

Rich Pictures: A Visual Method for Sensemaking Amid Complexity

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Abstract

Recognition of the complexity of the world raises questions about new theories, methods, and capabilities for evaluation practice. Approaches originating in the systems sciences show promise; however, many require specialized expertise and resources. This article explores rich pictures as an accessible, low-resource method for facilitating sensemaking amid complexity. The method involves the free-hand drawing of a situation to richly illustrate what is happening and why using images, lines, and few words. The process and product are akin to elaborate childhood doodles, yet are remarkably powerful conveyors of tacit knowledge and issues, differing perspectives, and action possibilities. Drawing together methodological guidance, sensemaking theory, and an application with STEM higher education faculty, this article shows how rich pictures support sensemaking amid complexity and identifies potential applications and directions for research on the method.

Keywords

rich pictures, visual method, sensemaking, complexity, systems thinking

Recognition of the complexity of the world raises questions about new theories, methods, and capabilities for evaluation (Gates et al., 2021; Miller, 2016; Picciotto, 2020). As Picciotto (2020) contends:

Embracing complexity has emerged as a plausible strategy for pushing back the frontiers of knowledge in our post modern age. Complexity thinkers have found their place in the scientific sun by transcending mechanistic methods. Their models have acquired momentum in the social sciences and it is time to put them to work in evaluation (p. 57).

Putting them to work, so to speak, requires evaluators to learn new systems and complexity concepts and expand their methodological toolkits (Patton, 2016; Picciotto, 2020). Examples include enhancing mixed methods with complexity concepts (Kallemyn et al., 2020) and learning new

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methods such as complexity-appropriate computational modeling (Barbrook-Johnson et al., 2019) and participatory systems mapping (Barbrook-Johnson & Penn, 2021). Importantly, this requires going beyond sensitizing concepts (Patton, 2016) to “make a serious commitment to and investment in the careful study” (Miller, 2016, p. 268) of systems and complexity methods. This often takes considerable time to develop the expertise needed to skillfully apply the method within an evaluation process suited to the context and requires resources (e.g., training, software) (Barbrook-Johnson & Penn, 2021; Miller, 2016).

Given interest in methods to address complexity, this article features an accessible, versatile method that requires little training to learn and minimal resources to use yet has been underexplored for evaluation practice. The method—rich pictures—involves free-hand drawing of the complexity of a situation, individually, in pairs, or in groups, with the aim of richly illustrating what is happening and why using images, lines, and few words. Drawing complexity requires construction, deliberation, and interpretation making the process itself generative. Rich pictures originated in the systems fields within soft systems methodology (Checkland & Poulter, 2006, 2020)—a well-established approach to group problem analysis and action planning—and have value as an independent method (Bell et al., 2016; Berg et al., 2019; Ramage & Shipp, 2009). Since the origins of rich pictures in the 1960s, they have been used by researchers in numerous fields and practice areas (e.g., information systems management, education, sustainable development, and organizational performance) (Hanafizadeh & Mehrabioun, 2018; Mingers, 2000) yet are largely overlooked in the evaluation field. Existing guidance on rich pictures practically introduces the method (Bell et al., 2016; Barbrook-Johnson & Penn, 2021; Oakden, 2014; Williams, 2021), with little discussion of the underlying theory, methodological quality, and ethical issues (see Jackson, 2019 for an exception). Developments in visual and arts-based methods and practice (Caraway & Kinnear, 2022; Chilton & Leavy, 2014) offer ideas for using rich pictures in ways that go beyond their origins in soft systems methodology but have yet to be explored.

This article introduces rich pictures by bringing together theory, methodological guidance, practical considerations, and an illustration from my work. My primary aim is to explain and demonstrate the promise of rich pictures as a visual method to facilitate sensemaking amid complexity contributing to current debates about complexity-aware methods. For readers unfamiliar with rich pictures, this article provides a solid foundation such that after reading it one could experiment with the method or pursue suggested avenues for further learning (see Supplement 1). However, the article goes beyond existing how-to guidance by integrating sensemaking theory and visual research to provide a robust basis for applications and research on the method specific to evaluation practice. The article consists of five sections: (1) definitions of complexity and sensemaking in relation to situations that people want to understand and change; (2) summary of existing methods that support sensemaking amid complexity; (3) theoretical explanation of how rich pictures facilitate sensemaking amid complexity using a visual diagram; (4) guidance on how to facilitate a rich picturing process with an illustrative example; and (5) future directions for practical applications and research on this method.

On the Need for Sensemaking Amid Complexity in Evaluation Practice

This section defines complexity in relation to situations of interest which require participatory processes of sensemaking.

Complexity

Complexity is distinct from the everyday meaning, though different scholars, theorists, and schools of thought bring variations to how the term is used. A complexity-aware worldview challenges

Newtonian science and assumptions of a mechanical worldview such as reductionism (i.e., understanding the whole through careful study of the parts), linearity (i.e., outputs follow chronologically and in proportionality to inputs), and predictability (i.e., studying the influence of parts on other parts through effects that can be predicted) (Boulton et al., 2015; Gates et al., 2021). Complexity “sees the world as essentially interconnected...it reminds us of the limits to certainty, it emphasizes that things are in a continual process of ‘becoming’ and that there is potential for startlingly new futures where what emerges can be unexpected and astonishing” (Boulton et al., 2015, p. 1).

