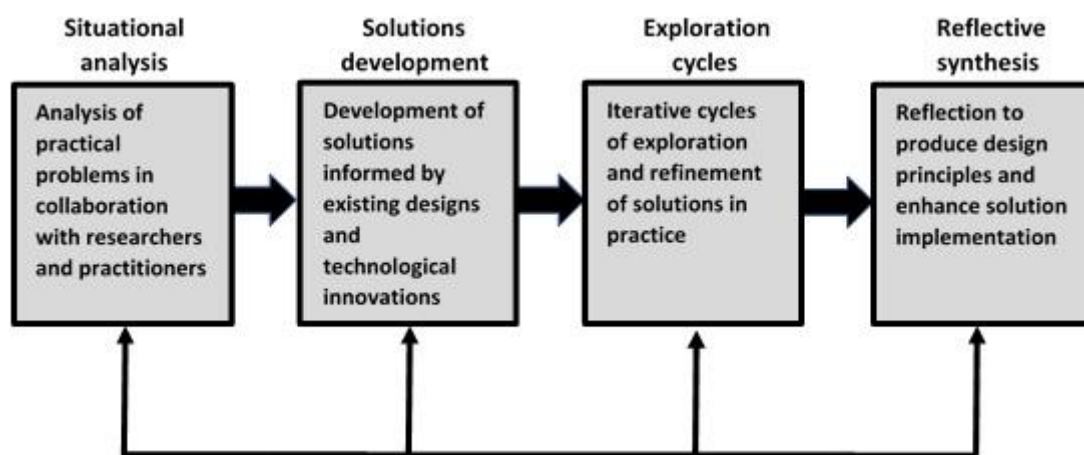

Situational analysis	Solutions development	Exploration cycles	Reflective synthesis
Analysis of practical problems in collaboration with researchers and practitioners	Development of solutions informed by existing designs and technological innovations	Iterative cycles of exploration and refinement of solutions in practice	Reflection to produce design principles and enhance solution implementation

Figure 1. Design-based Research Process - modified from Herrington et al, 2011

Our research question is not a proposition or a hypothesis to be tested through a process of falsification (Popper, 1959) that is typical of scientific inquiry processes. Instead, it represents a starting point for developing a sense of how GGQs might direct, shape and open-up inquiries. To date, we have analysed practical problems related a questions approach to inquiry and developed a 'big picture' of possibility for exploration through an iterative series of online conversations around climate change. From there we intend to synthesise principles that might enhance inquiry-based activity in digital environments, and perhaps inquiries in general.

Key dilemma – Deciding when to define by reduction or expansion.

3. Shaping Reality

While there is an increasing range of evidence-based research strategies driven by developments in big data, there is likewise a growing range of options in research methodologies (Davies, 2016; Delamont, 2012; Gwyther & Possamai-Inesedy, 2009). Making an appropriate choice for the challenge at hand, given its complexity and diversity, presents a challenge. We also recognise that in choosing a DBR approach, our decision shapes reality or a least potentially skews research towards the assumptions on which it is based (Allender, 1991). Mitroff and Kilmann (1978) identified four world views, summarized in Figure 2, that affect the degree to which insights into reality are revealed or disturbed by the methods employed. For us, DBR offers a mixed approach that can generate new theory while being grounded in design processes and action-based methods focused on solutions as well as opportunities for deep learning.

ANALYTIC SCIENTIST	CONCEPTUAL THEORIST
▪ A search for **truth** ▪ Quantitative methods	▪ A search for **understanding** ▪ Qualitative methods
PARTICULAR HUMANIST	CONCEPTUAL HUMANIST
▪ A search for **connection** ▪ Humanist methods	▪ A search for **change** ▪ Action-based methods

Figure 2. Four World Views

As a humanistic enterprise searching for understanding, change and connection our project raises a raft of ethical dilemmas. Given these dilemmas may be common to many research projects, the co-construction stance we have adopted accentuates the need to share these dilemmas with participants in order to build their trust and confidence in the project.

Key dilemma – Using appropriate methodologies.

