Body Mapping the Digital: Visually representing the impact of technology on archaeological practice.

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ABSTRACT

This paper uses a participatory, art-based methodology to understand how digital and analog tools impact individuals' experience and perceptions of archaeological recording. Body mapping involves the creation of life-sized drawings and narratives representing individuals' lived experiences, perceptions, and meanings within their social context. With data gathered during a series of focus groups, this paper explores body mapping as a visual research method in understanding the lived experiences of archaeologists with respect to changes brought about by digital technology.

While still ongoing, this research aims to encourage archaeologists to consider their evolving relationships with technology. Preliminary studies suggest that there are significant pedagogical, cognitive, and professional implications to consider when replacing analog with digital approaches in archaeological recording.

Keywords: archaeological methods, analog recording, digital archaeology, embodiment, body mapping, art-based research

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Introduction

Recording during archaeological fieldwork has developed from relatively rudimentary diaries and notes during antiquarian excavations to more routinized pro forma, developed in part in the United Kingdom as a response to large, urban excavations. With the advent of digital technologies, archaeology has adopted a range of technological solutions to address archaeological recording. Digital systems have been embedded within post-excavation processes for many years, with most finds and environmental recording work now born digital. Recent years have seen the pace of the so-called 'digital turn' accelerate, as mobile computing has expedited the full digitalization of archaeological workflows (Costopoulos 2016). A growing number of projects are choosing fully paperless recording, with tablets replacing context sheets while hand drawings are exchanged for digital drawings or replaced by 3D based methods altogether. With the promise of accuracy and speed, as well as of gaining novel ways of viewing archaeological evidence, a celebratory dialogue has developed around these technological advancements emphasising the efficiencies that digital tools have brought (Roosevelt et al. 2015; Berggren et al. 2015; Taylor et al. 2018).

While digital recording technologies have frequently been hailed for their benefits, rarely do these novel approaches bring critical methodological reflection on fieldwork practices (Perry and Taylor 2018). Concerns have been raised regarding the focus on speed and efficiency within digital archaeology and the impact of these technologies on training, analysis, and data preservation (Caraher 2016; Kersel 2016; Morgan and Wright 2018; Morgan et al. 2021; Perry 2018). Digital systems often mirror paper-based systems without considering how these novel datasets contribute differently to the analysis and dissemination of the archaeological record. As a result, the adoption of technology in archaeology has frequently pushed pre-existing frameworks and exacerbated issues present in archaeological field practice. While archaeological excavations have become increasingly efficient over the years, there have been concerns that this trend towards speed may compromise our understanding of the site. Traditional archaeological methods require archaeologists to spend more time in the field, carefully excavating each layer, drawing and recording their findings. Their digital counterparts, designed for speed, often result in fieldworkers engaging less intimately with the site during the recording process (Morgan et al. 2021).

Digital recording has been introduced in archaeological fieldwork, and while there have been studies regarding their proposed utility in increased speed, fidelity, and even reflexivity (Sapirstein 2020; Roosevelt et al. 2015; Berggren et al. 2015; Taylor et al. 2018; among others), there has been little examination of the impact of digital recording in the commercial sector. There are many questions raised by the mass adoption of digital archaeological recording techniques, including: How do digital recording strategies impact the documentation and interpretation of archaeological remains in the field? In what ways does the transition to digital recording impact the experience of fieldworkers? Do digital technologies facilitate or impede recording workflows in the field?

To gain insight into these problems and knowledge production in archaeology as a whole, this paper uses a creative, art-based methodology in order to empower archaeologists to consider the changing relationships between mind, body and practice brought about by digital technologies. Research incorporating alternative forms of knowledge have demonstrated the potential of visual methods in qualitative research (Letsiou 2017). In recent years, body mapping has gained increasing recognition within research communities as an art-based approach that extends beyond the limitations of words in conveying the complexities of embodied experiences (Skop 2016). With data gathered during a series of focus groups, this paper explores body mapping as a visual research method in understanding the experiences of archaeologists in regard to changes brought about by digital technologies.

