VICTORIA UNIVERSITY OF WELLINGTON

**Functional Fiction to Collective Action: Speculative
Participatory Serious Urban Design Gaming to
Enhance Slum-upgrading Processes**

BY

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Motivations for the Study

In 2013 while working in Kenya for the United Nations Human Settlement Programme (UN-Habitat), I spent weekends volunteering at Lipela Orphanage located about two hours' drive from Nairobi on the foothills of Mt. Kenya. One afternoon in September, after playing some football with the young people, I sat down under a tree to check emails on my smartphone. One of the youths, a 15-year-old boy named Edward, ambled over, squatted down beside me and asked if I had any games that he could play. As I was working with UN Habitat's Block by Block programme at the time, I had the pocket edition of Minecraft installed in my smartphone. I launched the application and handed him the device. Over the course of the next thirty minutes, Edward not only learned to navigate the interface of the game with skill but constructed a three-dimensional model of the orphanage in which he lived.

Shortly after this, I detailed the experience in a blog post I wrote for the Block by Block programme titled *Mobile Minecrafting in Central Kenya* (Beattie, 2013). The first observation I made concerned the prevalence of mobile phones, and more specifically mobile computing, in some of the most marginalised regions of Kenya. At the time, I pointed out that most 'slum-dwellers' had access to mobile phones with "at least the most basic of functionality" and that within the near future those same inhabitants would have access to cheap, broadband-enabled smartphones with three-dimensional rendering capabilities, which could be used by architectural designers to engage people in urban design processes ((Beattie, 2013). Digital technologies are a mainstay of many marginalised, informal settlement or slum communities. They are vital for communication, navigation, entertainment and even the functionality of what Robert Neuwirth calls the "informal economy"—or the diversified set of economic activities, enterprises, jobs, and workers that are not regulated or protected by the state—which relies on the prevalence of mobile microfinancing technologies (Neuwirth, 2012).

In 2016 the United Nations declared "online freedom" a "human right" (United Nations General Assembly, 2016). We are now at a point where many of the world's slum-dwellers carry the technology in their pockets necessary to build and share Computer-Aided Design (CAD) models, and the vast majority of people, even those most marginalised, have some degree of digital literacy due to this rapid and recent proliferation of technology (Tacchi & Chandola, 2016). This is an exciting time for

architects, urban designers and planners looking for new ways of ensuring that those most marginalised are central to decision-making processes in architecture and urban design.

The second observation I made in the blog post related to ways in which Edward constructed the model of his environment. As one would expect, the model was proportionally inaccurate—and was little more than a rudimentary spatial abstraction of his environment, constructed within the three-dimensional grid-based *Minecraft* medium. When I spoke with him about his model, I found that it was inspired by and represented much more than just the spatial attributes of his physical surroundings. What he had produced was a three-dimensional semi-fictional diagram of the orphanage—one that he used to explain the emotive qualities of the environment to me in a metaphorical way. As one of the oldest children at the orphanage, Edward was responsible for much of the cleaning and cooking that took place in the noisy steel shed that had little storage space and was not connected to the main hall building by any sort of shelter—something he saw as important during the rainy season. On the one hand, the spaces in which he carried out these activities, such as the kitchen and washing areas, were represented as enclosed concrete spaces as opposed to the corrugate iron and timber lean-to structure that existed in reality. He described these to me as a representation of his feelings about the activities he performed in them. On the other hand, the dormitory, where he relaxed, was modelled as a large open space, made out of lighter timber materials, with a high ceiling and large windows as opposed to the seemingly cramped dormitory with little natural light. Edward felt this space was his “relaxing space” or a sort of sanctuary—a space where he could retreat from the chores of everyday life. These assertions aided me in understanding what value these spaces had to Edward—not just whether or not they were functional.

The digital gaming experience I had with Edward served as one of the catalysts for this dissertation and represents one of the values of digital participatory design tools—the ability for community members to express themselves visually and to communicate emotive qualities of space. It was of course difficult to tell whether Edward’s explanation was a post-rationalisation or not, or even if it evolved over the course of its construction. But being able to use the game as a speculative discursive prop to talk about intangible perceptions of space—one’s feelings and one’s interactions—was of great value. The model served as a mechanism to enable Edward to communicate these values to me, to contemplate the relationships between spaces from his perspective,

and to not just do so abstractly or artistically, but to locate the conversation in space and time in a state of hyper-reality.

This experience of design-orientated digital gaming highlights the ubiquitous nature of the computer gaming medium. It speaks to how digital engagement strategies can be employed in different contexts to help people not usually engaged in design processes to find a voice and to collaboratively share their tacit knowledge, experiences and points of view. It also speaks to the ability of architectural representation to orientate that discussion towards memories, feelings, experiences and desires, which can be crucial for the identification and refinement of urban development problems and ultimately their solutions. The experience with Edward provided me with my first insights into the discursive qualities of a sort of hybrid-reality space that can be created between a fictional world created through representation and discussion and what Malmgren describes as the “empirical” world that is central to the aspirational outcomes of the dissertation (Malmgren, 1985). It encouraged me to explore how urban focussed gaming could prompt people to contemplate the intangible, or collaboratively draw out those tacit experiences of urban space and enable them to share those views with others who might empower them by pulling in the same direction. This goal forms the primary motivation for this research.

Table of Contents

<i>Motivations for the Study</i>	<i>i</i>
<i>Table of Contents</i>	<i>v</i>
<i>Acknowledgements</i>	<i>xiii</i>
<i>List of Figures</i>	<i>xv</i>
<i>List of Tables</i>	<i>xxiii</i>
<i>Publications Information</i>	<i>xxv</i>
<i>Glossary of Terms</i>	<i>xxvii</i>
<i>Abstract</i>	<i>xxxiii</i>
1. INTRODUCTION	1
1.1 RESEARCH CONTEXT	1
1.1.1 SLUM UPGRADING	4
1.2 THE PARTICIPATORY SLUM-UPGRADING APPROACH	5
1.3 THE RESEARCH PROBLEM	6
1.4 RESEARCH APPROACH	8
1.5 RESEARCH QUESTION AND AIMS.....	11
1.6 RESEARCH DESIGN OVERVIEW	12
1.7 OUTLINE OF THE DISSERTATION	12
2. LITERATURE REVIEW	17
2.1 SPECULATIVE ARCHITECTURE	19
2.1.1 Introduction.....	19
2.1.2 Defining Speculative Architecture.....	20
2.1.2.1 Speculative Architecture and Plurality	22
2.1.2.2 Temporal Positioning of Speculative Architecture.....	23
2.1.3 Ways of Speculative Architectural Worldmaking	29
2.1.3.1 Balancing Fiction and the Actual World	29
2.1.3.2 How is the Speculation in Architecture Legitimised?	30
2.1.3.3 Ensuring Intentional and Extensional Legitimacy in Speculative Architecture.....	31
2.1.4 Speculative Architectures to Promote Design Ideation	32

2.1.4.1.1 Utopias and Dystopias	32
2.1.4.1.2 Urban Extrapolations	34
2.1.4.1.3 Urban Thought Experiments.....	35
2.1.5 Enabling Social Discourse Through Speculative Architecture.....	36
2.1.5.1 Internally and Externally Oriented Speculations	37
2.1.5.2 Terminal and Instrumental Operational Modality	39
2.1.5.3 Agonistic Speculative Architecture as Discursive Provocateur.....	40
2.1.5.4 Participatory Speculation	43
2.1.6 Summary	45
2.2 PARTICIPATORY DESIGN	49
2.2.1 Introduction.....	49
2.2.2 Positioning Participatory Design	50
2.2.2.1 Towards Genuine Participation.....	51
2.2.2.2 Exploring Conflicting Perspectives and Assumptions.....	54
2.2.2.2.1 Knowledge Bases.....	55
2.2.2.2.2 Values and Goals	55
2.2.2.2.3 Negotiation of Knowledge, Values and Goals in Participatory Design.....	56
2.2.3 Revealing Participants' Knowledge, Values and Goals	57
2.2.3.1 Priming Participants for Participatory Design	57
2.2.3.2 Participatory Tools for Revealing Knowledge, Values and Goals	58
2.2.3.2.1 Visualisations.....	59
2.2.3.2.2 Participatory Design Activities	61
2.2.3.2.3 ICT based Approaches to Participatory Urban Design.....	62
2.2.4 Developing Knowledge, Values and Goals	64
2.2.4.1 Agreement and Conflicting on Knowledge, Values and Goals	65
2.2.4.2 Agonistic Approaches to Participatory Design Activities	70
2.2.5 Grounding Knowledge, Values and Goals.....	73
2.2.6 Summary	74
2.3 ARCHITECTURAL SERIOUS GAMES	77
2.3.1 Introduction.....	77
2.3.2 Defining Serious Gaming in Architecture and Planning	79
2.3.2.1 Games	79
2.3.2.2 Serious Games	80
2.3.2.3 Serious Games in Architecture and Planning	81

2.3.2.4	Serious Games Used in Slum-upgrading Research	86
2.3.3	Serious Game Design.....	91
2.3.3.1	Serious Game Mechanics.....	92
2.3.3.1.1	Game Mechanics.....	92
2.3.3.1.2	Learning Mechanics.....	93
2.3.3.1.3	Social Mechanics	94
2.3.3.1.4	Immersive Mechanics	94
2.3.3.2	Serious Game Dynamics.....	95
2.3.3.2.1	Immersion Dynamics	95
2.3.3.2.2	Creating Authenticity.....	96
2.3.3.3	Serious Games Aesthetics.....	97
2.3.3.3.1	3D Representation.....	97
2.3.4	Facilitating Design Collaboration and Ideation in Serious Games.....	102
2.3.5	Conflicting Stakeholder Perspectives and Social Capital in Serious Games.....	103
2.3.5.1	Civic Engagement and Social Capital.....	105
2.3.6	Summary	106
2.4	SYNTHESISING THE LITERATURE.....	109
2.4.1	Speculative Participatory Serious Urban Gaming (SPS-UG).....	109
2.4.1.1	SPS-UG Purpose.....	112
2.4.1.2	SPS-UG Content/Information.....	112
2.4.1.3	SPS-UG Framing	114
2.4.1.4	SPS-UG Mechanics	115
2.4.1.5	SPS-UG Fiction/Narrative	117
2.4.1.6	SPS-UG Aesthetics/Graphics.....	118
2.4.2	Summary	119
3.	THE RESEARCH APPROACH	121
3.1	INTRODUCTION	121
3.2	EPISTEMOLOGICAL ORIENTATION.....	123
3.2.1	Design as Action Research – A Methodological Approach	123
3.2.1.1	A Case Study Research Strategy Approach to Action Research	125
3.2.1.2	Action Research Through Participatory Design Workshops	126
3.3	RESEARCH DESIGN	127
3.4	THE RESEARCH PLAN.....	127

3.4.1	The Research Phases.....	128
3.4.1.1	Phase One - Context Documentation Studies and Analysis	128
3.4.1.2	Phase Two - SPS-UG Development	131
3.4.1.3	Phase Three - SPS-UG Workshops.....	132
3.5	ETHICS AND REPRESENTATION	137
3.5.1	Reflexivity, Validity/Transferability and Relevance	138
3.6	SUMMARY	140
4.	OPERATIONALISING THE SPS-UG APPROACH	141
4.1	INTRODUCTION	141
4.2	PHASE ONE: DOCUMENTATION OF THE RESEARCH CONTEXT	142
4.2.1.1	Ghazipur –Documentation of Context	142
4.2.1.2	Ghazipur Land Use	144
4.2.1.2.1	Ghazipur Housing	145
4.2.1.3	Ghazipur Livelihood Generation	147
4.2.1.4	Main Slum-Upgrading Issues	149
4.2.2	CS2 – Bhalswa – Documentation of Context	151
4.2.2.1	Bhalswa Land use	151
4.2.2.2	Bhalswa Livelihood Generation	155
4.2.2.3	Main Slum-Upgrading Issues	155
4.2.3	CS3 - Shanti Nagar – Documentation of Context.....	158
4.2.3.1	Shanti Nagar Land Use	158
4.2.3.1.1	Shanti Nagar Housing	161
4.2.3.2	Shanti Nagar Livelihood Generation	164
4.2.3.3	Main Slum-Upgrading Issues	165
4.2.3.4	Summary of Documentation of Context	166
4.2.4	Data Collection for Understanding Conflicting Perspectives.....	167
4.2.4.1	Data Collection Procedure	167
4.2.4.1.1	Ghazipur Perspectives.....	171
4.2.4.1.2	Bhalswa Perspectives.....	175
4.2.4.1.3	Shanti Nagar Perspectives	179
4.2.4.2	Identification of Important Contextual Issues.....	183
4.3	PHASE TWO: SPS-UG DEVELOPMENT	184
4.3.1	Stage One: Development of 3D Assets.....	184

4.3.1.1	Housing	186
4.3.1.2	Public Spaces	187
4.3.1.3	Public Buildings and Infrastructure	189
4.3.1.4	Commercial Activities	190
4.3.1.5	Compositing Urban Form for SPS-UG's	191
4.3.1.5.1	Compositing Urban Morphology and Contextual Issues	192
4.3.2	Stage Two: Development of Interactive Mechanics and Dynamics SPS-UG	194
4.3.2.1	Purpose/Aim/Goal	194
4.3.2.2	Framing	194
4.3.2.2.1	SPS-UG Level Progression	195
4.3.2.3	Mechanics	201
4.3.2.4	Aesthetics/Graphics	202
4.4	SUMMARY	204
5.	CASE STUDY ONE-GHAZIPUR	207
5.1	INTRODUCTION	207
5.1.1	Summary of Case Study One – Ghazipur	207
5.2	CASE STUDY: GHAZIPUR	209
5.2.1	Aim of the Workshops	209
5.2.2	Ghazipur Participants	209
5.2.3	Workshop preparation process	210
5.2.4	Findings	214
5.2.4.1	Social Outcomes	216
5.2.4.1.1	Revealing Conflicting Perspectives	216
5.2.4.1.2	Evaluation of participant cooperation and understanding	217
5.2.4.1.3	Dissemination of workshop outcomes and experiences	218
5.2.4.2	Slum-Upgrading Outcomes	219
5.2.4.2.1	The importance of housing being in close proximity to the landfill ...	222
5.2.4.2.2	The community problems associated with lack of security or tenure	223
5.2.4.2.3	The role of the waste-to-energy plant within the community	224
5.2.4.2.4	The importance of location and use of public spaces and amenities	225
5.2.5	The role of “speculation” in aiding the exploration of conflicting perspectives and ideation	226
5.2.6	The relationship between the speculative and the real	228

5.2.7	Summary	230
6.	CASE STUDY 2 – BHALSWA	233
6.1	INTRODUCTION	233
6.1.1	Summary of Case Study Two - Bhalswa	233
6.2	CASE STUDY: BHALSWA	235
6.2.1	Aim of the Workshops	235
6.2.2	Bhalswa Participants	235
6.2.3	Workshop Preparation Process	236
6.2.4	Findings.....	239
6.2.4.1	Social Outcomes	240
6.2.4.1.1	Conflict as a generator of creative solutions to problems.....	240
6.2.4.1.2	Galvanising around Matters of Concern	243
6.2.4.2	Slum-upgrading Outcomes	246
6.2.4.2.1	The construction of higher quality housing	246
6.2.4.2.2	Access to basic infrastructure	248
6.2.4.2.3	Adapting the digital SPS-UG context to explore ideas.....	248
6.2.5	Challenges with working with the most marginalised.....	251
6.2.6	Experiential stories as a means to explore social and spatial tensions and ideas	253
6.2.7	Summary	255
7.	CASE STUDY THREE – SHANTI NAGAR	257
7.1	INTRODUCTION	257
7.1.1	Summary of Case Study Three – Shanti Nagar	257
7.2	CASE STUDY: SHANTI NAGAR.....	259
7.2.1	Aim of the Workshops	259
7.2.2	Shanti Nagar Participants.....	259
7.2.3	Workshop Preparation Process	260
7.2.4	Findings.....	263
7.2.4.1	Social Outcomes	265
7.2.4.1.1	Aiding the discussion of sensitive topics	265
7.2.4.1.2	Reflecting through Recursive Engagement	267
7.2.4.2	Slum-upgrading Outcomes	268

7.2.4.2.1 Access to schools	272
7.2.4.2.2 Environmental Concerns Relating to Garbage	272
7.2.4.2.3 Access to Public Spaces.....	273
7.2.5 The Role of Playfulness	274
7.2.6 Increasing Social Capital through Participatory Gaming	277
7.2.7 Digital Participatory Workshops with Marginalised Youth	278
7.2.8 SPS-UG Participatory Visioning	279
7.2.9 Summary	280
8. DISCUSSION: SPS-UG AS AN ENABLER OF SOCIAL AND DESIGN	
OUTCOMES	283
8.1 INTRODUCTION	283
8.1.1 Summary of the Discussion	284
8.2 ENHANCING SOCIAL OUTCOMES VIA THE SPS-UG APPROACH.....	285
8.2.1 Factor 1: Temporary Worlds and Perceptual Bridging.....	286
8.2.1.1 Social Interaction and Collaborative Learning	290
8.2.2 Factor 2: Developing Participants' Knowledge, Values and Goals.....	292
8.2.3 Factor 3: Grounding Participants' Knowledge, Values and Goals through Bricolage	294
8.3 ENHANCING DESIGN (SLUM-UPGRADING) OUTCOMES VIA SPS-UGS	294
8.3.1 Factor 1: Hybrid-Realities as a Means to Define Design Parameters.....	295
8.3.2 Factor 2: Spaces to Think Within	296
8.4 METHODOLOGICAL INSIGHTS INTO THE SPS-UG APPROACH	297
8.4.1 Evaluation of the Approach	297
8.4.2 Key Strengths and Opportunities	297
8.4.3 Key Challenges and Limitations.....	298
8.4.3.1 Limitations of Context and Application	299
8.4.3.2 Limitations of Methodology	299
8.4.3.3 Bridging the Gap Between Priming and Generating Slum-Upgrading	301
8.5 SUMMARY	302
9. CONCLUSION	305
9.1 REFLECTION ON THE RESEARCH QUESTIONS	306

9.1	RECOMMENDATIONS FOR FUTURE RESEARCH	308
9.1.1	Expanding the SPS-UG Framework	309
10.	WORKS CITED.....	311
	<i>Appendix 1 – Phase One: Maslow’s Palace Workshops – Interview Questions ...</i>	<i>353</i>
	<i>Appendix 2 – Maslow’s Palace In-Game Instructions</i>	<i>355</i>
	<i>Appendix 3 – Phase Three: Maslow’s Palace Workshops – Facilitation</i>	
	<i>Instructions</i>	<i>359</i>
	<i>Appendix 4 – Phase Three: Maslow’s Palace Workshops – Interview</i>	
	<i>Questions</i>	<i>361</i>
	<i>Appendix 5 – Digital Link to Maslow’s Palace</i>	<i>365</i>
	<i>Appendix 6 – Maslow’s Palace Workshop Transcripts</i>	<i>367</i>

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List of Figures

Figure 1. Diagram that shows the areas of interest, in particular the ones resulting in the intersection of the three main areas investigated in the literature review.....	1
Figure 2. Participatory functions deployed at various stages of the urban development process. Adapted from (Lucero et al., 2012; Lynch, 1984; Sanders et al., 2010).	10
Figure 3. “The Futures Cone”. Adapted from (Hancock and Bezold, 2003).....	24
Figure 4. Stanford Torus cutaway view. NASA, 1975.	25
Figure 5. Buckminster Fuller, Dome Over Manhattan, 1960.	26
Figure 6. A plan for Tokyo 1960 by Kenzo Tange.....	27
Figure 7. Architect Olalekan Jeyifous imagines what Lagos, Nigeria could look like in the future in his series Shanty Megastructures, 2016.	28
Figure 8. Clean Air Pod, Ant Farm, 1960.....	33
Figure 9. Rapid Re(f)use: Waste to Resource City, TerreformOne, 2009.....	34
Figure 10. Under Tomorrow's Sky, Liam Young, 2013.	35
Figure 11. The film Jonah (2013, directed by Kibwe Tavares, explores the effects of tourism, globalisation, and commercialisation in Zanzibar through speculative architectural filmmaking.....	35
Figure 12. Weaponized Architecture, Léopold Lambert, 2010.	36
Figure 13. Positioning terminal-instrumental/ internal external Speculative Architecture. Adapted from (Tharp & Tharp, 2019).	37
Figure 14. Million Dollar Blocks, Laura Kurgan, 2012.	42
Figure 15. Underground Berlin 3, Lebbeus Woods, 1988.	43
Figure 16. Future of Hearts and Minds scene (Gerber, 2018).	44
Figure 17. Driverless City: Scenario builder, mind map and visualisation to support citizen conversations for a future with driverless cars (Clarke et al., 2018).	45
Figure 18. Ladder of Citizen Participation. Adapted from Arnstein (1969).....	52

Figure 19. Future Visioning Workshops using simple props for reflecting, discussing and visualising future aspirations, fears and expectations about urban futures amongst disparate participants (Pollastri et al., 2017, p. 8).....	61
Figure 20. Screen shot from the Smarticipate participatory urban design tool (Z. Khan et al., 2017).	63
Figure 21. Placing feedback on a selected urban feature in Min Stad (Tahvilzadeh, 2015).....	64
Figure 22. The Product Value Game: Two players negotiate silently which values they want to attribute to their product using colourful picture cards (Iversen & Buur, 2002).....	67
Figure 23. Participants playing “Play Noord” a Generative City Game designed to explore masterplanning by integrating typical and atypical urban actors through a City Game interface (Tan, 2014, p. 269).....	68
Figure 24. Finding Places by the CityScienceLab at Hafencity University and the city of Hamburg in partnership with M.I.T. (Noymana, Holtz, Kröger, Noennig & Larson, 2017).....	69
Figure 25. A participant in Kibera, Kenya highlights the size of the football pitch in the Minecraft model as part of a UN-Habitat participatory slum-upgrading project (Westerberg & von Heland, 2015, p. 8)	70
Figure 26. Participants contributing to the Change By Design project in Nairobi, Kenya (Frediani et al., 2011, p. 108).	72
Figure 27. The World Game: Integrative Resource Utilisation Planning Tool, R. Buckminster Fuller, 1967.	78
Figure 28. London Developers Toolkit, You+Pea.....	82
Figure 29. Block'Hood, Jose Sanchez, 2017.....	84
Figure 30. Sim City, Maxis, 1989.....	85
Figure 31. Cities Skylines being projected onto a wall for use in participatory design workshops in Norra Djurgårdstaden, Stockholm, Sweden, 2016.....	86
Figure 32. GetH20 (Butterfly Works, 2010).....	87
Figure 33. Block by Block participants in Nairobi Kenya collaborate in public space design (Block by Block, 2017).	88

Figure 34. Places identified as different types of properties in YouPlaceIt (Poplin & Vemuri, 2018, p. 78).....	89
Figure 35. Participation event in Mumbai—residents using VR devices (Markopoulou et al., 2018, p. 229).	90
Figure 36. Participation event in Mumbai—residents using VR devices (Markopoulou et al., 2018, p. 229).	90
Figure 37. Kolb’s experiential learning model. Adapted from (Kolb, 1984, p. 21).	93
Figure 38. Simplified, low-polygon graphic style of 3D City Builder.	99
Figure 39. Stylised graphic style used in Block’Hood.	99
Figure 40. Realistic visual style of Cities Skylines with “Slums for Cities Skylines” modification.....	100
Figure 41. Synthesising the “SPS-UG” approach (author, 2019).	110
Figure 42. Serious Game Design Assessment Framework Adapted from (Mitgutsch & Alvarado, 2012).	111
Figure 43. Synthesising the SPS-UG approach, contributing game elements (by author).....	119
Figure 44. The research design.	122
Figure 45. Visualising the central role of SPS-UG participatory design workshops with the case study communities.	126
Figure 46. Phase Three research procedure.	135
Figure 47. Research Phases One and Two detailed within this chapter.	142
Figure 48. Ghazipur, Delhi, India. Satellite image from Google Earth., 2019.	143
Figure 49. Ghazipur area, Delhi. Satellite image from Google Earth., 2019.....	144
Figure 50. Ghazipur land use, 2019.	145
Figure 51. Ghazipur. Satellite image from Google Earth. Accessed 2019.	146
Figure 52, left. Residents cooking next to open drains, Ghazipur, 2017. Photo by Author.	147
Figure 53, right. Ghazipur dwellings, 2017. Photo by Author.	147

