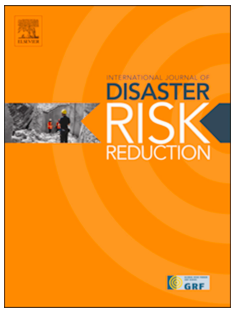

The holistic bricolage research approach and disaster-risk reduction

Alessandra Lotteri, Janet Speake, Victoria Kennedy, David Chester

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Title:

The holistic bricolage research approach and disaster-risk reduction

Authors

Alessandra Lotteri[1]*, Janet Speake[2], Victoria Kennedy[1], David Chester[3]

[1]Department of Geography and Environmental Science, Liverpool Hope University, Hope Park, Liverpool L16 9JD, UK; [2] PVC Research Office Honorary Research Fellow Liverpool Hope University, Hope Park, Liverpool L16 9JD UK; [3]Department of Geography and Planning, University of Liverpool, Roxby Building, Liverpool L69 3BX, UK;

*Corresponding author Alessandra Lotteri lottera@hope.ac.uk

Janet Speake speakej@hope.ac.uk

Victoria Kennedy kennedv@hope.ac.uk

David Chester jg54@liverpool.ac.uk

Title:

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Abstract

This paper calls for scholars to consider and reflect on the potential advantages of the application of a holistic bricolage approach within a wider range of research contexts including disaster-risk reduction (DRR). We introduce holistic bricolage as a sixth dimension of bricolage and bricoleur expertise in addition to the other already established five dimensions. We propose holistic bricolage as a practical, 'full' approach applied from project creation to write up, which is capable of supporting transdisciplinary research in settings with diverse data and complex social interactions, such as those found in disaster-risk reduction research.

Key words

Bricolage, bricoleur, holistic bricolage, methodological bricolage, disaster-risk reduction (DRR), critical approach, São Miguel, Azores

Introduction

Calls have been made by Hällgren & Rouleau (2018) and others (e.g. Bueddefeld et al., 2021), to take stock of research methods used in extreme contexts and to move them forwards. They have, in effect, thrown down the gauntlet for scholars to use and develop alternative research methods for application in researching risk, emergency and crisis. McGowran & Donovan (2021) also highlight how the development of new forms of transdisciplinary research with accompanying new methods, interpretations and ideas may have positive impacts on disaster mitigation research. They especially note new forms of research which better recognise the role of human factors, especially the importance of the researcher, their positionality and reflections. Although not undertaken in direct response to these calls, our work provides a concrete example of one such alternative, the holistic bricolage, and its contribution in disaster-risk reduction studies.

Bricolage is a combinatorial research approach in which various methods, techniques, and information sources can be used to capture the essence of events from different angles (Papaioannou, 2023). The research produced with bricolage views the "whole as greater than the sum of the parts" (Kincheloe, 2005a, 344). In essence, bricolage requires a deep knowledge of theoretical frameworks and methodological practices to enable the researcher, bricoleur, to combine resources and craft them with the new purpose of answering research questions (Ben-Asher, 2022). The informed choice made for every section of the research, provides a rationale that "bonds everything together" (Papaioannou, 2023, 2). In this context, the bricoleur recognises that knowledge is socially constructed (Kincheloe, 2005a; Papaioannou, 2022). Hence, the bricoleur maintains "that the object of inquiry is ontologically complex in that it cannot be described as an encapsulated entity" (Kincheloe, 2005a, p.333), but must be considered in the time and space context (Kincheloe, 2005b). Therefore the bricoleur understands that there is "no correct description of an event" (Ben-Asher, 2022, 2) and they need to declare their positionality in every aspect of the research. As Denzin and Lincoln (1994, 3) describe, "the bricoleur understands that research is an interactive process shaped by personal history, biography, gender, social class, and ethnicity".

The bricolage concept, introduced by Lévi-Strauss (1966), has been utilised in qualitative research for more than 60 years, and over the decades, it has been conceptualised first by Denzin and Lincoln (2000) and then refined by Kincheloe (2005) and Berry (2006; 2015) as having five dimensions, namely: methodological, theoretical, interpretive, political and

narrative bricolage (Table 1). To date, bricolage in its diverse forms has been successfully demonstrated in multiple studies across a range of disciplines, for example, anthropology, psychology, sociology, social work, and geography (Lévi-Strauss, 1966; Weinstein & Weinstein, 1991; Kincheloe, 2001, 2005; Denzin & Lincoln, 2011; McSweeney & Faust, 2019; Speake & Pentaraki, 2022). However, this paper introduces a sixth dimension, holistic bricolage, presenting it within the setting of disaster-risk reduction research (DRR), as an example that has potential application in this and other cognate research fields.