This research complements existing research (e.g., Morgan et al. 2021) in understanding the cognitive and physical impacts of digital recording in the context of archaeological fieldwork. It represents preliminary investigations derived from a wider AHRC CDP funded project, co-supervised by the Department of Archaeology at the University of York and the Museum of London Archaeology (MOLA) which investigates the impact of digital methods on the documentation, interpretation, publication, and dissemination of archaeological knowledge. This research will provide the background to understanding digital recording in terms of the long tradition of archaeological craft at MOLA, with particular attention to the process of archaeological knowledge production, the role of fieldworkers, and the changes brought about by digital recording technologies in archaeological fieldwork.

Body Mapping

Body mapping is an established form of art-based research that examines the way in which participants interpret, give meaning to and make sense of their experiences within their social context. As a participatory research method, body mapping focuses on constructing a narrative through creative, reflexive and emotive means, viewing the body as a space of inquiry. Rooted in feminist theories of embodiment and multiplicity of experience, body mapping is a visual and visceral approach that seeks to communicate complicated lived experiences in a way that goes beyond the scope of language (Haraway 1988; Moss and Dyck 2003; Jokela-Pansini 2021). It employs visual storytelling to illustrate social, political and economic processes of an individual's lived experience through the creation of life-sized drawings (body maps) as part of a reflective and creative process and has been employed by a range of disciplines for both therapeutic and research purposes (Gastaldo et al. 2012).

The approach originated in Jamaica as an art therapy to investigate female sexuality (MacCormack and Draper 1987) and was subsequently developed (seemingly independently from the previous study) to explore the personal and political dimensions of HIV/AIDS (MacGregor 2009). An initial facilitation guide was developed by South African artist, Jane Solomon (2002), and used as an international training tool. Using this guide, the approach was further developed by clinical psychologists as a therapeutic way to record stories (Morgan 2003). The technique was later adapted for research as a way to encourage participant reflection through a narrative process (Gastaldo et al. 2012). Body mapping has since developed as a research method used to explore a range of topics, including health related issues (Skop 2016; among others), sexuality and gender, psychological trauma (Santen 2014, 2015), experiences of discrimination (Gastaldo et al. 2012), urban planning (Sweet and Ortiz Escalante 2015), and workplace risks (Keith and Brophy 2004; for a full review see de Jager et al. 2016).

The body mapping process varies depending on its application and purpose and can last anywhere from a few hours to several days. The researcher begins by introducing body mapping as an approach, its process and its application in the study, ensuring participants are informed about how the resulting data will be used. Once consent has been obtained, participants are asked to trace their body outline on large paper before commencing a series of reflective exercises. The process is facilitated and guided by the researcher, who encourages participants to consider symbols, colours, feelings, and environment as they reflect on their embodied experiences (Gastaldo et al. 2012). Participants are encouraged to portray their experiences in the manner which makes sense to them without restriction to a singular mode of communication.

Through this creative approach, participants are empowered to consider their experience beyond the boundaries of language, allowing for the representation of sensory, physical, and emotional dimensions of experience. The body mapping process draws participants' attention to their bodies and embodied experience, encouraging awareness and reflection. It offers participants an empowering means to communicate ideas, experience, and meanings in the way they would like it told. As a result, the process has the potential to engage and enable its participants to communicate creatively through a deeper, more reflexive process. Body Mapping challenges ideas that the social world can be explored using solely language and aims to represent otherwise intangible and difficult dimensions of experience (Baerg 2003). As such, body mapping is a holistic approach which examines the interplay of individuals' mind, body, and social context, gaining access to their perceptions, meanings, and the explanatory models they bring into an encounter. In this way, the process of body mapping moves beyond Cartesian dualism by bringing together participants' minds, bodies, feelings, thoughts, experiences, and social interactions (Skop 2016). Crucially, when participants are provided with the extended process of body mapping, they can identify insights that may not arise in conventional interview approaches. The approach lends itself to alternate story telling while providing the capacity for eliciting feeling states among participants, creating an atmosphere conducive towards introspection, reflection and the organisation of emotions and meanings. These elements made body mapping a compelling research methodology to address the questions central to this research.

Exploratory Workshops

This study uses body mapping to capture rich, multidimensional information on the impact of digital recording on the embodied experiences of archaeologists to understand the cognitive and physical impacts of digital recording in the context of archaeological fieldwork.