For this article, it is helpful to have a more specific definition of complexity. Drawing on Midgley (1992; 2016), complexity includes three dimensions: natural, subjective, and normative. Natural world complexity refers to the nature of reality or “what is.” Of emphasis here are the inter-relationships that generate emergent patterns (Reynolds et al., 2016). Inquiry into natural world complexity aspires for truth, claims that correspond with reality, often through modeling causal relationships and verifying these models through empirical analysis. Subjective world complexity refers to what any individual is thinking, feeling, or experiencing with an ideal of understanding multiplicity (Midgley, 2016). This recognizes “social phenomena are capricious...necessarily expressed in abstract terms, and...subject to multiple and changing interpretations” (Checkland & Poulter, 2006, p. 175). This dimension calls attention to how perspectives are shaped by lived experience, culture, role, and other aspects of identity and positionality. Normative complexity refers to “what ought to be” (originally labeled as social complexity by Midgley, 2016). This speaks to the moral and pragmatic considerations where inquiry aims to have right, justified actions. This connects to the concept of boundaries in which choices are made about what to include and exclude when examining complexity; these choices can have practical, political, and ethical consequences (Gates, 2018). A multidimensional definition of complexity includes the interconnectedness of the world, the plurality of ways humans view and experience this interconnectedness, and the ways our understandings are bounded and this boundedness has consequences for what we can know and do.

Situation of Interest

In rich pictures, complexity matters in relation to a situation that a group of people want to understand and influence change in. Intentionally distinguished from social problems and systems, which are the focus of other systems approaches (Williams & Hummelbrunner, 2009), situations are circumstances people find to be problematic, undesirable, and in need of change or response at a particular place and time (Gates, 2016). Some researchers use problematic situation (Mingers, 2000) to indicate “where answering questions about ‘what’ we should do is as significant as determining ‘how’ to do it” (Jackson, 2019, p. 403). Situations are inherently loosely bounded such that different people bring unique knowledge and perceptions regarding what’s happening, why, and what should be done next and are “not tied to any time scale” (Jackson, 2019, p. 432). Situations are sometimes labeled “wicked problems” when the circumstances of concern are ill-defined because information or knowledge is uncertain, confusing, and/or rapidly changing, and there are differing perspectives (Crowley & Head, 2017; Rittel & Webber, 1973). In an evaluation setting, the situation of interest refers to the underlying set of circumstances, needs, or problems that the initiative(s) being evaluated aim to address.

Sensemaking

The complexity of a situation of interest necessitates participatory processes of sensemaking. This term was first theorized by organizational theorist Karl Weick (1995) as “the transformation of raw experience into intelligible world views”. Maitlis and Christianson (2014) describe sensemaking

as a “process through which people work to understand issues or events that are novel, ambiguous, confusing, or in some other way violate expectations” (p. 57). Importantly, sensemaking “challenged notions of an objective reality and instead emphasized the social construction of reality” (p. 60). Sensemaking differs from a solely empirically based analysis of a situation at one point in time based on a data set. Instead, people engage in an open-ended, dynamic process that assumes transience and change, rather than constancy or stability. The aim is to arrive at a good-enough understanding from which to identify actions; whatever actions are taken, in turn, influence the situation inviting subsequent sensemaking. This may focus on current, past, or future conditions or a combination of these. This is not to suggest that sensemaking precludes the use of data. Rather, as Weick et al. (2005) underscore “sensemaking is not about truth and getting it right. Instead, it is about the continued redrafting of an emerging story so that it becomes more comprehensive, incorporates more of the observed data, and is more resilient in the face of criticism” (p. 415).

Facilitating sensemaking about the complexity of a situation of interest has not typically been part of evaluation practice. However, evaluators use methods to accomplish related tasks which I explore next.

Methods, Gaps, and Opportunities for Sensemaking in Evaluation

This section briefly summarizes well-documented methods grounded in different disciplines that are or could be used in evaluation practice to facilitate sensemaking amid complexity. These include three groups: methods used early in an evaluation to assess needs, context, and evaluability; methods to map or model systems; and visual and arts-based methods. Each offers advantages for analyzing dimensions of complexity; but none facilitates a participatory sensemaking process in relation to natural, social, and normative dimensions of complexity suggesting a contribution of rich pictures. Additionally, the accessibility and low-resource requirements of rich pictures offer an additional advantage.

Methods to Understand Needs, Context, and Evaluability

Evaluation practice has historically focused on social science methods for analyzing needs (Rossi et al., 2019) that an intervention addresses and the surrounding context (Conner et al., 2012; Podems, 2019) and evaluability of an intervention. Evaluators may begin with a needs assessment although they often rely on existing descriptions of the social need or problem and the target population of the initiative to be evaluated (Rossi et al., 2019). “A need in the simplest sense is a measurable gap between two conditions—what is and what should be” (Altschuld & Watkins, 2014, p. 5). This gap is not objective but a socially constructed set of claims; these claims can and should be supported by empirical data (Rossi et al., 2019). An analysis of needs typically involves empirical data, whether through a landscape analysis, root cause analysis, or needs assessment, or, more informally, a look at what underpins mission and goal statements on websites, brochures, etc. A context analysis involves looking at “all the factors that affect the intervention, the evaluator, the evaluation process, and its findings, and how those findings are received” (Podems, 2019, p. 275). Conner and colleagues (2012) suggest that a thorough context analysis considers multiple domains, including “physical, organizational, social, cultural, political, and historical” (p. 93). Evaluability refers to “the extent to which an activity or project can be evaluated in a reliable and credible fashion” (OECD-DAC, 2010, p. 21). Dimensions of assessing evaluability include the nature of the theory of change; the availability or feasibility of attaining relevant data; and the potential utility and contribution of an evaluation to the key people (Trevisan & Walser, 2015). Assessing evaluability may involve original data analysis and/or use of a checklist.

These methods help evaluators understand what problem or need an intervention aims to address, whether the intervention is ready to be evaluated, and what to consider in relation to an evaluation; they typically do not open-endedly explore subjective and normative perspectives on the situation that warrants change nor facilitate participatory sensemaking processes. This suggests advantages of rich pictures early within an evaluation process.