3.1 Multiple variables

The complexity of multiple realities among participants engaged in making sense of climate change issues around a set of GGQs is not amenable to a quantitative analysis of variables implicit in an analytical scientists' approach. Instead, our eclectic mix of a search for understanding, change and connection is predicated on a 'big data' outlook; that is, as distinct from 'thin data' around a narrow-delineated set of variables (Geetz, 1973).

An amalgam of 'question threads', mind-maps, persuasive commentaries, analytical digests, and the reflections of participants, as well as observations made by the researcher make up the data set. Our pursuit of sensemaking (Madsbjerg, 2017) among participants makes gathering qualitative data from different angles highly desirable, almost an imperative. The emergent rich pictures reveal insights without the need to calculate around sets of variables.

Key dilemma – Knowing when to seek 'big data' and when 'thin data' is required.

3.2 Interpretative bias

Interpretation biases on the part of the researcher are a critical issue (Kaptchuk, 2003). Our focus on GGQs makes this particularly challenging, none the least because the researcher inevitably has perceptions of the meaning of these questions and their potential application. The pitfalls include:
- Confirmation bias—interpreting evidence that supports the researcher's preconceptions differently from evidence that challenges these convictions;
- Rescue bias—discounting data by finding selective faults in its scope and design;

- Auxiliary hypothesis bias—introducing ad hoc modifications to imply that an unanticipated finding would have been otherwise had the conditions been different; and
- Orientation bias—the possibility that an interpretation or a hypothesis itself introduces prejudices and becomes a determinate of experimental outcomes.

Key dilemma – Identifying biases and taking steps to minimize them.

3.3 Overestimation misleads

Overstating the justification for the choice of methodologies or overclaiming outcomes taints the veracity of conclusions drawn. This issue is accentuated in cases of studies like ours that seek to explore the expression and development of human consciousness, especially when the dynamics of conversations are fast moving. The temptation to embellish or oversimplify within the context of the subject matter being investigated also needs to be avoided, as do undue assertions or extrapolations beyond the reality of the matters being studied.

Key dilemma – Avoiding unjustifiable exaggeration.

3.4 Strategic coherence

Sensemaking among participants, around climate change, stimulated by GGQs is likely to yield a vast array of perceptions, mental imaging and imaginative thoughts. This socio-cultural reality needs to be central to the selection research strategies as well as compatible with the philosophical underpinnings of DBR (Anderson & Shattuck, 2012). Coherence is essential. We believe a combination of Action Research (Kemmis & McTarrart, 1998) and 'Appreciative Inquiry' (Cooperrider, 2016) fulfil this requirement. Dialogues around an agenda of – 'what's the best of what is', 'what could be', 'what should be', and 'what will be' are inherently respectful.

Affording proper respect to the sensitivities of participants, their predilections and their personalities is imperative. The fact that case studies or detailed personal stories of an ethnographic nature are not involved minimizes intrusion on the privacy of participants.

Key dilemma – Looking for strategic compatibilities and consistencies.

3.5 Guiding principles

DBR maximizes legitimacy by shaping data collection, analysis, interpretation and synthesis around real-life contexts, diverse methodologies, multiple iterations, and collaborative partnerships. In so doing, enactment of the ethical principles that follow is of paramount importance.
- Justice to participants – by making them equal partners in the investigations.
- Justification of intentions – by negotiating the content and process of investigations with participants.
- Efficacy of methodologies – by making the intention of a search for understanding, change, and connection explicit to participants.
- Reporting responsibilities – by having participants cite and comment upon all personal material relevant to them.
- Proper use of referents – by accurate citing of comments and sources.

In a co-construction project, these principles create openness and trust, and afford dignity and recognition of personal identities; thereby, encouraging participants to share their thoughts and feelings.

Key dilemma – Making sure justice and equity underpin activity

3.6 Researcher predilections

Barab and Squires (2004), in a critique of DBR, raised the ethical argument "If a researcher is initially involved in the conceptualization, design, development, implementation, and re-searching of a pedagogical approach, then ensuring that researchers can make credible and trustworthy assertions is a challenge". This view is counter-balanced by the claim that the veracity of conclusions is enhanced when the mental-set of the researcher is exposed from the onset and only used as a 'lens' through which observations are made and interpreted. In 2018 the editor of the scientific journal *Nature* stated that the biases, insights and deep understanding of inquiry contexts that researchers possess can be a valuable research tool, especially when researchers and communities work together.