Table 1: Six dimensions of bricolage[1]

Approach	Descriptors	Example of field of application
Theoretical Bricolage	Employs a wide knowledge of social theoretical positions to define and fit the purposes, meanings, and uses of the research act.	Cultural anthropology (e.g., Chao, 1999); jurisprudence (e.g., Hull, 1991), education (e.g., Hatton, 1989; Morton, 2023; Wright, 2020); Medical Education (Wyatt et al.,2022; Gonzalez & Lypson, 2022).
Methodological Bricolage	Employs numerous data-gathering strategies from diverse disciplines to study a phenomenon from various angles.	Design and the creative arts (e.g., Yardley, 2008; Yee & Bremner, 2011; Kroll, 2021); social sciences (e.g., Kincheloe, 2011; Phillimore et al., 2016); social and cultural geography (e.g., Freed-Garrod, 2010; Molecke & Pinkse, 2017); political geography (e.g., Freeman, 2020) health geography (e.g., Madge, 2018; Speake & Pentaraki, 2022); tourism (e.g., O'Regan, 2015; Stoffelen, 2019; Wilson and Hannam, 2017).
Interpretive Bricolage	Utilises a range of interpretive strategies to position and frame research components as framed within the bricoleur's understanding of the interpretive process. Central to it are the identity and positionality of the bricoleur, combined with other perspectives derived from wider contexts such as social theoretical positions, and social, cultural, economic and political structures.	Cultural history (Haw, 2005); Creative writing (Kroll, 2021)
Political Bricolage	Considers that all research processes have political implications, which are are manifestations of power. No mode of knowledge production is free from the inscriptions of power and this is explored by the criticality of the bricolage.	Ethnography (e.g., Markham, 2005); psychology (e.g., Ben-Asher, 2022); entrepreneurship studies (e.g., Di Domenico et al., 2010)
Narrative Bricolage	Appreciates the notion that all research knowledge is shaped by the types of stories inquirers tell about their topics. Thus, more complex and sophisticated research emerges from the bricolage.	Design and the creative arts (e.g., Yardley, 2008; Yee & Bremner, 2011), ethnography (e.g., Markham, 2005), tourism (e.g., O'Regan, 2015)
Holistic Bricolage	Explores an all-encompassing research approach that may utilise methodological,	Disaster-risk reduction (DRR) (Lotteri, 2020)

[1] Methodological, theoretical, interpretive, political and narrative bricolage are the five established dimensions of bricolage (Denzin and Lincoln,2000; Kincheloe, 2005a; Berry, 2006). The holistic bricolage derives from the work of Lotteri, 2020, Lotteri et al. (work in progress)

	interpretive, theoretical, political, narrative of expertise throughout a study from start to finish. It includes project creation, data and information collection, synthesis and study structure write-up and presentation.

55

56 We start our exposition by reviewing key facets in the development of the bricolage research
57 approach which contextualise, and inform, our understanding of the meaning(s) of bricolage,
58 and the central position of the researcher-as-bricoleur. We then introduce the concept of holistic
59 bricolage as a sixth dimension to add to methodological, theoretical, interpretive, political and
60 narrative bricolage, before discussing its potential scope in disaster-risk reduction studies.

61 **Bricolage and the bricoleur: a critical contextualisation**

62 Bricolage is a combinatorial research approach in which a range of methods, techniques,
63 and information sources can be used to make sense of the world and address an issue. Lévi-
64 Strauss (1966) introduced into the realm of anthropological and social sciences theory the
65 metaphor of bricolage (French for DIY - 'do-it-yourself') and its accompanying process of
66 'making-do' with whatever is 'at-hand' to undertake a task. The bricoleur, as craftsperson,
67 therefore undertakes bricolage by both utilising the tools and resources at-hand (Kincheloe,
68 2006; Rogers, 2012; McSweeney and Faust, 2019; Papaiannou, 2023), whilst also drawing on
69 their relationship with, and interpretation of, their environment and its resources (Duymedjian
70 & Rüling, 2010; Lotteri et al., in progress).