Figure 54. Delhi Metro Station under construction with residential area in the foreground, Ghazipur 2017. Photo by Author.	147
Figure 55, left. Ghazipur landfill, dairy farm buildings and dairy cows grazing on the landfill. Ghazipur 2017. Photo by Author.	148
Figure 56, right. Recycling human hair, Ghazipur, 2017. Photo by Author.	148
Figure 57, left. Outsourced garment labour, Ghazipur, 2017. Photo by Author.	149
Figure 58, right. Waste-to-energy Plant, Ghazipur 2017. Photo by Author.	149
Figure 59. Overlooking garment factories and indoor dairy farms with Ghazipur landfill in the background, 2017. Photo by Author.	149
Figure 60. Bhalswa, Delhi. Satellite image from Google Earth., 2019.	151
Figure 61. Bhalswa case study site. Satellite image from Google Earth., 2019.	152
Figure 62. Bhalswa landfill as viewed from Bhalswa Dairy, 2017. Photo by Author.	152
Figure 63. Wider Bhalswa area land use, 2019.	153
Figure 64, left. Bhalswa dwellings as viewed from the landfill, 2017. Photo by Author.	154
Figure 65, right. Bhalswa dwellings within the slum area next to the landfill, 2017. Photo by Author.	154
Figure 66. A typical dwelling within the slum area next to the landfill, Bhalswa, 2017. Photo by Author.	154
Figure 67, left. Waste collection at the top of Bhalswa Landfill, Bhalswa, 2017. Photo by Author.	155
Figure 68, right. Waste sorting, Bhalswa Landfill, 2017. Photo by Author.	155
Figure 69. Toilets and storage spaces are located in the cloth covered shacks at the rear of the photo, which are partially dug into the landfill behind, Bhalswa, 2017. Photo by Author.	156
Figure 70, left. A child mining the landfill for salvageable items, Bhalswa Landfill, 2017. Photo by Author.	157
Figure 71, right. Children collecting discarded bricks for local construction from the landfill, Bhalswa Landfill, 2017. Photo by Author.	157
Figure 72, Shivaji Nagar, Mumbai. Satellite image from Google Earth., 2019.	158

Figure 73. Shivaji Nagar. Satellite image from Google Earth., 2019. Adapted by Author.....	159
Figure 74. Shivaji Nagar land use, 2019.....	159
Figure 75. Shanti Nagar, Mumbai, 2017. Photo by Author.	160
Figure 76. Single storey dwellings, Shanti Nagar, Mumbai, 2017. Photo by Author.	162
Figure 77. Two storey dwellings in Shanti Nagar, Mumbai, 2017. Photo by Author.	162
Figure 78. Multi-Storey dwellings and the open area of the Deonar landfill being used for recreational purposes. Shanti Nagar, Mumbai, 2017. Photo by Author.	163
Figure 79. Shanti Nagar, Mumbai, 2017. Photo by Author.	164
Figure 80. Open area of the Deonar landfill being used for recreational purposes. Shanti Nagar, Mumbai, 2017. Photo by Author.	165
Figure 81. Rooftop of the Chintan operated school, Ghazipur fieldwork, February 2017. Photo by Author.	167
Figure 82. Participant Occupations, Ghazipur, 2017.....	168
Figure 83. Bhalswa fieldwork, February 2017. Photo by Author.....	169
Figure 84. Participant Occupations, Bhalswa, 2017.....	169
Figure 85. Shanti Nagar fieldwork location, Apnalaya community centre, February 2017. Photo by Author.	170
Figure 86. Participant Occupations, Shanti Nagar, 2017.....	170
Figure 87. Thematic analysis of the Ghazipur interview data identifying a range of conflicting perspectives on slum-upgrading issues.	173
Figure 88. Thematic analysis of the Bhalswa interview data identifying a range of conflicting perspectives on slum-upgrading issues.	177
Figure 89. Thematic analysis of the Shanti Nagar interview data identifying a range of conflicting perspectives on slum-upgrading issues.....	181
Figure 90. Exemplar diagram of a virtual SPS-UG environment.....	193
Figure 91. Level One – Maslow’s Palace.	197
Figure 92. Level Two – Maslow’s Palace.	198

Figure 93. Level Three – Maslow’s Palace.	199
Figure 94. Level Four– Maslow’s Palace.	199
Figure 95. Level Five– Maslow’s Palace.....	200
Figure 96. In-game instructions in English and Hindi, Maslow’s Palace.....	203
Figure 97. In-game instructions in English and Hindi, Maslow’s Palace.....	204
Figure 98. CS1 – Ghazipur located within the visual timeline of the research methodology.	208
Figure 99. Chintan School location of the Ghazipur workshops. November 2017.	211
Figure 100. Entering the Chintan School, the location of the workshops, Ghaizpur, November 2017.	212
Figure 101. Participants of the Ghazipur Workshops, November 2017.	212
Figure 102. Floorplan of workshop space.....	213
Figure 103. Ghazipur Workshop 2 participants playing Maslow’s Palace, November 2017.	213
Figure 104. Pre-test / Post-test analysis of Ghazipur workshop groups. The diagram indicates some consensus building surrounding proximity to the landfill as a main slum-upgrading issue (right) as opposed to a variety of issues being identified before the SPS-UG process (left).	220
Figure 105. Workshop Group Three, Ghazipur.	223
Figure 106. Group Four, level five, Maslow’s Palace. Ghazipur, November 2017. Participants removed the existing metro station, responding to the threat of forced eviction within their community.	223
Figure 107. Group Four, Level Five, Maslow’s Palace. Ghazipur, November 2017. Participants designing community meeting spaces and public spaces close to their homes and work areas.	225
Figure 108. Group Two, Level Five, Maslow’s Palace. Ghazipur, November 2017. Constructing housing within the landfill boundary—the in-game outcome functioning as a diagram.....	228
Figure 109. CS2 – Bhalswa located within the visual timeline of the research methodology.	234

Figure 110. The location of the Bhalswa workshops. November 2017.....	236
Figure 111. Participants of the Bhalswa Workshops, November 2017.	237
Figure 112. Floorplan of workshop space.....	238
Figure 113. Bhalswa Workshop 2 participants playing Maslow’s Palace, November 2017.	238
Figure 114. Bhalswa Workshop One, Level Four outcome. Participants’ outcome as a result of cooperative weighing of pros and cons of design options, November 2017.	242
Figure 115. Bhalswa Workshop Two, Level Four outcome. Participants’ outcome as a result of a solution to a conflict, November 2017.....	243
Figure 116. Pre-test / post-test analysis of Bhalswa workshop groups. The diagram indicates some solidarity surrounding access to drinking water, the construction of adequate housing, better drainage and access to hospitals.	244
Figure 117. Group Two, Level Five, Maslow’s Palace. Ghazipur, November 2017. Participants designing housing, community meeting spaces and public spaces close to their homes and work areas.	247
Figure 118. Aerial image showing the undeveloped parcel of land (top, centre) behind the Bhalswa slum community. Image via Google Earth, 2019.	249
Figure 119. The game environment area that the participants of Group One cleared to explore upgrading ideas.....	249
Figure 120. The game map before Group One’s gameplay, Bhalswa, 2017.	250
Figure 121. The workshop outcome of Group One, Bhalswa, 2017.	250
Figure 122. Phase Three research procedure. Bhalswa, Group Two.....	254
Figure 123. CS3 – Shanti Nagar located within the visual timeline of the research methodology.	258
Figure 124. The location of the Shanti Nagar workshops. November 2017.....	261
Figure 125. The Apnalaya Community Hall, Shanti Nagar, Mumbai, December 2017.	261
Figure 126. Floorplan of the Shanti Nagar workshop space.....	262

Figure 127. Shanti Nagar Workshop 2 participants playing Maslow’s Palace, November 2017.	263
Figure 128. Iteration one. Shanti Nagar, Group Five.	268
Figure 129. Iteration two. Shanti Nagar, Group Five.	268
Figure 130. Pre-test / post-test analysis of the Shanti Nagar workshop groups. The diagram indicates some solidarity surrounding access to drinking water for all workshop groups and lack of access to public toilets for Group Three.	270
Figure 131. Level Three research procedure. Shanti Nagar, Group Three.	273
Figure 132. Level five outcome, Workshop Group Four. Shanti Nagar, Group Three.	274
Figure 133. Participant of Group One playing Level Five, Shanti Nagar. Left image via Google Earth, 2019. Right image by author.	276

List of Tables

Table 1. Levels of Participatory Design Empowerment. Adapted from (Senbel & Church, 2011).	54
Table 2. Summary of game features identified as key to player engagement. Adapted from (Rooney, 2012).	96
Table 3. Speculative Strategies for Urban Design Serious Gaming. Adapted from (McLaughlin, 2005, p. 133).	101
Table 4. SPS-UG content/information strategies derived from the literature.	113
Table 5. SPS-UG framing strategies derived from the literature.	114
Table 6. SPS-UG game mechanics derived from the literature.	116
Table 7. SPS-UG fictional space/narrative strategies derived from the literature.	118
Table 8. SPS-UG aesthetics/graphics strategies derived from the literature.	118
Table 9. Synthesising Action Research and design processes.	124
Table 10. Phase One data collection purpose and methods – fieldwork 2017.	128
Table 11. Phase One interview questions.	130
Table 12. Phase Two purpose and SPS-UG development methods.	132
Table 13. Phase Three data collection purpose and methods – fieldwork 2017.	132
Table 14. Summary of the key variables identified between the case study sites.	166
Table 15. Identification of important contextual issues.....	183
Table 16. Development of 3D Assets - Housing	186
Table 17. Development of 3D Assets – Public Spaces	187
Table 18. Development of 3D Assets – Public Buildings and Infrastructure	189
Table 19. Development of 3D Assets – Commercial Activities	191
Table 20. Parts, Subclasses and features for compositing urban morphological and contextual issues in the SPS-UG.	192
Table 21. Maslow’s Palace Level Progression Summary.....	196

Table 22. Demographic information about workshop participants – Ghazipur, Delhi.....	210
Table 23. Maslow’s Palace workshop outcomes – Ghazipur.	214
Table 24. Demographic information about workshop participants – Bhalswa, Delhi.....	236
Table 25. Maslow’s Palace workshop outcomes – Bhalswa	239
Table 26. Demographic information about workshop participants – Shanti Nagar, Mumbai.....	260
Table 27. Maslow’s Palace workshop outcomes – Shanti Nagar	263

Publications Information

The following is a list of publications published during this dissertation.

Beattie, Hamish. Participatory Urban Design Gaming: A Perceptual Bridging Approach.” *Context: Design, Architecture, Culture* (blog), September 9, 2018. <https://contextbd.com/participatory-urban-design-gaming-perceptual-bridging-approach/>.

Beattie, Hamish and Daniel Brown. “Solidarity through Difference: Speculative, Serious Participatory Urban Gaming (SSP-UG).” *International Journal of Architectural Computing* 17 (Forthcoming).

Beattie, Hamish, Daniel Brown, and Morten Gjerde. “Generating Consensus: A Framework for Fictional Inquiry in Participatory City Gaming.” In *Serious Games 4th Joint International Conference, JCSG 2018, Darmstadt, Germany, November 7-8, 2018, Proceedings*, 126–37. Valencia: Springer, 2017.

Beattie, Hamish, Daniel Brown, and Sara Kindon. “Functional Fiction to Collective Action: Values-Based Participatory Urban Design Gaming.” In *Intelligent and Informed: Proceedings of the 17th International Conference on Computer-Aided Architectural Design Research in Asia*. Wellington: The Association for Computer-Aided Architectural Design Research in Asia, 2019.

———. “Perceptual Bridging as a Strategy for Stakeholder Social Capital Building and Ideation in Participatory Urban Design.” Lisbon, Portugal: Centro de Estudos Internacionais, 2018.

———. “Speculative Participatory Serious Urban Gaming: Evaluating the SPS-UG Design Framework.” In *Anthropocene: Design in the Age of Humans: Proceedings of the 18th International Conference on Computer-Aided Architectural Design Research in Asia*. Bangkok, 2020. (Forthcoming).

Beattie, Hamish, and Tane Moleta. "Videogame Urbanism: Pedagogical Outcomes of Exploring Serious Architectural Design Games in the Academic Design Studio." In *Anthropocene Design in the Age of Humans: Proceedings of the 18th International Conference on Computer-Aided Architectural Design Research in Asia*. Bangkok, 2020. (Forthcoming).

Glossary of Terms

Agonistic Participatory Design. Participatory Design processes that create agonistic space. In Agonistic Participatory Design processes, consensus should not be forced (Boano & Kelling, 2013); instead, opportunities should be provided for stakeholders to participate in contestation, or constructive controversies, among ‘adversaries’ who have opposing matters of concern but also accept other views as ‘legitimate’ (Björgvinsson et al., 2012; DiSalvo, 2012).

Agonistic Pluralism. Agonistic Pluralism is best understood in relation to antagonism, which is the struggle between enemies, while agonistic pluralism represents the contestation of multiple coexisting and conflicting perspectives between adversaries (Emilson, 2015, p. 50).

Agonistic Space. A situation where the different stakeholders do not necessarily reach a consensus surrounding a design, but rather create an arena that reveals conflict or tensions and that allows multiple opposing views to coexist (Hillgren, Seravalli, & Emilson, 2011, p. 179; Huybrechts, Dreessen, Schepers, & Salazar, 2016).

Agonistic Speculative Architecture. The creating of spaces for discussion and imagination of multiple possible futures by provoking a condition of pluralism and contestation through design that avoids presenting totalising hegemonic future “solutions” in the name of generating “consensus” (Leeuwen, 2015, p. 800).

Co-Design. A particular type of participatory design whereby expert designers and people not trained in design work together in collective creative ways throughout the whole design process (Sanders & Stappers, 2008).

Explicit and Observable Knowledge. Participant knowledge that can generally reveal stakeholders’ preferences for one thing over another.

Games. A system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome (Salen & Zimmerman, 2004, p. 80).

Genuine Participation. A processes in which all participants within a design activity have equal power to determine the outcome of the decisions made, as opposed

to merely being informants (Blundell-Jones et al., 2005, p. 27; Simonsen & Robertson, 2012, p. 5).

Informal Settlements. Inhabitants have no security of tenure with regard to the land or dwellings they inhabit, with modalities ranging from squatting to informal rental housing; the neighbourhoods usually lack, or are cut off from, basic services and city infrastructure; the housing may not comply with current planning and building regulations and is often situated in geographically and environmentally hazardous areas (UN-Habitat, 2015a).

Instrumental Speculative Architecture. The speculative architectural design is part of other designerly activities such as participatory design. (Tharp & Tharp, 2019). Instrumental speculative architectural projects behave similarly to participatory design research tools—explicitly framed to engage potential users and hopefully produce insight into their hopes, dreams, values, concerns, behaviours, etc. This type of design includes the observer as an active contributor to the speculation. (Tharp & Tharp, 2013, p. 408).

Latent Needs. Needs that participants are not yet aware of. They are needs that become realised in the future.

Participation. The term “participation” masks the fact that participatory design processes range in degrees of stakeholder empowerment from partial participation, or what Jeremy Till calls “pseudo-participation”, to full control of the process by the participants (Till, 2005, p. 25). These degrees are identified in Sherry Arnstein’s frequently cited ‘Ladder of Citizen Participation’ model (Figure 18. Ladder of Citizen Participation. Adapted from Arnstein (1969).), in which she sets out a hierarchy of stakeholder control (Arnstein, 1969). At the bottom of the ladder is “manipulation” of participants and at the top is “citizen control”.

Participatory design tools. The material components that are used in Participatory Design activities (Sanders, Brandt, & Binder, 2010).

Participatory Design Tools. Tools include digital and physical games, mapping instruments, and visualisation systems among others, are used in participatory design activities to engage stakeholders in design thinking (Sanders, Brandt, & Binder, 2010). They “scaffold” and “support collaborative [design] enquiry” and help to “bring

together a network of actors with different backgrounds, competencies and experiences” (Brandt et al. 148).

Participatory Design. The direct involvement of users and stakeholders in the design of products, services, and systems they use (Kensing, 2003; Simonsen & Robertson, 2012). The purpose of participatory design is to develop new knowledge geared towards participants’ ability to take action in informed ways.

Participatory Slum-Upgrading. Slum residents are involved in the decision-making process of upgrading as project partners. This shift reflects wider movements in development practice towards a capacity building based approach (Minnery et al., 2013; Pugh, 1995, p. 381; Rigon, 2014)

Perceptual Bridge. A perceptual bridge between the audience’s perception of their world and the speculative representation that roots the speculation within people’s everyday actual world. The perceptual bridge can fill the gap between the viewer’s actual world—present a state of mind, technical knowledge, psychological perception and cultural background—and the speculation’s world (Auger, 2012, p. 66). In doing so a perceptual bridge can ground the speculation by employing typologically familiar design elements to “ensure that it connects with an identified audience’s perceptions of the temporal world around them” (Auger, 2012, p. 180).

Serious Game Aesthetics. The category of Aesthetics describes the desirable emotional responses evoked in the player, when they interact with the game system. The aesthetics of the game help the designer describe the dynamics and the mechanics of the game to the player, set the tone, and give clear feedback to the players regarding scores, time, resources and progression.

Serious Game Dynamics. The category of Dynamics describes the run-time behaviour of the mechanics acting on players’ inputs and each other’s outputs over time. These may include time pressure, lack of resources to complete a certain task, or incentives and achievements that guide players toward a particular action.

Serious Game Mechanics. Mechanics are the various actions, behaviours and control mechanisms afforded to the player within a game context (Hunicke et al., 2004). Together with the game’s content, such as levels and resources, the mechanics support overall gameplay dynamics.

Serious Game. A serious game is “a mental contest, played with a computer in accordance with specific rules that uses entertainment to further government or

corporate training, education, health, public policy, and strategic communication objectives” (Zyda, 2005). The purpose of serious games is ultimately to be both educational and fun (Bellotti, Kapralos, Lee, Moreno-Ger, & Berta, 2013a).

Slums. As a synonym of informal settlements, slums are defined as “large agglomerations of dilapidated housing often located in the most hazardous urban land” that also “lack supply of basic urban infrastructure and services, public space and green areas and are constantly exposed to eviction, disease and violence” (UN-Habitat, 2015a).

Slum-Upgrading. A process through which informal areas are gradually improved, formalised and incorporated into the city itself, through extending land, services and citizenship to slum dwellers (The Cities Alliance, 2014).

Social Design. Participatory approaches to researching, generating and realising new ways to make change happen towards collective and social ends, rather than predominantly commercial objectives (Armstrong et al., 2014).

Speculative Architecture. Designed to promote the consideration of alternate visions and possible futures and to scaffold discussions about what the future might look like. They can be, and have been, used as a means of imagining new possible ways of living as communities (Dunn, Cureton, & Pollastri, 2014, p. 14)...“remove the commercial constraints that might normally limit the design process; use prototypes as the main method of enquiry; and use fiction to present alternative futures, pasts or presents to create space for thinking, questioning and dreaming” (Auger, 2012, p. 136).

Speculative Participatory Serious Urban Gaming (SPS-UG). SPS-UG’s are concerned with drawing together speculative architecture, participatory design and serious games literature in order to go beyond the visualisation of design options, thinking about single speculations or aiding learning about collaborative design processes: it also aims to help participants in a given community or locale to reflect upon a plurality of possible futures that might help them to explore perspectives and corresponding goals surrounding the upgrading of their infrastructures and environments, i.e., to enhance both *social* outcomes and related *design* (slum-upgrading) outcomes.

Tacit knowledge. Knowledge that cannot readily be expressed in words (Polanyi, 1967).

Terminal Speculative Architecture. The design is the terminus of the design activity (i.e. the outcome or design solution). (Tharp & Tharp, 2019).

Values. The enduring beliefs that we hold concerning “desirable modes of conduct” or “end-state of existence in different situations”, societies and cultural contexts (Iversen, Halskov, & Leong, 2012, p. 89).

Abstract

People who are marginalised in slum-upgrading processes can benefit from participatory design strategies. When marginalised slum communities confront and explore conflicting perspectives, values, assumptions and goals through negotiation within participatory design processes, the ability to harness the collective intelligence of people to work towards collective action can be enhanced. However, a tension exists in the participatory design literature between those participatory processes that seek to facilitate social outcomes such as social capital building, and those that seek only to implement an urban development or upgrading project (slum upgrading) as the outcome. Exploring new methods of design participation that integrate both social outcomes and design processes can help alleviate this tension by recognising a diversity of stakeholder perspectives on urban-related issues and help them work towards implementing lasting communal change that explicitly takes into account cooperative development action.

The dissertation explores an innovative approach to participatory slum upgrading, which proposes bringing together *speculative architecture*, *participatory design*, and *serious gaming* approaches to help stakeholders to explore conflicting perspectives, assumptions and corresponding future visions surrounding architectural and urban issues. The research focusses on how these three areas can be brought together to help develop a new approach for designing participatory design tools for marginalised communities. The research explores how a “speculative, participatory, serious urban gaming” (SPS-UG) approach might be used to help marginalised communities consider past, future and present community experiences, reconcile dissimilar assumptions, and generate social outcomes and in-game design responses, while priming participants for further long-term, slum-upgrading design engagement processes. Empirical material for this research was gathered from a range of case study workshops prepared with three landfill-based communities and external partners throughout 2017, which utilised a new SPS-UG computer game I designed called *Maslow’s Palace* to evaluate the approach.

The research shows that the SPS-UG approach was successful in guiding the design of a serious game to help reveal, develop and ground stakeholder knowledge, goals and values surrounding slum-upgrading issues. Through an exploration of social

complexities involved in the participatory design process, participants were stimulated to share diverse opinions and aspirations and thus deepen their understanding of self, others, norms and institutions. The SPS-UG approach contributed to slum-upgrading outcomes for communities by aiding slum-upgrading ideation, framing the consideration of alternate views and possible futures, and scaffolding discussions about what the future might look like through visual representation of possible design alternatives. Finally, the research discusses key methodological insights, and the challenges faced when working with marginalised communities while pursuing social and slum-upgrading outcomes through a gaming approach. This is significant when considering how the approach might interface with other slum-upgrading processes outside of the scope of this research or function as a catalyst for the transformation of other physical urban environments and socio-cultural contexts.

1. Introduction

The research proposes to bring together *speculative architecture*, *participatory design*, and *serious gaming* approaches to help slum-dwellers explore conflicting perspectives, assumptions and corresponding future visions surrounding slum-upgrading issues (Figure 1). The research focusses on how this approach can help develop participatory design tools for slum communities around the world using case study examples from India.

Figure 1. Diagram that shows the areas of interest, in particular the ones resulting in the intersection of the three main areas investigated in the literature review.

1.1 Research Context

Landfills, in many developing countries and indeed in some developed nations, can be catalysts for the development of unplanned informal settlements or slums. The

United Nations Human Settlements Programme defines *Informal Settlements* as those in which:

inhabitants have no security of tenure with regard to the land or dwellings they inhabit, with modalities ranging from squatting to informal rental housing; the neighbourhoods usually lack, or are cut off from, basic services and city infrastructure; the housing may not comply with current planning and building regulations and is often situated in geographically and environmentally hazardous areas (UN-Habitat, 2015a).

Slums, as a synonym of informal settlements, are defined as “large agglomerations of dilapidated housing often located in the most hazardous urban land” that also “lack supply of basic urban infrastructure and services, public space and green areas and are constantly exposed to eviction, disease and violence” (UN-Habitat, 2015a).

As land surrounding landfills is generally seen as undesirable and usually initially vacant, it is often available for informal settlement. Living near landfills can also be attractive to migrants or economically disadvantaged people, as they can offer community members a means of livelihood through “waste-picking”—or the reclamation of reusable and recyclable materials from solid waste streams—as an adaptive response to poverty, forced resettlement, migratory pressures and employment scarcity (Medina, 2008). Some people work in the informal recycling sector as a migratory transitional occupation before finding more formal employment, and some engage with waste picking as an income supplementation strategy, and after some time, secondary or tertiary means of livelihood—such as small stores—are established to service the informal economy (Neuwirth, 2012). For many, however, collecting and processing materials from city streets, landfills and garbage trucks become a long-term livelihood solution, central to the functionality of these communities (Marello & Helwege, 2014; Medina, 2008; The World Bank, 2013; Wilson, Velis, & Cheeseman, 2006).

Once established, inhabitants of landfill-oriented slums can face a number of hardships. They generally illegally occupy land, which can result in issues regarding security of tenure and forced eviction, as well as harassment from government and law enforcement. Oftentimes people have the ability to construct better homes for themselves but choose not to allocate their resources to this due to the threat of forced

eviction and the possibility of having to rebuild their homes somewhere else. Inhabitants of landfill-oriented slums can also suffer from an acute lack of access to adequate housing stock, water and electricity infrastructure, sanitation facilities, adequate roads and drainage, availability of public and community spaces, health facilities and schools.

To compound matters, landfill-based communities often have very complex socio-cultural structures with high proportions of children, single mothers, widows, the disabled and the ill. Recent migrants and refugees also often make up a large proportion of these communities due to rural-urban, intra-urban and inter-urban migration, meaning newcomers arrive with new and different cultural backgrounds, languages and worldviews. The resulting diversity can mean that if and when community members engage with urban development processes such as slum-upgrading projects to work towards solutions to the aforementioned problems, individuals may enter workshops or community meetings with different assumptions, viewpoints, and interpretations of situations. While community members may have similar goals such as reaching the best decision or outcome for the community, their different worldviews and corresponding values may interfere with their ability to view and discuss issues in similar ways (Mohammed & Ringseis, 2001).

As a result of differences in worldviews and values, communities can be limited in their ability to engage, decide, plan and lobby for effective future development action—either from bottom-up action or as part of a facilitated project (The World Bank, 2013). Community members can also be less likely to come up with solutions that benefit all inhabitants; completed projects might not be maintained by the community due to a “poor fit” of the design outcome; social rifts between different factions might eventuate and stall development processes; and projects might be less likely to attract funding or be seen as less beneficial to politicians who might look to endorse projects for the projects’ merits or even their own political gain. This limitation, with its roots in the social-cultural intricacies of the context, can ultimately affect a landfill-oriented slum community’s ability to become empowered to overcome problems through mutual understanding, ideation and collective action.

