

## PARTICIPATORY DESIGN: AN INTERSUBJECTIVE SCHEMA FOR DECISION MAKING

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### Abstract

*The focus of this paper is participatory design (PD); a field that has been in existence since the 1960s. Reflections on a PD project in which the author played a central role revealed that existing literature does not engage adequately with intersubjective decision-making in PD processes. In this paper, appropriation and re-imagination of the Nordic framework for performance-based standards results in a novel multidimensional schema with five mutually related steps. Analysis indicates that the schema has a capacity for enhancing intersubjectivity in PD decision-making while also rendering the process more malleable to multiple viewpoints and their fusion into progressively definitive shared outcomes. In the conclusions, prospects for projective and reflective application of the schema explore its transformative capacity for professional and lay participants and its potential role in engendering critical design pedagogy.*

**Keywords:** *Participatory Design; Sustainability; Public Space; Nordic Framework for Performance-based-Standards*

### PROBLEM STATEMENT

Participatory decision-making is gaining in significance in addressing the contemporary socio-ecological challenges of sustainability and development (Becker, 2005; Bowns and da Silva, 2011). Participatory design is seen as a means to relevant and satisfactory outcomes.

Predominant participatory design (PD) discourse falls into three broad themes. The first is about the theoretical underpinnings and historical development of PD (e.g. Spinuzzi 2005). The second is on the methods (tools and toolkits) for facilitating the PD process (e.g. Sanders et al 2010, Muller 1993, Sanoff 2000, Fischer 2004, Charrette Centre 2011). The third is descriptive-analytical discourse on the processes and outcomes of particular PD applications in real projects

(e.g. Harris 2010, Frauenberger et al 2010, Binder and Brandt 2008, Merkel et al 2004, Björngvinsson et al 2010, Kwok 2004). PD is applicable to a variety of tangible and intangible ends in fields as diverse software engineering, workflow planning and architecture. Sanders et al (2010) categorise PD according to purpose. They propose that the purpose of PD may be: probing participants, priming participants, getting a better understanding of participants' experiences, or generating ideas/scenarios for the future. The project from which this paper arises was centred on generating ideas for the materialisation of a small public space. Henceforth, PD in this paper is used in relation to form-space design at the scale of a small public space. Referring to the taxonomy of PD practices by Muller (1993), this project falls under envisioning future solutions – specifically the future workshop.

The need for an explicit synthesising PD framework becomes greater with increase in number and variety of participants and in brief complexity. In the case of a single lay participant or few participants with a lot in common, it is relatively easy to agree on PD solutions. For example, participatory design of a house (a relatively well-defined design object) is readily achievable by offering a single spatial module, such as 2.5m cardboard model cubes, to a prospective owner to stack together and configure his or her own house. But where there are

multiple participants drawn from diverse users with substantial but varied stakes in the final outcome, and where the brief constitutes as such are variable, the case for a synthesising framework in the PD becomes much stronger. In this case, multiple participants are united by a common need but they may have significant differences in backgrounds, resource- and power-bases, interests, competencies and modes of communication (see Hamdi 2004). This variety brings richness, but if not well-facilitated, can precipitate counterproductive dynamics (Metze 2009). In reflecting on the processes of a PD project in which I was involved, literature review revealed that while there are many well-tested tools for generating ideas from multiple participants, explicit *intersubjective* decision frameworks for ranking and choosing amongst diverse participants' inputs to realise progressively definitive but representative outcomes are not well researched. Fischer (2004) theories how conceptual barriers in PD can be overcome using "boundary objects" – designed situations that provide "back-talk" to enable communication between participants and trigger creativity. Ostensibly, the boundary objects are a synthesis of initial ideas from all participants but it remains unclear how this synthesis is achieved in the first place. It also remains vague how the insights resulting from the subsequent interaction with the boundary object are synthesised. This is perhaps attributable to the fact that PD combines design and participatory knowledge types, each of which has a significant implicit content (Niedderer, 2007, Spinuzzi 2005). In the absence of such a decision framework, the PD processes are susceptible to undue influence by those who are relatively advantaged e.g. due to higher formal education levels, more power, and institutional resources or better rhetorical skills – to the disadvantage of relatively disenfranchised participants and possible forfeiture of the richness inherent in PD variety. Hence the question of a synthesising framework for PD is an important one. This paper aims to investigate this question by proposing an intersubjective framework for participatory design decision-making.