71 Lévi-Strauss positioned bricolage within a structuralist method of enquiry in the search
72 to reveal the underlying structures "governing human meaning-making" (Rogers, 2012, p.2).
73 Although bricolage has its roots within structuralist thinking, its development and applications
74 flourished amongst poststructural researchers and scholars (Denzin, 2018; Denzin & Lincoln,
75 1994; Rogers, 2012). A characteristic feature of the expansion in the use of bricolage, as
76 featured in the work of Denzin was the 'paradigmatic' application of bricolage within for
77 example, postmodernism, poststructuralism and feminism (Freeman, 2020),

78 Denzin and Lincoln (1994, p. 2) presented bricolage as a research approach that comprises "the
79 combination of multiple methods, empirical materials, perspectives and observers in a single
80 study" and argued that the use of bricolage adds "rigour, breadth and depth to any

investigation". In so stating, Denzin and Lincoln moved away from 'paradigms' to more 'neutral' perspectives, a view reasserted in a later interpretation of bricolage not being tied to one individual belief system which constrains the research (and the bricoleur) to a particular worldview (e.g. Yee & Bremner, 2011; O'Regan, 2015; Denzin & Lincoln, 2018).

In a similar vein, Kincheloe (2005a) argued that the freedom of the bricoleur is not random but is guided by the continuous dialogue with the material available and the deep self-reflection of the researcher (Kincheloe, 2005a). Such assertions centre on bricolage as a research orientation that enables researchers to express themselves, while focusing on the subject and to clarify their position as interpreters (Kincheloe, 2005a), which will ultimately inform theorisation. This view is supported by Whitehead and McNiff's (2006, p. 28) argument that "theory generation is far from neutral" with researchers taking a particular stance/side, offering one interpretation of the subject under investigation. Within bricolage, a clear definition of the positionality and identity of the bricoleur can mitigate issues related to potential bias in ways that might not be so clearly articulated in other research approaches (Sharp, 2019).

Nevertheless, whatever the bricoleur's theoretical and conceptual framing, and ultimate theorisation, a distinctive characteristic of the bricoleur*'s* work is that it develops within the dimensions of interpretive reflexivity (Stoffelen, 2018; Andrew & Karetai, 2022). This means that the bricoleur is open and receptive to multiple sources and the ways these can be 'assembled' to create 'thick description' (Phillimore & Goodson, 2004; Wilson & Hollinshead, 2015). Kincheloe (2001, 2005a, b, 2006, 2011) includes thick description in the components of bricolage together with complexity and inter- and multi-disciplinary work that "challenges and informs understanding about researching social contexts" (Renwick, 2014, p.323). Scholars have often described thick description as the qualitative approach opposite to thin description, seen as a presentation of facts (see Davis 1991; Geertz 1973; Jorgensen 2009). Rather than focussing on and presenting facts, thick description provides an in-depth illustration, analysis, and interpretation of social actions within a specific context (Denzin, 1989; Ponterotto, 2006). The credibility of the approach relies on the integrity of the researcher's interpretation, which is set at the centre of the study (Sankofa, 2022). In other words, the researcher can choose how to explore to produce the interpretation.

Thus, the bricoleur contests already-prescribed methods, and chooses the "*most appropriate* method of portraying any particular aspect of the emerging portfolio" (Andrew & Karetai,

2022, p .97). As Ben-Asher (2022, p. 2) addresses, the bricoleur's "points of view shifts between the theoretical infrastructure and the observation of the phenomenon, the information that arises in the context of the researched topic, the data analysis, the researcher's point of view, the literary genre that is relevant to different parts of the research, and the language in which it is presented".

It is clear that after Lévi-Strauss and throughout the twists and turns of bricolage's development trajectory as a research approach, the role of the bricoleur has remained centre-stage. Evolving from the earliest definitions of bricoleur as a handy(wo)man using the tools they have to hand to undertake a task (Kincheloe, 2001), and transposed into academia in which the bricolage approach aims to delve deep into complex subject matters (Denzin & Lincoln, 1994). The bricoleur is an 'expert' and able to compare methods, epistemologies, and social theoretical paradigms, whilst not being 'chained' to one specific assumption (Kincheloe, 2001).

A distinctive feature of bricolage expertise is that the bricoleur has the capability and know-how to recognise the unusual and interpret data and information from a wide range of sources. Insights so gained, could be taken to be attributable to serendipity and or/chance. However, it is the confidence and knowledge of the expert bricoleur which enables the identification and highlighting, positioning and interpretation of the unexpected and unusual. In this respect, the knowledge and confidence of the bricoleur extends to 'capturing' serendipity and discovery and thence to 'making meaning', pushing boundaries (Cardno et al., 2017), and recognising and identifying new areas of research (Ben-Asher, 2022). In doing so, this further elucidates and exemplifies the role of the bricoleur in bricolage as an immanently creative process of knowledge formation. Also, as reported by Andrew and Karetai (2022), in conducting bricolage, bricoleurs put "something of [themselves] into it"