1.1.1 Slum Upgrading

The demolition and resettlement of informal settlement and slum communities have traditionally been operationalised by local and national governments in order to remedy the “slum problem” (Baviskar, 2003; Macharia, 1992; Olthuis, Benni, Eichwede, & Zevenbergen, 2015); however, demolition and involuntary resettlement are now generally considered to be ineffective, as they can result in the destruction of livelihood and social networks of community members (Roquet, Bornholdt, & Lukic, 2015, p. 2). Resettlement can result in the need for complex livelihood restoration processes and tailored social support surrounding the resettled community.

In response to the problems surrounding the resettlement approach, during the last two decades of the twentieth century, focus has shifted towards informal settlement upgrading processes—or “slum upgrading” and rehabilitating existing slums in-situ (Hamdi, 1991; Huchzermeyer, 2010; Lochner & Ntema, 2013; Mukhija, 2017; Turley, Saith, Bhan, Rehfuess, & Carter, 2013). Cities Alliance defines slum upgrading as: “A process through which informal areas are gradually improved, formalised and incorporated into the city itself, through extending land, services and citizenship to slum dwellers” (The Cities Alliance, 2014).

Slum upgrading refers to improvements in housing and/or basic infrastructure, social infrastructure such as community centres, education facilities, health services and economic infrastructure such as job growth in slum areas. More specifically, slum-upgrading actions consist of physical, social, economic, organisational, and environmental improvements that are undertaken as a collaboration between individuals, community groups, businesses and local authorities (French, Popal, Rahimi, Popuri, & Turkstra, 2018; United Nations, 2016; United Nations Human Settlements Programme, 2003, 2013). They try to increase security of tenure of informal settlement communities through working with local authorities (Olthuis et al., 2015, p. 272; The World Bank, 2013; The World Bank Group, 2001). These approaches would, ideally, foster social and economic inclusion, that can bring about such physical improvements (Skinner, French, Acioly, & Reid, 2014, p. 3) and improve quality of life.

Some of the benefits of slum upgrading approaches are that they are more “inexpensive, feasible, and flexible than adopting common demolition and relocation mechanisms” (Olthuis et al., 2015, p. 271). According to Skinner et al; slum upgrading

remains “the most financially and socially appropriate approach to addressing the challenge of existing slums” (Abebe & Hesselberg, 2015; Patel, Siliuzas, & Mathur, 2015; Roquet et al., 2015; Skinner et al., 2014, p. 17). In addition, it has become progressively clearer that single project-based approaches to upgrading—such as providing a building or a single piece of infrastructure to one specific community—have been insufficient to alleviate the hardships faced by these communities (Skinner et al., 2014; UN-Habitat, 2015b). Consequently more holistic approaches to slum upgrading have become the international policy norm (UN-Habitat, 2016a).

1.2 The Participatory Slum-upgrading Approach

Over the past four decades a shift has taken place towards “participatory” slum upgrading where residents are increasingly involved in the decision-making process of upgrading as project partners, this shift reflects wider movements in development practice towards a capacity building based approach (Minnery et al., 2013; Pugh, 1995, p. 381; Rigon, 2014). Participatory architectural design and stakeholder participation in community upgrading and design have many benefits. They can increase the chance of successful project implementation improvements, as stakeholders are more likely to support plans that can reduce risk and timeframes for project completion (Majale, 2008). Carefully-orchestrated participatory processes generally also result in projects that are well-suited to community needs. They can be transformative through building the capacity of those who are traditionally omitted from city building procedures to engage with development processes (Angel, 1983). In this context, participatory slum upgrading can give those who are generally marginalised a space to express opinions and ideas, and provide a chance for them to be included in the decision making that will impact their lives, livelihoods, and wellbeing (Frediani, French, & Ferrera, 2011, p. 18).

Majale (2008) argues that a participatory approach to upgrading, through which residents are able to provide meaningful input into the project, can lead to the empowerment of the residents (Majale, 2008). MacPherson (2013) explains that participation in slum upgrading allows people to expand their capabilities, and in turn, their freedom (p. 88). Frediani & Boano describe this as the construction of “capability space” (Frediani & Boano, 2012, p. 13). According to a UN-Habitat report, this

participatory design in slum-upgrading can have both social and infrastructural/spatial value. “Community participation can at many stages both preserve residents’ sense of belonging and ensure that the services provided are what local people want, value and are ready to look after” (UN-Habitat, 2016b, p. 62).

Davis and Garb posit that when marginalised communities confront and explore conflicting perspectives, values, assumptions and goals through negotiation within participatory design processes, the ability to “harness the collective intelligence” of people to work towards collective action can be enhanced (Davis & Garb, 2017, p. 77). Through an exploration of social complexities involved in participatory design processes, participants can be stimulated to “share diverse opinions and aspirations [and] thus deepen their understanding of the self, others, norms and institutions” (Frediani & Boano, 2012, p. 216). Carl DiSalvo argues in his article “Design, Democracy and Agonistic Pluralism” that participatory design processes can become processes that are guided by normative principles of being open to contestation and reconfiguration (DiSalvo, 2010). They can function as a catalyst for transformation of physical urban environments and socio-cultural contexts¹.

1.3 The Research Problem

While stakeholder participation in community upgrading and design can be both *socially* and *practically* advantageous, creating fora for both social outcomes and slum-upgrading outcomes to be addressed can be challenging.

A tension exists in the participatory architectural design literature between those participatory processes and tools that seek to facilitate social outcomes—or so called “social design”—and those that seek to implement an architectural design project as the outcome (Armstrong, Bailey, Julier, & Kimbell, 2014; Frediani, 2016). *Design outcome* focussed participatory processes have generally been well-intentioned but are often criticised as being short-sighted regarding their ability to effectively address issues of power dynamics and social relationships. They often do not adequately allow for an exploration of conflicting stakeholder perspectives, assumptions and

¹ This mode of participatory architectural design is in direct opposition to dominant modes of pseudo-participation. The issues of manipulative and exploitive modes of “pseudo-participation” have been widely detailed (Arnstein, 1969; Cooke & Kothari, 2001; Frediani & Boano, 2012; Sinha, 2012).

corresponding future visions surrounding architectural and urban issues and increasing cooperation and agency to affect change over their environment. As noted by Cook and Kothari in their book *Participation: The New Tyranny*, such processes often do not adequately deal with both the complex social structures shaped by various cultural nuances and asymmetries of power, when faced with implementation-driven design projects and short timeframes for project completion (Cooke & Kothari, 2001)². Jeremy Till posits that the challenge of the *design outcome* approach is linked to the way in which architecture is inherently a spatial problem-solving discipline. “In architectural practice, the ‘problem’ is what gives the profession something to act upon in a specialised manner” (Blundell-Jones, Petrescu, & Till, 2005, p. 26). By not carefully considering people’s tacit and latent feelings and values in participatory architectural practice, we unnecessarily limit design’s engagement processes to “explicit and observable knowledge about contexts” and negate their ability to explore future alternatives with reference to non-physical attributes of setting (Sanya, 2016; Visser, Stappers, Van Der Lugt, & Sanders, 2005). Frediani argues that being overly fixated on a *design outcome*, at the cost of participants’ tacit and latent feelings and values, can inadvertently “homogenise the needs and aspirations” of participants (Frediani, 2016).

Meanwhile “*social design*” participatory architectural design processes are those often motivated by challenging the drivers of socio-political issues and improving the conditions for a disadvantaged and often confined community. Social design processes can struggle to interface with design processes that meet the diverse needs of communities. Armstrong et al. define *social design* as participatory approaches to researching, generating and realising new ways to make change happen towards collective and social ends, rather than predominantly commercial objectives (Armstrong et al., 2014). *Social design*³ participatory processes are less focussed on the production of design outcomes, and instead focus primarily on building mutual understanding, networks and relationships between participants—or *social capital*.

While participants of *social design* participatory processes might see significant increases in their social capital, the often long duration and lack of focus on pragmatic

² As Jeremy Till points out, it is important to note that no participatory process, however well intentioned, is going to completely dissolve asymmetries of power and inequalities between participants (Blundell-Jones, Petrescu, & Till, 2005).

³ For a discussion on how “social design” differs from “social innovation” and “social entrepreneurship” see Markussen (2017).

or spatial design outcomes can mean that those increases are not easily transferable to design processes and outcomes. Additionally, while some processes may provide transformative outcomes in the context of a specific workshop activity, the *social outcome* may not translate to the *design* process, which might be facilitated weeks or months afterwards. Discussions had in one *social capital* building process—such as an icebreaker session—can be lost in the transition to a design mapping activity. Discussion surrounding feelings relating to cultural history, or personal experience relating to gender inequality, for example, might be put aside when, at a later date, discussion turns to implementation and costing procedures for a proposed design. Design projects implemented at the conclusion of the social design process can therefore be subject to the same patterns of social conflict, domination and suppression that necessitated the social design process in the first place (Frediani & Boano, 2012).

Exploring new methods of design participation that integrate both social outcome and design processes can help alleviate this tension. The investigation of the threshold between *social outcome* and *slum-upgrading outcome* participatory design processes forms the central research problem of this dissertation.

1.4 Research Approach

This thesis explores how design strategies derived from speculative architecture, participatory design and serious gaming approaches might be brought together to enhance both *social* outcomes and related *design* (slum-upgrading) outcomes for urban slum dwellers.

As Johansson points out, the challenge often faced by engaging non-experts in design processes is that the “trained designer may use a pen and a piece of paper to illustrate his ideas while other stakeholders need other kinds of design material to be able to sketch” (Johansson, 2005, p. 17). Architecture has a long history of visualising future possibilities through “*speculative architectures*” designed to promote the consideration of alternate visions and possible futures and to scaffold discussions about what the future might look like. They can be, and have been, used as a means of imagining new possible ways of living as communities (Dunn, Cureton, & Pollastri, 2014, p. 14). Speculative architectures are designed for the purpose of fantasising, discussing and challenging perspectives, values and assumptions on architectural,

urban, social, political and environmental concerns. Speculative architectures can generate discussion and pluralistic visions of the future in order to defamiliarise situations to open up space for thinking about sensitive topics. Interestingly, some scholars have argued that speculation could hold a potential for participant-involvement and collaboration in participatory design processes. As pointed out by Knutz, Markussen, & Lenskjold, with few exceptions (Blythe & Wright, 2006; Dindler & Iversen, 2007), the question of the relationship between speculation or even fiction and participatory design remains largely unexplored (Knutz, Markussen, & Lenskjold, 2016).

“*Participatory design*” is a collection of design approaches, methods, tools and techniques that are shared between many disciplines. In defining “participatory design”, it is important to differentiate between a number of often conflated terms. While the terms “participatory design” and “co-design” are often used interchangeably in the literature, co-design is actually a particular type of participatory design whereby expert designers and people not trained in design work together in collective creative ways throughout the whole design process (Sanders & Stappers, 2008). Participatory design is much broader and encompasses actions at different stages of the design process, as well as being applicable to the design process holistically. While participatory design was developed mainly for ICT development, it is today applied in a wide range of fields such as urban design, architecture, slum upgrading, product development, industrial design and service design. *Participatory design tools*, which include digital and physical games, mapping instruments, and visualisation systems among others, are used in participatory design activities to engage stakeholders in design thinking (Sanders, Brandt, & Binder, 2010). They “scaffold” and “support collaborative [design] enquiry” and help to “bring together a network of actors with different backgrounds, competencies and experiences” (Brandt et al. 148).

Participatory design can be positioned within slum-upgrading processes in a number of ways. It can be used to understand the slum situation, establish networks for slum-upgrading work, undertake capacity building activities, prioritise interventions at neighbourhood level, and support the implementation of projects identified by the participants, which includes concept development and detailed design, construction and maintenance (Skinner et al., 2014, p. 15). These participatory design functions can be organised under four broad categories: to *prime* participants for a design process by encouraging the exploration of future visions or the building

of social capital, to help *diagnose* or define problems, to *generate* design ideas and/or to *evaluate* design outcomes (Figure 2). They are generally used throughout the early stages of a slum-upgrading process in order to generate a desired social impact and/or to facilitate the collaborative exploration or development of design ideas (Lucero, Vaajakallio, & Dalsga, 2012; Lynch, 1984; Sanders et al., 2010). This thesis reflects this in its scope.

Figure 2. The research scope includes pre-design and some early design activities, specifically focussing on capacity building, problem definition, analysis, research, programme definition and idea generation, aligning with priming, diagnostic and generative participatory design activities. Adapted from (Lucero et al., 2012; Lynch, 1984; Sanders et al., 2010).

Recent developments in digital game creation software have opened up new research areas to explore the development of architectural *serious games* focussed on helping stakeholders explore conflicting perspectives, assumptions and corresponding future visions. Currently the development of digital urban design games is gaining prominence for their ability to draw stakeholders together in multiplayer environments, allowing players to collaboratively explore different perspectives, design alternatives

and solutions in a medium with a low cost of failure (Poplin & Vemuri, 2018; Shen, Ma, Sugihara, Lei, & Shi, 2014; Vemuri, Poplin, & Monachesi, 2014; Zhang, Shen, Wang, Kobayashi, & Lin, 2017). Serious games are recursive, fluid, adaptable and responsive in their presentation of content and so are a promising medium for the development of speculative participatory design tools. Like other examples of new media approaches, serious games also offer new ways to gather data that is difficult to gather—such as tacit knowledge of participants about context—allowing for more comprehensively-informed and participatory decision-making processes. However most architectural and planning-oriented serious games tend to focus on “design outcomes” as the main objective (Ampatzidou et al., 2018; Mather & Robinson, 2016; Poplin & Vemuri, 2018; von Heland, Westerberg, & Nyberg, 2015; Yamu, Poplin, Devisch, & De Roo, 2017; Yan, Culp, & Graf, 2011), while architectural and planning-oriented serious games that focus specifically on implementing social change functions are much more scarce (Holland & Roudavski, 2016; Vemuri et al., 2014). A lack of focus on the social dimension of serious games can limit constructive discourse surrounding goals and values that can lead to better idea exploration, discourse, decision making, and increases in consensus, cooperation and empowerment.

1.5 Research Question and Aims

Research Question: How can speculative architecture, participatory design and serious gaming approaches be brought together to enhance both *social* outcomes and related *design* (slum-upgrading) outcomes for urban slum dwellers?

Research Aims:

Aim 1: To identify how “speculative architecture” has enabled an exploration of possible futures, conflicting stakeholder perspectives, and corresponding goals surrounding social, architectural and urban issues.

Aim 2: To document how “participatory design” has enabled an exploration of possible futures, conflicting stakeholder perspectives, and corresponding goals surrounding social, architectural and urban issues.

Aim 3: To question how “serious games” have enabled an exploration of possible futures, conflicting stakeholder perspectives, and corresponding goals surrounding social, architectural and urban issues.

Aim 4: To develop, implement and reflect on the use of a speculative, participatory, game-based approach to slum-upgrading in order to aid the generation of useful urban slum-upgrading oriented social outcomes and related architectural design slum-upgrading outcomes for disparate stakeholders in marginalised communities, more specifically, dwellers of landfill-oriented slums.

Aim 5: To generate insights, guidelines and recommendations for the future practice of a speculative, participatory, game-based approach in similar contexts.

1.6 Research Design Overview

To respond to the research question and aims, a qualitative Action Research methodology was used that was centred on case studies, that utilise participatory design workshops as a research method (Foth & Axup, 2006; Frediani et al., 2011; Groat & Wang, 2002; Pollastri, 2017; Reason & Bradbury, 2001; Sanders, 2008; Silverman, 2015; Swann, 2002).

This approach was operationalised in participatory gaming workshops conducted with three case study (CS1-3) landfill-based slum communities in India. CS1 was conducted with the Ghazipur community in Delhi, CS2 was conducted with the Bhalswa community in Delhi and CS3 was conducted with the Shanti Nagar community in Mumbai.

This approach underlines the experimental nature and character of the work and provides a coherent way for discussing how the arguments are connected to the design work and to academic discourses.

1.7 Outline of the Dissertation

Chapter One lays out the research problem by detailing the current issues regarding participatory slum-upgrading processes. It defines the research context and scope. It

defines social outcomes and urban upgrading outcomes within this context and scope and introduces speculative architecture, participatory design and serious games as the three strands of literature upon which Chapters Two and Three will draw. The research question has two main components (*social outcomes* and *design (upgrading) outcomes*). The first is in relationship to the social considerations of community members regarding the negotiation of conflicting perspectives and goals, and the second concerns slum upgrading as a design process that might be aided in a number of ways through collaborative ideation.

Chapter Two, Literature Review, responds to Aims 1 - 3 and positions the research within current discourses in participatory design, speculative architecture, and serious games. Chapter Two is divided into three sections. The first section addresses Aim 1 by reviewing how speculative architectural design strategies have been used to promote an exploration of conflicting stakeholder perspectives, to consider alternate visions and possible futures and to scaffold discussions about different futures might look like.

I first define *speculative architecture* as a future-focussed design genre that emphasises the importance of generating pluralistic visions of the future. I argue that speculative architectures have been a key instrument for designers to defamiliarise situations to open up space for thinking about sensitive or controversial topics. I review selected examples of speculative architecture in order to identify how previous speculative architectures have been used to critique the real world, how they have been legitimised and contextualised from the perspective of the viewer and how they have been framed to provoke urban, architectural social discourse. I then identify a number of strategies that can help facilitate an exploration of conflicting stakeholder perspectives, assumptions and corresponding goals surrounding architectural and urban issues. I highlight a disconnect between many works of speculative architecture and the context and people for which they are designed; the section indicates that many class, colonial and gender hierarchies and biases are often reinforced, thereby compounding inequality. The section concludes by recognising that, while speculative architectural projects have been internally valuable to architectural discourse and have raised important social and spatial issues for debate within the discipline, there are few examples of purposefully public-facing speculative architectures. Research regarding how speculative architecture can actively engage the communities it is addressing has been under-explored.

The second section of Chapter Two addresses Aim 2 by considering how participatory design processes have been used to engage stakeholders and marginalised communities in both design and social capital building processes. Here, I address the complex semantic issues surrounding the term *participatory design* by defining and positioning it within current architectural discourse. I review the processes, techniques and tools employed by architects and designers to facilitate collaborative design and social capital building processes within impoverished communities. I argue that while participatory architectural design processes generally result in projects that are well-suited to community needs, they often do not adequately allow for an exploration of conflicting stakeholder perspectives, assumptions and corresponding goals surrounding architectural and urban issues. Inadequately allowing for exploration can limit a group's ability to generate effective ideas, visions, concepts or solutions that benefit all inhabitants or users.

Finally, the third section addresses Aim 3 by first positioning *serious games* within the participatory design literature as a design tool for fostering collaboration between disparate non-expert participants via a collaborative digital medium. I next identify how digital games act as a medium for generative participatory design inquiries through a review of current approaches to serious games. I define key characteristics of serious games as effective tools for participatory social and slum-upgrading inquiries, as well as strategies for how they have resulted in either social and design oriented outcomes.

Chapter Three responds to Aim 4. In Section 3.1, I draw on the strengths of speculative architecture, participatory design and serious games to synthesise them into a “Speculative Participatory Serious Urban Gaming” framework or (SPS-UG). I then outline the action research approach and provide an overview of the research context. As noted in Section 1.6, empirical material for this research is informed by a computer game I designed and tested in three case studies with three landfill-oriented slum communities in India—Ghazipur, Delhi (CS1), Bhalswa, Delhi (CS2) and Shanti Nagar, Mumbai (CS3). I carried out research in these locations in association with external partners throughout 2017.

Chapter Four details the operationalisation of the SPS-UG framework and its application within the case study contexts. The chapter is composed of two sections. The first section details the documentation of each research context including the fieldwork procedures and analysis, while the second section details issues pertaining

to the development of an SPS-UG for use in participatory design gaming workshops with the research communities. These include the creation of 3D assets and their composition into virtual environments and the definition of interactive game elements, mechanics and dynamics in line with the SPS-UG purpose of facilitating ideation and negotiation of conflicting perspectives.

Chapters Five - Seven document the experience of the three case study communities with whom I utilised the approach and methods outlined in Chapter Four.

Chapter Eight discusses the results arising from the computer game I designed and tested in all three case studies, their commonalities and the differences between them in relation to Aims 1-5. I discuss the method and the framework detailed in Chapter Three within the context of the research results. I then evaluate the approach is evaluated for its ability to generate both a range of *social outcomes* and *design (slum-upgrading) outcomes*.

Chapter Nine concludes the dissertation by articulating key findings, insights and conclusions drawn from the learnings from the previous chapters and how they respond to the research question and aims. I critically reflect upon the implications of the research findings. Additionally, I discuss the implications for participatory design and community development, particularly for dwellers of landfill-oriented slums. I conclude by proposing directions for future research.

2. Literature Review

The first three sections of this chapter position the research within current discourses in speculative architecture (2.1), participatory design (2.2) and architectural serious games (2.3), contributing specifically to the follow three research Aims:

Aim 1: To identify how “speculative architecture” has enabled an exploration of possible futures, conflicting stakeholder perspectives, and corresponding goals surrounding social, architectural and urban issues.

Aim 2: To document how “participatory design” has enabled an exploration of possible futures, conflicting stakeholder perspectives, and corresponding goals surrounding social, architectural and urban issues.

Aim 3: To question how “serious games” have enabled an exploration of possible futures, conflicting stakeholder perspectives, and corresponding goals surrounding social, architectural and urban issues.

The fourth section of this chapter (2.4) synthesises the literature into a framework that I call “Speculative Participatory Serious Urban Gaming” (SPS-UG), which is concerned with drawing together speculative architecture, participatory design processes, and serious games literature to address Aim 4:

Aim 4: To develop, implement and reflect on the use of a speculative, participatory, game-based approach to slum-upgrading in order to aid the generation of useful urban slum-upgrading oriented social outcomes and related architectural design slum-upgrading outcomes for disparate stakeholders in marginalised communities, more specifically, dwellers of landfill-oriented slums.

2.1 Speculative Architecture

The important thing is not to offer any specific hope of betterment but, by offering an imagined but persuasive alternative reality, to dislodge my mind, and so the reader's mind, from the lazy, timorous habit of thinking that the way we live now is the only way people can live.

— (Le Guin, 2004)

2.1.1 Introduction

Speculative architectural representations of future urban environments and their associated ways of life contribute to our social imagery. They can be, and have been, used as a means of imagining new possible ways of living as communities (Dunn, Cureton, & Pollastri, 2014, p. 14). Speculative architectural works are not intended to be built, but are designed for the purpose of fantasising, discussing and challenging perspectives, values and assumptions on architectural design, urban, and related social, political and environmental concerns. Such projects are often justified by arguing that they expand the territory of the discourse on what architecture might be (Pickersgill, 2017, p. 71).

The purpose of this section is to:

1. Define “speculative architecture” and key associated terms and attributes;
2. Review the approaches to generating future-oriented visioning through the design of speculative architecture;
3. Identify and analyse key speculative architectural strategies to help stakeholders explore possible futures, conflicting stakeholder perspectives and assumptions, and corresponding goals surrounding social, architectural and urban issues;

4. Summarise the review by presenting relevant strategies derived from the literature that may be used in the design of effective speculative architectural visioning to address the Research Question.

2.1.2 Defining Speculative Architecture

***Strategy SA-I:** Consider the speculation's connection and position in relationship to plurality and temporality.*

***Implications for Research:** This section discusses the temporal positioning of speculations within the possible or plausible temporal bands to help ground the speculation by creating a logical path from the present to the proposed speculative scenario, while facilitating a pluralistic temporal lens to challenge the viewer's assumptions through the proposed visualisation.*

The use of the term “speculative architecture” was chosen for the purposes of this research for a number of reasons to differentiate *speculative architecture* from its many close relatives, such as *visionary architecture*, *fantasy architecture*, *architecture fiction* and *paper architecture* (Bingham, Carolin, Cook, & Wilson, 2004; Gissen, 2009; Spiller, 2007). The intention of the research investigation is to provoke meaningful and useful debate that leads to social and design outcomes. Visionary architecture is not necessarily intended to provoke meaningful and useful debate, and examples that might provoke meaningful design or social debate do not necessarily deal explicitly with the future. The word “fantasy” faces a similar challenge, as it implies that the architecture is imaginary or not based in any perceivable reality or was conceived for entertainment purposes. The use of the word “fiction” in architecture also informs the viewer that the architecture is not related to reality and magnifies conjectural tendencies. While the term “paper” architecture explicitly implies architecture not meant to be built, it does not accurately reflect the current state of the largely digital architectural design practice. For these reasons, the term “speculative” is preferable as it suggests a relationship between ‘here and now’ and the speculative design proposal—which is considered important when considering slum-upgrading processes. Whilst the terms listed above overlap or lack commonly agreed definitions, they arguably share certain similarities in that they: “remove the commercial constraints that might normally limit the design process; use prototypes as the main

method of enquiry; and use fiction to present alternative futures, pasts or presents to create space for thinking, questioning and dreaming” (Auger, 2012, p. 136).

Clear (2013) suggested in his article “Drawing Time” for the *Drawing Architecture* edition of AD magazine that “architects do not make buildings; they make a range of different types of representations that may be used in the construction of buildings or they may be used in a number of ways to create a wide array of spatial possibilities” (Clear, 2013, p. 72). Auger (2013) argues that speculative design projects primarily use visualisations at the heart of their inquiry to reframe discussions about alternative pasts, presents and futures. They allow observers of the speculation to not only consider how things might be, but also why things are the way that they are—as a way to reflect upon, critique or challenge existing powers, processes and systems (Auger, 2013, p. 2).