Methods to Model or Map Systems

Expanded methodological options come from the systems and complexity fields, an area that shares broad concerns with “systems” and “the core idea of an adaptive whole to understand or intervene in the complexities of human affairs” (Checkland & Haynes, 1994, p. 189). Systems fields include hundreds of theories, concepts, approaches, and methods (Williams, 2021). These are sometimes discussed as three major waves: hard systems thinking, soft systems thinking, and critical systems thinking (Midgley, 2007). Another way of grouping methods concerns describing and analyzing situations, changing and managing situations, and learning about situations (Hummelbrunner & Williams, 2009).

Systems methods gaining attention in evaluation center on systems mapping, primarily to model and analyze causal relationships or processes (Barbrook-Johnson & Penn, 2021). Examples include participatory systems mapping, causal loop diagrams, Bayesian belief networks, and system dynamics (Barbrook-Johnson & Penn, 2021). Of note, these methods focus on visually representing one or several systems of interest. This typically requires first distinguishing which system(s) to prioritize within a situation (Lewis, 1992). Additionally, this reflects attention to natural world complexity of interrelationships with secondary consideration of subjective and normative complexity within the mapping process. While rich pictures are sometimes labeled as a system mapping method, they are less structured and focus on learning about and acting to change situations rather than analysis of systems or causal processes (Williams & Hummelbrunner, 2009).

Visual Methods to Explore Perspectives

A third category of methods comes from visual, creative, and arts-based approaches. These include films, videos, photographs, drawings, cartoons, graffiti, maps, diagrams, cyber graphics, signs, and symbols (Chilton & Leavy, 2014; Knowles & Cole, 2008). Participatory visual methods involve people in (re)constructing meaning through visuals including photo elicitation (i.e., where photographs produced by researchers or participants are used in interviews) (Margolis & Zunjarwad, 2018); graphical elicitation (i.e., an iterative process that uses sketches, drawings, comics, or diagrams to stimulate discussion) (Prosser & Loxley, 2008); graphic novels (i.e., continuous images that incorporate texts and symbols to address themes such as autobiography and daily life) (Galman, 2009); and sensory ethnography (i.e., visual and audio technologies to observe and interview participants producing a song or film, walking interviews, group discussions, creative workshops, or other mediums) (van der Vaart et al., 2018).

In addition to facilitating participation in sensemaking, visual methods also enable interrogation: “the visual constitutes not just an object to be seen, but a lens through which we perceive and understand the world around us” (Caraway & Kinnear, 2022, pp. 1–2). This makes visual methods “inherently political undertakings” as they “make possible particular ways of seeing, thinking, and imagining our worlds” (Taschereau Mamers, 2022, p. 158). Therefore, it is necessary to carefully consider the processes of visualizing, including who gets to participate (and who doesn’t) and potential material consequences, recognizing visuals may reinforce domination or “serve as a means of resistance and negotiation” (Caraway & Kinnear, 2022, p. 2). Visual artifacts also may be

interrogated to explore or challenge ‘how histories are narrated, how precarity might be attended to, or how categories of knowledge are reproduced or disrupted (Taschereau Mamers, 2022, p. 158).

As a method, rich pictures align with visual methods in terms of facilitating participation to explore perspectives and to challenge, counter-narrate, or reconstruct knowledge. Rich picturing stands out in its use of free-form hand drawing with adults as a mode of sensemaking.

How Rich Pictures Facilitate Sensemaking Amid Complexity

This section develops a theoretical explanation of how and why the process of generating and interpreting rich pictures facilitates sensemaking. Figure 1 provides a simplified visual. This visual shows a group of people gathered together in relation to a cloud (A) to symbolize the complexity of a situation of interest. Individually, they bring together their tacit knowledge and mental models indicated by three heads (B). They come together to co-construct a shared picture (C); this process involves surfacing and negotiating between their multiple perspectives (interplay of B and C) generating a picture richer than what any one of them could independently generate and distinct from simply combining separate pictures. This process involves accommodation leading to possible actions, indicated by a curved arrow (D).

Situation of Interest (A)

Participants in a rich picturing process should be directly involved in or affected by a situation. They may draw the boundaries around that situation or see it differently but they should see themselves as all invested in the same loosely structured set of circumstances. Together, they will build up the “the richest possible picture” (Jackson, 2019, p. 402) to support their understanding and help identify ways to act to influence change. This process directly engages people in co-constructing ideas of what’s problematic and what’s advantageous. In some circumstances where an established framing of a problem exists, rich picturing could be used to critique that framing, asking “what’s the problem represented to be?” (Archibald, 2020, p. 6).

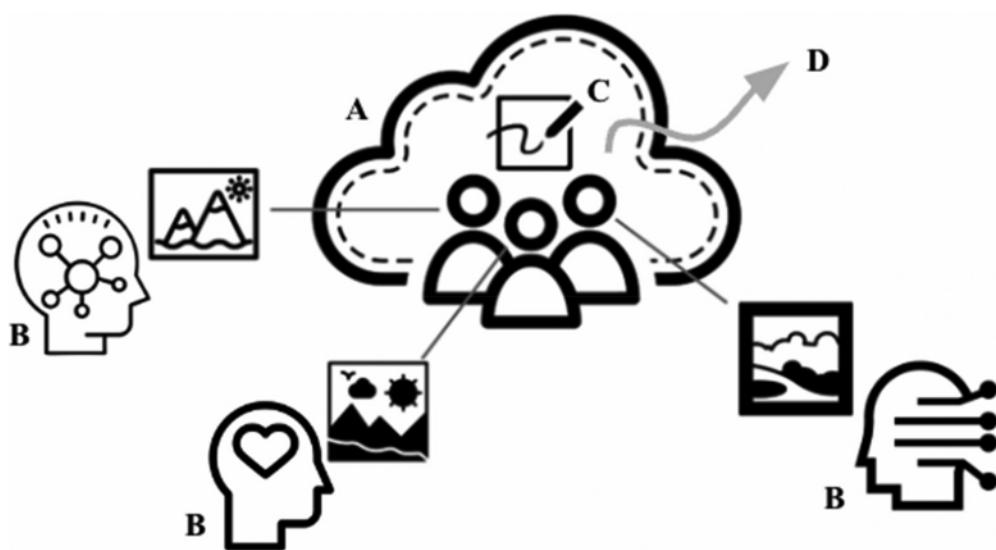


Figure 1. How rich pictures facilitate sensemaking amid complexity.