In this view, the role of the bricoleur is pivotal in bricolage research, which is both a key strength and potentially, a weakness. Much depends on the expertise, creative and confidence of the bricoleur, and their capacity to organise, interpret, synthesise, frame and present findings of the study with creativity, academic flair, and rigour. In these circumstances, an expert bricoleur's navigation through potential pitfalls of data 'messiness' and analytical 'casualness', can reveal unforeseen, unexpected, and complex insights about the research scenario. Also, as posited by Holman Jones (2005) and Andrew and Karetai (2022) amongst others, bricoleurs in their use of bricolage can pull together 'art' and 'science' in a unifying way to contribute to changing us and our world for the better. Earl (2013, p.15) has noted that bricolage seeks

"pursuit of social change". We assert that this is in accord with the critical tradition in research, which strives to seek ways in which to make the world more just and a better place for all (Lotteri, 2020; Speake & Kennedy, 2019; Speake & Pentaraki, 2022).

Given the inherent complexities and potential messiness of bricolage (Berry, 2015; Crouch, 2017), it is essential for the bricoleur to be both reflective and provide a chain of evidence narrating how the bricolage was constructed (including reflective journaling), effectively creating an audit trail of the processes undertaken during the project design, information collection, synthesis and form of presentation/write-up (Haw, 2005; Markham, 2005; Wibberley, 2012, Lotteri, 2020).

Holistic bricolage and disaster-risk reduction research

Within the overarching perspective of the expert bricoleur, over time different types of bricolage expertise have been proposed: theoretical, methodological, interpretive, narrative, and political bricolage (see Table 1). Theoretical bricolage, sets the bricoleur to work "between and within competing and overlapping perspectives and paradigms" (Denzin & Lincoln, 2008, p.5). Methodological bricolage leads the bricoleur to focus on performing diverse tasks, from conducting interviews to intensive self-reflection. Interpretive bricolage ensures that the bricoleur sees the process of constructing knowledge as the interactive process between the research topic and the researcher's background. Narrative bricolage ensures that the bricoleur understands how knowledge is produced through ideologies and discourses and seeks "to understand their influences on research processes and texts" (Rogers, 2012, p.6). Political bricolage leads the bricoleur to acknowledge that science is not value-free and that all research findings may have political implications (Denzin & Lincoln, 2008). Many research fields across the sciences, social sciences, and arts and humanities have adopted one or more of these dimensions of bricolage as an established methodology and means of inquiry (see Table 1).

When focusing on DRR research, the use of bricolage has tended to be framed as a means of using what is 'to hand' to explain, present and provide a way to overcome the effects of crises (e.g., Cleaver, 2001; Frick-Trzebitzky et al., 2017). Levi-Straussian principles of bricolage have influenced the development of social theory and organisational theory (Markham, 2017) and underpin social bricolage and organisational/institutional bricolage currently used by DRR researchers. Zahara et al. (2009) introduced the idea of social bricolage as the application that focuses on social needs, which, as Nelson and Lima (2020, p. 725) point out, "are likely to be

paramount in any response to a disaster". Johannisson and Olaison (2007, p. 55) use the term "social bricolage", referring to social networking activity and spontaneous collective action as part of an emergency rapid response. In this field, for example, Nelson and Lima (2020) examined how the community of Córrego d'Antas, Nova Friburgo in Brazil responded in a variety of ways, including social bricolage, to being hit by deadly mudslides in January 2011.

Lanzara, proposed the concept of institutional bricolage based on the notion that "institutions often are the outcomes of the recombination and reshuffling of preexisting or other institutional materials that happen to be at hand and that, even when depleted, can serve new purposes" (Lanzara, 1998, p. 26-27). Cleaver applied the term institutional bricolage and tackled its impact on development interventions by arguing that they "should be based on a socially informed analysis of the content and effects of institutional arrangements, rather than their form alone" (Cleaver, 2002: 11). Within this approach, Frick-Trzebitzky et al. (2017) explored how institutional bricolage shapes the distribution of adaptive capacity in adaptation to urban flooding in the Densu delta in Greater Accra, Ghana. Furthermore, Gisquet and Duymedjian (2022) evaluated how the importance of space distribution in disaster situations can support the bricolage intervention. These are examples of how bricolage has been applied in DRR studies to analyse and support practice rather than as an overall and encompassing methodological approach to research in a hazardous environment, which we propose in this paper. Given that the use of social and organisational/institutional bricolage appears to be becoming an increasingly tried and trusted tool in the DRR researcher's tool-kit, it is perhaps surprising that the application of the methodological bricolage research approach in DRR has been far less frequent. Recently though, the use of methodological bricolage has started to feature in disaster-risk reduction research for example in the work of Main (2019) and Sinclair (2019). Main (2019) used a novel methodological bricolage approach in the study 'Natural hazards, vulnerability, and resilience in the Maltese Islands'. This study adopted the bricolage 'crystal' metaphor (Richardson, 2000) where the lenses provided by six research method techniques are applied in a non-linear and non-sequential way. Main reported that bricolage produced insights into the nature of elements and factors of hazard exposure, vulnerability and resistance "that were largely unanticipated before the research process took place" (2019, p. 308). Sinclair (2019) created a unique methodological bricolage in an exploration of processes of policy mobility in the governance of volcanic risk, by drawing particularly on the notion of 'making do' as an adaptive process of enquiry (Lorimer, 2009), rather than adherence to "one