## THE PROJECT

The PD project that is the background to this paper was collaboration between a team of academics and SUN-VPUU<sup>1</sup>. Before the project SUN-VPUU, through extensive participatory mechanisms came up with proposals for in-situ slum upgrading for Monwabisi Park - an informal settlement of 24 000 people in 2009 (Sikhula Sonke 2010) located in Cape Town. This settlement was one of the five identified for upgrade by the City of Cape Town administration (CoCT). The vision of the programme is to build safe integrated communities by upgrading the settlement without moving people out of the area. Central to the SUN-VPUU approach are the urban design principles of Crime Prevention through Environmental Design (CPTED) (Newman 1973, Jeffrey 1977) which were encapsulated in a Spatial Reconfiguration Plan (SRP) for Monwabisi Park. The SRP further informed a package of plans ranging in scale from urban design concept plans, through to precinct level, and to detail and building plans. In these plans, the role of safe walkways and urban parks in crime prevention was highlighted along with the need to reconceptualise pre-school facilities in line with violence prevention principles to contribute to early childhood development (more information: [www.vpuu.org.za](http://www.vpuu.org.za)). Aspects of early childhood education were proposed to occur in small public spaces known as *Emthonjeni*. The *Emthonjeni* concept was co-developed by SUN and Sikhula Sonke (a local NGO) using participatory methods. The genesis of the word is rural Xhosa land in the Eastern Cape Province of South

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<sup>1</sup> VPUU: Violence Prevention through Urban Upgrading (a large-scale collaborative programme for slum upgrading between the City of Cape Town Administration and the German Ministry of International Affairs). SUN: Sustainable Urban Neighbourhoods (an urban design consulting firm which is the executing agent for VPUU). More info: [www.vpuu.org.za](http://www.vpuu.org.za) SUN is used in this paper in its capacity as implementing consultant for VPUU.

Africa, where it traditionally describes a well-point – a place where women and children come to fetch water and do laundry. As transposed to an urban area in the SRP, the *Emthonjeni* is embedded in the finer-grained small-public spaces as a place to protect young pre-school children from crime when parents are away at work. The background to this is that research indicated that children were most vulnerable to crime precisely during working hours when their parents were absent (Sikhula Sonke 2010). In Monwabisi Park, as in other many Cape Town informal settlements, a public tap and ablution facilities at 200m centres are usually provided for sharing by a number of families. Because of their capacity to attract people, the spaces around the taps have a potential to be active outdoor spaces. This potential is however not fully realised because they are in a general state of disrepair (Figure 3). Thus the spaces around the taps are ideal for site repair (see Alexander et al 1977) with the intention of transforming them into attractive public spaces. It is these spaces that under the SRP were to be designed into *Emthonjenis* - places of meeting, and child play and safety through active surveillance.

In 2011, SUN-VPUU granted the UCT team permission to undertake PD for upgrading one such water-point into an urban *Emthonjeni*. The UCT team consisted of four academics (3 architects and a landscape architect). SUN was represented by an urban designer and a community facilitator. Collectively the SUN-UCT team is henceforth referred to as the “designers”. On the basis of criteria jointly developed by SUN and the UCT team, 30 participants were selected from the community (these are hence referred as the “participants”). The processes and constructed outcomes of the PD are detailed in a poster (see Sanya et al 2015)