Tacit Knowledge and Mental Models (B)

The method of using visuals and minimizing words can push people to reveal tacit knowledge. The Open University Systems Thinking in Practice program describes the value of rich picturing as follows:

Drawing rich pictures can return you to the simplicity of a childhood vision where you mirror directly what you observe, and in that process reveal how you feel about it. This seems to bypass the mental filters which tend to frame that vision in terms of the generally accepted story, or to obscure the things it is hard to say without offending. The use of humour and imagery make it possible to say things it is otherwise difficult to raise; they can provide a space within which you have license to say something that would otherwise be taboo. (Open University as cited in Bell & Morse, 2013a, p. 336)

Pain (2012) draws on psychoanalytical schools of thought to contend that “what would be repressed or not expressed shows up visually or symbolically when people draw their perceptions” (p. 307), and researchers underscore the benefits of diagrams, in general, to “allow groups to explore their subconscious, their occult sentiments and conflicted understandings” (Bell & Morse, 2013a, p. 331). Checkland referred to this as “Weltanschaunung (W) or worldview, a relatively stable tendency to interpret the situation in which they find themselves in a particular way” (Jackson, 2019, p. 404). Several prior applications of rich picturing emphasize its value for surfacing and engaging participant voices and lived experiences, including residents’ perceptions of business projects following natural disasters (Walker et al., 2014), educational technologists’ understandings of innovation (Cox, 2010), how elderly adults in Shanghai perceive the health impacts of environmental issues (Kish et al., 2016), and high schoolers’ attitudes and perceived stereotypes toward female computer scientists (Berg et al., 2018).

Multiple Perspectives and Negotiation (C)

Rich picturing involves co-construction of a shared picture, or individual construction and then sharing, processes that bridge “differing worldviews with the aim of creating a shared understanding” (Berg & Pooley, 2013b) that can “help groups arrive at a consensual analysis of a situation” (Bell & Morse, 2013a, p. 332). As such, “intersubjective meaning is constructed through a more mutually co-constituted process” (Maitlis & Christianson, 2014, p. 78). Bell and Morse (2013b) describe this shift as aiding groups in exploring group members’ “conscious and unconscious workings... the group mind as represented in a picture” (p. 30). Shared focus on a picture as a material object that can be iteratively revised helps anchor and structure discussions, with the picture serving as an “epistemic object...a tool that can be used to help people engage in joint discussion and interpretation, while also pointing to new questions or gaps in understanding” (Szijarto & Cousins, 2019, p. 166). This type of epistemic object has been important in multidisciplinary settings (Miettinen & Virkkunen, 2005) and research networks of practice (Khazraee & Gasson, 2015), as well as in situations of uncertainty, complexity, and adaptation (Szijarto & Cousins, 2019).

Differences of perspective and positionality can pose challenges, as individuals may need to negotiate within the process; power dynamics and perceived status can influence which representations make it onto the paper. Negotiation is seen as a necessary and generative process, as “societies and organizations can only be governed through a complex process in which shared norms and values are established and maintained. This depends on the negotiation of relationships between participants” (Jackson, 2019, p. 405). Theoretical groundwork by sensemaking scholars offers conceptual guidance for such processes including *sensebreaking*, the ways “people reconsider the sense that they have already made, to question their underlying assumptions, and re-examine their course of

action" (Maitlis & Christianson, 2014, p. 69), and *sensegiving*, how some individuals try to influence "the sensemaking and meaning construction of others toward a preferred redefinition of organizational reality" (Gioia & Chittipeddi, 1991, p. 442).

Accommodation and Action (D)

By drawing, groups confront and reconcile differences in relation to the situation. This was vital within soft systems methodology: "our experience is that genuine consensus is extremely rare in human groups and is probably unwelcome because differences of worldview generate energy and lead to fresh ideas. The norm is to find accommodations between conflicting world views" (Checkland, 2007, p. 505 as quoted in Jackson, 2019, p. 415). Negotiation and accommodation of perspectives into shared knowledge then leads to ideas for action possibilities. This process exists within other arts-based research methods and has been juxtaposed as a way to "create productive, humanizing problem-solving communities where positivist and postpositivist social science paradigms have struggled and failed" (Chappell & Cahnmann-Taylor, 2013, p. 259). "Action is an integral part of sensemaking—that is, we know the world by taking action and seeing what happens next" (Weick, 1988 in Maitlis & Christianson, 2014, p. 84). Participants "learn their way to what changes are systemically desirable and culturally feasible" (Jackson, 2019, p. 402).

In summary, the processes by which rich picturing facilitates sensemaking move a group from experiencing a shared situation to surfacing and drawing their tacit knowledge and multiple perspectives, which, requires negotiation and accommodation. This generates ideas for what to do and these can be expanded and further explored through interpretation of a picture and incorporation of other methods.

Methodological Process and Example with STEM Faculty

This section provides guidance on how to facilitate a rich picturing process in three phases (i.e., planning and set up, picture generation, and picture interpretation) summarized in Table 1. I synthesize ideas from multiple sources including soft systems methodology, guidance on rich pictures, research

Table 1. Methodological Guidance for Using Rich Pictures.