Self-described “speculative architect” Liam Young defines speculative architecture as a “future focussed domain of architectural design” that is focussed on creating “new narratives about how new technologies and networks influence space, culture, and community” (Young, 2017). Young asserts that in creating works of speculative architecture, designers “try to imagine where new forms of agency exist within the cities changed by these new processes” (ibid.). Design critic and science fiction author Bruce Sterling argues that speculative architectural projects use ideas for the built environment to express themselves in a way that is comparable to how storytellers use words (Sterling, 2012). Works of speculative architecture tell stories about cities, spaces and the possibilities of the future through architectural design. They also employ a careful balance of fiction and reality through more accessible visual language than conventional architectural representation (Auger, 2013). Speculative framing of architecture has also been used to help to disseminate ideas to much wider audiences than just those architecturally trained.

Some of the broader criticisms of speculative architecture are described below. Auger, whose research sought to formalise the methodology of speculative design, describes the term “speculative” as having “strong leanings towards conjecture or guesswork”, meaning that works of speculation might be easily dismissed as not real or not worthy of careful consideration or critical thought (Auger, 2012, p. 137). Further, as Forlano and Mathew point out, much of the criticism faced by speculative design is directed at the elitist nature of speculative architecture and how non-expert audiences can struggle to engage with it (Forlano & Mathew, 2014).

The term “design” is used in a number of ways throughout this section. As Bannon and Ehn point out, one of the difficulties in any enquiry concerning the concept of *design* is that the term has so many different meanings that it can be difficult to determine exactly what kind of process, practice or product is being examined (Bannon & Ehn, 2013, p. 40). In discussing speculation in this section, I refer to *design* as the creative process of designing generally in many cases—removed from the end product of the design process (i.e. a building, space or urban design)—as well as to the design process within the domain of architecture more specifically.

2.1.2.1 *Speculative Architecture and Plurality*

Discussing a plurality of possible futures through architectural speculations can lead to further understanding of the perspectives of others by challenging the viewer’s assumptions through the proposed visualisation (Pollastri et al., 2017, p. 2). “Speculative design is distinct [from conventional architectural practice] in that it strives to open up a discursive space that is underwritten by the unavoidable plurality of the future” (Lindley, Sharma, & Potts, 2014, p. 240). Design can convert ideas that exist in a plurality of possible futures into specific manifestations that are experienced in the present. Herbert Simon argued in his book *The Sciences of the Artificial* that “everyone designs who devises courses of action aimed at changing existing situations into preferred ones” (Simon, 1969, p. 111). Where built architectural design is concerned with existing situations and preferred design outcomes, speculative approaches generally acknowledge and work in full acceptance of the plurality of the future. Speculative architects engage in “prospective thinking” and try to create “new alternative images of the future—visionary explorations of the possible, systematic investigation of the probable, and moral evaluation of the preferable” (Toffler, 1978, p. x). When designing architecture through a pluralistic temporal lens, “the audience is invited to engage and navigate the confluences and divergences in this complex dynamic space, in order to negotiate and trace out their most desirable paths ahead” (Rosenbak, 2019, p. 159).

Unlike the field of *future studies*, which specialises in corporate-orientated future visions, speculative design disciplines are not about anticipating what designs, spaces, relationships and technologies will be like. They are involved in provoking contemplation on possible alternate futures and using them as “tools to better

understand the present and to discuss the kind of future people want, and of course, ones people do not want” (Dunne & Raby, 2013, p. 2).

To highlight this separation between conventional design and speculative design practices, Dunne and Raby divide design into two broad categories: *affirmative design* and *critical design*. They posit that affirmative design encompasses conventional design practice and reinforces how things are now. Critical design, on the other hand, rejects the status quo as the only possibility (Dunne & Raby, 2001). Pollastri expands these two categories by arguing that they can also be applied to other forms of design that explicitly engage with futures—such as speculative architecture (Pollastri, 2017, p. 50). *Affirmative speculative design* is primarily focussed on the development of future visions such as corporate design fictions as a form of foresight that explores future trends while simultaneously influencing areas of research, development, and investment, while *critical speculative design* is focussed on the design of future worlds or elements of future worlds as a way of critically questioning and provoking discussion on multiple possible futures and their implications (ibid.).

2.1.2.2 *Temporal Positioning of Speculative Architecture*

One of the most widely accepted temporal models used to position pluralistic works of critical speculative design is Joseph Voros’s Foresight Framework (Voros, 2003). The framework was adapted from a taxonomy of futures developed by Henchley (1978) and first graphically represented (see Figure 3), as the “Futures Cone” by Hancock and Bezold (1994). The framework provides a clear description of the multiple future possibilities and their degrees of probability—being categorised on a continuum that includes impossible futures at one end and probable futures at the other. This section outlines approaches to architectural speculations positioned within five temporal bands—*impossible*, *possible*, *plausible*, *probable* and *preferable*.

Figure 3. “The Futures Cone”. Adapted from (Hancock and Bezold, 2003).

Impossible architectural speculations are those that are impossible based on current understandings of physical laws. In defining impossibility for the purposes of thinking about speculative architecture, Dunne and Raby draw on theoretical physicist Michio Kaku’s definition of three classes of impossibility presented in his book *Physics of the Impossible* (2008). “Class one” impossibilities include technologies or systems that are impossible today, but that do not violate the known laws of physics (ibid.). “Class two” impossible speculations sit at the very edge of our understanding of the physical world, possibly taking thousands or millions of years to become available (ibid.). Finally “class three” impossibilities fundamentally violate the known laws of physics in some way (ibid.). This class of impossibilities might include speculations that require time travel or faster than light travel or buildings that violate a physical law such as Newton’s law of universal gravitation. Speculations in this temporal band are not particularly useful for meaningful discussions leading to social and design outcomes, as they are too far removed from current reality (ibid.). Based on these definitions, a number of popular architectural speculations fall within the impossible temporal band, including fictional approaches to cities—ring worlds such as the *Stanford Torus* concept developed by NASA in collaboration with Stanford University, levitating cities, and space elevators, for example (Figure 4). This is generally the realm of superheroes, fantasy and entertainment, located in the far future and having little relationship to the actual world and therefore has little relevance to this thesis.

Figure 4. Stanford Torus cutaway view. NASA, 1975.

Possible architectural speculations are those that could happen but are improbable as they require either a large amount of knowledge to be attained first, or a large social or technological development to occur. For example, speculations such as Buckminster Fuller's *Dome over Manhattan* (1960) (see Figure 5), Ron Heron's *Walking City* (1964-1966) and Manuel Domínguez's *Very Large Structure* (2013) projected visions of the future focused on the mechanisation of the city through mobile architectures as a response to technological, environmental and social upheaval. While these technocratic futures are made more believable due to technological advancements and environmental pressures of the time, they still represent a significant departure from reality; however, possible speculations do have value as they question the status quo by highlighting risks, absurdities, and latent dystopias, and they provide unconventional alternatives to seemingly unavoidable outcomes. They often do this by pushing scenarios to their extremes and so have some relevance to this thesis (see urban *extrapolations* in section 2.1.4.1.2).

Figure 5. Buckminster Fuller, *Dome Over Manhattan*, 1960.

Plausible speculations are those that ‘could’ happen based on our current understanding of physical laws, technological understandings and social and political processes. Plausible speculations generally encompass foresight and scenario planning exercises and are not about prediction but about exploring alternative near-future situations (Dunne & Raby, 2013, p. 4). Coulton et al. argue that it is the *plausible* and *probable* temporal bands that have most to offer when attempting to raise awareness or provoke discussion surrounding a speculative design that relates to the dual requirements of the research question of this thesis (Coulton, Burnett, & Gradinar, 2016, p. 4). Similarly, Dunne and Raby claim that this is because plausible and probable scenarios generally have a logical path from the present to the proposed speculative scenario (Dunne & Raby, 2013, p. 4). This path should encompass a believable series of events that led to the new situation, even if not entirely. This allows viewers to relate the scenario to their own world and to use it as an aid for critical reflection; however, it is important to note that the boundary between what is probable, plausible and possible is not a defined boundary, as different people might categorise a work of speculation differently. Additionally, Coulton et. al. point out that different attributes of a design situation might be considered plausible or probable depending on one’s particular point of view (Coulton et al., 2016, p. 4). For example, Tange’s

radical scheme known as *A Plan for Tokyo, 1960 – Toward a Structural Reorganization* presented at the World Design Congress held in Tokyo in 1960 proposed to expand across Tokyo Bay at a time when many cities around the world were feeling the effects associated with urban sprawl (see Figure 6). Unlike other younger members of the Metabolist movement who presented fantastic distant future speculations and struggled to find acceptance of their works, Tange's speculation appeared to be more sophisticated and realistic and demonstrated that the idea of "city as process" could be carried through into a powerful, architectural language and thus gain widespread traction (Lin, 2007, p. 110).

Figure 6. *A plan for Tokyo 1960 by Kenzo Tange.*

Likewise, Jeyifous, in his project *Shanty Mega-structures* (2016), juxtaposed the sprawling mega city of Lagos in 2050 with development of high-rise slum communities often displaced by urban development (see Figure 7). The project generated interesting discussion by presenting an *extrapolation* of the current urban environment of Lagos (Okwuosa, 2018). While the work was well received, it did create some confusion; Jeyifous stated in a CNN interview that "people will

occasionally be inclined to confuse architecturally inspired artworks that make a social or political commentary with real-life, solutions-based design projects" (Gbadamosi, 2016). This assertion indicates that there can be a disparity between the designer's intention and how the design is received.

Figure 7. Architect Olalekan Jeyifous imagines what Lagos, Nigeria could look like in the future in his series *Shanty Megastructures*, 2016.

Probable architectural speculations are those that are likely to occur, usually based on (in many cases, quantitative) current trends (Voros, 2017). Most architectural projects are located within this temporal band and describe near-future scenarios that are likely to happen unless there is some extreme upheaval, and they are generally focussed on presenting very near future scenarios. This type is not of particular usefulness in the context of this research, as it represents the “business as usual” approach to architectural design.

Finally, Voros adds *preferable* speculations. These are those futures that one thinks ‘should’ happen. As preferable futures can intersect with the other temporal bands, Voros argues that these are based on normative value judgements as opposed to the mostly cognitive (Voros, 2017).

2.1.3 Ways of Speculative Architectural Worldmaking

Speculation is based on the ability of the viewer to imagine possible alternate pasts, presents or futures, where the speculative design acts as a prompt for the imagining (Dunne & Raby, 2013, p. 70). Speculative architectures employ a number of different methods of *worldmaking*, such as ensuring a balance between the fictional aspects of the speculation and real-world elements, composing them into new configurations. These include balancing the speculation and actual world referents, engaging viewers through typological familiarity and ensuring legitimacy of the speculation is maintained by ensuring internally consistent extensional expectations.

2.1.3.1 *Balancing Fiction and the Actual World*

Strategy SA-2: *Ensure a careful balance of fictional and non-fictional elements.*

Implications for Research: *The review details how fictional attributes can allow speculative architectures to appear subversive, and create irreverent environments that are conducive to the exploration of ideas, which is a useful strategy for provoking both social and design oriented discussions.*

Speculative architectures designed within each of the aforementioned temporal bands undertake a balancing act that is key to their success: the careful management of the “speculative” attributes that are in essence future focussed “fictions”. If a speculative architecture strays too far from the *actual world* and presents clearly implausible concepts, the audience might struggle to relate to the proposal, resulting in a lack of engagement or connection. In a conventional sense, one might think of fiction as something completely unrelated to reality—something that is unreal. Conversely, Dindler describes fictional works as “not yet real”, which implies more specifically a future relationship with time within what Ylipulli, Luusua, & Ojala describe as a “hybrid reality” of speculative architecture (Dindler, 2010a, p. 73; Ylipulli, Luusua, & Ojala, 2017).

As proposed by Malmgren in his book *Fictional Space in the Modernist and Postmodernist American Novel* (1985), *fictional worlds* are not stable constructs, but rather constantly emerging entities constantly recreated by differing viewers because of their different interpretations of the fiction—through what Neilsen, Phelan and

Walsh call a “double exposure of the real and the imagined” (Doležel, 1998; Malmgren, 1985; Nielsen, Phelan, & Walsh, 2015). The fluid state of these fictional attributes can allow speculative architectures to appear subversive, and create irreverent environments that are conducive to the exploration of ideas. This is a useful strategy for provoking both social and design oriented discussions.

2.1.3.2 *How is the Speculation in Architecture Legitimised?*

Strategy SA-3: *Engage the viewers through typological familiarity in order to form perceptual bridges to ensure that the speculation connects with an identified audience’s perceptions of the temporal world around them.*

Implications for Research: *The review highlights the importance of grounding the consideration of pluralistic pasts, presents and futures in the real-world experiences of the observer.*

One of the key factors responsible for the legitimisation of a speculation from the perspective of the viewer is the careful management of the fictional attributes in relation to actual world referents (Auger, 2012, p. 140; Knutz, Markussen, & Lenskjold, 2016). If the design strays too far into the impossible to present clearly implausible concepts, the audience may struggle to relate to the speculation, resulting in a lack of engagement, connection or discussion. Conversely if it is too familiar, the fiction is too easily assimilated into the normative, and thus the desired discursive space may not be facilitated.

Auger argues that in order for speculative design to be effective, a “perceptual bridge” must be created between the audience’s perception of their world and the speculative representation that roots the speculation within people’s everyday actual world. The perceptual bridge can fill the gap between the viewer’s actual world—present a state of mind, technical knowledge, psychological perception and cultural background—and the speculation’s world (Auger, 2012, p. 66). In doing so a perceptual bridge can ground the speculation by employing typologically familiar design elements to “ensure that it connects with an identified audience’s perceptions of the temporal world around them” (Auger, 2012, p. 180). The strength of a speculation’s perceptual bridge comes from achieving the right blend of factual authenticity from the present when scaffolding provocative future visions (Coulton et

al., 2016). Once a perceptual bridge is created for the viewer, it can then be manipulated. Auger states that:

These perceptual ‘bridges’ can then be stretched in precise ways: this might be a technical perception such as extrapolating how they think a technology is likely to develop; a psychological perception such as not breaking taste or behaviour taboos; or a cultural perception such as exploiting nostalgia or familiarity with a particular subject. In this way the speculations appear convincing, plausible or personal, whilst at the same time new or alternative (Auger, 2012, p. 180).

Knutz et al. argue that if a perceptual bridge is well established, people may be willing to accept proposals that appear at first sight to be unfamiliar (Knutz et al., 2016).

2.1.3.3 Ensuring Intentional and Extensional Legitimacy in Speculative Architecture

Strategy SA-4: *Ensure legitimacy of the speculation is maintained by ensuring internally consistent extensional expectations.*

Implications for Research: *The review shows the importance of the creation of coherent and legitimate speculations to enable the consideration of possible futures, conflicting stakeholder perspectives, and corresponding goals.*

To enable constructive critique and discourse, a speculative possibility must have legitimacy in the eyes of the viewer. Kendall L. Walton’s theory of make-believe, presented in his book *Mimesis as Make-Believe*, asserts that fictions “prescribe imaginings” and “generate fictional truths” (Walton, 1993, p. 39). Speculation functions in much the same way as fiction, in that “truths” are constructed from the foundation for acceptance of new interpretations of worlds and conditions.

Pickersgil argues in his article “Possibilia: Possible Worlds and the Limitless in Architecture” that “in a complex propositional world, such as those represented in many speculative architectures, there is a question regarding the extensional expectations of that world” (Pickersgill, 2017, p. 77). Extensionality, in this instance, means that the knowledge base of propositions can be checked against what is known

and true about the speculation (ibid.), i.e. there is a logical chain from the present to the speculation and the speculation is internally consistent when advancing speculative truths.

Pickersgill also points out that in the absence of information provided, the extensional referents of the speculation adhere to the qualities of the *actual world* in order for it to have legitimacy (ibid.). In doing so, the speculation creates a reality that inherently presents, within the limits of the media, a maximally consistent possible world made of both speculative components and actual world referents (Pickersgill, 2017, p. 78). This means that architectural speculations should ideally be real in their world—or their intentional speculative properties—whilst also displaying extensional referents that make them appear to have family resemblances to other familiar worlds such as the actual world (Pickersgill, 2017, p. 78).

2.1.4 Speculative Architectures to Promote Design Ideation

Three main types of speculative architecture can be deduced, which are used in orientating the imaginings surrounding speculative architectures. These are utopias and dystopias, urban extrapolations and urban thought experiments.

2.1.4.1.1 *Utopias and Dystopias*

Probably the purest form of speculative worldmaking in architectural design is “utopia” and its opposite “dystopia” (N. Coleman, 2005; Levitas, 2013; Mitchell, 2010; Pinder, 2013). Lefebvre argues in his book *Critique of Everyday Life* that the use of utopias and dystopias in speculations is a way of imagining real possibilities out of what appear to be impossibilities in order to engage critically with the present (Lefebvre, 1991).

The 1920s and the 1960s resulted in two waves of utopian “communitarian” architecture in Europe. Some of the approaches such as Le Corbusier’s *Ville Radieuse* (1924), or works by Italian futurist Antonio Sant’Elia, focused on emerging cultural conditions such as mobility and flexibility. Others such as Constant Nieuwenhuys’s *New Babylon* (1959-74) and Yona Friedman’s *Ville Spatiale* (1958-59) used utopias as instruments of societal change (Awan, Schneider, & Till, 2013). Conversely, Archigram’s technocratic consumerist cities including Plug-in-City, 1964, The

Walking City, 1964 and Instant City 1968 extrapolated the technological advancement of the time. Similarly, Archizoom's *No-Stop City* (1969), an example of the Italian Anti-design movement, was an ironic response to Archigram's consumerist logic and their desire to detach architecture from politics. Like Archizoom, Superstudio (1966-78) were critical of mainstream architecture for ignoring and perpetuating social and environmental issues, designing critical projects that imagined dystopian worlds and using an infinite grid as a recurring motif for a continuous and uniform environment. Ant Farm's dystopian critique of the North American culture of mass media rejected those same notions of consumerism in their dystopian *Clean Air Pod* (1960) (see Figure 8) or their *Inflatocookbook* (1971)—an instruction manual for inflatables that constituted a type of participatory architecture that allowed the users to take control of their environment in the face of environmental concerns. TerreformOne's *Rapid Re(f)use: Waste to Resource City* (2009) envisions New York City in the year 2120 (Figure 9). The *Rapid Re(f)use* project supposes an extended New York reconstituted from its own landfill material and depicts a large-scale monument made from the garbage produced by New York City in one hour on a typical day.

Figure 8. *Clean Air Pod*, Ant Farm, 1960.

Figure 9. *Rapid Re(f)use: Waste to Resource City*, TerreformOne, 2009.

Darko Suvin uses the term “cognitive estrangement” to describe how alternate realities such as utopias or dystopias can aid critique of our own world through contrast (Canavan & Suvin, 2016). However, the limitation of utopias and dystopias is that they are frequently viewed as a dangerous concept that resulted in Nazism, Fascism, and Stalinism, which are the fruits of utopian thinking (Dunne & Raby, 2013, p. 73) or are dismissed by viewers due to the number of popular culture references—what Fear terms “dystopia fatigue” (Fear, 2017).

2.1.4.1.2 *Urban Extrapolations*

Many architectural speculations provide “extrapolations” or “what-ifs” based on current trends. Liam Young’s speculative urban design project *Under Tomorrow’s Sky* (2013) (Figure 10) assembled a think tank of architects, urbanists, scientists, technologists, futurists, illustrators and science fiction authors to collectively author a proposal for a future city—an imaginary urbanism, the landscapes that surround it and the stories it contains. “Emerging in the shadows of the decaying towers of a post oil Dubai, *Under Tomorrow’s Sky* is imagined as a new terraformed urban island” (Young, 2013). Similarly, *Jonah* (2013) directed by Kibwe Tavares uses speculative

architectural filmmaking to explore the socio-cultural impact of rapid tourism growth in Zanzibar (Figure 11).

Figure 10. *Under Tomorrow's Sky*, Liam Young, 2013.

Figure 11. The film *Jonah* (2013, directed by Kibwe Tavares, explores the effects of tourism, globalisation, and commercialisation in Zanzibar through speculative architectural filmmaking.

2.1.4.1.3 *Urban Thought Experiments*

Another way of provoking thinking about what might be possible is to treat design speculations not as narratives or coherent “worlds” but as “thought experiments”—

constructions, crafted from ideas expressed through design—that help us think about difficult issues (Dunne & Raby, 2013), thought experiments such as presenting counterfactual architectures—those conceived after altering a historical fact to propose what might have happened—or taking generic propositions and pushing them to their logical extremes to derive an absurd or ridiculous outcome. The works of Léopold Lambert, described in his *Weaponized Architecture* (Figure 12), provide thought experiments by designing architecture as a political weapon. Lambert states that his goal is not to prove that architecture is always political, but to propose a discursive vision that is specifically filtered by its political and social implications to enlarge the field of the narratives that architecture carries (Lambert, 2010, 2011, p. 13). The work, which focuses on a dual programme for Palestinian farmers and the neighbouring Bedouin populations, addresses the fragmentation of the West Bank into areas, providing “ports” that are interpretable in the context of the nomadic way of life as counterfactual to the existing reality—an alternate reality.

Figure 12. *Weaponized Architecture*, Léopold Lambert, 2010.

2.1.5 Enabling Social Discourse Through Speculative Architecture

Strategy SA-5: *Ensure the design language and the medium of the speculation are appropriate to be both instrumental and externally focussed and discuss both social and design implications.*

Implications for Research: *This section discloses that speculations should be “externally” focussed in order to provoke exploration of possible futures, conflicting*

stakeholder perspectives, and corresponding goals amongst non-experts, while being examples of “instrumental” speculative architecture to produce insights into the viewers hopes, dreams, values, concerns and behaviours and thus both socially and slum-upgrading orientated.

In their book *Discursive Design: Critical, Speculative and Alternative Things*, Tharp and Tharp describe two orientations and two operational modalities of speculative design projects that can be used to frame how a specific work of speculative architecture is intended to drive discourse (Tharp & Tharp, 2019). They describe speculative designs as both being internally or externally orientated and having an “instrumental” or “terminal” operational modality. These can be applied to the domain of speculative architecture in order to posit how different works of speculative architecture try to illicit and provoke discourse—by either prompting self-reflection, igniting the imagination, or affecting positive social change. These can be seen in Figure 13.

		Terminal			
Internal	<p>The architecture is the terminus of design activity.</p> <p>Audience is the architecture profession and related disciplines.</p>		<p>The architecture is the terminus of design activity.</p> <p>Audience is those outside of the architecture profession.</p>		External
	<p>The architecture is part of other design activity.</p> <p>Audience is the architecture profession and related disciplines.</p>		<p>The architecture is part of other design activity.</p> <p>Audience is those outside of the architecture profession.</p>		
		Instrumental			

Figure 13. Positioning terminal-instrumental/ internal external Speculative Architecture. Adapted from (Tharp & Tharp, 2019).

2.1.5.1 Internally and Externally Oriented Speculations

Tharp and Tharp describe internally oriented speculative projects as those used to help elicit reaction from other architects, critics, theorists, designers, engineers, marketers, executives, etc. They are generally not meant to be viewed or consumed by the public or the user group of the end design, and the focus of the criticality is largely directed at architecture itself (Tharp & Tharp, 2013, p. 409). Many of the works previously described in this chapter, such as those by Archizoom or Superstudio, can arguably fall into this category as their critical practice is largely inwardly focussed, similar to the text-based field of architectural criticism. While useful for providing engaging visions of the future, the design does not have control over how information is gathered from the engagement process such as from observations or surveys.

Critics of this approach to generating discourse through speculative design have characterised it as often being “Eurocentric”, highlighting its excessive focus on aesthetics (on the visual and narrative level), its vanity and its tendency to escape to dystopian scenarios and separate from the real world (Mitrović, 2016). In writing about internally orientated speculative design, Oliveira Prado’s point out a “general disregard for race, class and gender within speculative design projects and publications” as a symptom of being inwardly focussed (Prado & Oliveira, 2014). In line with this, some have argued that internally orientated speculations can often resort to reductionism of complex issues (Coulton et al., 2016). Cameron Tonkinwise, Head of Design Studies at the School of Design at Carnegie Mellon University, has criticised the lack of variation within the discourse and imagery of internally orientated speculative design practices, arguing that its white, intellectual, middle class, western-centric perspective stands in the way of truly engaging with meaningful debates about discrete and diverse futures (Tonkinwise, 2014, 2015, 2016). Pollastri argues that critical discourse surrounding internally orientated speculative architectural practice often uses the pronoun “we” to describe the whole of humanity while neglecting to acknowledge that visions of the world are not value-neutral, and no two ‘cones of futures’ are alike (Pollastri, 2017, p. 57). This is important as, in terms of temporality, there is no universal starting point for the futures cone (Tonkinwise, 2014, p. 174).

Conversely externally orientated speculative design projects are those that strive for impact beyond the domain of design experts by generating discourse that is external to the domain. Tharp and Tharp describe this form of design to generally be dealing with “non-design” topics and include those directly affected by the topics in the discussion. The goal of externally oriented speculative architecture is therefore not to use the

design to communicate a critique of architecture itself. Instead design and the unique qualities of a specific speculative design are “leveraged as a unique brand of communication about issues beyond its traditional borders” (Tharp & Tharp, 2019, p. 154).