#### **METHOD: A MULTIDIMENSIONAL SCHEMA**

The aim of this paper is to investigate an intersubjective framework for decision-making that channels the varied views and inputs from diverse PD participants into progressively definitive but representative design choices in such a way that the inherent PD variety enriches outcomes of the process. The Nordic framework for performance-based standards allows both specificity and open-endedness in the design process. It is hierarchically arranged to allow for a diverse range of design solutions to definitive higher-level intentions (Foliente et al 1998). The versatility of the Nordic framework is because it specifies design objectives and attributes instead of designed products (Foliente et al 1998 and Foliente 2000). Attributes are stated in qualitative terms (as functional statements) and in quantitative statements (as performance requirements). Objectives frame the definition of a set of congruent attributes. In turn attributes, are the basis for generation and evaluation of proposed solutions. Under the Nordic framework, any designed product is considered satisfactory so long as it fulfils the specified attributes.

This paper adapts the Nordic framework by nesting within it processes for brief definition, alignment with budget, proposed solution ranking and temporal prioritisation to define a multidimensional schema for PD. In the schema, the attributes are refined into firmatas (structural and constructional integrity, utilitas (functional efficacy), venustas (aesthetics) and sustainability. Firmatas, utilitas and venustas are borrowed from Vitruvius’s tripartite articulation of architecture (see Rowland I.D. and Howe T.N 1999). Sustainability is aimed to focus on aspects that have not traditionally been explicit components of architecture but that have attained in relevance in contemporary times. Nested within the attributes are processes for brief definition, budgeting, proposed solution ranking and temporal prioritisation. A possibility for exclusion of out-of-scope elements is offered. The resultant multidimensional schema is shown in Figure 1 below. Brief constitutes depend on the client’s requirements but are framed by the attributes.