Phase	Considerations
Planning and Set Up	Purpose and intended uses Facilitators Participants involved in or affected by situation of interest Timeframe, room layout, and materials Warm-up and tone
Generating Rich Pictures	Instructions Prompts Encouragement
Interpreting and Using Rich Pictures	Action analysis Visual analysis Content analysis Critical analysis
Methodological Quality & Ethics	Recoverability of the process Informed consent and confidentiality Minimization of potential harm Authorship and ownership of the data

examples, and visual methods and practice. This guidance does not neatly mirror the theoretical discussion and instead focuses on the practicalities of the method. Keep in mind that there is no one right way to draw a rich picture (Lewis, 1992); each application varies by use, user, and context (Jackson, 2019). This section centers on rich pictures as an in-person, synchronous group activity and excludes other uses of rich pictures, such as leveraging visuals or rich pictures to elicit interview data (Booton, 2018; Glegg, 2019), to depict field notes (Conte & Davidson, 2020), and within qualitative research generally (Cristancho & Helmich, 2019).

I feature an example of a rich picturing process and product from my use of this method within a multi-institutional network of science, technology, engineering, and mathematics (STEM) faculty funded by the National Science Foundation to co-create ways to improve STEM teaching and learning (Santangelo et al., 2021). The Network's leaders were looking for a consultant to facilitate faculty team workshops to facilitate systems thinking and mapping to explore ways to broaden STEM participation in their institutional, school, and/or departmental contexts. I incorporated research on the use of this method within the workshops with exempt review from an Institutional Review Board and participants' informed consent.

Planning

The first step to rich picturing involves creating conditions for robust participatory engagement through consideration of who will facilitate and participate; preparation of an appropriate timeframe, room, materials, and warm-up exercise; and establishment of a light-hearted and encouraging tone.

Facilitators and Participants. Facilitation provides guidance and ease to the process—particularly when barriers to the process arise or differing perspectives or tensions get expressed. Facilitation styles for rich picturing “differ considerably depending on audience, domain and experience of the facilitator” (Berg, 2015, p. 69). Rich picturing is appropriate and accessible to a wide range of participants and there are multiple ways to set up participant groups. When deciding who should participate, prioritize involving those with direct knowledge and experience of the situation of interest (Ufua & Adebayo, 2019). It is important that participants have freedom to express themselves without coercion from management, marketing, or other groups (Ufua & Adebayo, 2019) and willingness to attend to “power struggles inherent in the collective processes of meaning construction” (Maitlis & Christianson, 2014, p. 98).

In the example, I worked with project leads and a graduate student to design a half-day workshop aimed at building team relationships and shared purpose for how they could broaden participation in STEM. A majority of participants worked in the same discipline and were from several institutions. We set up groups based on institution with each group comprised of five to eight people with a mix of roles (e.g., dean, department chair, senior faculty, and junior faculty). I facilitated the workshop beginning with an introduction to systems thinking followed by a rich picturing session.

Time frame, Room Layout, and Materials. Drawing a rich picture typically takes approximately 90 min, depending on the size of the group, the complexity of the situation, and/or extent of participants' experiences. Because additional time is needed for room and group preparation, for groups to discuss their pictures, and for facilitators to record pictures and clean up, the rich picturing process may take two to four hours. The spatial layout typically consists of one table per group in a room large enough to spread those tables out. Each table should be large enough for a big piece of paper with adequate space around the table for participants to sit or stand. If groups share their pictures with each other, wall space for a gallery walk or space in the room for groups to move from table to table is extremely helpful (Oakden, 2014). The key materials are large sheets of

blank paper, such as a roller cut into sheets of easel paper, and colorful markers. Some facilitators use post-its and scrap paper, as well. The example workshop followed this layout.

Warm-Up and Tone. As most adults are not familiar with drawing as a method, it can be advantageous to facilitate a warm-up exercise to allow participants to introduce themselves if they are not familiar with each other, and, ideally, to create a sense of ease, comfort, and camaraderie. While facilitators might opt to design a warm-up exercise that prompts discussion about the situation of interest—and some groups might do so without any prompting—both scenarios are generally discouraged because participants tend to talk faster than their message can be incorporated into the picture. Individuals or groups may also start to tell a single narrative about the situation or frame it as a problem and/or solution. Though some participants may want to draw on scrap paper before drawing on the shared paper, this, too, is generally discouraged and may also contribute to group fracturing (Williams, 2021).

Discomfort or perceived risks can stop people from drawing, and/or revealing, creating, or exacerbating tensions (Oakden, 2014). It thus helps when facilitators set a light-hearted and encouraging tone and reorient participants to that tone anytime an individual or group appears stuck, disengaged, frustrated, or uncomfortable. As they begin, and at different points during the process, group members may experience hesitation, discomfort, self-doubt, tension, and other emotions, and facilitators can use a range of strategies (e.g., using background music, making nonoffensive jokes, encouraging creativity, and risk-taking) to anticipate and manage participants' emotions as valued aspects of the sensemaking process.

Generating Rich Pictures

Supporting a group-level rich picturing process requires clear instructions, prompts, and encouragement. This is the case because adults tend to default to language (writing or talking) and cognitive analysis—whereas rich picturing is about drawing, first and foremost, with sensemaking occurring during and after the drawing process.

Instructions. Begin by telling participants that they will create a hand-drawn picture that captures as much as possible about what's going on and how members of the group perceive or experience the situation. What matters is not the drawing itself, but the process of drawing together. The focus should be creating abstract, conceptual understandings, rather than a literal diagram, though some groups/facilitators may mix the two (Lewis, 1992) and others may choose to draw an ideal or desired situation ("what should be") (Macintyre, 2020). It is helpful to provide high-level direction that participants can refer to, such as "pay attention to structure, process, and climate" (Jackson, 2019, p. 421; see Williams, 2021, p. 30 for a more detailed prompt). Ground rules may include avoiding text (using visuals instead) and keeping the paper "visible to all members of the group at all times so it is clear to all that decisions have been made as to the components and linkages" (Bell & Morse, 2013a, pp. 333–334). Some facilitators ask groups to start with a title that roughly labels the situation using descriptive, neutral, and open-ended language (Williams, 2021).