2.1.5.2 *Terminal and Instrumental Operational Modality*

Typically, in speculative architecture a designer conceptualises, designs and instantiates a design in some physical or digital form—such as a drawing or physical model, for example. The speculative design is then released publicly, generally with the aim of generating discourse or engendering reflection about the design topic. Once the designer completes and distributes the speculative design, their job is basically finished; the hope of reflection and transformation is fundamentally beyond their control. This is what Tharp and Tharp refer to as a “terminal” form of speculative design—where the speculative design is the terminus of the designer’s direct control.

Conversely there is growing discourse moving instead in the direction of “instrumental” speculative projects that behave similarly to participatory design research tools—explicitly framed to engage potential users and hopefully produce insight into their hopes, dreams, values, concerns, behaviours, etc. (Tharp & Tharp, 2013, p. 408). This type of design includes the observer as an active contributor to the speculation. While much of the exploration of this type of instrumental speculative design has been in the creation of physical representations of speculative designs, some authors have been exploring this form of speculative design in media more conducive to the observer being an active contributor—such as digital games (Baumann, Stokes, Bar, & Caldwell, 2017; Coulton et al., 2016; Forlano & Mathew, 2014; Lindley et al., 2014; Rynning, 2017). Tharp and Tharp refer to this as *instrumental* speculative design (Tharp & Tharp, 2013, p. 408). Instrumental speculative architectures are therefore those used differently than simply to project a vision of the future; they are more of a probe used to evoke user responses, unveiling views that may be difficult to assess otherwise (ibid.). Here the research value is not the speculative architecture itself but instead the subsequent conversation that it engenders. The design acts as a discussion instrument for some other means, and the designer/researcher is an active participant. Tharp and Tharp argue that in forming instrumental designs, ambiguity can be intentionally leveraged (ibid.). This is useful because, as Gaver et. al. discuss,

ambiguity allows designers to “suggest issues and perspectives for consideration without imposing solutions... to raise topics or ask questions while renouncing the possibility of dictating [users’] answers” (Gaver, Beaver, & Benford, 2003, p. 240).

2.1.5.3 *Agonistic Speculative Architecture as Discursive Provocateur*

Strategy SA-6: *Ask questions through the speculative design language, instead of providing solutions, in order to enable open discussion in which diverse perspectives are able to be brought forward, contested and discussed.*

Implications for Research: *The review extends the focus of speculative architecture from merely creating discourse, to purposely eliciting conflicting voices in constructing pluralistic speculative visions through an external instrumental approach. This has implications for enabling the exploration of possible futures, conflicting stakeholder perspectives, and corresponding goals amongst disparate groups.*

An external instrumental approach to speculative design, which has much in common with “agonistic” speculative design and employs agonistic theory developed by Mouffe (2000b) and detailed in Section 2.2.4.2, allows for the creating of spaces for discussion and imagination of multiple possible futures by provoking a condition of pluralism and contestation through design that avoids presenting totalising hegemonic future “solutions” in the name of generating “consensus” (Leeuwen, 2015, p. 800). Agonistic pluralism is often linked to speculative design disciplines through Carl DiSalvo’s (2012) concept of adversarial design, which DiSalvo describes in his book *Adversarial Design* as: “Rather than framing the conflict as among enemies that seek to destroy one another, the term adversary is used to characterize a relationship that includes disagreement and strife but that lacks a violent desire to abolish the other” (DiSalvo, 2012, p. 6). Agonistic design reveals its roots in the Greek word for struggle or competition, “*agon*”, which Roger Caillois explains in *Man, Play and Games* (1961) as one for the four types of games—the others being “*alea*” or chance, “*mimesis*” or role playing and “*ilinx*” or vertigo, in the sense of altering perception (Caillois, 1961; DiSalvo, 2012, p. 6). In this way, adversarial design draws on this game-like situation to provide a platform for disparate “individuals, organisations, ideologies and actions” to engage in discourse surrounding sensitive or controversial issues (DiSalvo, 2012, p. 52). By posing questions, as opposed to solutions, to viewers through design,

adversarial design can nurture a plurality of speculative ideas and futures and enable open discussion in which diverse perspectives are able to be brought forward.

Recently, there have been more attempts at including conflicting voices in constructing pluralistic visions for urban futures by giving agency to those affected by the design and by designing instrumentally external speculative design. These are designed to contextualise discussions and provoke debate about speculative pasts, presents and futures. For example, Laura Forlano and Anijo Mathew use a combination of speculative design techniques and co-design methods to explore how “design frictions”—or the conflicts, tensions and disagreements provoked by instrumental and external speculative design—can move complex socio-technical discussions embedded in urban infrastructures forward (Forlano & Mathew, 2014). They detail how speculative design can engage participants in contestations about urban values that can be used to create “constituencies” around important “matters of concern” (Forlano & Mathew, 2014, p. 20). Similarly, the *Liveable Cities* project, presented by Pollastri et al. (2017), focuses on ways of visualising possibilities for life in future cities by combining speculative design practice and agonism through an approach called “Visual Conversations on Urban Futures” (VCUF). The approach uses building blocks, mapping, participatory design methods and information visualisation techniques that engage participants in developing visions of urban futures (Pollastri, 2017; Pollastri et al., 2017). Through co-created speculations and “composite scenarios”, the approach is able to capture the complexity of the discussions and showcase divergent, conflicting ideas, rather than just synthesising the results into a single, narrative vision.

The *Million Dollar Blocks* project (see Figure 14) by Laura Kurgan at the Spatial Information Design Lab at Columbia University provides an example of agonistic design. It uses designed maps to document patterns of incarceration and urban development, which serve as discursive objects that raise questions and proffer implicit judgements about allocation of capital and social resources within cities (Kurgan, 2012). The *Million Dollar Blocks* questions, and challenges, conditions and structures in the urban environment; it opens a space for contestation by challenging assumptions surrounding the question: “Where does the prison population come from?” (ibid.).

Figure 14. *Million Dollar Blocks*, Laura Kurgan, 2012.

Lebbeus Woods's *Underground Berlin* (1993) and his *Radical Reconstruction* proposal for Sarajevo (1993–1994) can be considered works of agonistically oriented speculative architecture (Figure 15). The projects propose architecture designed to invoke discussion about social structures on either side of the Berlin Wall and after the war in Bosnia and Herzegovina, respectively. His stated purpose for doing so was to (indirectly) liberate the under-privileged within the existing, tumultuous, socio-urban structures, by influencing architects dealing with the pragmatics of reconstruction to consider other potential spatial arrangements and thereby engender social healing (Fahey, 2013, p. 131). Woods invited autonomous interpretation and use through his concept of “freespaces”, which are architectural spaces that must be: “1) free of pre-assigned purpose or meaning and 2) difficult to inhabit; intended for those willing to invent ways to inhabit them” (Woods, 2009). Freespaces therefore provoke the viewer to interpret them as they see fit.

Figure 15. *Underground Berlin 3*, Lebbeus Woods, 1988.

Indicative of this, Woods’s Sarajevo proposal, which could be described as both *terminal* and *instrumental* speculative design, was not about returning the city to its original state, or even a new definitive state at all, but about a transformation of society, politics and economics through architecture (Woods, 2007). Fahey argues that the extent to which Woods deals with social concerns in this theory is best captured in his concept of the ‘heterarchical’, a central proponent of his concept of free interpretation (Fahey, 2013, p. 132). Woods defines “hierarchy” as a ‘religious-moral precept’ of the ‘patriarchal world view’ and “heterarchy” as “the system of stasis, predictable patterns, determinacy, and unidirectional communication” (Woods, 2004). Woods designed spaces free of predetermined purpose that could be programmed by the transformed community corresponding to the new post-war conditions. The “visible signs of change become sites of transition in the process of creating a new as-yet-unknown social order” (Woods, 2004, p. 26).

2.1.5.4 *Participatory Speculation*

While speculative architecture is aimed at provoking debate and inspiring a diverse range of possibilities, it often does not succeed because of who is invited to participate in it. Recently “participatory speculation” has been gaining prominence as an approach to engage people in the crafting of the speculation (Clarke et al., 2018; Gerber, 2018;

Jones, 2019). Participatory speculation involves using knowledge generated through research about a context — people, cultures, materials, histories, industries, and infrastructure— and then re-configuring this with the relevant people to speculate on alternative possibilities for that context. Generally, the approach includes developing a selection of provisional artefacts in the form of low-fi prototypes, and future scenarios from a participatory workshop to scaffold the speculation.

For example, Gerber, (2018) used a participatory speculation approach to engage community members in Ferguson, USA in imagining the design of urban environments that are kept safe without policing. Speculative props were designed to materialise community members' visions and to provoke conversation around utopias and their negative implications (see Figure 16).

Figure 16. Future of Hearts and Minds scene (Gerber, 2018).

Similarly, Clarke et al., (2018) used a participatory speculation to explore different perspectives for smart cities to push forward a cultural change in relation to sustainable smart cities. The research focussed on using low-fi prototypes, and future scenarios to provoke the participants into situated participatory speculation during a group walk through Hasselt, Belgium (refer to Figure 17).

Figure 17. *Driverless City: Scenario builder, mind map and visualisation to support citizen conversations for a future with driverless cars (Clarke et al., 2018).*

While the existing practice of participatory speculation has explored engaging people in the co-creation of speculative visions, it lacks the fidelity of representational techniques, and the ease at which the participants can develop representations and test a range of speculative ideas or scenarios.

2.1.6 Summary

This section has summarised how speculative architecture has been designed to promote the consideration of alternate views and possible futures, and to scaffold discussions about what the future might look like. The chapter started by adopting a definition of *speculative architecture* that emphasises the importance of generating pluralistic visions of the future to defamiliarise situations to open up space for thinking about sensitive topics through multiple lenses. The section discussed temporal positioning and located examples of speculative architectural projects within temporal bands.

Designing externally oriented instrumental speculative architectures that are interested in involving the public as active co-creators has opened up new opportunities for arriving at design and social outcomes and exploration of possible futures,

conflicting stakeholder perspectives, and corresponding goals surrounding social, architectural and urban issues; however, limited examples exist of purposefully engaging non-experts in speculative architectural design.

From this speculative architecture literature review, six strategies can be adapted from the literature that can help disparate stakeholders explore conflicting perspectives, assumptions and corresponding goals surrounding architectural and urban issues:

Strategy SA-1: Consider the speculation's connection and position to plurality and temporality;

Strategy SA-2: Ensure a careful balance of fictional and non-fictional elements;

Strategy SA-3: Engage the viewers through typological familiarity in order to form perceptual bridges to ensure that the speculation connects with an identified audience's perceptions of the temporal world around them;

Strategy SA-4: Ensure legitimacy of the speculation is maintained by ensuring internally consistent extensional expectations;

Strategy SA-5: Ensure the design language and the medium of the speculation are appropriate to be both instrumental and externally focussed and discuss both social and design implications;

Strategy SA-6: Ask questions through the speculative design language, instead of providing solutions, in order to enable open discussion in which diverse perspectives are able to be brought forward, contested and discussed.

The temporal positioning of speculations within the possible or plausible temporal bands help to ground the speculation by creating a logical path from the present to the proposed speculative scenario, while facilitating a pluralistic temporal lens to challenge the viewer's assumptions through the proposed visualisation. Speculative worldmaking strategies, which are employed in creating coherent speculative propositions to enable viewers to imagine other alternatives and the importance of grounding the consideration of these pluralistic pasts, presents and futures in the real-world experiences. Speculations can be "externally" focussed to provoke exploration of possible futures, conflicting stakeholder perspectives, and corresponding goals amongst non-experts, while also being "instrumental" to produce insights into the viewer's hopes, dreams, values, concerns and behaviours. Within the context of this

research investigation, speculative architecture should purposely elicit conflicting voices in constructing pluralistic speculative visions through an external instrumental approach. In order to operationalise speculative architecture in this manner, there is a need to learn from participatory design, which I review in the next section.

2.2 Participatory Design

Diversity encourages creativity, while repetition anaesthetizes it. Often architecture is too homogenous, sometimes because of a self-centered desire to see buildings apart from their context, sometimes because of an exaggerated aesthetic commitment, which tends to a precious architects' architecture. But whatever the cause, such homogeneity makes it difficult for the users to add anything on their own, and we lose that rich source of popular creativity, which can transform a space into a place and give it life. If we were able to obtain the space and the means to allow the inhabitants to organize their own buildings, they would by their own efforts generate both the diversity and the close relations to the fabric which is lacking.

— (Kroll, 1986, p. 175)

2.2.1 Introduction

As introduced in Chapter One, over the past two decades a shift has taken place towards “participatory” slum upgrading where residents are increasingly involved in the decision-making process of upgrading as project partners (Cities Alliance, 2010; French et al., 2018; MacPherson, 2013; Minnery et al., 2013; Perten, 2011; Pugh, 1995, p. 381; Rigon, 2014; The World Bank Group, 2001; UN-Habitat, 2016a). Generally, “participatory design” techniques are used in participatory slum upgrading in order to structure collaborative design activities or workshops that actively contribute toward upgrading projects. The concept and applications of participation have been widely investigated in the integrated fields of political science and planning.

The purpose of this section is to:

1. Define “participatory design” and key associated terms and attributes (section 2.2.2);

2. Review the approaches for enablement of *design ideation* in support of collaborative architectural design inquiry through the design of participatory design processes (section 2.2.3);
3. Identify and analyse participatory design strategies to help stakeholders explore conflicting stakeholder perspectives and the building of civic engagement and social capital in relation to social, architectural and urban issues (sections 2.2.4-2.2.5);
4. Summarise the review by presenting relevant strategies derived from the literature that may be used in the development of effective participatory design processes to address the primary Research Question (section 2.2.6).

2.2.2 Positioning Participatory Design

“Participatory design” is defined as the direct involvement of users and stakeholders in the design of products, services, and systems they use (Kensing, 2003; Simonsen & Robertson, 2012). Simonsen and Robertson identify two fundamental aspects of participatory design. First, participatory design seeks to enable those who will use the design outcome to have a voice in its design, without needing to speak the language of professional designers. Second, people who are not professional designers, such as those living in informal settlements, may not be able to define what they want from a design process, without knowing what is possible (Simonsen & Robertson, 2012, p. 2). The purpose of participatory design is to develop new knowledge geared towards participants’ ability to take action in informed ways. Actions for change require that goals are discussed and shared among participants and that the actions are part of a plan constructed by all participants (Kensing & Greenbaum, 2013, p. 26). One of the principal theorists explicitly addressing the notion of participatory design community participation and development has been Sanoff (1985, 2000, 2005, 2007). Sanoff has been influential in consolidating the field of participatory design by producing a series of methodologies that can be replicated and applied in the field. Sanoff expands the definition of participatory design as “an attitude about a force for change in the creation and management of environments for people” (Sanoff, 2007, p. 59).

In defining participatory design, it is important to differentiate between “design” and “planning”, which are terms often used interchangeably, yet they are different from one another. While planning is defined as the act of devising a scheme, programme, or

method worked out beforehand for the accomplishment of an objective, design is a conceptual activity involving formulating an idea intended to be expressed in a visible form or carried into action (Terzidis, 2007). Terzidis argues that “design is about conceptualization, imagination, and interpretation”, while “planning is about realization, organization, and execution” (Terzidis, 2007, p. 69).

Sinha explains in her book *Architecture for Rapid Change and Scarce Resources* that a participatory design oriented methodology ensures that everybody in a community including women and children can be empowered to transform their environment in a way that is responsive to community members’ cultural and practical needs (Sinha, 2012, p. 175). Community “participation” is often described as a “bottom up” instrument of “inclusion”—as a genuinely inclusive process used to cultivate “collective power to reshape the processes of urbanization” through the introduction of a myriad of views, positions and interpretations of situations (Harvey, 2003). Frediani et al. point out the many benefits to participatory urban upgrading projects. They have a greater chance of attracting national and international funding due to a perception that, when stakeholders are included and outcomes are more likely to be realised; they cultivate “collective power” of constituents conducive to reforming development processes through the introduction of a myriad of views, positions and interpretations of situations; they are politically profitable in the eyes of local and national governments as well as Non-Governmental Organisations (NGOs); and they have “positive marketing potential” for donor or partner private organisations that might provide core business or project-specific funding to the development organisation, in exchange for the incorporation and use of their tools in the development process (Frediani et al., 2012, p. 18).

2.2.2.1 Towards Genuine Participation

Strategy PD-1: *Ensure that all participants within a design activity have equal power to determine the outcome of the decisions made, as opposed to merely being informants.*

Implications for Research: *This section discusses the various types of design participation and argues that most participatory design processes can be categorised as “partial participation” processes, offering little more than consultation processes*

regarding professionally developed plans and thus limiting stakeholder empowerment through social and design outcomes.

The term “participation” masks the fact that participatory design processes range in degrees of stakeholder empowerment from partial participation, or what Jeremy Till calls “pseudo-participation”, to full control of the process by the participants (Till, 2005, p. 25). These degrees are identified in Sherry Arnstein’s frequently cited ‘Ladder of Citizen Participation’ model (Figure 18. Ladder of Citizen Participation. Adapted from Arnstein (1969).), in which she sets out a hierarchy of stakeholder control (Arnstein, 1969). At the bottom of the ladder is “manipulation” of participants and at the top is “citizen control”.

Figure 18. Ladder of Citizen Participation. Adapted from Arnstein (1969).

According to Bødker et al., “Participation is the core of Participatory Design. The fundamental developments in the field have come from efforts to investigate, understand, support and practise what can be labelled as ‘genuine’ participation in design (K. Bødker, Kensing, & Simonsen, 2004) or what Arnstein calls “degrees of citizen power” (Arnstein, 1969). “Genuine participation” refers to processes in which all participants within a design activity have equal power to determine the outcome of the decisions made, as opposed to merely being informants (Blundell-Jones et al., 2005, p. 27; Simonsen & Robertson, 2012, p. 5). Within a genuine participation-based approach, the architects, planners or other experts such as local government officials or NGO staff are no longer granted the role as master of the project. Petrescu argues

that in genuinely participative approaches, “the experts should accept losing control and rather than being a master, they should understand themselves as one of the participants” (Petrescu, 2005, p. 55).

Genuine participation in design can also foster local catalyst actions and set precedents for more democratic forms of urban upgrading and empowerment through collective action (Frediani, 2016; Hamdi & Goethert, 1997). Drawing on the notion of transformative theory developed by planning theorist John Friedman, Till describes this form of participation as “transformative participation” (Friedman, 1987; Till, 2005, p. 27). In this way Till argues that participatory design can function “not as a means for experts to mediate diverse interests, but rather as a forum for empowerment and contestation targeted at the social and physical production of the built environment (Till, 2005).

The term ‘participation’ is sometimes appropriated in situations that do not actually involve full participation. These forms of participative project can be referred to as “partial participation” or what Till describes as “placatory participation” (Till, 2005, p. 26). In terms of Arnstein’s Ladder of Citizen Participation, they represent at best “degrees of tokenism and at worst ‘no power’” (Arnstein, 1969). Till argues that much of what passes for participation in architecture is actually only placatory, where the participant is lured by the term “participation”, “whilst in fact being passive in the face of decisions already made by only one party” (Till, 2005, p. 27). Often partial participation based approaches offer no more than consultation processes of professionally developed plans in line with ‘visions’ defined by local government showcasing a predefined vision where little is done with the information gleaned from participatory processes (Frediani et al., 2011; Kindon, 2010). This is very common in projects dealing with those most marginalised—such as the inhabitants of informal settlements—who are rarely involved in actually defining and making the development decisions (Frediani et al., 2011). Their involvement is generally limited to providing feedback on design propositions or voicing their objections long after the project has been defined by officials, designed by architects, engineered by engineers, costed by surveyors, and put out to tender by building contractors (Frediani et al., 2011).

In order to classify levels of empowerment in participatory design processes, Senbel and Church propose an analytical framework that can be used for categorising different participatory design visualisation tools such as physical and digital models, as well as for the design of new ones (Senbel & Church, 2011). They proposed six categories of

participatory design empowerment: information inspiration, ideation, inclusion, integration and independence. In this framework, the highest level of design empowerment, independence, succeeds when residents are able to act to create their own plans and visions (Table 1).

Table 1. Levels of Participatory Design Empowerment. Adapted from (Senbel & Church, 2011).

Instances of Design Empowerment	Form of Empowerment
Information	Participants gain a new understanding of planning issues and possibilities through substantive and procedural knowledge.
Inspiration	Participants are compelled to act in response to the visualization material.
Ideation	Participants are able to generate and express ideas and thoughts about the future of their urban environments.
Inclusion	The ideas and thoughts of participants are included among other priorities in urban design decisions.
Integration	Participants collaborate in the coproduction of plans and proposals.
Independence	Participants are able to create their own independent plans and visions.

This approach has been particularly successful when considering new media approaches to urban design participation such as the development of ICT approaches (Gün, Demir, & Pak, 2019; Pak & Verbeke, 2014) and the construction of virtual worlds and games for participatory design visualisation (Billger, Thuvander, & Wästberg, 2017; Jutraz & Zupancic, 2015).

2.2.2.2 Exploring Conflicting Perspectives and Assumptions

When marginalised communities confront and explore conflicting perspectives and assumptions through participatory design processes, the ability to “harness the collective intelligence” of people to work towards collective upgrading actions (Davis & Garb, 2017, p. 77) can be enhanced. In order to do this, stakeholders must be given space to understand each other, “confront theories, perspectives and frames of thought” and be supported in “experiencing, testing, transforming, and developing early ideas” (Sanders & Stappers, 2014). Sanders points out that discovering what people know helps disparate stakeholders to communicate with each other and that understanding what stakeholders feel gives participants the ability to empathise with each other (Sanders, 2001, p. 3).

The two most important aspects of confronting and exploring conflicting perspectives are participants' knowledge bases and the values and goals each participant holds. Creating a broader understanding of these amongst stakeholders can help to create a level playing field by making everyone's positions known when working towards upgrading goals.

2.2.2.2.1 *Knowledge Bases*

Sanders and Dandavate (1999) propose that participants' experiences can be understood by studying what people say, do and make in participatory workshops. They highlight four types of knowledge that are observable within participatory design: explicit, observable, tacit and latent knowledge (Sanders & Dandavate, 1999). Explicit knowledge refers to things about which people can talk, for example in interviews. Observable knowledge can be found in peoples' actions, practices and environments and can be approached by observing what people do and how they use things. Explicit and observable knowledge can generally reveal stakeholders' preferences for one thing over another. Tacit knowledge includes knowledge that cannot readily be expressed in words (Polanyi, 1967). Latent knowledge is the hardest to reveal, as this generally includes things of which participants are unaware but recognise as being relevant to them once satisfied (Bowen, 2010, p. 2; Sanders, 2001). Tacit knowledge and latent knowledge include people's dreams and feelings and are often subconscious.

2.2.2.2.2 *Values and Goals*

Values are enduring beliefs that we hold concerning "desirable modes of conduct" or "end-state of existence in different situations", societies and cultural contexts (Iversen, Halskov, & Leong, 2012, p. 89). They act as a goal, and they guide attitudes, judgements and comparisons across specific objects and situations and beyond immediate goals to more long-term goals (Rokeach, 1973). As such, a participant's collection of values or value system is the generalised plan within whose frame or horizon they try to determine, from case to case, what is good or valuable, what is preferable or not, what we endorse or oppose and what we believe in or not (Iversen et al., 2012, p. 89).

2.2.2.2.3 *Negotiation of Knowledge, Values and Goals in Participatory Design*

Participatory design is driven by social interaction, as users and designers learn together to create, develop, express and evaluate their ideas and visions. Researchers such as Soja (2010) and Schneider and Till (2009) have explored concepts such as “spatial justice” and “spatial agency” that build on the physical deterministic approach to participation by recognising the role of the built environment in challenging, sustaining or reproducing exclusionary processes in cities. Carroll and Rosson argue that participatory design is fundamentally about negotiating values—or a “moral proposition” (Carroll & Rosson, 2007, p. 243). Iversen et al. argue that this moral position can be realised through participation in design activities to establish positions or level the playing field (Iversen et al., 2012, p. 87).

A useful negotiating tool that has been detailed widely in the participatory design literature is the “boundary object” (Bjögvinsson, Ehn, & Hillgren, 2012; Brandt et al., 2013; Muller & Druin, 2002; Sanders & Stappers, 2014; Star, 1989; Vines, Clarke, Wright, McCarthy, & Olivier, 2013). Susan Leigh Star suggests that boundary objects enable grounding by maintaining coherence across various social worlds—or between groups or individuals with disparate values (Star, 1989). “Boundary objects” are objects that are plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites and able to manifest as physical entities, spaces, concepts or social systems. Brandt et al. argue that boundary objects can create continuity within a participatory design process by creating mutual ground for different interest groups so that they can contribute to the design process (Brandt et al., 2013). Thus, they can be useful for common language within the boundaries of a specific upgrading project. In participatory design, designers and users navigate the problem space through the use of boundary objects, including low fidelity prototypes, role-playing games, and sketches (Muller & Druin, 2002; Sanders & Stappers, 2008; Vines et al., 2013).