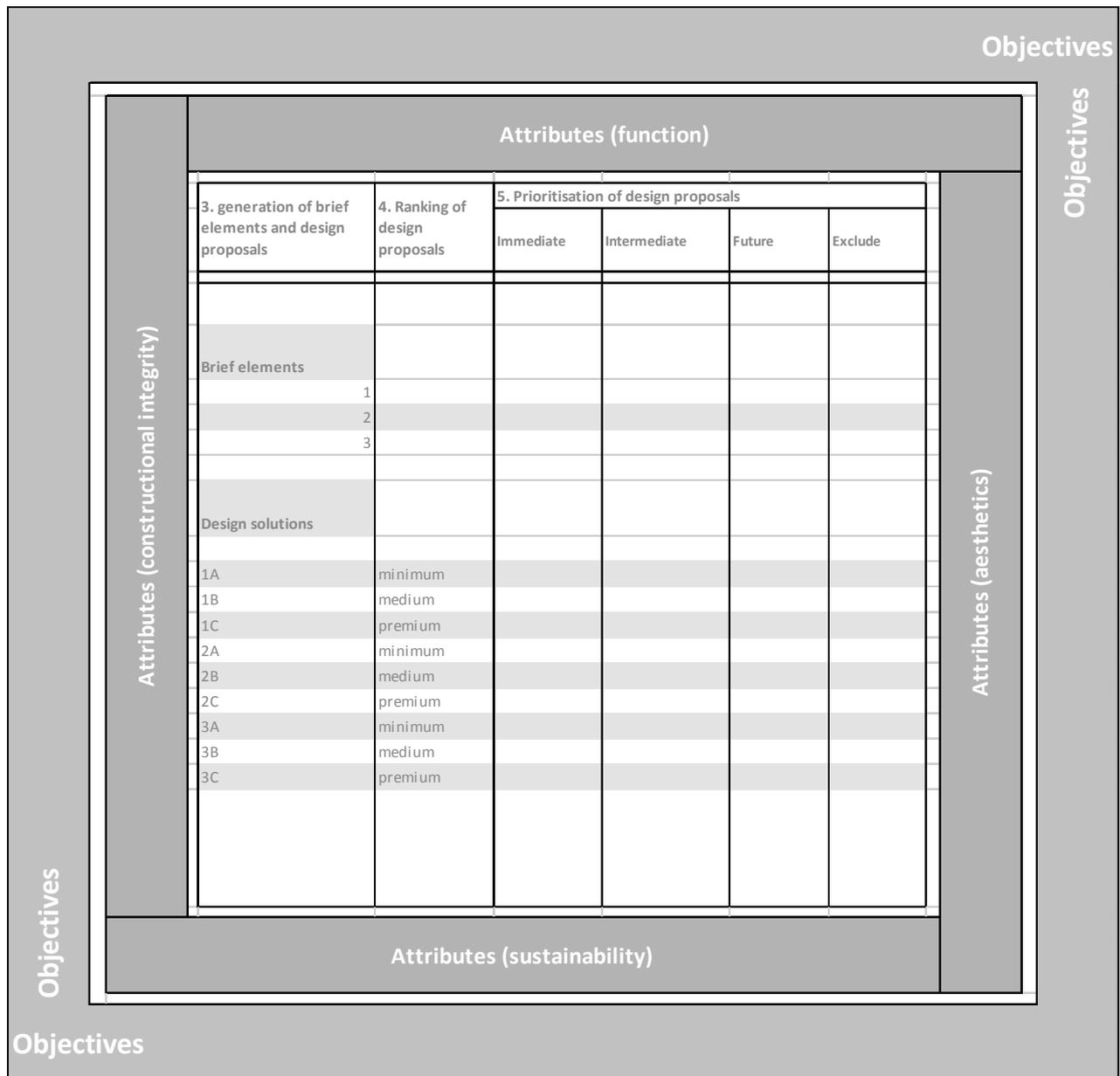


Figure 1: an Intersubjective Decision Making Schema for Participatory Design (Source: Author)

### RESULTS: USING THE SCHEMA

The value of PD discussions comes from cross-pollination of participants' and designers' knowledge. Where designers have acquired knowledge via formal education and work experience, the participants possess tacit knowledge derived from a long immersion into context and experiential understanding of their own needs (Spinuzzi 2005). The PD discussions should therefore be extremely well-facilitated to ensure that participants and designers alike bring their knowledge and experiences to bear. The multidimensional schema facilitates intersubjective decision-making in five steps:

- definition of objectives,
- formulation of attributes,
- definition of brief constitutes,

- generation and ranking of design proposals
- temporal prioritisation of design proposals.

The sine qua non for the success of this schema is that each step is clear in intention and executed in a discursive transparent manner with every participant having a fair chance to engage. The discussions and decisions of each step should also be recorded. Whereas the process is *presented* below as sequential, it should have inbuilt mechanisms to facilitate iterative refinement of each stage.

First, *objectives* are defined in terms of requirements and goals in relation to broader society. Objectives are strategic in nature and go beyond the scope of a single project. They should be defined in a large scale participatory process using a method like Community Action Planning – CAP (Hamdi, 2004). Objectives are formulated long before any project is conceived. Goal setting is normative and hence objectives defines what ought to be done (Becker 2005). Therefore, objectives are ultimately underpinned by values, value negotiations and choices (Marini, 2015).

In the second step, *attributes* are formulated according to the categories of firmitas, utilitas, venustas and sustainability. Defining attributes at this stage constrains the subsequent discussions to those relevant to the project objectives while remaining accommodative to different kinds of proposals in terms of brief constitutes and design solutions. It is crucial at this stage to ensure that (i) what might seem rather obvious to designers is made explicit, explained to the participants and included in the attributes (e.g. aspects relating to technical performance, functionality etc.) (ii) less obvious concerns are carefully teased out from the participants and explicitly co-opted into the attributes. This can for instance be through Appreciative Inquiry (AI) (See Salama, 2008) where participants choose existing artefacts/urban spaces and then disaggregate them into attributes.