Prompts and Encouragement. A final set of tips has to do with nudging for richness. Groups or individuals sometimes narrow in on a single narrative or metaphor that drives the entire picture. Any such single-minded or dogmatic thinking should be gently broadened. Many groups create pictures that make little or no sense to an outside observer, and facilitators who see this happening can encourage participants to selectively use text to label key structures, processes, people, or lines (Williams, 2021). Once some initial stick figures or symbols are drawn, it's the facilitator's task to try to keep people drawing. Consider keeping the prompts visible and encourage participants to revisit the list of

what to include to see what they have left out. It can also be helpful to invite participants to reflect on what they don't know or what puzzles them and incorporate that into the picture (Williams, 2021).

Example of a Rich Picture. I invited participants to draw a picture that richly captures the situation of broadening participation in STEM at their institution illustrating any problems, concerns, or issues they were aware of and what they saw as assets or strengths to build on. I emphasized telling the full story acknowledging that differing perspectives, roles, norms, values, and worldviews exist. Most groups developed pictures of their institutional campuses located within

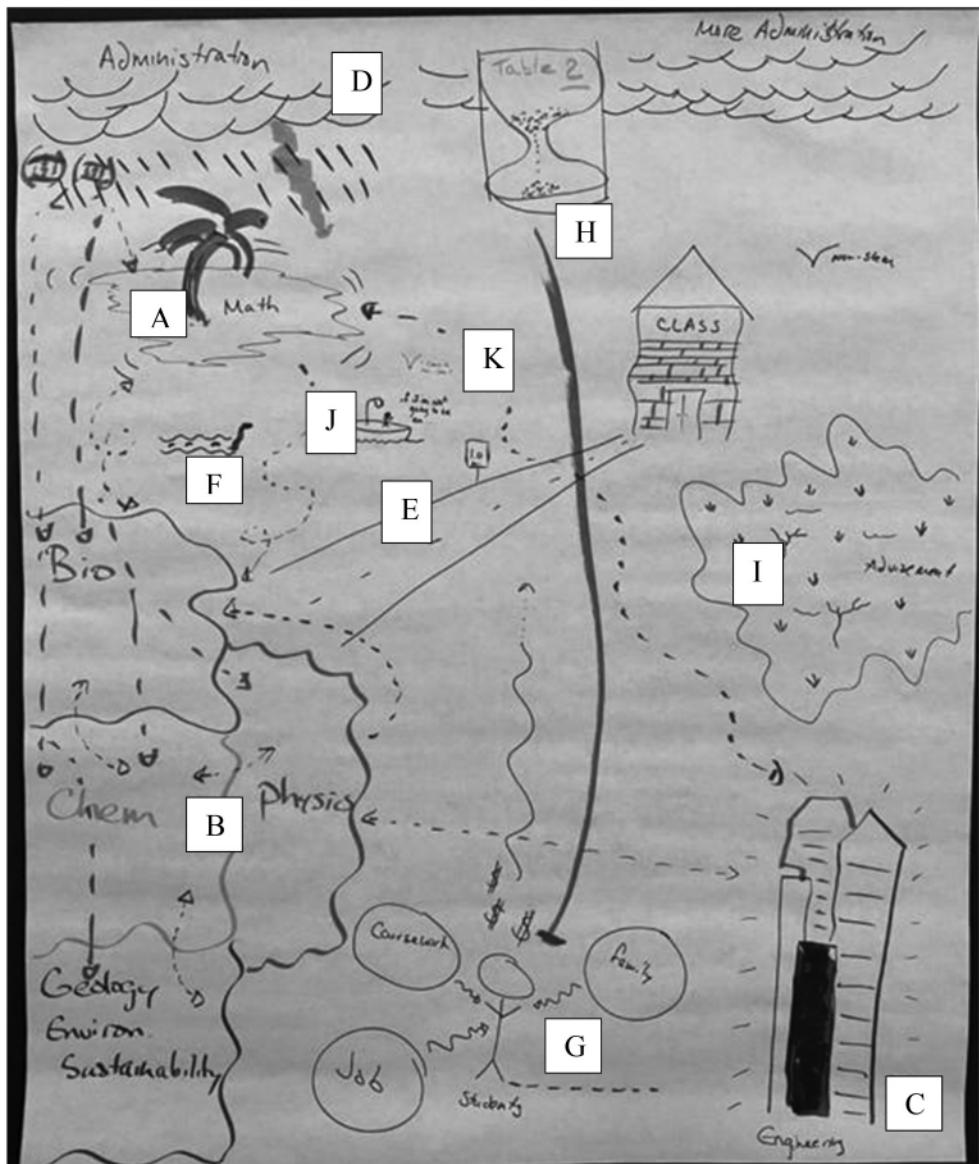


Figure 2. Rich picture of students' STEM pathways.

surrounding communities and showed the paths by which students entered into or left STEM courses, majors, and careers.

Figure 2 shows one picture followed by this group's narration in Figure 3. I added text boxes with letters to connect features within the picture and narrative to help readers interpret the picture. This picture presents a geographic map of the different STEM departments students must navigate as they complete their coursework. Whereas four departments interact closely—biology, physics, chemistry, and geology—math appears as its own stranded island. Engineering, in its fancy setting, is highly valued and well supported by school administration, which is presented as a cloud system stretched over the whole map as an overall context of