pre-existing, purist methodological framework" (Sinclair, 2019, p. 53). The study incorporated ethnography, historical enquiry, human geography and applied vulcanology.

Beyond the forms of bricolage already used in DRR, there is another, holistic bricolage, which in this paper we propose as being a sixth dimension of bricoleur expertise. Lotteri (2020) applied what we define as holistic bricolage, i.e. a sixth dimension of bricolage: an all-encompassing research approach, to explore the changing spatial patterns of human vulnerability and resilience on the island of São Miguel, Azores (see Figure 1). This encompassed project creation, data and information collection, synthesis *and* study structure write-up and presentation. Importantly, from the perspective of developing the use of bricolage and its various dimensions within DRR, the idea of holistic bricolage has been developed *within* a DRR context. To the best of the authors' knowledge, Lotteri's work was the first application of holistic bricolage to a DRR study. However, studies using bricolage as an overarching process successfully applied from the beginning to the end of a project, incorporating both the methodology by which the research is produced and the form of its presentation, have been undertaken in other fields, principally in creative and performing arts (e.g., Yee & Bremner, 2011; Andrew & Karetai, 2022). It is within the context of the DRR study by Lotteri (2020), that holistic bricolage has been so named and in the current paper identified as a sixth dimension of bricolage and bricoleur expertise.

Figure 1 represents the holistic bricolage developed and applied in the specific disaster-risk reduction context of Lotteri's (2020) study, including the particular data/information sources used. The overarching framing of Figure 1 identifies and positions the centrality of the bricoleur's role, which applies to all studies using holistic bricolage. Thus, the figure has universal applications and has wider application beyond DRR. Other bricoleurs would likely identify different components, such as data sources and analytical techniques, based on their expertise and research questions. The detailed context and framing for Figure 1 is as follows.

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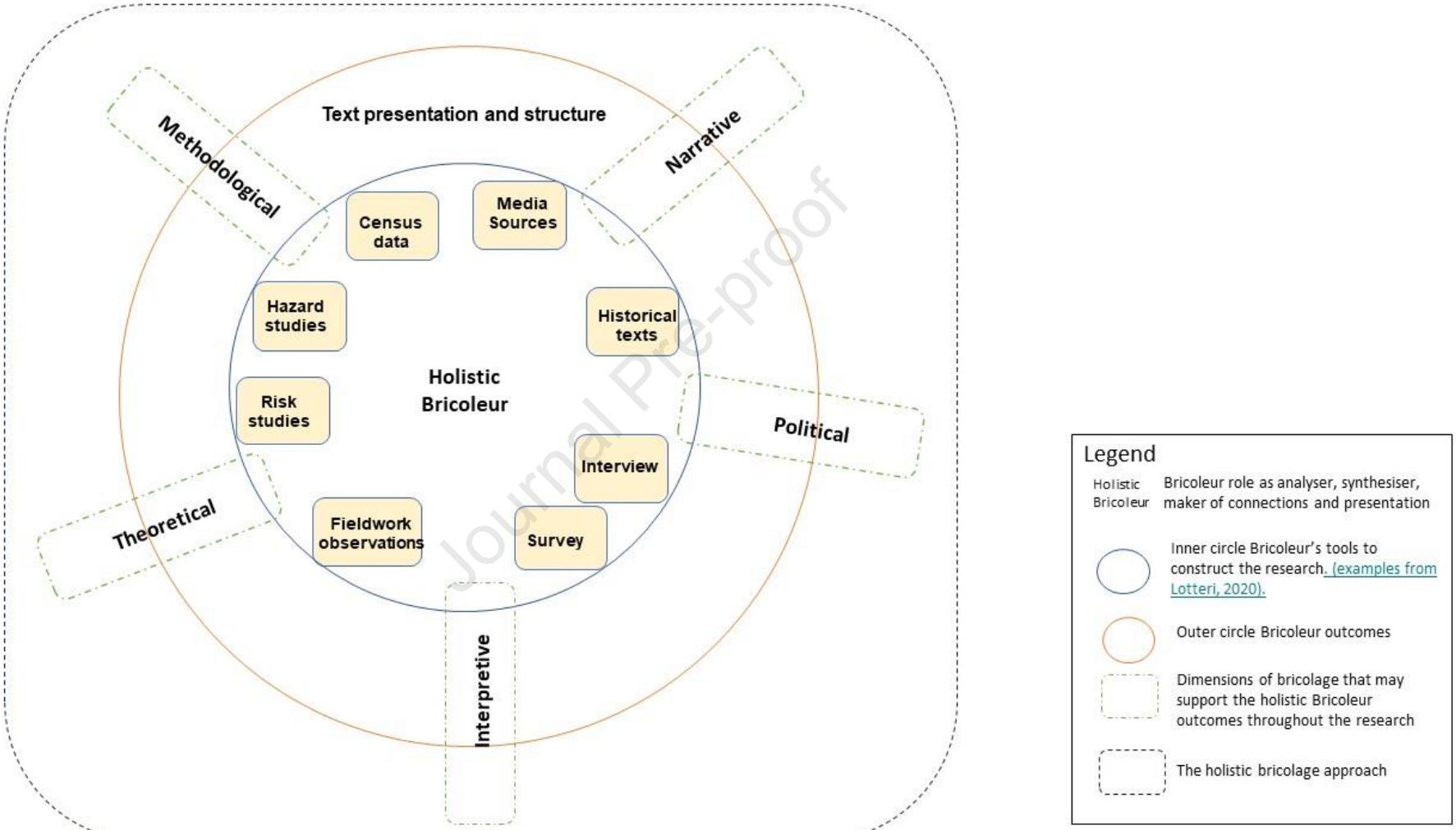