The third and fourth stages are nested within the attributes and objectives. The two stages will be much more productive if each is foregrounded by exercises aimed at familiarising the participants with a range of existing solution options (Kensing and Munk-Madsen, 1993) in order to immerse them into the domain of interest (Sanders et al 2010). Depending on the skills level of the participants and available budget, this can be done through case-study field visits, videos, lectures and literature. The third stage of the PD involves *generation of brief constitutes*. In the fourth stage *design proposals* are defined to fulfil the brief using any of the available PD tool/s or by the designers. Furthermore, in reference to the project objectives and attributes, the generated proposals are ranked into minimum, medium and premium ones.

The fifth stage is embedded in the third and fourth stages above. It involves *temporal prioritisation* of brief elements and design proposals. This yields those proposals that must be realised in the immediate term on the one hand, and those that could be attained in the intermediate and future terms on the other hand. It also highlights brief and design proposals that are incommensurate with project attributes and objectives for exclusion. Apart from the attributes and objectives, other criteria for temporal prioritisation in the PD reference the available budget; the capacity of the proposals to leverage high-impact future activities; and the proposals' characteristics in terms of cost/benefit allocation between private and communal users. Immediate priority should be given to proposals of a public-benefit nature – even where they are relatively high cost – so long as they have great capacity to trigger diverse kinds of communal appropriation and emergent private enterprise in the longer terms (see Hamdi 2004). It should be noted that for some brief constitutes, suggested proposals may not be feasible in the immediate term – whether be they minimum, medium or premium solutions. And yet for others, it might be imperative to implement premium solutions in the immediate term. A further dimension to be noted is that a solution can start off as minimum in the immediate term but be upgraded into a medium/premium one in the longer term. Thus, with inclusion of the temporal dimension,

minimum, medium and premium proposals from participants are not necessarily mutually exclusive but can be a basis for phased qualitative and functional growth improvement.

The above is the complete suite of steps in the schema. However, for the schema to be useful, it is not always necessary that every given PD process executes all the steps. For instance in the PD of a school, certain brief constitutes such as a given number of classrooms to cater for a specified number of children in certain age-cohorts, could be inherent in the project itself. Auxiliary facilitates such as ablutions and offices could likewise be implied. And yet, if the intention of the PD is to reimagine what a school can be, it might actually be advantageous to start off by defining objectives and attributes in order not to be stultified by convention in generation of the brief elements and design possibilities. For the project that stimulated this paper, the client's project requirement of a small public space is of such a nature as to be amenable to different brief constitutes and material manifestations. Hence, in this case, definition of the brief constitutes became a discursive process in which the schema presented in this paper can add great value to the PD process. Thus an advantage of this schema is that a choice can be made, where, with the given time and resources, participants' abilities, nature of design problem, to focus the PD discussions. Being clear which particular stage(s) of the schema to focus the discussions clarifies the intentions – thereby safeguarding relevance of PD outcomes.

### RETROSPECTIVE REFLECTION ON THE EMTHONJENI PROJECT

The experiences in execution of the *Emthonjeni* PD project are what spurred the author to rethink how the project could have better been executed. The multidimensional schema is primarily meant for application to future projects. But in a retrospective application of the schema (Figure 5 in Appendix A), the PD outcomes are analysed to uncover some lessons. It should be noted that some of the design proposals and rankings into minimum, medium and premium are more analytical than factual in this section. Structuring the outcomes in the schema reveals immediate term prioritisation of the ranked design decisions as per Table 1 below.

Table 1: Immediate Term Prioritisation of Ranked Design Decisions (Source: Author).