Shared experimentation, the sharing of knowledge and reflection on values, is an essential part of the participatory design process. Participatory design processes can make explicit the critical, and inevitable, presence of values (Suchman, 1993). Iversen et al. show that knowledge and values can be revealed through dialogue centred on design activities, where participants express their opinions, preferences, particular

commitments and orientations that expose preferences, agreements and conflicts. Participants' knowledge and values can be highlighted by facilitating the revealing of values, developing them and supporting their grounding within participants' everyday experiences through participatory design activities (Iversen et al., 2012, p. 87).

2.2.3 Revealing Participants' Knowledge, Values and Goals

***Strategy PD-2:** Reveal stakeholder perspectives and assumptions in order to make positions known through design activities and ideation.*

***Implications for Research:** The review highlights the importance of aiding participants to reveal conflicting perspectives, knowledge bases and the values and goals each participant holds. Successful approaches include the development of participatory tools for capturing and understanding not only explicitly articulated information, but also forms of tacit or experiential knowledge from non-expert participants.*

One aspect of participation, which makes confrontation between conflicting perspectives and assumptions inevitable, is that the participants will bring to the table their personal beliefs (Till, 2005, p.34). Till argues that in the “negotiating space” created within participatory design activities, mutual cooperation, uncontested knowledge bases, open communication and eventual consensus do not exist, contrary to ideals of consensus-based participatory action (Hillier, 2003; Till, 2005, p. 34). Through ideation—the negotiation of design alternatives, the personal with the social, and the individual with the collective—“political space” emerges, revealing goals, assumptions and aspirations of the participants (Till, 2005, p. 34). Iversen et. al argue that the various methods used in enacting collaborative design activities, such as mock-ups, scenarios and sketching, act as reflective “tools to think with” (Iversen et al., 2012, p. 97). Through dialogue, discussions, observations and interpretations of design artefacts created by participants' design activities and ideation, participant values can emerge through explicit, observable, tacit and latent means (Iversen et al., 2012, p. 94).

2.2.3.1 Priming Participants for Participatory Design

Authors such as Sanders (2010), Holtzblatt et al. (2004), Visser et al. (2005), Gaver et al. (1999) and Lucero et al. (2012) stress the importance of sensitising participants to the topic central to participatory design activities before the actual participatory design session. Sanders et al. describe these as “priming activities” that operate at the front end of the participatory design process to help prepare participants and experts for the process of designing and to immerse them in the domain of interest (Sanders et al., 2010). In line with this, Visser et al. have focused on the process of establishing collaboration, and they have introduced a sequence of research steps that they call “contextmapping” (Visser et al., 2005). In contextmapping, co-design activities evolve from simple activities or exercises to more demanding ones. By emphasising the process view, they highlight the role of a step-by-step process that allows participants to become increasingly aware of their own experiences. This approach is also reflected in the work of Lucero et al., who posit that in conducting dialogue-labs sessions, they have sensitised participants to the topic of the design process by involving them in “probes studies” (Lucero et al., 2012) and contextual inquiries (Holtzblatt et al., 2004).

2.2.3.2 Participatory Tools for Revealing Knowledge, Values and Goals

Participatory design tools, which include mapping instruments, design toolkits, visualisation systems and games, are used in participatory design activities to engage stakeholders in design thinking (Sanders et al., 2010). An essential task of participatory design is to develop tools for capturing and understanding not only explicitly articulated information from experts and technicians, but also forms of tacit or experiential knowledge (Björgvinsson, Ehn, & Hillgren, 2012; Pollastri, 2017, p. 64). Participatory design tools are conventionally used as a strategy to engage those most marginalised in slum-upgrading (French et al., 2018; Hamdi, 2010; Sanoff, 2000, 2007), and they have been used to include participants at all stages of the development process, including decision-making, implementation, monitoring, evaluation, and maintenance stages (Brandt et al., 2013; MacPherson, 2013, p. 86). They have been shown to help support collaborative design enquiry, and they help to “bring together a network of actors with different backgrounds, competencies and experiences” to conceptualise or contribute to a design project (Brandt et al. 148). They are generally designed with four objectives: probing participants to express their experiences, feelings and attitudes in forms and formats that provide inspiration for designers

through design exercises (Gaver et al., 1999; Mattelmäki, 2006); priming participants in order to immerse them in the domain of interest; obtaining a better understanding of their current experience; and generating ideas and design concepts for the future, for instance by creating and exploring future scenarios (Sanders et al., 2010).

Bjögvinsson et al. argue that identifying, mapping, and dealing with controversies and conflicting ideas provoked through collaborative design exercises is at the core of participatory design (Bjögvinsson et al., 2012). By letting people make something new, for example letting them create a simple mock-up or a collage, participatory design can help them to have a grasp of the knowledge values of other participants (Sanders & Dandavate, 1999; Visser, 2009).

2.2.3.2.1 *Visualisations*

In *Co-Design: A Process of Design Participation* (1989), Stanley King et al. suggest that visualisation of design ideas, problems or concepts is crucial to effective participation in design processes, because it is the only common language between all participants—a language where technical thinking, the jargon of designers and the visions of participants may find equal footing (S. King, Conley, Latimer, & Ferrari, 1989). Design visualisations have long been at the heart of the discourse of participation (Al-Kodmany, 1999; Pollastri, 2017; Simonsen & Robertson, 2012). A visualisation is a design artefact—such as an image, drawing, physical model or digital model. The visualisation translates information, which by itself is not directly observable, into a visual representation that facilitates the understanding of such information by the creator or by an audience or participants. Visualisations in participatory design are cognitive tools that present working ideas and concepts for personal reflection or to facilitate a discussion among peers or with external stakeholders (Pollastri, 2017, p. 71). Visualisations are usually not truthful representations of perceptible reality, but records of how a participant sees something (Crowe & Laseau, 1986; Dörk, Collins, Feng, & Carpendale, 2013; Pollastri, 2017).

As Johansson points out, the challenge often faced in participatory design is that the “trained designer may use a pen and a piece of paper to illustrate his ideas while other stakeholders need other kinds of design *material* to be able to sketch” (Johansson 17). The materials are what Donald Schön calls “the materials of the design situation” and are frequently referred to in the participatory design literature (Agger Eriksen,

2009; Brandt et al., 2013; Lanzara, 1991; Schön, 1983)”. Eriksen classifies such materials as the ready-made content visualised or used within a given participatory design activity, such as pen and paper, clay, disposable cups, maps and images (Eriksen, 2009). They are generally brought into the participatory design gathering without specific meaning, and the meaning is attached to them through reinterpretations according to particular needs. They are the things participants discuss and with which they interact; they are the items that provoke ideation and influence the relationship between activities, participants and designers.

In line with the description of “tools-to-think-with” (i.e. enacting collaborative design activities, such as mock-ups, scenarios and sketching) Eva Brandt describes materials used in collaborative design processes as “things-to-think-with” (Brandt, 2007, p. 179). Bødker (2009) describes how participants “*speak through*” different types of participatory design workshop boundary objects that act as discursive “props” and give shape to their expectations, their outlook, their values and so forth (M. Bødker, 2009, p. 21). Walton (1993) argues that discursive props work by giving mandate to particular imaginings Walton (1993) . Dindler and Iversen (2007) show that these props do not need to be overly complex or be true representations of reality in order to provoke reflections on design situations, perspectives or goals. Instead, simple props such as a cardboard monitor, speakers and a microphone may be used to generate effective discourse during a participatory design activity (Dindler & Iversen, 2007). Pollastri et al. show that simple props can be used to create what they call “Future Visioning Workshops” (see Figure 19) for reflecting, discussing and visualising aspirations, fears and expectations about urban futures amongst disparate participants (Pollastri et al., 2017). In this way, the participatory design approach has much in common with Schön’s (1983) articulation of design as ‘reflection-in-action’, a process engaged in by an experienced and reflective design-practitioner. But while Schön takes the perspective of the individual designer, the direct involvement of future users in a participatory design process involves collective ‘reflection-in-action’ between multiple participants.

Figure 19. Future Visioning Workshops using simple props for reflecting, discussing and visualising future aspirations, fears and expectations about urban futures amongst disparate participants (Pollastri et al., 2017, p. 8)

2.2.3.2.2 Participatory Design Activities

Collaborative design techniques allow participants to test a range of design alternatives and to consider several overlapping perspectives/theories/frames as well as real-world systems. There are many different strategies, methods and techniques detailed in the literature that describe how stakeholders can be involved in the ideation, concept development and early prototyping phases of participatory design processes. The visualisation of ideas by participants through ideation allows those perspectives to be identifiable in abstraction and to become concrete through the creation of design artefacts that are more easily communicated to other participants (Sanders & Stappers, 2014). These strategies, methods and techniques include future workshops (Kensing & Madsen, 1992), generative participatory design (Brandt et al., 2013; Sanders, 2000), dialogue-labs (Lucero et al., 2012, p. 2), metaphorical design (Madsen, 1994), inspiration card workshops (Halskov & Dalsgaard, 2006) and design games (Brandt, 2006; Brandt & Messeter, 2004; Brandt, Messeter, & Binder, 2008).

Many of these methods and techniques focus on discrete stages of the design process. For example, generative participatory design techniques, first defined by Elizabeth Sanders et al (1999), are an example of “priming activities”. Using physical

participatory design materials such as two-dimensional collages, mappings, visual and verbal triggers, physical games and props, participants are encouraged to “make designerly artefacts and then tell a story about what they have made” (Visser et al., 2005, p. 122). The artefacts and descriptions or enactments of their use developed by participants through the participatory design process can be analysed to find underlying patterns that can help participants build social capital and form useful analytical research as the foundation of further design explorations (Sanders & Stappers, 2014). These tools generally provide invaluable information to designers by challenging participants to express their tacit knowledge of the participants or allow for the exploration of latent needs, aspirations and dreams (Sanders, 2000). They can allow participants to discover and express imagined conceptions of past, present and future experiences with one another, as well as responses to problems and alternatives to current situations. The purpose of these techniques is to help create a shared language between participants, and between experts and participants, for the communication of tacit and latent attributes of a design context.

2.2.3.2.3 *ICT based Approaches to Participatory Urban Design*

The use of ICT-based participatory urban design tools has become prominent over the last decade. Many new digitally-enabled participatory techniques, tools, and applications have been developed to facilitate the participation of stakeholders and residents in a variety of ways. Desouza & Bhagwatwar argue that ICT-based participatory design tools are technology-enabled forums created to retrieve, analyse, visualise and share information, expertise and solutions that advance social causes and/or resolve social and policy problems (Desouza & Bhagwatwar, 2014, p. 26).

Past research has examined technology-enabled participation platforms (Desouza & Bhagwatwar, 2014) to demonstrate their potentials (Falco & Kleinhans, 2018), to reveal the empowerment goals (Pak & Verbeke, 2014), to identify types of mobile apps for citizen participation (Ertiö, 2015) and to offer evidence-based design guidelines for participation processes (Bryson, Quick, Slotterback, & Crosby, 2013). Gün, Demir, & Pak examined ICT-based participatory design platforms to reveal how these platforms empower and restrict citizens’ engagement. Gün et al., (2019) found in an analysis of 25 ICT-based urban participation platforms, only 12% of platforms’ [Maptionnaire, MinStad (Tahvilzadeh, 2015) and Smarticipate (Z. Khan et al., 2017)] participants

create their own design, plans and visions. Their findings also indicate that a majority of these platforms (76%) focused on only two objectives: problem identification and feedback collection (Gün et al., 2019, p. 16).

However, many of these approaches use abstract visualisation techniques such as GIS based systems that can result in a lack of engagement. Smarticipate for example utilises the OpenStreetMap platform see Figure 20, below.

Figure 20. Screen shot from the Smarticipate participatory urban design tool (Z. Khan et al., 2017).

Others such as the City of Gothenburg’s Min Stad web portal and application provide an annotated 3D visualisation of the city for urban planning and interaction, allowing for the inclusion of personal stories, interaction with the city’s landmarks, as well as linking to the city museum’s archive of historic images (Tahvilzadeh, 2015). The approach, which utilises un-textured, extruded urban forms in combination with satellite imagery, lacks in visual fidelity to represent emotive qualities of space (Figure 21).

Figure 21. Placing feedback on a selected urban feature in Min Stad (Tahvilzadeh, 2015)

2.2.4 Developing Knowledge, Values and Goals

***Strategy PD-3:** Develop stakeholder collective knowledge, values and goals by clarifying and refining them to allow their translation from abstract formulations to more concrete design concepts.*

***Implications for Research:** The review highlights the importance of aiding participants to develop conflicting perspectives, knowledge bases and the values and goals each participant holds. Adopted approaches include exploring, reframing or suspending assumptions through defamiliarisation strategies, games-based approaches or agonistic approaches.*

Once participant knowledge, values and goals have been revealed, they can be developed in one of two approaches, depending on whether there is agreement or conflict. All revealed knowledge and values are brought to the fore in the participatory design process, even if particular values conflict and present dilemmas to the process. As Iversen et al. describe, either direction requires designers to decide how to facilitate and orchestrate this process with participants (Iversen et al., 2012, p. 95).

2.2.4.1 *Agreement and Conflicting on Knowledge, Values and Goals*

In the first approach, if all participants are in agreement concerning knowledge, values and goals surrounding a design situation, then the participatory design process can focus on clarifying and refining the values, which allows a clearer translation of values from abstract formulations to more concrete design concepts (Iversen et al., 2012, p. 95). Through reflection and discussion surrounding collaborative design activities, participants can then hone their collective design preferences. Participants are prompted to reflect and verbalise their views of how they could envision the future design. This technique also allows participants to express aspects of their preferences pertaining to this design.

An alternative approach is used when conflict or contestation of knowledge or values is revealed in this approach; allowing participants to explore, reframe or suspend assumptions can be beneficial (Al-Kodmany, 1999; Frediani, 2016; Frediani et al., 2011; Hamdi, 2010; von Heland et al., 2015). Through an exploration of social complexities and conflict involved in participatory design processes, participants can be stimulated to “share diverse opinions and aspirations and thus deepen their understanding of the self, others, norms and institutions” (Frediani & Boano, 2012, p. 216). Sharing opinions is important as values and knowledge are not always explicit and can emerge when users are challenged by other participants or stakeholders (Halloran, Hornecker, & Fitzpatrick, 2009).

A number of methods are described in the literature to enable the sharing of opinions and ideas. One of the earliest is described by Ehn as the *Verfremdungseffekt* (or the theatrical “distancing effect”), which is used to “make well-known situations appear as something new” to the participants; this approach can allow participants to suspend assumptions (Ehn, 1988, p. 90). Similar concepts were also explored by Bell, Blythe, & Sengers (2005). They describe “defamiliarisation” as a useful tool for creating space for critical reflection, and thereby for opening up new possibilities for design. Making the design situation or context “strange” provides designers and participants with the opportunity to actively reflect on, rather than passively propagate, the existing politics and culture and develop new alternatives for design (Bell, Blythe, & Sengers, 2005, p. 150). Further, Dindler and Iversen use physical props to construct a “fictional inquiry” scenario (Dindler & Iversen, 2007). By having all stakeholders act out their traditional role in a fictional space, they were able to temporarily suspend their viewpoints and

reframe this dilemma without participants feeling threatened. Dindler advocates that this is ultimately facilitated through the use of mock-ups, which can be used to separate participants from reality in what Walton calls a *game-of-make-believe* (Walton, 1993, p. 28). Such ‘games-of-make-believe’ have been tested in different ways by different theorists: Triantafyllakos et al. suggest introducing fictional characters to participatory design scenarios for a similar effect (Triantafyllakos, Palaigeorgiou, & Tsoukalas, 2010); Morrison describes “Narrative Anthropomorphism”, which consists of creating personas and narratives for designed artefacts in order to understand and discuss their complexity (Morrison, 2014); Salvador and Howells describe what they call a “Focus Troupe” in which they use dramatic “vignettes” to create common contexts for design situations (Salvador & Howells, 1998); Johnson uses “Science Fiction Prototyping”, which uses science fiction based scenarios to discuss the implication of future design trajectories (Johnson, 2011); similarly, Blythe and Wright’s “Pastiche Scenarios” (Blythe & Wright, 2006) use fictional scenarios from novels and films to structure participatory design inquiries.

Participatory design games have been widely used to develop knowledge, values and goals by establishing “explorative design dialogues” through novel configurations of the game materials and the present and future practices to which these materials point (Brandt & Messeter, 2004; Brandt et al., 2008, p. 51; Iversen & Buur, 2002; von Heland et al., 2015; Westerberg & von Heland, 2015). Participatory design games invariably have to have an “element of fun and irreverence, frankness and surprise along with interaction”, which makes them successful (Sinha, 2012, pp. 177–178).

In describing design games, Brandt et. al draw on Caillois and Huizinga’s seminal work on play and games to point to how play and games can help the participants step outside of the ordinary, which can enable critical reflection (Brandt et al., 2008, p. 51; Caillois, 1961; Huizinga, 1955). Participatory design games are useful for engaging a diverse group of players around a collaborative activity guided by simple and explicit rules and assigned roles, and supported by pre-defined gaming materials. As Brandt et al. describe, the game materials typically point to existing practices and/or future possibilities and are played within confined and shared temporal and spatial settings often removed from the everyday context of the players. At the end of the game, the players will have produced representations of one or more possible design options (Brandt et al., 2008, pp. 53–54).

Participatory design games have successfully incorporated a number of the strategies above, such as role playing, scenario-oriented approaches and fictional approaches (Ampatzidou et al., 2018; Di Mascio & Dalton, 2017; Iversen & Buur, 2002). Mascio and Dalton demonstrate that the alternative ways of representing and communicating information in architectural and urban participatory design games can make the participatory design process more interesting and playful and hence more effective, and this can be an effective way to establish a dialogue between designers and participants (Di Mascio & Dalton, 2017, p. 433). Iversen and Buur build on Habraken and Gross's concept design games but apply the idea in an educational setting organised around the notion of "design is a game" (Figure 22) (Habraken & Gross, 1988; Iversen & Buur, 2002). They propose that creating, playing and reflecting game playing can be an effective way of learning how to establish social interaction between stakeholders in the participatory design process. According to them, the "game frame encourages participants to pay attention to the social and communicative processes of design", which Vaajakallio argues is essential in participatory design to create and maintain collaboration between participants (Iversen & Buur, 2002; Vaajakallio, 2012, p. 91).

Figure 22. The Product Value Game: Two players negotiate silently which values they want to attribute to their product using colourful picture cards (Iversen & Buur, 2002)

The first architectural or urban design games typically revolved around topics such as land use, community development, public participation, city management, transportation, ecology and natural resources. The game *Metropolis*, created by Richard Duke, the father of planning simulation games, is a planning game in analogue format, created to engage members of a city council in urban development planning (Duke, 1995). More recent approaches, such as *Generative City Gaming* presented by Tan, detail participatory design games for “city making purposes” that do more than “teach, train, strategize, predict and entertain” (Figure 23) (Tan, 2014, 2016, p. 274). The approach seeks to add the design and decision-making dimensions, the social and political structures of cities, and the topological context through the design of the physical board game’s style format.

Figure 23. Participants playing “Play Noord” a Generative City Game designed to explore masterplanning by integrating typical and atypical urban actors through a City Game interface (Tan, 2014, p. 269)

Other participatory design approaches have shown success in using physical/digital interfaces to engage participants. *Finding Places* (2016), developed by FindingPlaces, is a collaborative project run by the CityScienceLab at Hafencity University and the

city of Hamburg in partnership with M.I.T and their open-source program CityScope. Tangible-Interactive-Modelling (TIM) technology is used to find suitable spaces in Hamburg for constructing accommodation for a further 20,000 refugees (Figure 24). It utilises LEGO-tised 3D representations of existing urban areas in Hamburg, providing an analogue-digital interface that encourages non-expert stakeholder participation in rapidly prototyping urban interventions. Using Lego enables anyone to participate in the building of models without being intimidated by complex algorithms and interfaces (Noymana, Holtz, Kröger, Noennig & Larson, 2017).

Figure 24. *Finding Places by the CityScienceLab at Hafencity University and the city of Hamburg in partnership with M.I.T. (Noymana, Holtz, Kröger, Noennig & Larson, 2017)*

Digital approaches to participatory design games have shown some success in engaging stakeholders in design conversations. *Block by Block* (2012), which is a project in collaboration with the United Nations Human Settlements Programme (UN-Habitat) uses the *Minecraft* platform as a community participation tool in the design of urban public spaces, with the goal to raise funds for the improvement of public spaces worldwide with a particular focus on poor communities in developing countries (see Figure 25) (von Heland et al., 2015; Westerberg & von Heland, 2015). Likewise, *Betaville* (2011) is a 3D multiplayer environment for real cities, offering stakeholders a new collaboration tool for realising urban re/development projects. Open-source

technology enables players—ranging from individuals and groups to professional design firms and planning offices—to upload projects in the form of 3D models. It is designed to empower stakeholders to float ideas and find common ground, proactively and cost-effectively gathering information for informed decision-making. The game-based platform consequently has the capacity to filter more favourable ideas and catalyse cooperative action, while avoiding costly early-stage investments of time and money required by more traditional methods (Koplin & Skelton, 2012). However the game is based around consensus building and does not purposely provoke contestation of ideas.

Figure 25. A participant in Kibera, Kenya highlights the size of the football pitch in the Minecraft model as part of a UN-Habitat participatory slum-upgrading project (Westerberg & von Heland, 2015, p. 8)

2.2.4.2 Agonistic Approaches to Participatory Design Activities

The concept of agonism was brought forward by political scientist Chantal Mouffe (Mouffe, 2000a, 2004), primarily as a way to approach political hegemony and ensure the voices of marginalised actors are heard. “Agonistic pluralism” is best understood in relation to antagonism, which is the struggle between enemies, while agonistic pluralism represents the contestation of multiple coexisting and conflicting perspectives between adversaries (Emilson, 2015, p. 50). A number of designers have

operationalised the “agonistic pluralism” for socio-political engagement through participatory design to address conflict and contestation of assumptions and perspectives (Björgvinsson, Ehn, & Hillgren, 2012; Munthe-Kaas, 2015; Pløger, 2004).

There is growing interest in design practices that create “agonistic space”, i.e., where the different stakeholders do not necessarily reach a consensus surrounding a design, but rather create an arena that reveals conflict or tensions and that allows multiple opposing views to coexist (Hillgren, Seravalli, & Emilson, 2011, p. 179; Huybrechts, Dreessen, Schepers, & Salazar, 2016). Animating the debate about urban poverty eradication, slum upgrading and participatory design, Boano et al. draw on Rancière’s ontology of “dissensus” (Rancière, 2011)—in which he posits that “conflict within a group can and should be reframed as something fruitful” (Boano & Kelling, 2013). Constructing a participatory “architecture of dissensus” “refers to the way in which community members reposition themselves as viable development partners, thereby interrupting the dominant—fundamentally exclusive—way in which urban development happens” (Boano & Kelling, 2013).

Proponents of “Agonistic Participatory Design” argue that consensus should not be forced (Boano & Kelling, 2013); instead, opportunities should be provided for stakeholders to participate in contestation, or constructive controversies, among ‘adversaries’ who have opposing matters of concern but also accept other views as ‘legitimate’ (Björgvinsson et al., 2012; DiSalvo, 2012). Providing such opportunities has been discussed in the literature as “infrastructuring”—providing the conditions needed for social change and aligning inscribed norms and values across contexts through socio-material negotiations (Björgvinsson, Ehn, & Hillgren, 2010; Hillgren et al., 2011).

A number of authors have documented the operationalisation of agonistic participatory design. Architecture sans Frontières-UK (Frediani, 2016; Frediani et al., 2011) conducted a series of workshops organised by Architecture sans Frontières-UK, titled Change by Design (see Figure 26). The workshops in Salvador da Bahia, Brazil (2009 and 2010), Nairobi, Kenya (2011), and Quito, Ecuador (2013) consisted of two weeks of activities in close collaboration with local partners. Activities were organised into four different stages: diagnosing, dreaming, developing, and defining. They used what the authors describe as “catalyst themes”, such as dignified housing growth, which were useful in defining the spatial principles based on values and daily practices

(Frediani, 2016, p. 106). The authors argue that “solidarity is more deeply formed when sharing and discussing differences—when bonds are formed not by identities or histories of oppression in common, but by hope of what is yet to come (Frediani et al., 2011, p. 108). The project showed that participants formed solidarity through the recognition of difference and alliances through multiplicity (Frediani et al., 2011, p. 108).

Figure 26. Participants contributing to the Change By Design project in Nairobi, Kenya (Frediani et al., 2011, p. 108).

Similarly, the PocketPedal project by Holland and Roudavski showed that agonistic space can be created through a digital game-based approach. The project utilises a purpose-built smartphone game to help participants discover and cultivate commonalities between cyclists and motorists surrounding the issues of implementing cycleways in inner city Melbourne. It facilitated the creation of a common language amongst participants and the alignment of inscribed norms and values across contexts through socio-material negotiations (Holland & Roudavski, 2016).