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Figure 1 Holistic Bricolage: an example within disaster-risk reduction (DRR). 1. Holistic bricoleur. The bricoleur is positioned at the centre of the research process from start to finish and their role includes analysis, synthesis and making connections between components. 2. Blue circle. The bricoleur uses all research tools at their disposal to construct their research - including the choice of theoretical framings, methodological techniques, data types and analytical tools. 3. Brown circle. The bricoleur uses bricolage outcomes to determine structure and presentation of the write-up/dissertation/paper. 4. Green rectangle. All dimensions of bricolage that may support the holistic bricoleur. 5. Black rectangle. The holistic bricolage approach.

The researcher's positionality as bricoleur is fundamental, subjective, anbrd circumstantial. In the qualitative paradigm, "researcher subjectivity is integral to the analysis" (Braun & Clarke, 2022, p.13), and is encapsulated in the central position of the holistic bricoleur in Figure 1. The inner-blue circle contains exemplar data types (in this case the principal sources such social survey questionnaire, fieldwork observations etc., used by Lotteri, (2020) but would be different for each individual bricolage study. Any one of these data types could be the starting point for detailed investigation, for as Berry (2015) suggests, the starting point of bricolage can be the element the bricoleur is most familiar with. The bricoleur combines the data from the "plurality and diversity of starting points" (Berry, 2015, p. 89) through a deep analysis of the theoretical frameworks and consideration of methodological practices (Berry, 2015; Sharp, 2019). It is the bricoleur, in their central role, who creates and provides a coherent argument by cross-checking all the data, while choosing the most appropriate methodology and modes of analysis. This decision making is based on the variety of data available, taking into account time constraints, their own expertise and the research questions. During this process, the bricoleur avoids "the deployment of a hotchpotch methodology" (Sharp, 2019, p.52) by ensuring that the approaches complement each other epistemologically (Kincheloe, 2005a; Sharp, 2019). The combination of these approaches supports the researcher in understanding the existing data better, whilst also identifying additional data sources which may inform wider perspectives. The bricoleur continues the dialogue with the data (represented by the inner-blue circle attached to each data box in Figure 1) to develop the most appropriate structure and presentation for the study (represented by the outer-brown circle in Figure 1). Holistic bricolage considers the write up as a part of the process and in its inclusion of project/thesis/paper structure, organisation and presentation, reinforces the role of the bricoleur in recognising and facilitating connections between methodology and presentation. Creativity in structure and presentation to appropriately convey research outcomes (as determined by the holistic bricoleur researcher) can include and combine multiple presentational formats which may be different to, and challenge, more 'traditional'/'expected' formats for individual research fields/disciplines (Yee, 2017; Lotteri, 2020; Ben-Asher, 2022).