Solutions for implementation in the immediate term	
Minimum	upgraded tap; washing platforms; benches; shelter; lighting; play facilities
Medium	ground cover;
Premium	drainage

The decisions of what was to be prioritised did not take place in the PD. Rather, sketchy proposals (in words and drawings) were taken from the participants and enhanced by the designers. The academics in consultation with SUN-VPUU, came up with an initial proposal for the *Emthonjeni*. The proposal centred on the existing tap to respond to pedestrian movements along an existing road, and worked with the sloped site to retain the ground and provide multi-functional platforms on a stepped concrete slab. An adjacent softer area was provided for child play. The above proposal was presented as a balsa model (see Figure 4) to SUN-VPUU and the participants for discussion and approval. Subsequently, the proposal was handed over to an architect for final design, working drawings and contract management. The final solution as detailed and constructed was subterranean drainage; a stepped floor slab and an adjacent softer play area; two curved retaining walls; a wider multi-functional platform; and another platform adjacent to the tap. The material palette was limited to concrete and plastered brickwork (see Figures 2 and 4) – two cost-effective but robust materials with which a local SMME contractor would be familiar.

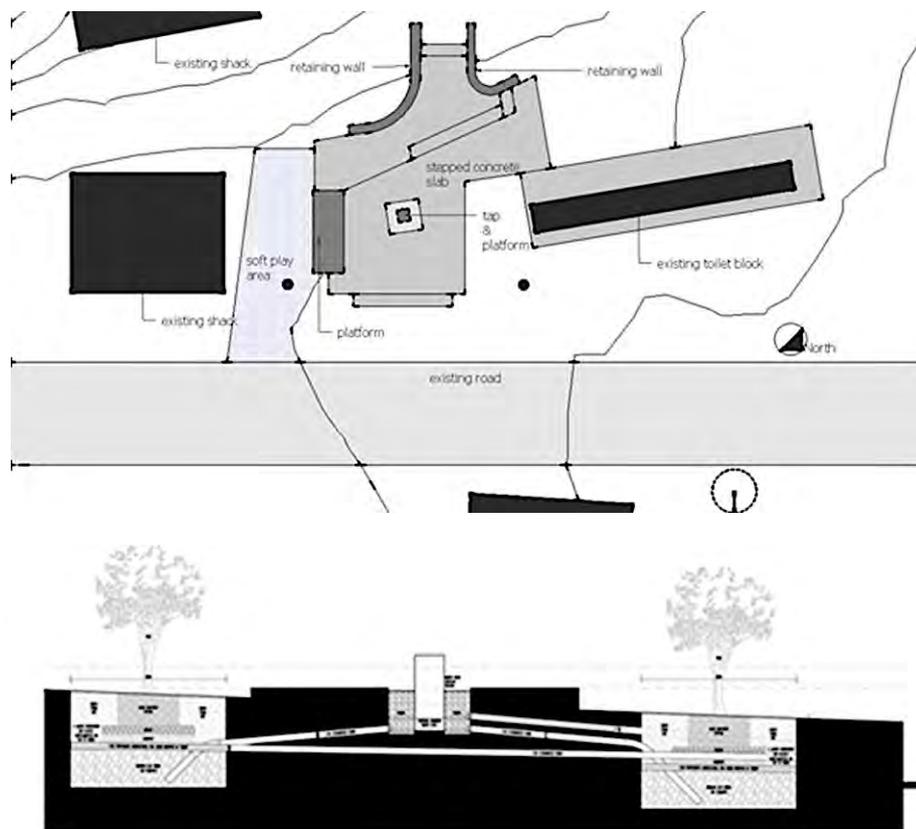


Figure 2: Sketches of the Small Public Space as Finally Designed (Plan and Section).  
(Section drawing credit Jacob Parker Architects)

The retaining walls are shaped to define entrance to the Emthonjeni, and are at such a height that they can also serve as seats while doing laundry, having a chat, or playing board games. The wide platform can also be used as a seat for the same functions. Moreover, careful placement of elements and sizing of the Emthonjeni makes the space suitable for public functions. This was demonstrated during the handover ceremony where 50 people were accommodated with room for many more. The slope and stepped slab makes it possible to see and hear the speaker. On that day, the broad platform was used as a table for refreshments. From what was essentially a rubbish dump with a run-down water-point, the space was transformed into a positive outdoor space. Aesthetically disposed in pinwheel composition around the water point, the azure blue platforms promise to become and remain an integral and utile component of the evolving urban environment (Figure 4).