2.2.5 Grounding Knowledge, Values and Goals

***Strategy PD-4:** Ground the participant's everyday knowledge and experience to create common ground or shared language between participants.*

***Implications for Research:** The review highlights the importance of aiding participants to ground conflicting perspectives, knowledge bases and the values and goals each participant holds. Adopted approaches include aiding participants to undertake collective design cycles of reflection and action, and applications of prototyping to connect their abstract participatory design experience to their real-world experience.*

When perspectives and assumptions about values have been reconceptualised through negotiation and exploration within the participatory design process, they need to be “grounded” so that stakeholders can navigate this new-found conceptualisation successfully within their everyday interpretations of their built environment (Clement & Besselaar, 1993; Iversen, Halskov, & Leong, 2010; Iversen et al., 2012; Kensing, 2003). Büscher et al. describe how grounding can be achieved through a triangulation of “bricolage”—the construction of concepts that are combinations of various participants’ ideas and experiences into a scenario that they collectively believe will work, prototyping in-situ, and what they describe as “future laboratories” as techniques that allow stakeholders to balance and negotiate between “blue-sky conceptualising and pragmatic issues of development and implementation” (Büscher, Eriksen, Kristensen, & Mogensen, 2004; J. E. Innes & Booher, 1999).

Drawing on the work of Schön, Büscher et al. state that in order to navigate grounding, stakeholders need to operate within cycles of “doing and reflecting”—design by doing and design by reflecting (Argyris & Schön, 1978; Büscher et al., 2004; Schön, 1983). Similarly, ideation can be grounded in the users’ experiences through creative artefacts produced by the participants. Vaajakallio and Mattelmäki argue that when design is enacted, it “becomes manifested through a performance, visualizing the consequences to everyone present and allowing what Schön describes as “joint reflection-in-action” that engages all participants in the design situation” (Schön, 1983; Vaajakallio & Mattelmäki, 2014). Iversen et al. state that grounding can be facilitated through the acceptance and use of a prototype in an existing practice, or with reference

to the real world, which can be carried out by dissemination activities or the implementation of a prototype on-site (Iversen et al., 2012, p. 100).

2.2.6 Summary

This section has discussed how *participatory design* has been used to help disparate stakeholders explore conflicting perspectives and assumptions surrounding architectural and urban issues through collaborative design activities. The section positions participatory design as a conceptual activity that is useful in blue-sky approaches to participatory upgrading, and it emphasises that citizen control is more important than token participation approaches. The review has shown the importance of priming or preparing participants for participatory design activities by slowly leading them into the design process.

Collaborative ideation and design activities can help participants reveal their positions to one another through ideation and the negotiation of design alternatives; help them develop collective knowledge and values through the navigation of conflict and difference; and ground them in their real-world experience through in-situ prototyping.

From this participatory design literature review, four strategies can be adopted that can help disparate stakeholders explore conflicting perspectives, assumptions and corresponding goals surrounding architectural and urban issues:

Strategy PD-1: Ensure that all participants within a design activity have equal power to determine the outcome of the decisions made, as opposed to merely being informants.

Strategy PD-2: Reveal stakeholder's perspectives and assumptions in order to make positions known through design activities and ideation.

Strategy PD-3: Develop stakeholder collective knowledge, values and goals by clarifying and refining them to allow their translation from abstract formulations to more concrete design concepts.

Strategy PD-4: Ground the participant's everyday knowledge and experience to create common ground or shared language between participants.

In the next section I build on this to discuss how digital games act as a medium for generative participatory design inquiries through a review of current approaches to serious games and define strategies for how they have resulted in either social and design oriented outcomes.

2.3 Architectural Serious Games

People who know how to make games need to start focusing on the task of making real life better for as many people as possible (McGonigal, 2011).

2.3.1 Introduction

As part of the United States contribution to the 1967 International and Universal Exposition in Montreal (Expo 67), American architect, systems theorist, designer, and futurist R. Buckminster Fuller proposed The World Game: Integrative Resource Utilisation Planning Tool. Sometimes called the World Peace Game, it was an educational simulation game structured on the foundation of open cross-border collaboration between nations and even continents to help create solutions to problems such as overpopulation and the irregular distribution of global resources. Based on Fuller's Dymaxion map, it involved groups of players cooperatively responding to sets of problematic hypothetical scenarios, through a lens of a holistic world view, which consequently challenged the dominant nation-state system. The aim of the game was to explore how to "make the world work for 100% of humanity in the shortest possible time through spontaneous cooperation without ecological damage or disadvantage to anyone", thereby increasing levels of empowerment and quality of life for all (Fuller, 1971). While Fuller was commissioned to build his "geodome" structure for Expo 67, his proposal for the inclusion of the World Peace Game (see Figure 27) as a fundamental component of the exhibition was rejected by the United States Information Agency (USIA) (Fuller, 1971). The USIA, anticipating the communicative, collaborative and subversive power of Fuller's World Peace Game, deemed it too revolutionary, due to its proposal of the cooperative redistribution of resources and the suggestion of destabilising existing power structures via collaboration across international borders to solve global problems (ibid). It was feared

that games would give the unskilled, uninformed masses the tools to subvert the status quo.

Figure 27. *The World Game: Integrative Resource Utilisation Planning Tool*, R. Buckminster Fuller, 1967.

This section discusses current serious game design approaches and frameworks, and it defines and evaluates previous approaches to architectural design games that can help support collaborative architectural design inquiry. The review then looks specifically at literature on serious games that are *design ideation* oriented—those designed to enable the effective generation and communication of ideas, visions, concepts or solutions to design problems. It then looks at literature on serious games that are *socially oriented*—more specifically, those designed to explore conflicting stakeholder perspectives and build civic engagement and social capital.

The purpose of this section is to:

1. Define “serious games” and key associated terms and attributes (section 2.3.2).
2. Review the approaches for enablement of future-oriented *design ideation* in support of collaborative architectural design inquiry through the design of serious games (section 2.3.4).

3. Identify key *socially oriented* serious games strategies to help stakeholders explore conflicting stakeholder perspectives and the building of civic engagement and social capital in relation to social, architectural and urban issues (section 2.3.5).
4. Summarise the review by presenting relevant strategies derived from the literature that may be used in the development of effective speculations to address the Research Question (section 2.3.6).

2.3.2 Defining Serious Gaming in Architecture and Planning

2.3.2.1 Games

Strategy SG-1: *Ensure that serious games are designed to be both educational and fun while being designed to interface with slum-upgrading design processes.*

Implications for Research: *This section suggests that bespoke serious games that are designed for a specific objective are more effective than appropriating games to participatory design processes that were designed for other purposes. It also suggests that the design language sometimes used by architectural or urban design serious games is not optimally accessible to non-expert players.*

Before discussing serious games, it is important to define what a game is and how the term will be used in the context of this research, as a number of definitions exist in the literature. Salen and Zimmerman, in *Rules of Play: Game Design Fundamentals*, define *games* as “a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome” (Salen & Zimmerman, 2004, p. 80). Clarke Abt states that when “reduced to its formal essence, a game is an activity among two or more independent decision-makers seeking to achieve their objectives in some limiting context. A more conventional definition would say that a game is a contest with rules among adversaries trying to win objectives” (Abt, 1970, p. 6). As Alenka Poplin points out, one of the most interesting attributes, particularly with reference to architectural games, is the acknowledgement that a game is an activity in which players make decisions (Poplin, 2012, p. 198). In many planning games, winning a conflict between players is not the ultimate goal. Most design or planning games are non-competitive, shifting the focus away from winning toward the “fun of playing and win-win relationships” and in doing so can encourage playfulness and

cooperation (ibid). Turner posits that the playfulness of games creates a liminal state in which hypothetical scenarios may be played out. Turner notes that:

part of [play] subverts past legitimacies and structures; part of it is mortgaged to the future in the form of a store of possible cultural and social structures, ranging from the bizarre and ludicrous to the utopian and idealistic, one of which may root in a future reality (Turner, 1987, p. 96).

Thus, through the experience of play, participants are able to forget the present, suspend disbelief, and accept the rules and space of action defined in the game by voluntarily participating in what Huizinga terms the “magic circle” in his book *Homo Ludens* (Huizinga, 1955). In relation to spaces within the magic circle, “all are temporary worlds within the ordinary world, dedicated to the performance of an act apart” (Huizinga, 1955, p. 10). As Salen and Zimmerman point out in applying the magic circle concept to the design of entertainment-based games, as a player steps in and out of a game, he or she is crossing that boundary—or frame—that defines the game in time and space (Salen & Zimmerman, 2004).

2.3.2.2 *Serious Games*

Applications of serious games can already be found in a number of fields including cultural heritage, engineering, education, health and business (Ma & Oikonomou, 2011). As Di Mascio and Dalton explain, this is due to the fact that their alternative way of representing and communicating information has the potential to make the learning process more interesting and playful and hence more effective (Di Mascio & Dalton, 2017, p. 434).

The concept of “serious games” was first conceptualised by Clark Abt, in his seminal work *Serious Games*, as those designed to do more than just entertain (Abt, 1970). Zyda provides the following definition: a serious game is “a mental contest, played with a computer in accordance with specific rules that uses entertainment to further government or corporate training, education, health, public policy, and strategic communication objectives” (Zyda, 2005). The purpose of serious games is ultimately

to be both educational and fun (Bellotti, Kapralos, Lee, Moreno-Ger, & Berta, 2013a). Paul Wilkinson provides an insightful and comprehensive review of the history of serious games that exceeds the scope of this review (Wilkinson, 2016).

It is important to highlight the distinction between serious games and “gamification”. While games are considered to embody the experiential and behavioural qualities of gameplay, gamified applications are notably centred around the use of specific game elements invoking playful or ludic qualities (Ampatzidou et al., 2018; Deterding, Dixon, Khaled, & Nacke, 2011). Gamification involves “the use of game design elements in non-game contexts” (Ampatzidou et al., 2018; Deterding et al., 2011) and became recently popular when game elements started being employed primarily for marketing purposes (Cunningham & Zichermann, 2011; Huotari & Hamari, 2011).

2.3.2.3 *Serious Games in Architecture and Planning*

In her essay “Gamespace Urbanism: City-Building Games and Radical Simulations for Failed Architecture”, Federica Buzzi argues that city-planning computer games promise fresh potential for simulation and exploration of radical urban scenarios—and subsequent social, political, and ethical critique. She argues that “[b]eyond critique and virtual entertainment, the question they open up is whether games can be used as reliable systems to study and solve actual and theoretical conflicts” (Buzzi, 2017).

The use of custom serious games that influence real-world architectural and planning systems through virtual experimentation has received growing attention in recent years (Ampatzidou et al., 2018; Poplin, 2011; Poplin & Vemuri, 2018; Veeningen, Szirbik, & Blokhuis, 2017; Yamu et al., 2017). Approaches such as those by multimedia architectural designer and artist Lawrence Lek depict speculative worlds and site-specific simulations using gaming software such as Maya and Unity. Often based on real places, Lek’s works such as *Unreal Estate* (2015) and *Shiva’s Dreaming* (2014) use distortions of virtual time and space in order to present uncanny takes on an alternative reality, which are pitched at those seeking to subvert the authority institutional establishments. Likewise, the architectural design practice You+Pea, founded by Sandra Youkhana and Luke Caspar Pearson, has been investigating how architects can use video game technologies as an interactive means of understanding buildings and cities. Their projects, such as the *London Developers*

Toolkit (2016) (see Figure 28), which is a satirical app referencing the frustration of being architects in London without much architectural agency amongst the many stakeholders, are all designed to impact on our perception of and interface with reality through virtual experiences and interactions.

Figure 28. *London Developers Toolkit*, You+Pea.

The interest of urban scholars in serious games stems from games' specific ability to balance entertainment and learning (Jabbar & Felicia, 2015; Boyle, Connolly, Hainey, & Boyle, 2012; Whitton, 2011). Many early applications of table-top based serious games in architecture and planning have focussed predominantly on addressing topics such as land use, transportation, ecology, and management of natural resources through the interactive modelling of urban dynamics. Beginning in the 1960s and 1970s, Jay Forrester's (1969) work on urban dynamics, as well as Richard Duke's manual *Metropolis: The urban systems games*, inspired a number of simulation-based gaming approaches (Duke, 1975). For example Meadows et al. alarming report "The Limits to Growth" adopted system-dynamics based world models, predicting an emerging ecological, energy, and demographic crisis (Meadows, Meadows, Randers, & Behrens, 1972); the popular city-building game *SimCity* was influenced by this work (Mayer, 2009). More specifically in urban planning, the use of games for various design purposes in particular has remained a popular tool for spatial modelling,

simulation and public participation (Ampatzidou et al., 2018; Devisch, Poplin, & Sofronie, 2016; Poplin, 2012).

Di Mascio and Dalton divide more recent approaches to digital serious games in architecture into two categories. The first category uses game engines mainly for visualising a design scheme to present it to players or stakeholders, as opposed to allowing them to actively contribute to it—what was described in the previous section as a “partial participation” based approach (Borries, Walz, & Bottger, 2007; Di Mascio & Dalton, 2017, p. 439; Yamu et al., 2017). The majority of design proposals visualised through these technologies are also primarily developed by urban designers or architectural professionals, so the players are asked to provide their thoughts only at a later stage. In other words, the ‘participatory’ aspect of the ‘serious game’ is post hoc rather than concurrent (Di Mascio & Dalton, 2017; Indraprastha & Shinozaki, 2009). For example, O’Coill and Doughty created a virtual environment with the aim of improving the communication of an existing design proposal to residents of Hull in East Yorkshire, England; this game environment was displayed during a design workshop after which comments were solicited (O’Coill & Doughty, 2004).

The second category represents the more recent approaches to serious games, where games are used for more design-oriented purposes. This category has become more popular in recent years due to increased access to videogame development packages that require less computer knowledge and computer coding ability to develop custom games, such as Unity3D and Unreal Engine (Korody, 2016; Poplin & Vemuri, 2018; Westre, 2014). For example, *Block’hood* (2017) (see Figure 29), developed by Sanchez in Unity3D, is a crowd-sourced simulation-based serious game oriented towards ecological urbanism. The game, based on a rectangular voxel grid, allows the player to place modules—each of which represents a different unit such as housing, wind turbines, farms, water towers and parks—that provide fresh air, shops that produce income and clinics that reduce sickness (Sanchez, 2015). Players are challenged to maintain an ecological balance as each block placed will consume and produce resources of different kinds. Although *Block’hood* is mostly abstract and not situated within an existing urban condition, it establishes the significance of gaming and user participation in education and contemporary urbanism (Markopoulou, Ingrassia, Chronis, & Richard, 2018, p. 226). Likewise, the custom serious game *B3—Design your Marketplace!* (2014), developed by Alenka Poplin, engaged the citizens of Billstedt, Germany in the redesign of the town square. The game provided them the

opportunity to select and add street furniture objects (such as benches, lights and trees) and to (re)arrange the position of these elements around the 2D and 3D virtual representations of the square; the game allowed participants to share ideas and vote for each design solution, improving the communication between citizens and planners (Poplin 2011).

Figure 29. *Block'Hood*, Jose Sanchez, 2017.

The design-oriented category also includes those serious game approaches that repurpose commercial-off-the-shelf (COTS) games as a cost- and time-effective strategy for design purposes, which has had some positive impact. Urban design and architecture are topics in many commercially developed videogames designed for entertainment purposes, including simulation and strategy games such as *SimCity* (1989) (Figure 30, below), *Minecraft* (2009), *Anno 2205* (2015) *Cities Skylines* (2015), *Prison Architect* (2015) and *Parkitect* (2018). Many have been utilised for serious design purposes. Often in a COTS-based approach, real-world sites are modelled within an existing city building style game with which players then experiment. The approach is not particularly flexible regarding the implementation of custom game rules or mechanics.

Figure 30. *Sim City*, Maxis, 1989.

For example, the city building game *Cities Skylines* (Figure 31) has been used for a number of serious game based urban design applications. It was used successfully in the design of a new transportation system being built in the Norra Djurgårdstaden district of Stockholm, Sweden that was planned using the game and documented in the film *My Urban Playground* (2016). Its primary success was that it enabled players to simulate the district in-game to test different scenarios and explore possible methods for Norra Djurgårdstaden to become sustainable, and versatile enough to support the needs of its residents, while adding 12,000 new homes and 35,000 workspaces to help combat accommodation shortages in the area (Wakefield, 2017). In addition to professional city builders and planners, the public were also involved in the project, offering ideas and modifications in line with the workshop’s goals (Donnelly, 2016).

As Ulrich and Henrik-Helms (2017) and Poplin (2011) argue, COTS games are hindered by the fact that they are designed for entertainment—not participatory design processes (Poplin, 2011; Ulrich & Henrik-Helms, 2017). The repurposing of COTS games for urban design purposes can also confuse players involved in the participatory process. For example, a participatory gaming workshop instruction given by a facilitator might contradict a built-in game mechanic or goal, creating confusion amongst participants. Some COTS games can be operated in an open world “build” mode for participatory design workshops, which removes built-in game rules; however, in this case the gaming process relies on a combination of verbal or written

external workshop instructions provided by a facilitator to structure the gameplay activities, which can lead to issues regarding clarity of instruction.

Figure 31. *Cities Skylines* being projected onto a wall for use in participatory design workshops in Norra Djurgårdstaden, Stockholm, Sweden, 2016.

2.3.2.4 *Serious Games Used in Slum-upgrading Research*

A number of examples exist where serious games have been used for slum-upgrading purposes in various capacities.

GETH2O (2010) (Figure 32), developed by game developers Butterfly Works, is an online flash and mobile phone game that deals with the themes of poverty, corruption, water scarcity, crime, and community development. The aim of the game is for players to develop houses while dealing with the issue of a lack of potable drinking water. Its purpose is to enhance understanding of the basic dynamics of conflict, conflict escalation, the role of the community and the role of individuals in preventing conflict and promoting peace. The designers intent was that playing the single player mobile phone game fosters awareness about how to peacefully handle community problems and options, which are then flagged for common action and possible long-term results. As such, the game provides an engaging, self-reinforcing context in which to motivate and educate players; however, while the game focusses on exploring many of the issues faced by slum dwellers in upgrading processes, it is single player, meaning that collaboration between various stakeholders is not supported, and the board-game-like

interface provides only two-dimensional pictorial representations of buildings and spaces, and so might struggle to interface with design processes if it were used in a pragmatic slum-upgrading context.

Figure 32. *GetH2O* (Butterfly Works, 2010).

Block by Block represents a serious application of the sandbox⁴ videogame *Minecraft* in a partnership between the game's makers Mojang and the United Nations Human Settlements Programme, the UN agency promoting sustainable towns and cities (see Figure 33). In this initiative, players are engaged in the redesign of specific urban public spaces using *Minecraft* to alter existing conditions represented within the game.

The Block by Block programme organises workshops with 30-to-50 people who live and work around the planned public spaces. Divided into groups of around three or four people, the local residents are taught how to build in the virtual landscape of *Minecraft*. The project has been successful in that several series of workshops have been coordinated in various countries including Kenya, India, Haiti, Mexico and Nepal, with a number of implemented public spaces resulting from the workshops; however, the methodology used by UN-Habitat (von Heland et al., 2015) is limited in its scope to the pragmatic upgrading of specific spaces and does not focus on an

⁴ A sandbox is a style of game in which minimal character limitations (such as segmented areas via level progression) are placed on the gamer, allowing the gamer to roam and change a virtual world at will.

exploration of possible futures, conflicting stakeholder perspectives, and corresponding goals surrounding social, architectural and urban issues.

Figure 33. Block by Block participants in Nairobi Kenya collaborate in public space design (Block by Block, 2017).

YouPlaceIt! (2018) is an example of a Public Participation Geographic Information System (PPGIS) developed by Poplin & Vemuri and implemented in the Dharavi slum area of Mumbai, specifically dealing with stakeholder negotiation and consensus building regarding upgrading issues via a digital GIS interface (Figure 34). *YouPlaceit!* enables the players to design their own urban space by using different objects such as benches, trees, lights, and fountains focusing around a road construction process. The purpose of *YouPlaceIt!* is to enable stakeholders to communicate and resolve specific urban planning issues. This game assumes that the stakeholders wish to redevelop the area, create something new, and resolve problems or disputes that parties wish to negotiate (Poplin & Vemuri, 2018).

While the game was useful in driving negotiation, the GIS interface was found to be too complex for those with a low level of digital literacy. The approach did, however, open up a number of interesting questions relating to the aims of this

research, including the role of language in spatial games and its power to create coalitions and power relations; the role of negotiations in spatial games and their role in consensus finding participatory processes, modelling negotiations in spatial games, issues of serious upgrading aspects and how to combine them with playful and experimental game elements; the forms and implementations of collective reflections about upgrading issues and how they can be facilitated by a spatial game; and what characteristics of spatial games can successfully support community planning and civic engagement processes (Poplin & Vemuri, 2018, p. 86).

Figure 34. Places identified as different types of properties in YouPlaceIt (Poplin & Vemuri, 2018, p. 78).

In a further example, Markopoulou et al. (2018) utilise a virtual and augmented reality-based approach to serious games to “create a channel of communication with the actual users of the projects and through our digital intervention to better understand their needs and communicate their design intentions to the designers and stakeholders” (Markopoulou et al., 2018, p. 227). Through a project, located in the slum area of the Worli district of Mumbai, India, the authors explored using Augmented Reality as an interface to allow the players, as inhabitants of the spaces, to explore and experiment with the different ideas and configurations of the physical space through a tablet-based serious game simulation. The approach was shown to help both digitally-literate and illiterate players effectively make collaborative design decisions and give designers feedback on the preferred proposals through a simplified graphical user interface

(Markopoulou et al., 2018); however it was limited in terms of its collaborative capacity due to the single player nature of the Augmented Reality medium (see Figure 35 and Figure 36).

Figure 35. Participation event in Mumbai—residents using VR devices (Markopoulou et al., 2018, p. 229).

Figure 36. Participation event in Mumbai—residents using VR devices (Markopoulou et al., 2018, p. 229).

These examples have shown that slum-upgrading orientated serious games provide an engaging, self-reinforcing context in which to motivate and educate players towards slum-upgrading objectives; however, while games generally focus on exploring many slum-upgrading processes, some are single player, meaning that collaboration between various stakeholders is not supported and some use simplistic visual languages that provide abstract representations of buildings and spaces, and so stakeholders might struggle to interface with design processes if it were used in a pragmatic slum-upgrading context. Some examples, such as Block by Block, utilise off the shelf games that are not designed for participatory design purposes and so have a tension between the fictional objectives of the game designed for entertainment and the objectives of the participatory design activity. Some examples utilise GIS formats that have been shown to be too complex for those with low levels of digital literacy, which might reduce engagement and thus do not sufficiently allow players to address both social and design objectives.

2.3.3 Serious Game Design

***Strategy SG-2:** Develop serious game mechanics (various actions, behaviours and control mechanisms afforded to the player within a game context), the dynamics (the run-time behaviour of the mechanics acting on players' inputs and each other's outputs over time), and the aesthetics (which evoke desirable emotional responses evoked in the player, when they interact with the game system) to promote the objective of the serious game.*

***Implications for Research:** Consider both the desired social and design outcomes within a participatory process and develop serious games mechanics, dynamics and aesthetics to promote these objectives.*

The MDA (Mechanics, Dynamics, and Aesthetics) framework, developed by Hunicke, LeBlanc, and Zubek (2004) and taught as part of the Game Design and Tuning Workshop at the Game Developers Conference (GDC) between 2001 and 2004, has been widely adopted as an overarching framework guiding the design of digital games. It is also useful for the positioning of serious games. The framework describes how the three key components of “Mechanics” (detailed in section 2.3.3.1),

“Dynamics” (detailed in section 2.3.3.2) and “Aesthetics” (detailed in section 2.3.3.3) help to formalise serious game design, which is useful when considering the design of serious games.

2.3.3.1 *Serious Game Mechanics*

Mechanics are the various actions, behaviours and control mechanisms afforded to the player within a game context (Hunicke et al., 2004). Together with the game’s content, such as levels and resources, the mechanics support overall gameplay dynamics.

Some authors have provided useful frameworks for the design of serious game mechanics that have been utilised to add to this broader definition of game mechanics (Raphael, Bachen, Lynn, Baldwin-Philippi, & McKee, 2010; Mitgutsch & Alvarado, 2012; Ulrich & Henrik-Helms, 2017). Ulrich and Henrik-Helms (2017) provide a particularly useful framework for the design of serious game mechanics that addresses game mechanics in the four key dimensions of: game mechanics (section 2.3.3.1.1), learning mechanics (section 2.3.3.1.2), social mechanics (section 2.3.3.1.3), and immersive mechanics (section 2.3.3.1.4) (Ulrich & Henrik-Helms, 2017, p. 699).

2.3.3.1.1 *Game Mechanics*

Game mechanics are methods designed for interaction with the game state, which are invoked by the players, thus providing gameplay (Aldrich, 2009; Arnab et al., 2015; Bellotti, Kapralos, Lee, Ger, & Berta, 2013; Sicart, 2008). They help to create games that are fun to play. Djaouti et al. use game mechanics as a reference for interactive in-game content and gameplay that defines the rules and objectives of a game (Djaouti, Alvarez, Jessel, Méthel, & Molinier, 2008). More specifically, rules are those factors of influence that determine or limit a game player and their decisions (Tan, 2014, p. 83). Games are based on simple rules that are compulsory for all players. Using these simple rules, players create unpredictable complexities—especially in design oriented serious games (Tan, 2014, p. 129). Brandt et al. argue that in “design games”, collaborative activity should be guided by simple and explicit rules, where: the game materials or environment typically point to existing practices and/or future possibilities; the games are played within a confined and shared temporal and spatial

setting often removed from the everyday context of the players; the purpose of the game is to establish and explore novel configurations of the game materials and the present and future practices to which these materials point; and at the end of the game, the players will have produced representations of one or more possible design options (Brandt et al., 2008, pp. 53–54). In this way games can be a medium for other types of participatory design activity that comprise the rules, the game materials and the temporal or spatial setting.