“Starting off, note that math is off on its own island [A], physically on the campus. It's often in a separate building. We have these two buildings over here that are fairly close together, the biology and physics and chemistry and geology. And we tend to talk to each other pretty much within our buildings [B]. Chemistry and physics are in our building and biology and geology in their building. Then we're close enough so we have some interaction and some collaborative research. Then over here, this is engineering and it's a brand spanking new building that's going to be in the near future [C]. They kicked math out into the hinterlands over here into the deserted island, so then engineering is now incorporated as a school. It's considered very important by administration because parents understand if you get an engineering degree, you have a career. So, it's one of those obvious paths. But they are getting pressure from the administration. So, the administration are the dark clouds [D] up here raining down and lightning bolts on all of us. Also, they have eyes that are staring down at us on what we are doing. We have buildings that don't have classrooms. If you're in one of those buildings that don't have many classrooms—especially our science buildings are mostly devoted to lab rooms—you end up walking a long distance [E], says one mile, which is an exaggeration. But still it feels like it, especially on a day like this [referring to cold, windy weather], to get to your building with the classrooms. You have students and you're going to have office hours right after your class. Then you've got to come back to my building and we'll talk about it and then it's a long walk. So, this is the students walking back and forth and all around and they're getting lost and the Loch Ness Monster [F] comes and bothers them. To get from math and engineering, we should have more communication. It's a long distance. And then, of course, physics and engineering, even though it's a long distance, they think linearly. So, it doesn't matter to them. Down here is the poor student who is being dragged down by all these different forces, the job, the coursework, the family obligations and expectations [G]. And why do they [students] need the job? Because this is a private university. All of their money is being sucked up into the administration. And over here we have time. Time is a constraint [H] on all of us so we're all feeling the time. It's looming over us and we don't have enough time for students and faculty. And then over here you have the advisements swamp [I], where students get lost because they're not getting good advisement from central advising in the university. They really need to get advisement from people who are in the know. And the other thing is the expectations versus reality. So, these students say, oh, I'm going to be an engineer, oh, I'm going to be a doctor. If I'm not going to be a dah dah dah, what do I do? I'm stuck in this boat in the middle of nowhere [J]. So, what do you do? Well, you have to listen to a little birdie [K] that says come to non-STEM and be a non-STEM major. How do we get that little birdie to talk to them and tell them that it's a viable alternative for them because not everyone belongs in STEM? So, I think that's it.”

Figure 3. STEM faculty team's narration of their rich picture.

top-down pressure and oversight over all the departments. Meanwhile, advisement is disconnected and unwelcoming terrain, and students juggle different factors in their own lives that can become obstacles to achieving their STEM degree goals.

Interpreting Rich Pictures

After pictures are complete, introduce a process to facilitate interpretation and discussion. One widely used approach is a gallery walk, which involves posting pictures on a wall or at small tables and having groups rotate to explore each picture (Williams, 2021). It is helpful to have one group member remain with the picture to explain it to other groups, offering prompts such as: Guide your colleagues through the picture. Colleagues, be curious. Ask questions! Share what you notice and what surprises, puzzles, or concerns you. Questions typically emerge naturally from the pictures and in relation to the broader exploration of the situation, as pictures are forms of a “poly-vocal text” that can be read and engaged with differently (Galman, 2009, p. 214).

More formal analytic options include action analysis, visual analysis, content analysis, and critical analysis. These may leverage visual data within the picture or require recording and audio transcribing participant(s) verbal explanations to analyze the verbal data qualitatively. Action analysis uses rich pictures as a basis for groups to make decisions about what to do next. Soft systems methodology provides the original process for guiding groups from rich picture construction to feasible and desirable actions; for a concise overview, see Checkland and Poulter (2006) and Checkland and Poulter (2020). A second option is to analyze the picture visually. Adapting an established framework for art criticism, Bell and Morse (2013a) suggest seven foci: locate the style, descriptive features and structures, primary aesthetic features, value features, low-level interpretation, high-level interpretation, and critical judgment (p. 341). While there is not yet a commonly agreed syntax for images used in rich pictures, Berg and Pooley (2013a) developed an icon legend that can be useful. Content analysis (Bell et al., 2015; Berg et al., 2019), a third option, is a way to focus on concepts expressed within a rich picture or within the verbal narratives. Lastly, critical approaches such as critical systems heuristics (Ulrich & Reynolds, 2010) can be employed to interrogate issues present in a rich picture (e.g., power imbalances, excluded knowledges) or to raise questions about future possibilities that transcend constraints (e.g., counter-narratives) (Taschereau Mamers, 2022).

In the example, the workshop purpose of helping each group and the cross-institutional network identify ways to broaden participation in STEM shaped the formats and content of analysis. I facilitated several rounds of interpretation that involved groups analyzing their own pictures and a large cross-group discussion to identify patterns. In the example-rich picture (Figure 2) and narration (Figure 3), the group identified a multitude of issues that influence student pathways in STEM (e.g., differential resource and prestige for departments, parental pressure on students, disconnected advising) and how interconnections generate patterns, which may be viewed by some as positive (e.g., increase in engineering majors) and others as problematic (e.g., diminished student autonomy over academic and career path). It is through this open-ended surfacing of complexity, what is happening, and what it means from multiple perspectives, that the group could then consider possible options to influence change. Cross-department communication and bridging non-STEM and STEM student advisement became areas for the group to intervene that were not previously on the group’s radar.

Methodological Quality and Ethics

Criteria for assessing rich pictures and processes uphold the integrity of the method but are not well established. Checkland (2007) emphasizes the benefits of the process to inform a “debate about the

real world" within "a cyclic learning process" (p. 47) and not as models in which correspondence with the real-world matters. The focus on social and subjective perceptions of reality, rather than modeling reality based on empirical data is sometimes a critique but actually is in line with epistemological assumptions (Jackson, 2019; Mingers, 2000). Recoverability helps make the reasoning and activities explicit "so that an outside observer can follow the whole process and understand exactly how the outcomes came about" (Checkland & Poulter, 2006, p. 77; also see Holwell, 2004). Visual and arts-based methods suggest additional criteria including: fit of the method to the question; aesthetic power of the picture to stimulate engagement and/or action; usefulness for participants in understanding or acting on the situation; and self-expression especially for those whose experiences or interpretations have been excluded or suppressed (Chilton & Leavy, 2014).