The above retrospective exercise using the multidimensional schema reveals some noteworthy observations in the Emthonjeni project:

- The final design and construction outcomes of this project are hard permanent elements and are of medium or premium quality. The hard elements are: the subterranean drainage system, the stepped slab, the two platforms and the two retaining walls. They are prioritised for the immediate term. Characteristically, these are high cost and of a public-use nature.
- In the intermediate and future terms, softer clip-on elements, such as such as trees, a jungle gym (public benefit), vegetable planters and a soup kiosk (private benefit), can be added. Thus, the time dimension in the schema enables scaffolding whereby the immediate solution can leverage future public and private investment initiatives.

- Hence, it is advantageous to design the above permanent elements as leverage bases for phased improvement through public and private driven design appropriation. Embedding in the PD the capacity for add-on interventions offers prospects for co-option of different proposals over time. This way, the multi-dimensional schema may facilitate well-balanced discussions as it readily manifests how diverse users' needs and interests may be accommodated in the chosen solution. Therefore, the permanent zone embodies definitive design and investment choices but should be conceived as catalytic so that, though marking closure of one PD and construction phase, it also heralds the beginning of new possibilities.



Figure 3.a  
 Emthonjeni participatory design workshop  
 (Source: Author)



Figure 3.a  
 The site before intervention (Source: Author).



Figure 4.a  
 Design Model  
 (Source: Author)



Figure 4.b  
 Site after intervention (before trees are planted) (Source: Author).

### REFLECTIVE AND PROJECTIVE APPLICABILITY OF THE SCHEMA

The multidimensional schema offers prospects for *projective* application in envisioning future solutions and *reflective* utilisation to draw lessons from constructed artefacts.

*Projectively*, the multidimensional schema facilitates productive PD engagement by enhancing intersubjectivity and also due to the flexibility it adds by inclusion of budget alignment, solution ranking and temporal prioritisation. Significantly also, by framing brief and design

proposals within attributes and objectives and ultimately their underpinning values, the schema challenges participants and designers to deeply deliberate on what are appropriate design ends for investment of scarce societal resource.

*Reflectively*, the multidimensional schema opens up prospects to deconstruct spatial artefacts into attributes and their underpinning objectives and values. The schema is seen to be a mechanism to increase the scope of post-occupancy evaluation (POE) and precedent study beyond mere space and form to encompass the objectives and values that underpin spatial artefacts. Drawing from Appreciative Inquiry (AI), the schema can be used to deconstruct artefacts perceived as desirable by diverse participants into attributes and objectives; which in turn can spur deliberations on latent values. The empirical manifestation of shared values in desirable actions and artefacts may also trigger deliberations on questions of justice and fairness in the allocation of resources to different societal segments. In this way, the tool can be enable PD deliberations that are both critical and transformative.

Applied separately or together, projective and reflective use of the multidimensional schema offers immense capacity for enhanced engagement between design professionals and served communities. Current building PD methods are predominately focused on enabling the layman to manipulate form and space. In contrast, by foregrounding objectives and attributes as frames for design and construction this schema offers prospects for a deeper engagement with the values that underpin the normative objectives. In this way, congruent and divergent values can be uncovered to trigger deeper discussions around such questions as: is this what the community really needs? Are there important values that have been excluded? Is the opportunity cost of achieving the desired artefacts worth the values we might lose? And subsequently to agree on a set of values to inform a new set of objectives and attributes to shape the design process. Furthermore, interim outcomes of the PD process can be subjected to reflective evaluation as a means of testing the design proposals against agreed attributes and objectives.