Pilot Study

An initial pilot study was conducted amongst the three named researchers and a volunteer archaeologist. We tested the method on a small scale, with the aim to evaluate its potential in exploring the transition from analog to digital recording. This took place after a day of excavation at the Hili-16 Archaeological Excavations in the United Arab Emirates (UAE), so the experience was fresh in our minds. Using an A4 piece of paper, participants drew a body outline and illustrated the impact of analog recording on their experience in the field. The exercise was then replicated using another sheet of paper, but focused on the impact of digital recording, resulting in two separate body maps (Fig.1).

Participants took turns sharing their narratives, using the body maps to reflect first on their experience recording with analog tools, then digital. Even at this scale, body mapping showed promise in exploring individuals' experience of this transition, highlighting key themes for exploration. It became clear that issues surrounding engagement, movement, interactivity, agency, and collaboration were at the centre of tensions between analog and digital recording.
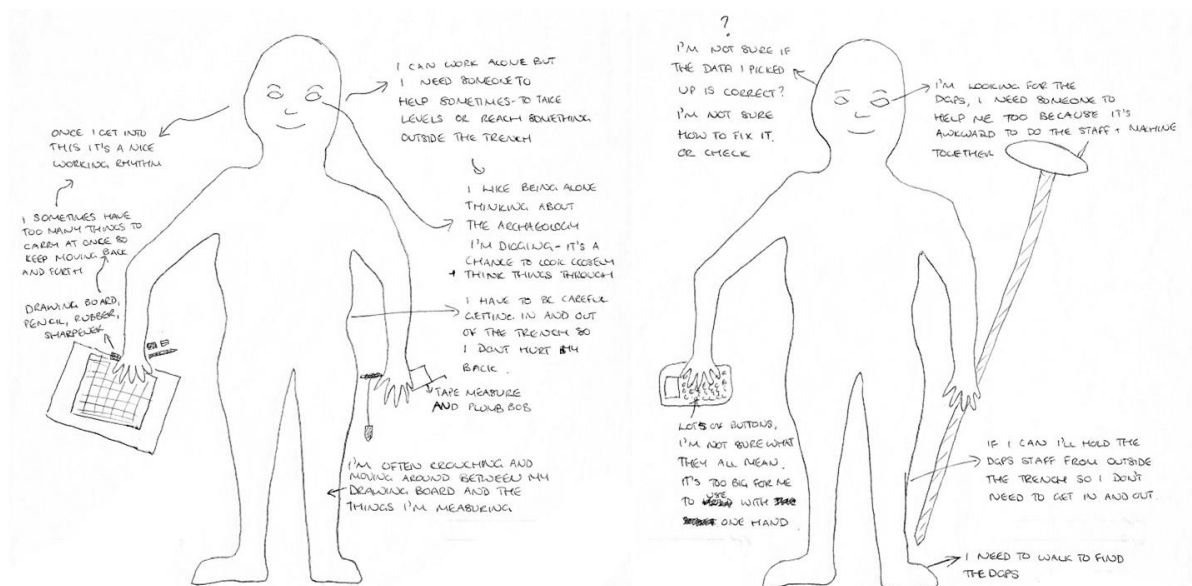

Figure 1: Examples of exploratory body maps from the pilot study, exploring analog recording (left) compared to digital approaches (right).

Focus Groups

Following the initial pilot study, two further exploratory focus groups were conducted in order to explore body mapping at its full scale. The initial focus group was held in the Digital Archaeology and Heritage Lab at Kings Manor (University of York). Our call for participants, shared among postgraduate students and staff at the University of York, resulted in the recruitment of eight participants with varying fieldwork experience in both research projects and commercial excavations.

Table1: Length of participant involvement in archaeological fieldwork.

Amount of experience	Number of Participants
0-1 year	4
1-3 years	4
7+ years	10

The second study took place at MOLA offices in London and focused on the lived experience of commercial archaeologists. The call for participants, shared with both the field and survey teams at MOLA led to the participation of six archaeologists with varying levels of experience in fieldwork, project

management and geomatics. As colleagues and co-workers, this group of participants were much more familiar with each other resulting in a relaxed environment.

These sessions began with an introduction to the study, body mapping as a method, and a breakdown of the session. As some of the participants had not been in the field for some time, we used photographs from our recent fieldwork in the UAE as memory aids, but otherwise did not define what constituted analog or digital recording.

Figure 2: Body tracing in progress. Left: Participant laying on large paper as their body is traced. Right: Rolled out paper roll with participant bodies traced.

Large metre wide paper rolls were then spread out onto the floors and art materials provided to participants, including pens, paint, markers, brushes, and sponges. As an initial exercise, participants were asked to consider their practice and choose a posture to be traced for their body map. The exercise demanded a degree of vulnerability for participants, as they laid down on the floor and trusted another individual to trace the outline of their body (Fig.2). However, the size and personal nature of the exercise also allowed for greater commitment and investment throughout the process inviting deeper reflection.

Once all participants had had their body traced, they were shown slides relating to each recording type (analog/digital), with accompanying prompts. Participants were asked to reflect on their use of analog and digital recording respectively, and communicate, by putting to paper in different colours/mediums, elements of their experience documenting using each approach.

Figure 3: Participants engaged in the body mapping process, visually translating their experience of analog and digital recording onto their body maps.

The resulting body maps were then used as a reference, as participants shared their narratives with the group, eventually provoking group wide discussion on the challenges of each approach. It was evident for both groups that the provided time frame was just short of sufficient and perhaps three hours, as opposed to two, would have been better suited for this adaptation and scale of the body mapping process.

Analysis and Results

The dataset for this study includes participants' narratives, the body maps, and any researcher notes made during the session. Sessions were recorded and analysis began by reviewing the audio and photographing the body maps. The sessions' verbal recordings were transcribed and cleaned and uploaded into the qualitative data management software program NVivo 12 and used to code and analyse the transcripts.

The study adopted an inductive approach which involved reviewing the transcript multiple times and generating initial codes line-by-line. These codes were further refined to develop axial codes through the systematic organisation of data into wider categories and subcategories. The organisation of data ultimately facilitated the identification of thematic codes which aimed to provide a comprehensive understanding of participants' experiences (Braun and Clark 2006).

Figure 4: Participants standing in front of their body maps as they reflect on and describe visual elements (colours, symbols, lines, shapes) representing their experience of analog and digital recording.

4.1 Thinking about the Body

The body maps created by the participants depicted a range of responses and when describing their experiences with analog and digital recording, several themes emerged consistently. Due to the nature of the research approach, participants' attention was drawn to their bodies, encouraging the characterisation of experience in physical and sensory terms: How they were moving in relation to the archaeology and other fieldworkers; The posture they adopted; What their hands were doing; What they were looking at; What they could smell, and where an experience was felt on the body. For example, one participant illustrated the visceral, gut feeling they associated with analog recording, *"I don't know where my guts are...but I feel that when you do, um, analog, you also involve your feelings more"* (Fig.5)*.*

In addition to its instinctive nature, it was clear that analog recording required greater physical load, many emphasized various areas of physical pain (back, knee, hand, elbow).

"it's more labor intensive to do like analog because I just think of all the bending down, standing up, bending down, squatting in the trenches trying to get your drawings in and measurements and how long you're stood in a position to draw something".

Surprisingly, despite the added physical labour and chance of injury, participants still expressed a preference for analog recording, finding it *"easier to engage"*. One participant described that while *"there were sort of negatives to [analog] in terms of the, of pain and possible personal risk, but I also did really enjoy it because I felt a connection to, to what we were doing".*

When comparing analog and digital recording approaches, participants identified differences in proximity and interactivity. In reference to digital approaches, one participant pointed out the greater distance when recording*, "I'm usually standing up with photogrammetry compared to when I'm drawing, um, which is usually quite up close to the archaeology".* Participants noted that the greater level of interactivity involved when using analog recording facilitated a deeper engagement between the

recorded material and their own cognitive processes, whilst digital approaches shifted the interaction towards a screen (Fig.6):

> "You've got the dirt falling from the hands as well, sort of like the archaeology is at your fingertips. It's right there. It's, it's engaged with you. As opposed the hand over there. It's more of the circuit. Your hands are used for the digital, the moving of screens rather than anything else".
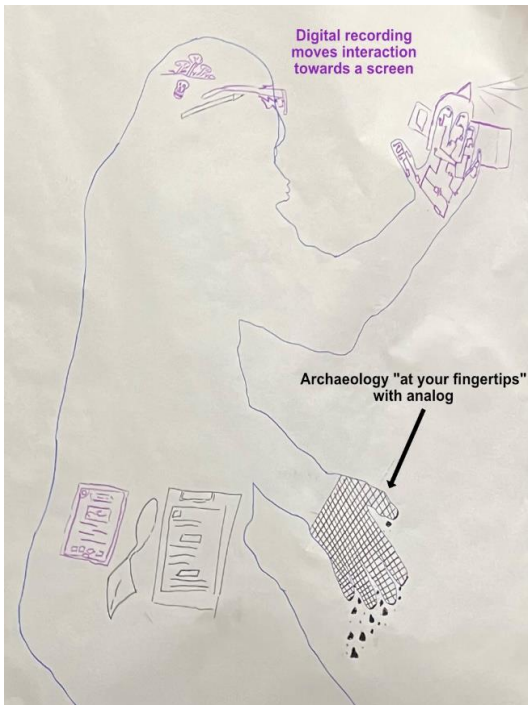

Figure 6: Body map example showing comparison in interactivity when using analog (black) recording as opposed to digital (purple) recording.
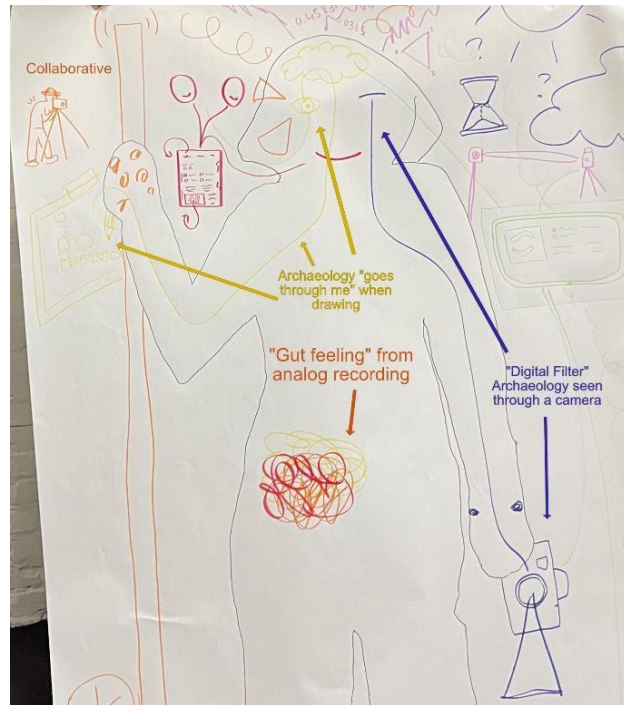
Figure 5: An example of a body map created by study participant. Analog recording is illustrated in warm colours (yellow, orange, red) while cool colours (blue, purple, green) are used for digital recording.

The act of manually engaging in the recording process requires an individual to closely observe, explore and interpret the archaeological objects or features, facilitating mental headspace. It allowed individuals to *"see things better"*, making it *"easier to understand the archaeology"*. This active involvement promoted heightened cognitive engagement, allowing individuals to make connections, identify patterns, and develop a more nuanced understanding of the recorded material.

Of particular interest were themes surrounding movement and embodiment, *"the top half of my body is where I think about when I'm doing analog recording…cause I'm like using my hip to lean things…my legs just don't seem to come into it. It's all about this part of my body"*. One participant intentionally engaged less in creative aspects of the process, relying on a couple of symbols to convey how little they were aware of their body when recording digitally, *"when I'm thinking about digital… I think about my legs a lot more because I'm aware that I'm moving and that I need to not step on things but the rest of my body kind of disappears. I don't think about it"*. In general, depictions describing the impact of digital recording were less likely to feature embodied aspects of experience.

4.2 Tangibility, Adaptivity and Agency

It was clear that many participants preferred analog recording, considering it more comfortable and familiar. One participant characterised analog recording as *"second nature"* while associating the change brought by digital methods and a discomfort, requiring increased mental effort, *"I can't just do it off the top of my head…which is mentally draining"*.

This discomfort was shared by various other participants, particularly those with significant field experience. Yet, amongst those with under three years' experience in archaeological fieldwork, three participants expressed that having been trained in both from the start of their career, they felt equally comfortable using either recording system or believed their applicability was dependent on the needs of

each project, *"I don't feel like my interpretations change, whether I'm doing digital or paperwork just because I am digitally like coherent and comfortable enough with it".*

One participant expressed that they trusted each approach differently; analog recording involved tangible engagement, the archaeologists must intentionally execute each component of the recording process *"I'm physically doing each element and putting it to paper and so I'm trusting it because I'm physically seeing myself do it"*. On the other hand, digital recording methods offered increased accuracy and reduced the likelihood of human error, but its data only existed digitally: *"you're just pressing a button, you're typing some stuff in and it kind of, you know, disappears for the moment"*. The ethereal nature of digital data was similarly noted by another participant: "the archaeology only exists in your head digitally, it's all virtual. It's not at your fingertips anymore…the information still exists, but it exists absent from those other tools".

Furthermore, it was communicated that when using digital approaches, the recorder's sense of agency and control diminishes, specifically in circumstances where recorders must rely on specialists: *"then kind of similar to what was discussed about having to be reliant...sometimes with tech like you have to rely on somebody else because you may not fully understand it"*. Several participants also highlighted the inflexibility of digital data entry when discussing adaptability in the field. Paper records are *"easily adaptable to changing situations. So if someone happens to accidentally machine out something, you can really quickly record something on a bit of permatrace in any way that you need to"*. Whereas with digital methods *"you can't actually just adapt the system, you have to use it as it is. You can't without a lot of effort...you can't change it for something off the hoof or on the fly"* (Fig.7). Using paper recording, archaeologists can make real-time adjustments to their recording, adding or refining details as necessary. This interactive process empowered them to actively shape and refine their understanding of the archaeology being recorded.

However, the added effort needed to make changes to digital data often resulted in these changes being dismissed or forgotten all together: *"if it's been drowned out and buried by 200 of other entries, you're very likely going to forget that that was even a thing".* Another participant agreed, *"mentally, you're gonna go, oh, I need to make a note to change that. But then by the time you get through everything, you just forget"*.

Many participants remarked on the depth of information captured through by-hand drawing that was lost when replaced by digital planning, which could be done "*from a distance*" and only captured *"an outline and not all the details of the feature"*. Furthermore, in reference to the interpretative power of by-hand drawing, one participant described a loss in understanding: *"I think there might be a certain loss with digital recording, to do with the drawing because sometimes when you're drawing in the field, you're interpreting as you draw"*.
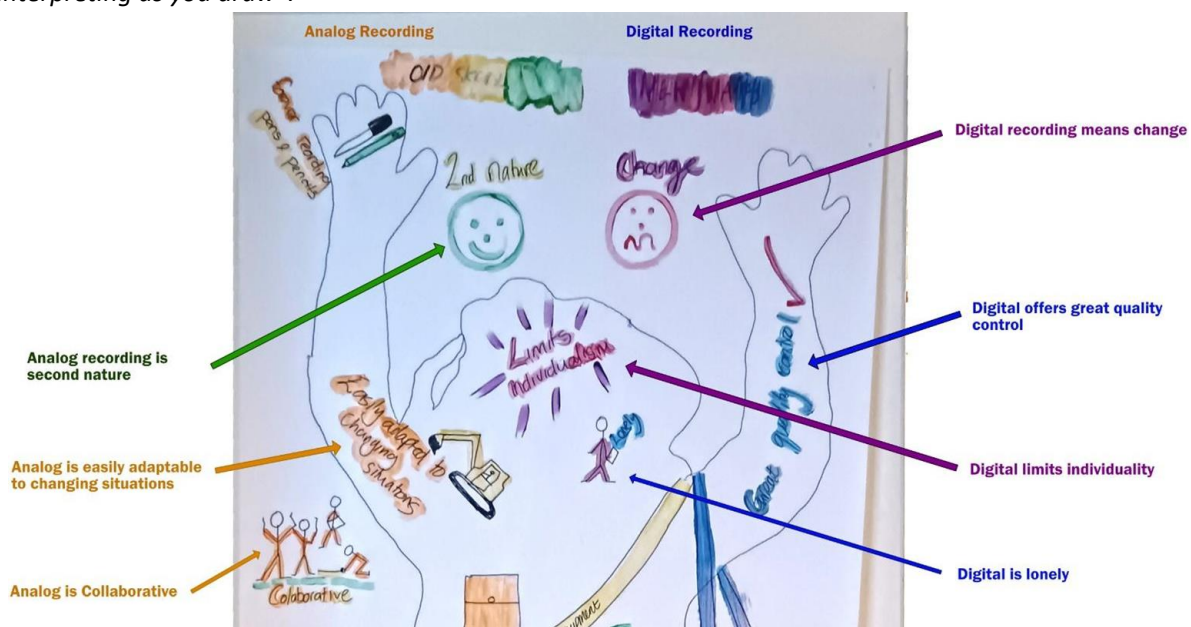

Figure 7: An example of participant body map showing various themes related to their experience of analog (left) and digital (right) recording.

4.3 Feedback and Connection

Analog recording was characterised as facilitating collaborative data collection and on-site interaction among team members (Fig.8). Several members of the team can take part in the recording process simultaneously, fostering the dynamic exchange of ideas, cross-checking of data, and collaborative decision-making during fieldwork:

> "So old school, from my perspective, I think it's way more collaborative, I think you have to talk to people, you have to get people to hold like the end of the tape, then…you have to go and get their piece of permatrace off them, you have to go and look at their context sheets".

Figure 8: Participant body map illustrating on site collaboration and feedback which occur using analog tools.

Digital recording, on the other hand, was described to enhance feedback through the ease of data sharing between the field and the lab, promoting remote collaboration, efficient information exchange, and synchronised updates.

Reflection and Discussion

This study provides valuable insights into the physical and cognitive impact of recording approaches on the lived experiences of archaeologists. During data collection and analysis, it was clear that visual and art-based methods facilitated a deep reflection among participants and evoked richer information than verbal interviews. The body mapping process took longer than a verbal interview, encouraging participants to linger longer, reflecting more deeply on the research topic as a result (see narrative therapy practice "loitering with intent", White and Epston 1990; White 2007).

The up close and personal nature of the exercise encouraged participants to consider bodily and sensory dimensions of experience in ways they might not have done otherwise (Fig.9). According to one participant in particular, the scale and interactive nature of the body map encouraged deeper reflection on the use of their body during the recording process:

> "I feel like I stepped out of myself…if you had just said like, tell me what parts of your body you used, rather than like, show me on a drawing. I would never have considered so many different parts of my body…Like what does this limb actually...how is it useful in archaeological recording?".

Fieldworkers have frequently been described as having "no voice" in literature (Lucas 2002); however, this approach shifts the dynamics of the interview process, putting the narrative power in the hands of the archaeologists. In this way, participants have authority and play an active role during the research process, making decisions on how to represent their own experiences in a personal manner.

Consistently noted in the results of this study is the perception among participants that analog and digital recording techniques both provide value, in different ways, for the documentation and interpretation of archaeological remains. It was clear that participants believed that the two approaches were not comparable, offering different levels of interaction, engagement, and cognition during the recording process.

Figure 9: Participant standing next to their body map imitating the traced body posture on their map.

The perceived gains brought by digital technologies were undeniable and included increased speed, ease of access, and the ability to examine features from new perspectives. In line with Taylor and colleagues' (2018) observations on the benefits of digital access in the field, participants in this study, in particular those working in the commercial sector, highlighted an enthusiasm for access to lab and specialists' data. However, while many argued in favour of digital systems, they still found issues with the replacement of analog drawing with digital alternatives. Morgan and colleagues (2021, 625) conclusions that "drawing is both essential to archaeological recording and of great pedagogical importance" is very much echoed in the results of this study. The unique role of by-hand drawing played in archaeological recording was shared by all participants in this study, who also expressed deep frustration with the impending nature of digital drawing software's.

Conclusions

The application of body mapping in this study has proven a useful tool in encouraging participants to consider bodily and sensory dimensions of experience when using analog and digital recording approaches in the field. In this approach, participants were encouraged to pay attention to their embodied experiences, promoting reflection on the interplay of the mind, body, and environment in the process of archaeological recording. Using this holistic approach, this study was able to highlight the role of embodied cognition and enactive knowledge in archaeological recording. The findings indicated a clear appreciation for the tangible and sensory aspects of analog recording, which fostered a deeper connection with the archaeological material and contributed to a sense of ownership and control over the recorded data. Digital recording, however, offered advantages in terms of data capture, efficiency, feedback and data sharing, enabling remote collaboration and information exchange. The study underscores the importance of recognizing the value of both approaches and adopting a balanced approach that leverages the strengths of analog and digital methods to enhance archaeological documentation and interpretation. Future work on this research will further refine the research methods and recommend holistic solutions that address the problems and opportunities of digital and analog recording in archaeology.

Funding and Disclosure

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