By involving participants in the generation and analysis of rich pictures, the method can counter ethical issues that arise from extractive methods in which researchers have greater authority over meaning and representation (Galman, 2009). Still, ethical issues arise and should be mitigated. These include ongoing, informed consent, confidentiality within groups, minimization of potential harm, and authorship and ownership of the data, among others. Participants "may reveal more than they were expecting to share" (Pain, 2012, p. 313). Thus, it is crucial to check in and provide participants with the right to withdraw and to minimize harm during and following the process (Glegg, 2019).

Future Directions for Rich Pictures in Evaluation Practice

This final section identifies ways to use rich pictures in evaluation practice and proposes directions for research on the method.

Practical Applications in Evaluation Practice

Additional uses include examining implementation processes, identifying emergent consequences, and incorporating practitioner and community tacit knowledge.

Examining Implementation Processes. Rich picturing could be useful in evaluation practice to visually depict how, why, for whom, and in what circumstances a change initiative operates. Rich pictures provide a way to engage actors in an unstructured process to draw out implementation processes from their vantage point. This process and the rich picture product can then be used to discuss and refine a theory of change model. Examples include rich pictures to depict barriers within the implementation of a childhood obesity program (Conte & Davidson, 2020) and to model the complexity of a change process by combining soft systems methodology and realist evaluation (Dalkin et al., 2018).

Identifying Emergent Consequences. Rich pictures could surface what is not planned for, anticipated, or intended within a specific change initiative or an evaluation—emergent and unintended consequences (Morell, 2018). Rich pictures could complement familiar methods, such as interviews, focus groups, observations, and document reviews, as well as those designed to identify emergent consequences, such as most significant change and outcome harvesting. For example, one could engage participants to visually draw a story of change as a complement to the established word-based approach (Dart & Davies, 2003) or facilitate rich picturing workshops as an input to "harvest" outcomes from staff and participants those who observed changes (Wilson-Grau, 2019), such as how elderly adults in Shanghai perceive the health impacts of environmental issues (Kish et al., 2016).

Incorporating Practitioner and Community Knowledge. The accessibility of rich picturing suggests opportunities to hear from groups otherwise excluded by evaluation processes, due to literacy, language, communication differences, age, or other dimensions of identity or social location, as documented by researchers working with people with severe mental illness (Fullana et al., 2014), those who experience addiction (Rhodes & Fitzgerald, 2006) and with children (Lomax, 2012). This suggests synergies of this method with culturally responsive evaluation (Hood et al., 2015) centered in peoples' lived experiences and to counter power imbalances. There may be additional advantages of this method to reduce evaluation anxiety among practitioners (Donaldson et al., 2002).

Methodological Research on Rich Pictures

Research on rich pictures as a standalone method is relatively recent (Bell et al., 2019), addressing facilitation options (Berg, 2015), iconography (Berg & Pooley, 2013a, 2013b), and approaches to interpretation and analysis (Bell & Morse, 2013a; Bell et al., 2019; Berg et al., 2019). Future research could deepen understanding of how rich pictures work as a process; compare the benefits of rich picturing and its use with other methods; and extend guidance to critical and transformative uses.

Process Dynamics. While few researchers have examined group interactions and discourse during rich picturing, Houghton (2013) explored how actors who actively hold differing worldviews find places of accommodation to arrive at shared strategies for change. Future research could connect with sense-making literature regarding "how individuals who hold different pieces of information are able to collectively construct new meaning" (Maitlis & Christianson, 2014, pp. 102–103) and dialogical approaches to knowledge creation in organizations (Tsoukas, 2009). A related issue is how participants' interest, power, authority, and background knowledge influence participation in rich picturing (Ufua & Adebayo, 2019).

Comparative Benefits and Methodological Sequencing. As a flexible and situated method, rich picturing can and should be tailored to the user, application context, and particularities of the application creating opportunities to guide intentional methodological sequencing (Barbrook-Johnson & Penn, 2021; Checkland & Poulter, 2006). Potential questions include what added value rich pictures bring to individual and group interviewing techniques (Booton, 2018); how rich picturing facilitates identification and examination of the macro-level structures that influence people's perceptions of their organizational and personal lived realities (Maitlis & Christianson, 2014); and ways to intentionally combine a "hard" systems method to analyze real-world causal relationships and a "soft" systems method to facilitate understanding such as the use of Bayesian networks with rich pictures (Shongwe, 2018).

Critical, Disruptive, and Transformational Uses. Originally, rich pictures were developed as a step within soft systems methodology which tends toward modest and incremental change strategies that can be agreed upon by groups (Jackson, 2019). This poses risks for reifying a view or strategy. However, there is a rich, growing body of literature on visual and arts-based methods that highlight the potential for transformative change (Chilton & Leavy, 2014) by, for example, "undercutting a prevailing worldview [which] may also mean a useful sort of emancipation of readers and viewers" (Chappell & Cahnmann-Taylor, 2013, p. 16). One way this can play out is when the sensemaking process facilitated by drawing leads to the construction of counter-narratives which empower or inspire a group to interrogate oppression and reframe a situation or their role within it (Taschereau Mamers, 2022). How to facilitate a rich picturing process to support critique and transformation is an open question worthwhile for future research.

Conclusion

This article explored the value of rich pictures for diagramming unstructured complexity as perceived by a group of people involved in a situation of interest. Drawing on methodological literature on rich pictures with sensemaking theory, visual methods and practice, case applications, and an example from my work, I argued that rich pictures facilitate sensemaking by helping people surface tacit knowledge, see multiple perspectives, negotiate shared understanding, and identify next actions. The real-life example of a rich picturing process with STEM faculty shows the method in practice. Future directions for evaluation applications include examining implementation processes, identifying emergent consequences, and incorporating practitioner and community tacit knowledge. Methodological research could deepen understanding of how rich pictures work as a process; compare the benefits of rich picturing and its use with other methods; and extend guidance to critical, disruptive, and transformative uses.

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