Our focus on exploring multiple realities and sensemaking among participants makes exposing the researcher's assumptions an important aspect of the authenticity of data analyses and the reliability of conclusions derived from them.

Key dilemma – Using researchers experience and expertise judiciously.

3.7 Conceptual coherence

Sensemaking is central to the pursuit of questions (Madsbjerg, 2017; Mason, 2014; Khan and Mason, 2015), which dictates a phenomenological search for multiple realities (Schutz, 1967). Our reflections are thus grounded around five interdependent perspectives. These are: personal consciousness, informed by Husserl (1936) and Heidegger (1962); temporal interpretations, informed by Schutz (1967) and Eberle (2010); mental modelling, informed by Lakeoff (1980) and Ricoeur (1978); contextual experiences, informed by Madsbjerg (2017) and Hitzler (2004); and interactive relations, informed by Jarche (2017) and Sporns (2019).

The accent is on qualitative dialogues with no attempt made to quantify either participant responses or the analytical insights of the researchers. The eclectic approach reflects recognition of the complexity of climate change as an issue and the diverse dynamics of participants asking questions.

Key dilemma – Ensuring authenticity and validity

3.8 Privileged responsibility

To seek insights into the sensemaking consciousness of people is a privilege steeped in responsibility. Each person's experience and thoughts are vast, much of which is either shielded from view in the subconscious mind or deliberately undisclosed. This raises crucial issues of the right of non-disclosure and the right to disengage, or to allow open disclosure. Equally important is recognition that conversations need to descriptive and appreciative, not judgmental. The participatory decision-making and iterative nature of DBR processes do much to ensure these rights are both respected and enacted.

The co-construction stance of our project is designed to build on the talents, interests and experience of participants in an environment of mutual respect and recognition.

Key dilemma – Respecting rights of engagement.

3.9 Multiple voices

The collective opportunity and responsibility for diversity of thought and action among participants, and between participants and the researcher, is a central tenant of our modus operandi. Cooperation and collaboration are manifest through sharing and negotiating actions, speculations and conclusions. All participants voices have value and need to be given respect and a non-judgmental hearing. In this way equity for all will underpin the effectiveness of our co-construction project.

At the same time, personal confidentiality is respected by requiring participants' permission for sharing material derived from the project as well as acceptance of content that is relevant to them. Ample opportunity is available to make modifications and additions at any stage, and to put forward

different propositions or interpretations. Participation in conversations on the project's blog is a personal choice without any expectation.

Key dilemma – Having a democratic ethos guide action.

3.10 Personal privacy

The need to protect against undue intrusion on participants' privacy is even present and accentuated when much of the discourse is by means of online environments. Personal anonymity and confidentiality are part and parcel of this responsibility. The potential for politically charged commentaries around issues of climate change heightens this dilemma. Electronic security by means of personal files and passwords together with encryption is essential. As is consent to participate in full knowledge of our project's purposes, processes and intended outcomes. Our project guarantees that these provisions are in place.

The substance of participants' responses, ideas and views, and the like, that emerge from the application GGQs also needs to be handled respectfully. Key is seeking each participant's acceptance before content relevant to them is made available to wider audiences.

Key dilemma – Protecting privacy within openness

3.11 Work recognition

The work of individuals and groups needs to be appropriately recognized and valued in accordance with each persons' wishes and expectations. Such acknowledgement is matter of honesty on the part of our project, the researcher in particular, as well as a means of affording social justice for the contributions of participants. Consultation with each participant is essential to determine how best this should be done and through what avenues; thereby, taking their sensitivies and aspirations in account. Participant contributions are no less valuable than that of researchers.

This is particularly pertinent in our project where work among participants is ongoing and synthetic; and not confined to once off events, even though they may be repeated a number of times. The iterative nature of our project places considerable demands on the commitment and perseverance of participants which requires due recognition.

Key dilemma – Observing rights associated with social justice.