Notwithstanding the various forms of bricoleur expertise, bricolage researchers *per se* are encouraged to enter into a dialogue with the data and embrace various methodological tools, *allowing them to apply the most appropriate technique to investigate a topic without the constraints of a fixed agenda* [the authors emphases], ultimately making visible dimensions and aspects in the study that might otherwise stay hidden.

Scope for holistic bricolage in disaster-risk reduction research

Disaster-risk reduction is a field that has traditionally been driven by data science methodological approaches. However, there are now many studies which highlight the contribution of the physical sciences and the social sciences and combine their various methodologies and perspectives (e.g., Perry & Lindell, 2008; Jóhannesdóttir & Gísladóttir, 2010; Bird et al., 2011; Scarlett, 2014; Lotteri, 2020; Rushton, 2020, Lotteri et al., 2024). The use of methodological approaches from fields in arts and humanities is also evident (e.g., Donovan, 2018; Chester et al., 2019a; Chester et al., 2019b; Mori, 2021). Practically, the use of the diverse methodologies used in such studies, invoke the understanding, collecting, analysing, and interpreting a variety of quantitative and qualitative data and information sources. The application of methodologies from other research fields has brought different and alternative understandings and interpretations to DRR studies. We suggest that within the current context of increasing openness to alternative research approaches in DRR, there is scope to apply an even wider range of research/methodological approaches, including a holistic bricolage approach. Some of the principal ways in which holistic bricolage can support DRR are:

1) Enabling fluidity in the application of appropriate methods and process/es (from sciences, social sciences, and humanities traditions, according to best fit for addressing a particular research question)

Holistic bricolage is an approach in which various forms of data (e.g. qualitative and quantitative), and different perspectives (e.g. the inclusion of multiple stakeholders) can be incorporated. It is an inherently qualitative research approach, yet one in which quantitative data analysis can be legitimately accommodated (Lotteri, 2020), for example the inclusion of quantitative techniques in the analysis of a social survey questionnaire (Lotteri, 2020). The epistemology of (holistic) bricolage is grounded within complexity science (Kincheloe, 2005a,b) in which, within a particular research field, more than two elements evolve and interact, diluting borders between disciplines and allowing the use of methods from different fields (Phelan, 2001; Anderson et al., 2005; Turner & Baker, 2019). These interactions can happen in multiple ways, be non-linear and be non-additive (Lotteri, 2020). In the disaster- risk reduction research setting, holistic bricolage can support the combination of insights from the geographical, geological, social, and historical sciences, amongst other fields of study and contribute to greater illumination and enhanced understanding of key issues.

2) Offering freedom from templates and rigid application of set methodologies and thereby harness innovation and creativity in method

Within DRR research, the use of methodologies which have prescribed templates/trajectories (Pratt et al., 2022) has distinct limitations. Prominent limitations include the difficulties of planning disaster research (Main, 2019; Lotteri, 2020), and the need for speed and flexibility in research in responding to disasters and other rapidly developing emergencies, such as the COVID-19 pandemic (Bueddefeld et al., 2021; Andrew & Karetai, 2022; Speake & Pentaraki, 2022). In instances where existing research templates have unhelpful rigidity or there is the expectation of lengthy longitudinal study or there is a need for an approach which can be applied in a rapidly evolving scenario, bricolage may be considered an appropriate approach to use by disaster- risk reduction researchers (Bueddefeld et al., 2021; Fetters & Molina-Azorin, 2021). This is largely because bricolage differs from mixed methods approaches in several ways. First, bricoleurs are aware that the interaction with the object of their investigation is always complicated and often unpredictable (Kincheloe, 2005a, 2005b; O'Regan, 2015, Andrew & Karetai, 2022). Second, in bricolage research strategies are generally not planned (Kincheloe, 2005a; O'Regan, 2015) but follow a logical, strategic, and self-reflective process throughout the investigation (Nelson et al., 1992; Kincheloe, 2005a; Andrew & Karetai, 2022). These characteristics supply bricoleurs with the freedom to move beyond the confines of a specific philosophy, field of study and methodological template, to go deeply into the multiple aspects of the research task; multiple aspects that are a feature of much disaster mitigation research.

3) Offering rapidity of application in times of emergency or crisis *and/or* suitability of application over longer term study (longitudinal research).

Planning disaster research can be difficult due to unpredictable situations when set in practice. There can be uncertainties in data availability and data collection to analyse, be time-restricted opportunities for research, and the necessity for speed, especially during and immediately after a disaster event. In such scenarios, the 'non-planned in advance' character of bricolage can be supportive, especially when the research subject involves people. The complexity and nuancing of bricolage enable the acquisition of multiple views and perspectives facilitated by open-minded data collection, analysis, and the construction of coherent, valid analysis and synthesis. Research during the COVID-19 pandemic has highlighted the utility of using flexible and often creative methodological approaches under fast emerging disaster scenarios (Bueddefeld, et al., 2021; Fetters & Molina-Azorin, 2021; Speake & Pentaraki, 2022) – scenarios which disaster-mitigation researchers face in a wide range of emergency situations.