Notably also, using AI in the schema allows designers and participants to uncover and communicate desired attributes and to use them in the subsequent stages of the process. This is particularly important considering that PD participants may struggle with articulating their tacit knowledge and in understanding designers' proposals. AI can therefore allow for intersubjective discussion of deconstructed boundary objects. Moreover, inclusion of budgetary alignment in the multidimensional schema offers the possibility for participatory budgeting. Experience in Brazil suggests that participatory budgeting can be immensely empowering (Bowns and da Silva). It gives participants a voice in determining what spatial-aesthetic objects ultimately get to be constructed. Even where the budget is fixed, participatory budgeting enable participants to have a say in determining the percentage portions of the funds for allocate to different outcomes.

The PD schema offers prospects for a critical design pedagogy that goes beyond focus on the aesthetised spatial object. The narrow focus of current education models begets ill-prepared professionals who are increasingly seen as superfluous in the eyes of society (Salama, 2008). Salama attributes this to an education that has lost touch with the needs of vast sections of society. Studio projects typically start off with a design brief to which students respond with largely abstract manipulation of spaces and form. In this paper's schema, the brief is seen to be nested within attributes, objectives and, ultimately, values. Hence, the schema opens avenues for a critical pedagogy to challenge students to analyse and evaluate underpinnings of design briefs and designed buildings. Using the schema, students can be facilitated to experience deep learning by engaging in such questions as what and whose values do design objectives and objects prioritise? Furthermore, the intersubjective schema can be used to engage students with societal constituencies to confront the values and objectives of the communities that building ought to serve. Similarly precedent analysis can go deeper than the extraction of tricks for design manipulation to problematize spatial artefacts and reveal the interests they serve and ignore. In

an active learning environment therefore, the schema can be used projectively and reflectively to develop in students the higher order skills.

## DISCUSSION AND CONCLUSION

Design, even by professionals, will always have a high implicit component. But to foster and safeguard the trust that underpins successful PD processes and products, it is essential to adopt an intersubjective framework for decision-making in the PD. This paper proposes a multidimensional PD schema which fuses ideas from the Nordic framework for performance-based standards with deliberations on budget alignment, proposal ranking and temporal prioritisation. The schema acts at a meta-level to facilitate intersubjective discussion of even the highly implicit proposals in the PD. By making explicit how participants' contributions shape choices, priorities and future possibilities, use of this paper's schema can contribute to cultivating trust and optimism in the PD process, and channel PD variety into design outcome richness. Where project stakes are high, it could also serve to deflect the ardour of opposed viewpoints from negative opposition to constructive engagement.

Moreover if applied with rigour in the PD process, the schema can enhance mutual consistence between objectives, attributes and design outcomes. The deliberations and outcomes of the multi-dimensional schema, if recorded as recommended, constitute an audit-trail against which various PD proposals and outcomes can be judged both during the PD processes and afterwards in future review.

Where it is not possible to execute all the five steps of the schema, it does seem that focussing the PD process on setting objectives and definition of attributes is much more empowering to lay participants than engaging in the more detailed specialised aspects of design. That is, it is more empowering to set the rules of the game, than to play. With this framework also, opportunity is availed for lay participants to act as arbiters of the professionals' design proposals under rules which they themselves (the participants) contributed to defining. The objectives and attributes serve as a basis by which participants can hold the designers accountable. This way, justification of professionals' viewpoints and proposals can cease being exclusively based on abstruse notions of scientific or professional knowledge.

The schema originates from reflections on spatial-aesthetic PD. It therefore has a degree of generalisability in spatial-aesthetic PD. More broadly, to the extent that the Nordic framework for performance based standards is applicable to product design, this paper's schema could be of relevance to PD of other products. To the author's knowledge, this is the first time that the Nordic framework has explicitly been used as part of a decision-framing mechanism for PD. The multidimensional intersubjective schema is novel and has significant implications for participatory design, design pedagogy, professional practice and research.

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