3.12 Cultural appreciation

The application of DBR in a search for understanding, change and connection is a humanistic enterprise. For participants and the researcher affording dignity and respect as well as building on talents and aspirations, in a climate of genuine collaboration, is vital. Particularly important is appreciation of different cultural beliefs, traditions and backgrounds. Indeed, multicultural perspectives and voices are a rich resource in pursuit of insights into sensemaking around the twelve GGQs which form the primary focus of our study.

Depending upon needs, circumstances and intentions asking questions is a sensitive personal or collective act that requires environments where each person is valued in their own right as well as for the ideas they hold. Indeed, it can be fraught in situations where divergent responses to questions including diverse views and attitudes have the potential to generate conflict. The facilitative role of the researchers will be crucial in fostering appreciation of difference and in creating situations where people are valued and treated equitably.

Key dilemma – Recognising and valuing diversity.

3.13 Community understanding

Depending upon situational practices within particular communities the values underpinning our project need to be made clear. In some circumstances, considerable negotiation, in a spirit of openness, may be required to gain acceptance at family or community levels. This does not necessarily mean agreement, rather a sense of thoughtfulness is developed around our intentions and practices sufficient to generate the degrees of freedom required to proceed without undue interference.

When people – design something, build it and own it – personal and collective commitment, and the quality of human interaction, is enhanced. Different perceptions, ideas and values that emerge from the discourse are an invaluable resource. In the case of a DBR project like ours building understanding and appreciation is a two-way process of respectful synthesis between community ideas and understandings and the intentions and practices of the research.

Key dilemma – Respecting cultural backgrounds and beliefs.

3.14 Genuine implementation

Performance of the values and ethical principles expressed in this paper is an ongoing challenge throughout the construction of inquiries and the insights derived from them. The narrative on completion and participant feedback will reveal the extent to which these intentions have been realised.

While this could be said for almost any research project, the exposure created by a co-construction project around GGQs and climate change will likely be transparent.

Key dilemma – Being true to one's word.

4. Conclusion

Research into complex systems in educational settings is increasing in importance (Dondlinger, 2007; Ladyman et al., 2011; Larsen-Freeman, 2016). Indeed, many research communities have come to appreciate that the insightfulness and validity of conclusions drawn tend to be more trustworthy if the diversity of issues as well as their dynamics are accommodated through judicious attention to their potential impact. As a consequence, socio-cultural questions become integral, especially in studies like ours which seek to explore sensemaking in a complex world. Over the last couple of decades, research methodology has seen a shift away from 'siloed' studies confined to specific disciplines, or closely related ones, towards a more integrated approach (The Editor, Nature Biotechnology, 2017).

DBR is a relatively young methodology, though it is 'young' in a context where new methodologies continue to emerge. The challenge to improve descriptions of it and to increase its rigor is ongoing (Easterday et al., 2014). What are the phases in DBR processes, what sets them apart from other forms of research, what are the design issues and characteristics of DBR studies? And in what ways can we better craft the iterative dimension, maybe by incorporating some aspects of scientific inquiry? For all its advantages DBR is not a panacea, it is just an improvement in the repertoire of methods available to researchers.

The role of the researcher in DBR is complex (Christensen & West, 2017). In many ways the role is analogous to that of 'Teachers as Researchers' promoted by Laurence Stenhouse and his team in 70s and 80s (Stenhouse, 1975). The role is fraught with conceptual and operational challenges as well as ethical dilemmas. These include-
- Determining the critical issues within the diversity at hand
- Facilitating the rigorous collection of a wide range of data ('Big data')
- Avoiding the potential to be susceptible to personal bias and favored relations
- Managing multiple roles required including those associated with project management.

Why did we choose DBR to explore possibilities for GGQs to contribute to digital environments? Because it is underpinned by a situated real-life focus and grounded in social interaction. Other salient features are participatory decision making which is implicit in the process and acceptance that insights gleaned are qualitative and contextual rendering applications to other systems by reference, not by statements of apparent certainty. Indeed, the notion of playful uncertainty has excited our imagination

and informed the rationale for our project. The qualitative nature of DBR also mirrors the substance of our research question and its parameters.

With these caveats in mind, our choice to apply DBR to a human system respects complexity and diversity yet presents significant dilemmas. Resolution of these issues is paradoxically at the heart of our justification for adopting this approach. Our answers will determine the moral veracity of our decision.

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