Despite its strengths, holistic bricolage has some limitations and criticisms levelled at the bricolage approach overall can also be directed at holistic bricolage. Principally, these limitations focus on the central, pivotal role played by the researcher as bricoleur, and the use of diverse, multiple methods.

The bricolage approach puts the bricoleur, with all their characteristics, at the core of the research (e.g., Kincheloe, 2005a, b; 2011; Berry 2006, 2015; Sharp, 2019). O'Regan, observes that "the strongest limitation that non-bricoleurs set upon the bricolage are the role of the bricoleur's perspective in the development of the study. Given that the bricoleur's perspective mediates all interpretation, critics argue that such research is thus laden with presuppositions, values, and biases, given bricolage largely rests upon the author's confidence in self-auditing observations, encounters, and practices" (O'Regan, 2015, p. 463). However, this can be mitigated by the researcher-as-bricoleur displaying reflexivity, honesty, and transparency (Ben-Asher, 2022). Much rests on the bricoleur grounding their study within a solid theoretical base, to avoid becoming a hotch-potch of methodologies (Sharp, 2019). In this paper, we assert that the bricoleur operating at the centre of the research is a strength, because they must address their positionality throughout the project (e.g., Denzin and Lincoln, 1994; Kincheloe, 2005a; 2011; Andrew and Karetai, 2022; Ben-Asher, 2022). Whilst declaring their positionality, the researcher as bricoleur needs to pay attention to "the choice of steps they take, to report transparently on these steps and decisions made 'correctly', and to accept the research as unique, a one-time effort under the given conditions" (Ben -Asher, 2022, p.6) to also ensure transparency and enable other researchers to debate and/or add a further angle of analysis.

Another argument lodged against bricolage is that the use of many methods can create an incoherent whole (Hammersley, 1999, 2004, Gobo, 2023). Hammersley (1999) also contends that social scientists should not assume the role of another type of scientist and *vice versa.* Although a researcher-as-bricoleur may be familiar with some, if not all, parts of the bricolage, we concur with Freire (1998), that bricolage can stem from epistemological curiosity which is maintained by the researcher-as-bricoleur during data/information collection and other stages of the research process, until the research issue can be fully understood. Moreover, when the research subject involves people, its inherent complexity calls for the many and varied perspectives which can be generated through 'open-minded' data collection, analysis, and subsequent coherent and valid synthesis (Lotteri, 2020).

Conclusion

Notwithstanding limitations, and for the reasons we have highlighted above, we propose and advocate that a holistic bricolage approach is an appropriate addition to the tool-box of research

approaches which can be chosen by disaster mitigation researchers. Our work also contributes to addressing the calls by Hällgren & Rouleau (2018), amongst others, to take stock of research methods on extreme contexts and move forwards. Such calls also invoke the challenge to develop and utilise alternative research methods for application in researching risk, emergency, and crisis, which is what our paper has done, in its presentation and discussion of the holistic bricolage approach and the pivotal role of the expert bricoleur researcher.

In research fields such as disaster-risk reduction, in which multi-perspectival views of the world are are paramount, we advocate that bricolage can contribute to and enhance our understanding. We assert that in its potential for multiple and mixed research methods to be used creatively by a bricoleur researcher, the holistic bricolage may encapsulate all of established five dimensions of bricolage and bricoleur expertise within a study from start to finish and can be applied in a broader range of research arenas than has hitherto been the case. We argue that this includes DRR research, where a comprehensive analysis of multiple types of data from social and physical studies supports the evaluation of risk. Given that DRR research lies at the nexus of human-physical world interactions, there is scope for utilising bricolage more widely as a research approach in this field. We have discussed the application of a holistic bricolage research approach within a critical transdisciplinary, science, social sciences, and creative arts/humanities context and present it as a research approach capable of capturing diverse data and complex social interactions, which we have argued is appropriate for more frequent use in DRR studies. Our work provides a response to recent calls for the identification and use of alternative research methods which can be applied in studies at times of emergency and crisis. Moreover, in exploring the use of bricolage through a critical approach lens, we assert that in pulling together diverse research fields and methods in a unifying way, the expertise of the bricoleur can contribute to the identification and theorisation of ways to tackle some of the most pressing issues in DRR and, in doing so, lead to greater social and environmental justice and equality.

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Declaration of interests

☒ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

☐ The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: