The Obstruction Manual: Insights on Sharing Instrument Design Knowledge for Active Learning

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Abstract

This paper addresses two longstanding challenges in the instrument design field: sustaining knowledge and practices embedded in an instrument over time, and sharing them educationally. We introduce the Obstruction Manual as a way to disseminate digital instruments and inspire variations rather than support replication. By strategically omitting some technical details while emphasising design speculations, contexts and processes, we aim to set in motion a productive struggle that poses challenges and surfaces insights, fostering active learning and creative adaptation. We report on the process of creating an Obstruction Manual for an existing instrument, describe its structure and content, and discuss how this approach supports both DMI education and longevity.

Keywords

Obstruction Manual, Knowledge Transfer, Sustainability, Documentation

1 Introduction

The debate on long term engagement with newly designed instruments has greatly evolved over the years. On the one hand, late discourse on sustainability has addressed stable use in relation to distributing cost over a longer lifespan [40], promoting reuse repair and hacking as virtuous approaches [18]. On the other hand, researchers have tackled sustainability of DMI (Digital Musical Instrument) knowledge itself, addressing both the preservation of embedded knowledge [40] and the replicability of instrument-based studies [21]. These approaches emphasize open-source and communities-oriented development [43], comprehensive documentation [12], and the centrality of knowledge-sharing [59].

Yet these issues have deep roots in the field as the NIME community has been concerned with the transfer of design knowledge, as well as the nourishment of instrumental practice, since its beginning [54]. The NIME literature offers various contributions of educational activities [29], such as reports on workshops [6], and university courses [50]. We aim to contribute an unorthodox perspective to this debate: that design knowledge sharing can promote deeper learning through intentional speculation and structured incompleteness.

This paper leverages the manual as an archetypal tool for knowledge sharing, mediating among practitioners (such as designers, composers, and performers), their communities, and the material affordances of the instrument itself. Our stance is that when manuals are chosen for dissemination, they warrant the same critical attention as the instruments themselves. Beyond their documentational and educational functions, manuals actively co-constitute the discourse that shapes how instruments are understood and used [44].

The work presented here constitutes the first phase of a project, where the second will involve expert DMI practitioners replicating an instrument using our approach, allowing us to examine whether and how our method scaffolds understanding, creativity, and the development of craft knowledge. This paper focuses on creating a manual for a specific instrument, the Chowndolo, and retrospectively analysing its design process to identify strengths and challenges in crafting DMI documentation that serves both pedagogical and knowledge-sharing purposes.

2 Background

Documentation and sustainability.

The practice of building digital musical instruments involves an extremely wide variety of crafts and techniques, from traditional woodworking to firmware coding and digital fabrication. This complexity, along with the experimental and bespoke nature of DMIs [7], makes knowledge transfer particularly challenging [59], contributing to a pattern where many instruments exist only as one-off prototypes or short-lived research artifacts [39]. This tendency toward "disposable instruments" [14] is reinforced by a disciplinary emphasis on novelty that can undervalue practices of reuse, modification, and sustained development [40].

Researchers have identified documentation as crucial for preventing this early disposal and the resulting waste of resources [39] and knowledge [40]. Calegario et al. highlighted the need for the community to address documentation quality and suggested a "checklist to help designers and developers to share their projects to increase the potential for replicability" [12]. More systematically, Fiordelmondo et al. provided a model for effective repositories containing source files, diagrams, schematics, and pictures [21]. However, such practices are not widely implemented [12], and repositories often lack the clear explanations necessary to enable others to reproduce, assemble, and use DMIs effectively [21]. In a nutshell, source code or fabrication files alone risk being insufficient to convey how an instrument is assembled, understood, or played.

This shortcoming points to deeper questions about what documentation should achieve. Many digital instruments occupy a space between artistic practice and technical experimentation, where complete procedural clarity may conflict with the open-ended and exploratory nature of a given artifact [36]. This tension extends to the challenge of documenting craft practices. The work of Zayas-Garin et al. on DMI apprenticeship has revealed that practical know-how in instrument making involves tacit knowledge, such as how materials should feel and be manipulated, that is difficult to communicate through documentation alone [59]. They highlight how direct engagement between designers

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and makers uncovers elements of craft knowledge that are often taken for granted, emphasising the embodied and experiential dimensions of digital lutherie.

Our work situates the instruction manual within this productive tension, building on the recognition of tacit knowledge, while proposing an alternative to direct apprenticeship. We draw on open hardware principles while strategically leveraging the inherent incompleteness of instructional design to engage practitioners in the active construction of their own knowledge.

Knowledge Transfer and Learning.

Since the first conference, interest in NIME education has grown steadily [27, 37, 38, 47, 54]. Yet when we focus on instrument design, the literature offers few contributions on creating teaching resources or instrument documentation for educational purposes. The closest examples are reports on university courses [32, 51], which primarily target newcomers and, reasonably, do not explicitly address the transmission of tacit craft knowledge in instrument design.

Our work builds most directly on the DMI apprenticeship by Zayas-Garin et al. [59], although they were "more interested in the replication aspect of the apprenticeship than the directional transfer of knowledge". We aim to address this gap by foregrounding knowledge transfer as an active learning process [8] where practitioners are provided with contextual guidance but must actively find their own technical and artistic solutions, enabling variation and creative adaptation.

Our approach is loosely grounded in Vygotsky's concept of the Zone of Proximal Development (ZPD): the space between what learners can accomplish independently and what they can achieve with guidance [15] - originally developed for child learning but widely applied to adult education [31]. Rather than providing (impossible) complete instructions or leaving practitioners (entirely) unsupported, we position documentation within this liminal space. The Obstruction Manual operates as a form of open scaffolding [57], offering rich contextual information while withholding key details. By intentionally creating strategic gaps (obstructions), we invite practitioners to draw on their own knowledge and experience [4], prompting reinterpretations of the conveyed design.

Lastly, broader interaction design discourse debate on how design knowledge is captured, transferred, and reactivated through material practice: Gaver et al. frame ambiguity as a resource for interpretation rather than a failure of clarity [23], Andersen and Wakkary show how open-ended making can surface personal design knowledge [5], and recent work on digital craftsmanship foregrounds samples and documentation as situated means for making tacit material knowledge shareable [3, 25].

These gaps, however, are not empty voids. Drawing on educational research that embraces artistic and speculative approaches [10, 33], we populate these spaces with open-ended insights derived from diverse iterations of the instrument rather than a single realized version. By presenting a speculative amalgamation rather than a faithful documentation, the manual functions as generative resource rather than archival record.

3 Methods

Our work builds on an existing instrument: the Chowndolo [42] - a pendulum-based instrument consisting of a suspended pendant with an attached magnet and coil, a metal base, and a set of configurable magnetic tiles. Performers interact by placing magnetic tiles on the base in different spatial arrangements, inducing the pendant to oscillate. The resulting magnetic field interactions between the pendant's magnet and the coil generate an analogue signal, which is amplified and mapped to control parameters of an FM synthesizer. The artefact serves as a situated case study for documentation.

This paper's methodological focus is the design process of the manual itself rather than its use in practice. We therefore analyse the documented decision-making, negotiations, and iterations through which the manual's structure, content, and rhetorical stance emerged, treating documentation as the primary design artefact and site of inquiry. Evaluation with external practitioners is outside the scope of this paper and is instead positioned as future work.

Our research adopts a practice-based approach [2, 13], using the design of an instruction manual for an existing instrument as the primary site of inquiry. The manual itself functions as a designed artifact through which questions of documentation, learning, and iteration in NIME are explored. More specifically, we adopt reflection-on-action methods [45, 53], documenting the design process and reflecting critically on decisions after meetings, conversations and design iterations. Rather than evaluating the instrument's performance or usability, reflection focused on how different documentation strategies revealed, obscured, or reconfigured understandings of the instrument and its use.

The design process central to our inquiry was conducted by two researchers (first and last author of this paper) with different backgrounds and expertise. One with a background in industrial design and sustainability of digital fabrication, the other with a music-technology background mainly working in the field of human-computer interaction with an interest in speculative and critical making. The second author, a researcher specialised in sustainability within NIME practices, contributed by supervising the data analysis and discussing the outcomes of the process.

The collaboration unfolded over approximately one semester, during which the two researchers interacted through weekly meetings and maintained ongoing communication via digital messaging. The tone of the interactions was informal and often marked by humour[52]. The first author maintained a design journal throughout the process. Meeting transcripts, message history, and journal entries formed a qualitative record of the design activity. This corpus was retrospectively analysed by all authors, serving as the basis for the discussion presented in this article.

As each of us brought distinct perspectives to the process, questions concerning what knowledge should be made explicit in the manual soon arose. Negotiating authorship, expertise, and interpretation through the manual's design became central to the inquiry. Rather than aiming to extract generalizable guidelines, our analysis focuses on articulating how specific documentation decisions emerged, shifted, and were negotiated over time, and how these decisions relate to broader concerns in NIME research. In particular, the process discussed below aims to provide insights into the development of documentation as a situated design practice, exploring critical decisions involved in making instrumental knowledge available, and surveying the implications of treating documentation as an interface that prompts learning, appropriation, and long-term engagement with DMIs.

4 Processes

We now examine the process behind the production of our documentation material. We trace the evolution of the manual across

Table 1: Documentation versions, key changes, and decision rationales.

Version	Version name / label	Key changes introduced	Decision rationale
A	IKEA-style step-by-step manual	Linear assembly sequence; procedural structure; diagrams; emphasis on order and component hierarchy	Initial assumption that documentation should guide reproduction through explicit procedural instruction
B	Exploded / modular manual	Step-by-step sequence removed; exploded views of parts; subsystems; writing diagrams; assembly via nested layers	Avoid over-directing users; shift from procedural instruction to structural intelligibility of the instrument
C	Hybrid manual with conceptual layer	Inclusion of background and frameworks; later compression into a single diagrammatic gesture	Balance reflective content with legibility; reduce visual clutter and user confusion
D	Two-layer documentation system	Separation between printed manual and online repository; manual PDF hosted alongside canonical files	Acknowledge limits of documentation as an ecosystem rather than a single artifact
E	Foldable poster-booklet format	Large sheet foldable into A5 pages; strict one-topic-per-page rule; modular visual layout	Treat documentation as a designed object; enforce clarity and modularity through format constraints
F	"Obstruction manual" (rhetorical shift)	Reframing of the booklet; explicit framing of non-compliant instructions; rhetorical stance	Distance from compliance-oriented instruction; position the manual as reflective and generative
G	Distribution and finalisation	Explicit PDF vs. print versions; QR codes for troubleshooting and resources; access priority added	Support different circulation contexts; manage evolving usage and ongoing updates

multiple versions and foreground the design decisions that shaped each iteration. To make these transformations visible, we present all developed versions in Table 1, and discuss in detail the decisions made and their underlying rationale.

From the outset, the documentation was conceived with a specific user profile in mind: expert digital luthiers familiar with embedded systems, signal flow, and experimental instrument building. This imagined audience informed both the technical depth of the explanations and the degree of implicit knowledge assumed throughout the text. Moreover, since the early steps, the manual was not conceived as a stand-alone document but as part of a distributable kit containing essential components. An online repository containing technical details of the project was also produced [1].

From procedural instruction to structural intelligibility.

Early documentation efforts were oriented toward a linear, procedural model inspired by assembly manuals such as those produced by IKEA. Initial project notes explicitly describe the expected outcome as *"a step after step manual like the IKEA ones"*, positioning the manual primarily as an instructional guide for reproducing the instrument.

This approach foregrounded sequence and compliance: parts were to be assembled in a prescribed order, and diagrams were expected to function as authoritative instructions. However, this framing soon became problematic. Concerns emerged that a strictly procedural manual would over-determine the user's actions and obscure the underlying logic of the instrument. This tension became explicit when one collaborator expressed a preference to avoid a step-by-step format altogether, prompting a redesign of the documentation structure: *"since he mentioned that he prefer not to have a step by step manual, I redo... providing an exploded vision of all the parts"*.

This shift marked a critical change in what the documentation was expected to do. Rather than instructing users how to assemble the instrument, the manual increasingly aimed to make the instrument intelligible — to expose relationships between components, subsystems, and materials. Exploded views, wiring diagrams, and sectional "zooms" replaced linear sequences, supporting interpretive engagement rather than procedural compliance.

Negotiating what information belongs in a manual.

As the documentation evolved, a recurring question concerned the scope of information appropriate to an instructional format. Most critically the manual omits: step-by-step assembly tasks, specific fabrication techniques, detailed electronic schematics, a complete materials list, thorough explanations of the sound synthesis technique, and introductions to the Pd language or Bela platform. These strategic omissions reinforce the idea that documentation require creative response and active reinterpretation rather than merely transmit procedures.

Furthermore, the inclusion of conceptual background, prior versions of the instrument, and inspirational references became a point of friction among us. While these materials were central to the project's development, their presence in the manual risked overwhelming or confusing users unfamiliar with the instrument's history. The resolution took the form of a single, schematic genealogy or timeline that condensed the instrument's evolution into an at-a-glance overview, while removing redundant imagery: *"I also simplified the conceptual part… removed some pictures to make our manual more 'essential'"*. Here, the manual functions as a boundary object that must balance completeness with legibility. In this light, limiting conceptual material was not a dismissal of the instrument's history but a recognition that excessive narrative complexity can undermine instructional usability.

Documentation as an ecosystem.

Another significant decision concerned the realisation that the manual could not—and should not—contain all relevant information. Technical constraints played a role in this recognition: many original design files were available only as PDFs rather than editable CAD formats, requiring reconstruction work to generate clear diagrams. More broadly, the diversity of materials involved (software, electronics, fabrication files, assembly videos) exceeded what could be meaningfully represented in print.

In response, the documentation was reshaped as a two-layer system: *"two layer: an online folder containing all the materials (including a PDF of the manual), as well as a printed thing"*. The

[1] https://doi.org/10.5281/zenodo.19892548

printed manual became an entry point — curated, finite, and intentionally incomplete — while the online repository functioned as a living archive containing canonical files and supplementary resources.

This decision reconfigured incompleteness as a design feature rather than a failure. QR codes embedded in the printed manual explicitly point to external resources for troubleshooting, updates, and detailed files, acknowledging the instrument's evolving nature. At the same time, this structure carries pedagogical implications: users are required to navigate distributed resources and engage in a degree of productive struggle to identify context-specific solutions. Rather than minimizing friction entirely, the manual fosters sense-making, reflective exploration and interpretative work as integral to the experience of replicating an instrument.

Furthermore, the team decided that the manual shall be included to a kit containing some basic components that are necessary to re-build a Chowndolo: a Bela board with preloaded Pd patch running on boot, magnets, and the coil used to sense their magnetic field. This shift reframed the documentation as accompanying material to a minimal hardware configuration, aligning written instructions with the practical conditions under which the instrument would be reconstructed or modified. In parallel, a dedicated online repository was established to host detailed files, schematics, code, and updates that exceeded the scope of the printed format.

Format as a driver of meaning.

Material and graphic decisions further shaped the documentation's analytical significance. Inspired by foldable maps, medicine leaflets, and plastic model manuals, the final printed artifact adopted a large format designed to fold into A5 pages. This choice imposed strict constraints: one topic per page, clear visual hierarchy, and minimal text density. These constraints were not merely aesthetic. They enforced modularity and compelled repeated decisions about prioritisation and omission. As noted in the diary, recommitting to the foldable format required renewed discipline: *"one topic per page"* became a guiding rule. In this sense, graphic design functioned as an epistemic tool, shaping how knowledge about the instrument could be organised and communicated.

Naming the manual.

A particularly explicit rhetorical decision was the naming of the booklet as an "obstruction manual." This term was adopted deliberately to distance our documentation from conventional notions of correctness and completion. The name signals that the manual is intentionally vague, a prompt for material exploration and critical engagement. This move reframes the implied user of the manual — not as a consumer or assembler, but as a critical tinkerer. It also aligns with the broader decision to avoid overly prescriptive instructions, such as step-by-step tasks to be performed to assemble the instrument, what specific fabrication technique should be used to make the instrument, detailed electronic schematics, a complete list of the physical and digital material accompanying the manual, as well as thorough explanations of the sound synthesis technique used and an introduction to the Pd language or the Bela platform. Such property of the manual reinforce the idea that documentation can provoke creative making and reflection rather than merely transmit procedures.

Versioning and distribution.

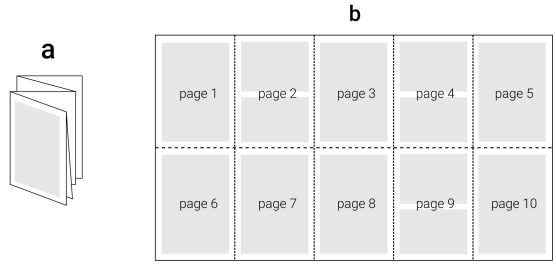

Figure 1: Diagram showing the structure of the manual folded (a) and opened (b).

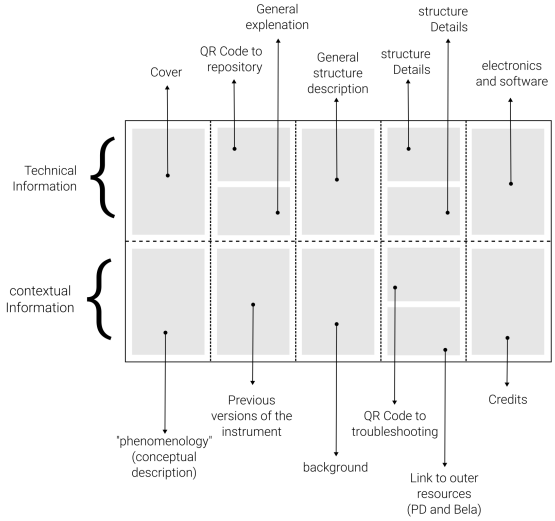

Figure 2: Diagram showing the content of the manual.

Finally, distribution considerations introduced further versioning. Conversations around dissemination explicitly acknowledged the need for at least two variants: a printable artifact and a PDF version suitable for online circulation (*"we need to make 2 versions of the pamphlet, one should be a PDF" transcript*). The distinction reflects practical realities — print availability, reproduction constraints — but also underscores that documentation is contingent on context.

The finalisation phase involved minor but telling adjustments: refining QR codes, adding credits, and ensuring consistency across formats. These late-stage decisions highlight that documentation work does not end with conceptual resolution, but extends into maintenance and care.

5 Outcome

The outcome of this work is a compact, foldable instructional artifact titled *"Chowndolo – Obstruction Manual"* (fig 3). The manual presents a curated snapshot of the instrument at a specific moment in time, explicitly positioned as a non-exhaustive and non-prescriptive form of documentation. This positioning resonates with prior discussions in the NIME community that frame DMIs as evolving assemblages whose knowledge cannot be fully stabilized through technical description alone - see the notion of *instrument snapshot* mobilised in [12, 59]. As stated in its opening section, the booklet *"is not a step-by-step guide for replication, but*

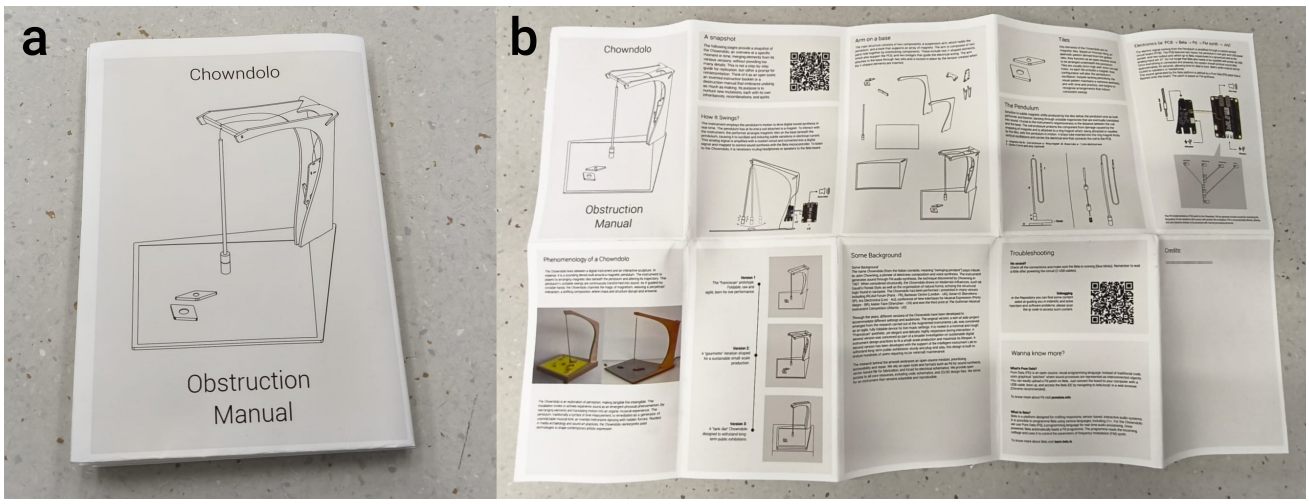

Figure 3: Picture of the manual folded (a) and opened (b).

rather a prompt for reinterpretation", framing the manual as an open score rather than a set of authoritative instructions.

Format and material structure.

The manual is designed as a single, foldable printed sheet (specific dimensions are 740*420 mm, foldable into a compact A5 format, Attachment 1 contains a PDF file of the manual), resulting in a modular layout where each page addresses a single topic. This constraint enforces visual clarity and limits informational density (fig 1). Such setup allows for a variety of modalities: the manual can be completely opened as a sort of poster, as well as kept partially folded, and work as a more compact pamphlet. The rear of the print was kept blank to foster facility of replication (most large size printers allow only for a single side printing) as well as providing the reader with some blank space for annotations and comments.

QR codes embedded in the printed artifact provide access to an online repository containing extended resources, including troubleshooting materials (a Bela program that allows to test autonomously input signal as well as audio output) and technical files (2D vector graphics and 3D model of the structure, electronic schematics, BOM of components and materials), thereby positioning the booklet as an entry point into a broader documentation ecosystem. A PDF version of the manual is also provided in the repository, ensuring accessibility beyond physical circulation.

Content organisation.

The manual is organised into loosely ordered sections combining descriptive, technical, and contextual information (fig 2):

- An opening page presents the Chowndolo as an evolving instrument and establishes the idea of the "snapshot": a synthesis that merges elements from different versions while explicitly resisting the notion of a definitive configuration.
- Structural diagrams describe the main physical components of the instrument, including the suspension arm, base, pendulum, and magnetic tiles. These diagrams are presented as exploded views rather than assembly instructions, emphasising relationships between parts rather than procedural sequences.
- A dedicated section explains the swinging mechanism and the role of magnetic tiles, which are based on Penrose tiling and function as an *"open intuitive score"* for shaping the pendulum's motion.
- The signal chain is described from pendulum to sound synthesis, outlining the role of the custom PCB, the Bela microcontroller, and a Pure Data (Pd) FM synthesis patch. Block diagrams and simplified schematics are used to convey system logic without requiring prior expertise in electronics or audio programming.
- Background sections provide a concise genealogy of three versions of the Chowndolo, situating the instrument within different performance and exhibition contexts.
- A short troubleshooting section addresses common issues (e.g., absence of sound) and introduces core tools such as Pd and Bela, with references to external documentation via QR codes.

Graphic language and tone.

Graphically, the manual adopts a restrained visual language based on monochrome vector drawings, minimal typography, and generous white space. Technical diagrams appear alongside brief contextual descriptions that position the instrument as *"living between a digital instrument and an interactive sculpture"* bringing experiential and perceptual dimensions into dialogue with technical exposition. The title "Obstruction Manual" reinforces this stance, signalling an intentional departure from conventional compliance-oriented instruction and framing imperfection, instability, and sabotage as necessary features rather than flaws. Figure 4 and figure 5 show examples related to technical and contextual information.

6 Discussions

Drafting (a rather fragile) pedagogy of obstruction.

Rather than treating learning as the passive acquisition of predefined skills, this work aligns with pedagogical models that emphasise learning-by-doing, situated participation, and engagement [26]. The Obstruction Manual operates within the lineage of NIME facilitation practices based on direct engagement with materials, enabling newcomers to access design knowledge intuitively through hands-on exploration [51]. The manual aims to function less as a self-sufficient instructional resource and more as a prompt for open-ended exploration. Its intentional incompleteness requires readers to negotiate meaning, test assumptions,

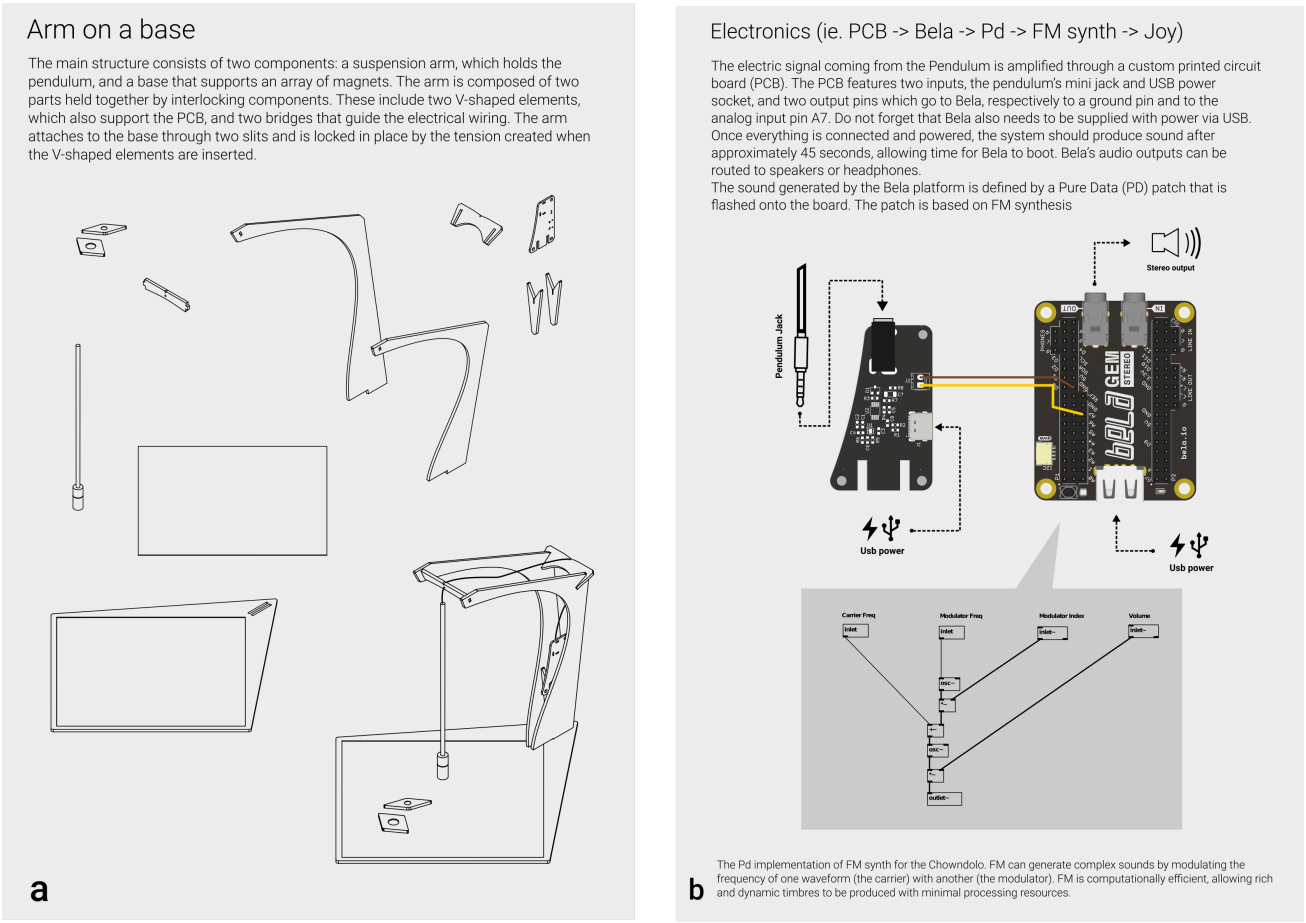

Figure 4: Example of content for technical information: the exploded view of the instrument (a) and a diagram describing electronics and software (b).

and develop their own interpretative strategies, thereby fostering deeper embodied learning.

Viewed through Vygotsky's ZPD, our design process revealed a crucial challenge: how much guidance is enough for an instrument manual? This tension was exacerbated in designing documentation for unknown future users - although our target are expert artists/makers. Our decisions about what to include or omit relied on imagining hypothetical practitioners - sometimes projecting our own learning trajectories, sometimes hoping for a "generalist" middle ground. Our emphasis on design context over technical specification also reflects an untested assumption: that active learning transfers more reliably across skill levels than explicitly providing specific solutions. Moreover, ZPD-based approaches generally assume calibrated, responsive support adjusted to individual learners — yet static documentation cannot adapt to user feedback or adjust support dynamically.

Nevertheless, the Obstruction Manual embraces a deliberately paradoxical stance. It is, in a sense, surreal and almost pataphysical in orientation [35]: it proposes the reconstruction of an instrument that, strictly speaking, does not exist in the described form. By merging elements from different versions and temporal iterations of the instrument, the manual invites practitioners to rebuild something speculative rather than replicate a stable artefact. This gesture aligns with its core intention. Instead of stabilising knowledge into a definitive object, it aims to partially generate design knowledge through productive impossibility.

We argue that this open, playful, and permissive attitude is precisely what allows makers to locate their own productive threshold of engagement. By withholding closure and encouraging reinterpretation, the manual creates conditions in which the task is neither trivial nor unattainable. Practitioners must mobilise prior knowledge, experiment, and reconcile gaps in the documentation. In doing so, they operate within a space that resembles that "middle stretch" in which challenge is sufficient to demand effort, yet structured enough to remain navigable.

The Obstruction Manual orients practice without prescribing it, explicitly inviting readers to reinterpret, adapt, and depart from the documented design decisions. In this sense, the manual's support is conceived as provisional - see the notion of scaffolding in education theory [57]. It aims to stabilise the learner just enough to engage with tasks slightly beyond their immediate competence, while leaving room for divergence and appropriation.

The deliberate omission of technical details can also be understood through the lens of fading within the ZPD framework [55]. While traditional fading involves the gradual withdrawal of support in response to learner progress, the Obstruction Manual anticipates this process structurally. By embedding omissions, it accelerates the shift of responsibility toward the practitioner. As engagement deepens and design decisions become more specific, the manual recedes in authority. The intention is to perform a staged retreat, encouraging the transition from guided reconstruction to autonomous instrument design.

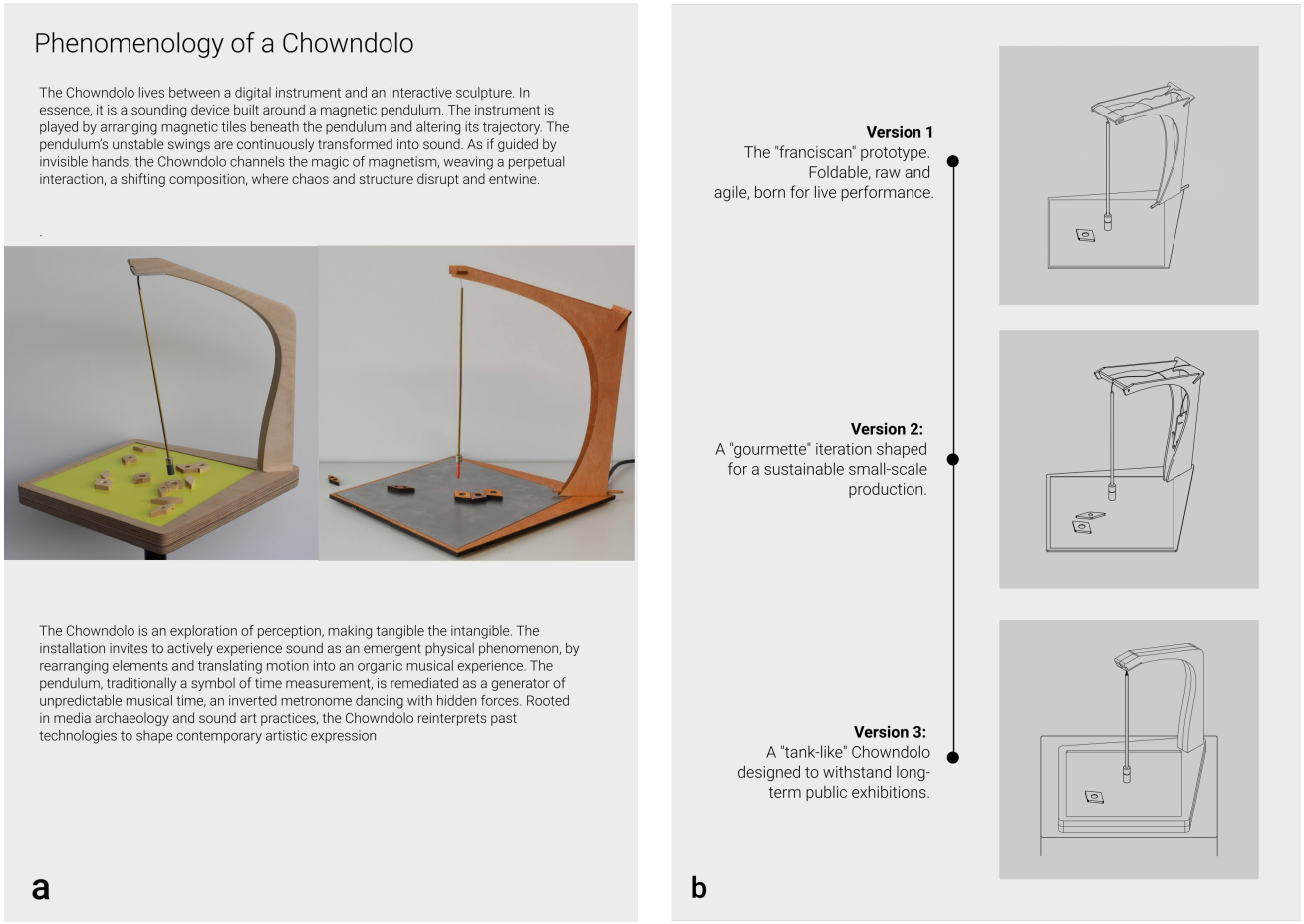

Figure 5: Examples of content for contextual information: "Phenomenology of a Chowndolo" (a) and a timeline showing different versions of the instrument (b).

Documentation and sustainability - revised.

We conceived the Obstruction Manual as a deliberate alternative to the usual documentation paradigms discussed in the NIME literature (or in general in fabrication related texts). Other documentation models tend to be mainly driven by a replication logic [12, 21], even when recognising the pivotal role of craft knowledge, material agency and tacit decision-making processes in transmitting digital lutherie knowledge [59]. In comparison, the Obstruction Manual does not seek reproducibility as an end goal, but cultivates divergence, situated reinterpretation, and appropriation.

While collaborative, ongoing, and flexible documentation frameworks in NIME emphasise completeness, updateability, and collective maintenance (in this sense the t-tree represent a valid example [11]) they nonetheless remain oriented toward functional continuity and operational clarity - for instance see a recent paper on good practices for sustainable digital fabrication [41]. The same approach can be found in instructional texts such as IKEA manual [56], which optimise for efficiency, standardisation, and error prevention, as well as in institutional tools like the French repairability index, where documentation is evaluated instrumentally as a means to enable disassembly and repair. In contrast, the Obstruction Manual foregrounds ambiguity and friction as productive qualities, aligning more closely with speculative and critical design approaches than with maintenance-oriented documentation.

In this context, appropriation is not a secondary outcome but integral to sustainability. Within HCI, appropriation describes how users reinterpret technologies in unanticipated ways [9] — a process historically central to musical practice, where devices acquire meaning through misuse and modification[2]. By resisting prescriptive instruction, the Obstruction Manual makes modification a necessary mode of engagement. This aligns with research on hackable instruments demonstrating how openness supports creative exploration [58].

The Obstruction Manual proposes to consider documentation as a material-discursive artifact: not a guarantee of replication or repairability, but a trigger for embodied experience, critical appropriation and long-term engagement with the instrument. In this sense, it operates orthogonally to both consumer-oriented manuals and policy-driven documentation regimes, proposing an alternative role for documentation within sustainable practices: exploration rather than optimisation. We argue that sustainability is not a static property achieved through comprehensive documentation, but an ontologically processual condition embodied in use over time [1].

[2]An overview of how misuse produced compositional approaches is presented in [40]

By foregrounding incompleteness, the manual invites readers to engage critically with the instrument rather than focusing on reproducing it, aligning with perspectives that frame design artifacts as open-ended propositions rather than closed solutions [48]. We therefore support sustainability not through faithful replication but through documentation that sustains ongoing engagement. This resonates with the adaptive reuse described in [40], with one key difference: rather than waiting for modifications to emerge through practice, we design the documentation to provoke them from the start.

Documentation as tactical media.

The design of the Obstruction Manual can be understood as a tactical intervention into the conventions of technical documentation. Rather than merely describing the instrument, the manual deliberately engages with, and reconfigures, the expectations embedded in instructional formats.

Research in HCI and software studies has shown that documentation is not neutral: it configures users and stabilises particular interpretations of technology [24, 49]. In developing the Obstruction Manual, we recognised that diagrams, omissions, and textual framing would position the reader either as an executor of predefined steps or as an interpretative agent. The manual therefore resists procedural closure, refusing to establish a single authoritative pathway toward the instrument.

Tactical Media theory provides a lens for this strategy. Tactical practices repurpose established formats to expose their embedded assumptions and power relations [22, 30]. The Obstruction Manual adopts the recognisable morphology of a technical booklet while withholding exhaustive schematics and complete instructions. In doing so, it turns the manual format itself into a site of intervention [16].

This positioning resonates with DIY and experimental music cultures, where zines combine instruction, reflection, and artistic stance, foregrounding situated knowledge over completeness [19, 28]. Similarly, the Obstruction Manual interweaves technical fragments with traces of design evolution, presenting the instrument as contingent rather than fixed.

Where conventional manuals optimise for clarity and standardisation [46], our manual introduces friction and interpretative space. In this sense, it aligns with adversarial and speculative design approaches that use artefacts to question dominant norms [17, 20]. Sustainability thus emerges not through stabilisation, but through activation: the instrument persists insofar as it is repeatedly reinterpreted. The Obstruction Manual inhabits the structure of the manual in order to destabilise its authority, transforming documentation from a vehicle of standardisation into a site of situated engagement.

7 Conclusions

In this paper we presented the Obstruction Manual as an alternative approach to DMI documentation that prioritises active learning and creative divergence over faithful replication. Using the Chowndolo as a situated case study, we reported on the iterative design process through which the manual shifted from a procedural logic toward structural intelligibility, strategic omission, and a multi-layer documentation ecosystem. Across the process and resulting artefact, we argue that documentation can be treated as a design object and a pedagogical interface.

Whether the Obstruction Manual successfully engages diverse DMI experts remains unknown. Future research observing how different practitioners engage with the manual will be essential for understanding whether our calibration choices genuinely support learning and long-term engagement or inadvertently create barriers and disposal. We expect practitioners' approaches to reimagining and rebuilding the instrument will reflect their socio-technical backgrounds and their communities' material practices and discourses [34].

A second direction involves probing our work across broader contexts. The ideas explored here — strategic opacity, divergence over replication, and documentation as activation — should be tested on other DMIs with different material, technical, and musical affordances. This would allow us to assess whether tactical documentation strategies remain productive across heterogeneous design ecologies.

Finally, we see the need to explore how the broader NIME community might be supported in producing instruction manuals as reflective design artefacts. Developing lightweight frameworks, shared templates, or facilitation formats could help reposition documentation from a secondary obligation to a central, creative component of instrument design practice.

8 Ethical Standards

There are no conflicts of interest in this paper nor human participants were involved. We believe that this paper touches upon topics (knowledge sharing and sustainability) explicitly or implicitly mention in the ethical code of NIME.

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