2.3.3.1.2 *Learning Mechanics*

“Learning mechanics” are those that aim to facilitate player learning through gameplay, translating learning techniques, methods and models into game mechanics that enhance players’ abilities to learn or interact with a specific topic, such as leaning a key design concept. These mechanics include providing feedback and guidance to players and allowing them to experiment. Many serious game researchers and designers draw on Arnab et al., who have listed a range of learning mechanics for use in serious games (Arnab et al., 2015).

Much of the serious games literature has put emphasis on informing serious game development with established instructional strategies and pedagogical theories (Arnab et al., 2015; Corrigan, Zon, Maij, McDonald, & Mårtensson, 2015; Kebritchi & Hirumi, 2008; Nazry & Romano, 2017; Rooney, 2012). Many serious games designers utilise the theoretical model of experiential learning defined by Kolb (1984). Kolb defines learning as “the process whereby knowledge is created through the transformation of experience” (Kolb, 1984, p. 41) (see Figure 37).

Figure 37. Kolb’s experiential learning model. Adapted from (Kolb, 1984, p. 21).

While various models of experiential learning have been proposed, Kolb's model—which has foundations in the philosophical traditions of Dewey, Lewin, and Piaget—is a central work in the field of serious games. According to Kolb, learning is cyclical and consists of four main stages. In the first stage, learners have an experience and observe and reflect on this experience. In the second stage, they draw conclusions, and in the third stage they make generalisations based on this reflection, so that their new knowledge can be used in other scenarios. In the fourth stage, learners test these generalisations and hypotheses through experimentations and further experiences (ibid.).

2.3.3.1.3 *Social Mechanics*

Social mechanics are those designed to facilitate social interaction between players or between players and the 3D game environment. Social mechanics permit the establishment of communication pathways between players where “expert knowledge”—or knowledge that players bring with them to the game as personal experiences—can be exchanged between players. Ulrich & Henrik-Helms argue that this allows for the formation of what Lave and Wenger earlier called “*communities of practice*” between participants (Lave & Wenger, 1991; Ulrich & Henrik-Helms, 2017; Wenger, 1998). Within these communities of practice, social norms can be created and institutionalised, form collective and individual actions (Postmes, Spears, & Lea, 2000), create positive space for individual and group flourishing (Argenton, Triberti, Serino, Muzio, & Riva, 2014) and induce inter-player cooperation (Morschheuser, Riar, Hamari, & Maedche, 2017).

2.3.3.1.4 *Immersive Mechanics*

Finally, immersive game mechanics need to be designed with the right amount of fidelity to create an immersive experience and authentically represent reality. Ulrich and Henrik-Helms (2017) and Zyda (2005) describe how game designers can create immersive serious games by designing intuitive game interfaces, immersive sound effects, and visually simulative 3D representations (Ulrich & Henrik-Helms, 2017, p. 700; Zyda, 2005).

2.3.3.2 *Serious Game Dynamics*

As mentioned previously, the MDA (Mechanics, Dynamics, and Aesthetics) framework describes how the three key components of Mechanics, Dynamics, and Aesthetics help to formalise game design. The category of Dynamics describes the run-time behaviour of the mechanics acting on players' inputs and each other's outputs over time. These may include time pressure, lack of resources to complete a certain task, or incentives and achievements that guide players toward a particular action. For example, in the game Monopoly, as the winning players becomes increasingly wealthy, they can penalise poorer players more effectively. As the gap between the winning and losing players widens, the number of invested players decreases and can result in tensions between players and a loss of agency (Hunicke et al., 2004).

2.3.3.2.1 *Immersion Dynamics*

Immersion dynamics is an important aspect of maintaining player motivation throughout the gameplay processes in order to meet educational or design-oriented objectives. Brown and Cairns (2004) define immersion as the user's degree of involvement with a computer game (Brown & Cairns, 2004), in a wide-ranging review exploring pedagogy, play and "fidelity"—using graphics, audio, video, three-dimensional virtual worlds, and artificial intelligence to authentically represent reality in serious games. Serious games theorists argue that players should be given control over their experience and be provided with a means to make choices (Bowman, 1982; Garris & Driskell, 2002; Hamari et al., 2016; Malone, 1981; Sweetser & Wyeth, 2005). Authors have also highlighted the importance of presenting players with progressive challenges and in some instances competition in order to increase immersion, and that these are balanced with the progression of player skills (Bowman, 1982; Garris & Driskell, 2002; Malone, 1981; Prensky, 2001; Sweetser & Wyeth, 2005). Players should be given a clear task or goal where their roles and responsibilities in the task are clearly defined. The rules need to be clear for all players in order for the game to be considered fair (Bowman, 1982; Garris & Driskell, 2002; Prensky, 2001; Sweetser & Wyeth, 2005). Players should also be given direct and instant feedback on their progression towards achieving an objective (Prensky, 2001; Sweetser & Wyeth, 2005). A summary can be found in Table 2, below.

Table 2. Summary of game features identified as key to player engagement. Adapted from (Rooney, 2012).

Study	Game Design Features
(Malone, 1981)	Fantasy (graphics), control, challenge, curiosity, collaboration, competition
(Bowman, 1982)	Clear task, identifiable roles and responsibilities, player choice, balance between player skills and challenges
(Prensky, 2001)	Clear rules, continuous challenge and competition, clear goals and objectives, direct and instant feedback, immersive story line
(Garris & Driskell, 2002)	Clear rules/goals, sensory stimuli, challenge, mystery, control
(Sweetser & Wyeth, 2005)	Concentration, challenge, skills, control, clear goals, feedback, immersion, social

2.3.3.2.2 *Creating Authenticity*

A number of authors, including Ulrich and Henrik-Helms, (2017), Coulton et al. (2014) and Charsky (2010), discuss how creating credible and authentic dynamics for players is important to achieve within serious games, but doing so can be challenging. Coulton et al. argue that in order to do this well, verifiable real-world data sources such as player experiences, environments and systems must be drawn upon throughout the design process of a serious game when designing game mechanics and 3D representations. In this way, the serious game may be anchored to the real world and the real-world experiences of the participants, which have been shown to have positive leaning and cooperative effects (Coulton et al., 2014; Morschheuser, Riar, et al., 2017).

Further, Charsky argues that serious games that require a high level of authenticity—those trying to educate or create realistic design proposals, i.e., with a high level of game “fidelity”—will help players transfer knowledge to the real world (Charsky, 2010); however, an issue that some highly realistic games face with regard to real-world design processes relates to their ability to visualise highly detailed outcomes. While realistic in-game representations can be engaging for participants, they can create confusion regarding pragmatic viability of in-game outcomes—such as design outcomes in a planning game created by participants. This has led to disappointment and tension amongst players and participants in some instances (von Heland et al., 2015). While in-game instructions might carefully explain the role of a

digital game as a tool to be used within a given design or learning process, the visual language that is used to represent in-game environments may be such that participants perceive the game visualisations as reality—such as a finalised design outcome. This has also been shown in cases utilising Geographic Information Systems (GIS) based serious games research, with non-expert players who might have a lower level of digital literacy (Borouhaki & Malczewski, 2010).

2.3.3.3 *Serious Games Aesthetics*

Strategy SG-3: *Utilise simplistic or stylised 3D representation in order to reduce issues regarding the pragmatic viability of in-game design decisions from the perspective of the participants.*

Implications for Research: *Ensure that serious games are designed to clearly communicate the intended viability of the workshop outcomes and aid visual communication.*

As mentioned previously, the MDA (Mechanics, Dynamics, and Aesthetics) framework describes how the three key components of Mechanics, Dynamics, and Aesthetics help to formalise game design. The category of Aesthetics describes the desirable emotional responses evoked in the player, when they interact with the game system. The aesthetics of the game help the designer describe the dynamics and the mechanics of the game to the player, set the tone, and give clear feedback to the players regarding scores, time, resources and progression. Hunicke et al. describe this relationship from the designer's perspective, where the "mechanics give rise to dynamic system behaviour, which in turn leads to particular aesthetic experiences. From the player's perspective, aesthetics set the tone, which is born out in observable dynamics and eventually, operable mechanics" (Hunicke et al., 2004, p. 2).

2.3.3.3.1 *3D Representation*

Di Mascio and Dalton argue that in designing architectural serious games "people's understanding of 3D representations of buildings and urban environments can be facilitated by designing a virtual navigable architectural environment of an existing place that citizens are familiar with" (Di Mascio and Dalton, 2017, p. 444). According

to Di Mascio and Dalton, the adjective ‘architectural’ means that particular care of architectural details is essential for two reasons: first, citizens can familiarise themselves with schematic 3D representations of architectural elements and 3D navigation; and second, a detailed 3D virtual environment increases people’s interest, immersion and engagement during virtual navigation making more enjoyable, playful and effective experiences (ibid.).

Some academic inquiry into the effectiveness of serious games has focused on player 3D immersion as the determining factor (Bellotti, Kapralos, Lee, Ger, & Berta, 2013; Susi, Johannesson, & Backlund, 2007); this has led to the design of games that are structurally and visually similar to successful entertainment-oriented games (McLaughlin, Smith, & Brown, 2010, p. 133). In line with this entertainment-oriented literature, Kickmeier-Rust et al. proposed that, for teaching and learning purposes, 3D immersive games are intrinsically superior to 2D games because the latter fail to hold a player’s attention for extended periods of time (Kickmeier-Rust et al., 2007). 3D virtual environments can be explored using a first-person perspective and in real time. Such virtual journeys provide experiences of spaces and freedom of movement closer to reality than via any other medium (Di Mascio, 2010). In these environments, movement and points of view are not constrained to predefined paths, and players can collaboratively share their narratives, such as stories and memories linked to or about a specific place during gameplay (Di Mascio & Dalton, 2017, p. 444).

As McLaughlin et al. argue, computer graphics in serious games, and games in general, can be divided into three primary categories: modelling (3D models), animation (the motion of 3D models), and rendering (how 3D lighting systems interact with surfaces of 3D models) (McLaughlin, Smith, & Brown, 2010, p. 133). Drawing on (McLaughlin, 2005) in an effort to categorise the relationship between computer graphics techniques and the graphical style of 3D representation within serious games, McLaughlin, Smith, and Brown (2010) provide a framework for visualisation styles within serious games in which they divide visual styles into simplified (Figure 38), stylised (Figure 39) and realistic (Figure 40).

Figure 38. Simplified, low-polygon graphic style of 3D City Builder.

Figure 39. Stylised graphic style used in Block'Hood.

Figure 40. Realistic visual style of Cities Skylines with “Slums for Cities Skylines” modification.

McLaughlin et al. argue against the use of realistic representation for a number of reasons. 3D representations that are more realistic are inherently more complex and require a higher level of technical expertise to design, as well as more computational power to be accomplished (McLaughlin et al., 2010, p. 136). Realism also depends on a number of systems being simulated, for instance the presence of people in the environment and their credible behaviour or the motion of trees or other environmental entities, in order to be convincing. Players may have expectations about the design of serious games that are based on their experience with commercial computer games. In that case, it is not unlikely that they will become disappointed, which may be reflected in less motivation and learning; however, both Vogel et al. (2006) and Wouters, Nimwegen, van Oostendorp, and van der Spek, (2013) investigated the level of realism (photorealistic, high-quality cartoons, low-quality pictures, or unrealistic) in relationship to learning and found no differences between the levels. Both studies showed that from the perspective of learning, there is no argument to opt for photorealistic visual designs, because more basic designs such as schematic/textual and cartoonlike designs can be equally or more effective. Further, McLaughlin, et al. demonstrate that the overall effectiveness of serious games on learning does not rise as a consequence of greater realism (McLaughlin et al., 2010, p. 136).

Table 3. *Speculative Strategies for Urban Design Serious Gaming. Adapted from (McLaughlin, 2005, p. 133).*

Visual Style	Visualisation Categorisation	Characteristics
Simplified	<p>Modelling: Objects and ideas represented as symbolic forms. Level of detail is low.</p> <p>Animation: Non-articulation of figures. Motion fidelity is low.</p> <p>Rendering: Minimal shading of curved surfaces and transparency. No texture mapping.</p>	Shorter development cycle due to simplistic modelling processes, low level of rendering complexity.
Stylized	<p>Modelling: Identifiable objects with unrealistic proportions or juxtapositions of parts. Level of detail can range from low to high.</p> <p>Animation: Articulation and deformation of figures present. Expressive actions are magnified. Motion fidelity varies according to expressive requirements.</p> <p>Rendering: Shading of curved surfaces, transparency, texture mapping.</p>	Shorter development cycle than realistic representation. Stylised visual style allows the designer to alter the level of detail in game assets and use rendering to narrative affect.
Realistic	<p>Modelling: Photo-accurate modelling of familiar objects. Level of detail is high.</p> <p>Animation: Coordinated systems defining both articulation and deformation such as from performance capture and physically based simulation. Motion fidelity is high.</p> <p>Rendering: Photo-realistic shadow casting, reflections, caustics, light scattering, radiosity.</p>	Time consuming, computationally intensive, potentially confusing for players regarding the pragmatic viability of in-game actions.

While it would be easy to assume that the teaching and learning of complex subject matter requires the use of sophisticated computer graphics, the situation is more nuanced. Some games requiring high levels of cognitive accomplishment, such as requiring the player to assimilate and use knowledge to create novel objects or situations, may be best served by simplified or stylised graphic styles such as those with a low-polygon count or simple colour and texture pallets (McLaughlin et al., 2010, p. 136). These stylised 3D representations have been used effectively in a number of serious games, such as the low-poly approach in *IDeEA Lab*'s serious games platform designed for fostering interdisciplinary design collaboration, led by Professor Jules Moloney at Deakon University (IDeEA Lab, 2017).

2.3.4 Facilitating Design Collaboration and Ideation in Serious Games

Strategy SG-4: *Ensure that serious games are used as a means to facilitate collectively creating ideas for the future and communicating a shared understanding of design problems.*

Implications for Research: *Utilise the simulation of reality, role-playing and support for faster collaboration such as visualisation, modelling and collaboration features to meet the requirements of ideation techniques for the collaborative process of idea generation.*

Most serious games are used primarily as a tool to support the diffusion of well-identified knowledge, for example to transfer a piece of knowledge (e.g., the use of a new procedure or best practice) to an individual player or players; however, some scholars have recently started to explore the use of serious games as a means to facilitate collectively creating ideas for the future. As Agogu, Levillain, and Hooge point out, the three characteristics of serious games—simulation of reality, role-playing and support for faster collaboration—meet the requirements of ideation techniques for the collaborative process of idea generation (Agogu, Levillain, & Hooge, 2015, p. 417). As pointed out by Finke, Smith and Ward, the generation of new ideas is a cognitive, creative process that is intended to combine and blend different pieces of knowledge to form a new original element of thought, i.e., a new idea (Finke, Smith, & Ward, 1992). The production of new ideas, whether individually or collectively, requires knowledge retrieval, idea association and knowledge creation (McAdam & McClelland, 2002), all of which are traits of knowledge manipulation activities that could be supported by serious games (Agogu et al., 2015, p. 417). For example, Couton et al. evidence this through the design of the serious game *Cold Sun* (2014), which allows players to effectively rehearse issues of climate change that will affect their plausible futures, and thus develop a greater understanding of some of these complex issues and consider ways to respond (Coulton et al., 2014). The authors show that the facilitation of a playful and subversive environment was conducive to encouraging greater exploration of ideas between players (Coulton et al., 2016; Salen & Zimmerman, 2004).

Further, serious games have been shown to be well-suited to communicating a shared understanding of design problems, because they allow participants “to

experiment with potential solutions in a safe setting and generate their own mental frames and responses to problems” (Swain, 2007). This participatory experimentation can be described as “collective tinkering” and can help stakeholders collaboratively generate ideas (Innes & Booher, 1999, p. 9). Within the safe, restricted, and structured realm of multiplayer serious games, stakeholders can gain feedback from others on each experimental iteration, accumulating new knowledge from the game system and player interactions (Cheng, 1999, p. 97). Serious games not only have the ability to deliver messages and simulate systems, but also to simulate participant experiences (Bogost, 2007). Brandt argues that collaboratively simulating urban design scenarios can be transformative for participants, because they can rehearse scenarios with a low cost of failure and then interpret game events’ personal experiences, on which they can draw in future situations (Brandt, 2006). In an example of this, Markopoulou et al. (2018) utilise a virtual and augmented reality based approach to serious games to “create a channel of communication with the actual users of the projects and through our digital intervention to better understand their needs and communicate their design intentions to the designers and stakeholders” (Markopoulou et al., 2018, p. 227). Through two projects, located in the Worli district of Mumbai, India and the SuperBlock project of Barcelona, the authors explored using Augmented Reality as an interface to allow the players, as inhabitants of the spaces, to explore and experiment with the different ideas and configurations of the physical space through a tablet-based serious game simulation. The approach was shown to help both digitally literate and illiterate players effectively make collaborative design decisions and give designers feedback on the preferred proposals through a simplified graphical user interface (Markopoulou et al., 2018).

2.3.5 Conflicting Stakeholder Perspectives and Social Capital in Serious Games

***Strategy SG-5:** Promote discourse surrounding goals and values that can lead to better idea exploration, discourse, decision making, and increases in consensus, cooperation and empowerment.*

***Implications for Research:** Mitigate internal dynamics such as inequality between players or deviation from the aim of the design game during gameplay through in-game exploration of social and design issues.*

Most architectural and planning-oriented serious games tend to focus on “design outcomes” as the main objective (Ampatzidou et al., 2018; Mather & Robinson, 2016; Poplin & Vemuri, 2018; von Heland et al., 2015; Yamu et al., 2017; Yan et al., 2011), while architectural and planning-oriented serious games that focus specifically on implementing social mechanics are much more scarce (Holland & Roudavski, 2016; Vemuri et al., 2014). A lack of focus on the social dimension of serious games can limit constructive discourse surrounding goals and values that can lead to better idea exploration, discourse, decision making, and increases in consensus, cooperation and empowerment. This facilitation is important because, as Tan argues, a stakeholder group’s reliance on existing decision-making mechanisms, rules and regulations, or the balance of power between the involved parties, may hinder the link between the game and the reality it aims to influence (Tan, 2014, 2016). Internal dynamics such as inequality between players, or deviation from the aim of the design game during gameplay, can also impact on the performance of the participatory gaming process (Tan, 2016).

However, even though simulation and modelling still play a pivotal role in urban planning, policy and design games, the potential of games to create environments for cooperation, civic engagement, negotiation and deliberation—by creating a level playing field among players—is attracting increasingly more attention, which is also informed by the rising interest in gamification (Ampatzidou et al., 2018; Devisch et al., 2016; Gordon & Baldwin-Philippi, 2014b; Poplin, 2012; Tan, 2014). Games processes have also been shown to help communities build cooperation as well as enhance social integration and connectedness, as shown in the work of (Argenton et al., 2014; Bagozzi & Dholakia, 2002; Morschheuser, Maedche, & Walter, 2017; Morschheuser, Riar, et al., 2017). They can have a direct impact on increasing decision making—giving disparate stakeholders, designers and planners new avenues to converse and shaping how players and their opinions are organised, become informed, collaborate and take action (Ben-Attar & Campbell, 2015; Morschheuser, Riar, et al., 2017; Raphael, Bachen, & Pedro F. Hernández-Ramos, 2012). Like other examples of new media approaches, serious games also offer new ways to gather data such as tacit knowledge of players about contexts—allowing for more comprehensively-informed and participatory decision-making processes. Foth et al. found that parallel development in the use of new media, such as narrative-driven serious games can ‘democratise’ urban development by allowing stakeholders to collaboratively express

tacit “lived experience” through in-game interactions (Foth, Hearn, & Klaebe, 2007, p. 6).

2.3.5.1 *Civic Engagement and Social Capital*

The social aspects of serious gaming have more recently been associated with a series of benefits for participation and civic engagement, such as raising awareness; increasing literacy on specific topics development; developing (complex) problem solving skills; testing difficult scenarios within a safe environment; and establishing networks and coalitions (Erhel & Jamet, 2013; Granic, Lobel, & Engels, 2014; Raphael et al., 2010; Raphael, et al., 2012). Multiplayer gaming has also been shown to foster “gaming social capital”, a gaming-related community construct that has been shown to be a positive antecedent in predicting both face-to-face social capital and civic participation. Both Molyneux (2015) and Williams (2010) show that there is a spill over effect from the teamwork and collaborative aspects of video games to the ability to work together in a real-world community (Molyneux, Vasudevan, & Zúñiga, 2015; Williams, 2010). Similarly, a study by Gordon & Baldwin-Philippi asked community members to play a specially designed civic planning game (Gordon & Baldwin-Philippi, 2014b). They observed “civic learning,” a process in which, through in-game communication and interaction, players can build trust in one another and feel greater ties to their community.

Games can serve as socio-cultural levellers and are therefore a potentially useful medium central to future-orientated development discussions for three reasons. First, as they are outside typical daily tasks, or what Huizinga calls the “magic circle” detailed in section 2.3.2.1, the processes and artefacts related to the videogame are less likely to appear to be “owned” by one player at the expense of others. Second, in playing games that are novel to all players, players are likely to learn games at a similar rate, without large differences in learning due to rank, authority, or background. Learning at a similar rate can lead to greater sharing of ideas, as each player has a similar level of expertise in relation to the gaming task. Third, games can help players cohere together and communicate better, because one of the purposes of games is enjoyment, which can build commitment amongst groups of players (Muller & Druin, 2002).

2.3.6 Summary

This section has defined and discussed how serious games have been used for ideation purposes as well as how they might contribute to exploring conflicting stakeholder perspectives. Most approaches to architectural and planning games have focussed on the visualisation of design processes, and there is a lack of literature regarding how *design-outcome* and *social-outcome* oriented serious games might be combined. The section addressed this gap by looking at serious games literature that is not specific to the realm of architecture and planning. The review showed that ideation can be aided through the simulation of reality, role-playing and support player collaboration. Through playing serious games, players can arrive at a shared understanding of key in-game issues through the rehearsal of scenarios in a medium that has a low cost of failure, which can facilitate building social capital and aiding civic engagement.

The review also highlights the fact that simplistic or stylised 3D representation styles are easier to produce, have been shown to be as effective as realistic representation styles and require less computational power to be accomplished, which are important considerations when designing serious games for marginalised communities where there might be a lack of access to technical resources. I argue that commercially produced games for the purpose of entertainment can be repurposed for serious means, but care needs to be taken not to create confusion for players due to a conflict of the goals of entertainment and the potentially divergent goals of the serious application of the game.

Stylised visual styles might also reduce issues regarding the pragmatic viability of in-game design decisions from the perspective of the participants. Players' collaborative learning can also be aided by moving through cycles of experiencing, reflecting and testing. While serious games are engaging for their entertainment-oriented elements, authenticity must be created by drawing on real-world data and experiences, in order to anchor the serious game experience to the real world. Further, in order to orientate the design of serious games, game mechanics, learning mechanics, social mechanics and immersive mechanics must all be equally considered.

From this serious games literature review, five strategies can be adopted that can help disparate stakeholders explore conflicting perspectives, assumptions and corresponding goals surrounding architectural and urban issues:

Strategy SG-1: Ensure that serious games are designed to be both educational and fun while being designed to interface with slum-upgrading design processes.

Strategy SG-2: Develop serious game mechanics (various actions, behaviours and control mechanisms afforded to the player within a game context), the dynamics (the run-time behaviour of the mechanics acting on players' inputs and each other's outputs over time), and the aesthetics (which evoke desirable emotional responses evoked in the player, when they interact with the game system) to promote the objective of the serious game.

Strategy SG-3: Utilise simplistic or stylised 3D representation in order to reduce issues regarding the pragmatic viability of in-game design decisions from the perspective of the participants.

Strategy SG-4: Ensure that serious games are used as a means to facilitate collectively creating ideas for the future and communicating a shared understanding of design problems.

Strategy SG-5: Promote discourse surrounding goals and values that can lead to better idea exploration, discourse, decision making, and increases in consensus, cooperation and empowerment.

Having established a range of speculative architecture, participatory design and serious games strategies that can be adapted that can help disparate stakeholders explore conflicting perspectives, assumptions and corresponding goals surrounding architectural and urban issues, the final section of this chapter explores how these might be synthesised into a framework to guide the development of speculative, participatory, serious urban games for use in slum-upgrading contexts.

2.4 Synthesising the Literature

The review of the literature suggests that a serious gaming approach to collaborative speculative architecture—embedded in the participatory design tradition of ideation, exploring conflict and the negotiation of values—can support upgrading oriented ideation and the negotiation of conflicting stakeholder perspectives.; however, how these methods and techniques might be productively combined is an area that is relatively unexplored. The following sections describe how the three fields of literature—namely of speculative architecture, participatory design, and serious games—have been integrated to formulate a new “Speculative Participatory Serious Urban Gaming ” theoretical framework designed to enhance social outcomes and related upgrading outcomes for urban slum dwellers. This original contribution to architecture is then discussed and evaluated in the remaining chapters of this thesis.

2.4.1 Speculative Participatory Serious Urban Gaming (SPS-UG)

The framework that I call “Speculative Participatory Serious Urban Gaming” (SPS-UG), is concerned with drawing together speculative architecture, participatory design and serious games literature in order to go beyond the visualisation of design options, thinking about single speculations or aiding learning about collaborative design processes: it also aims to help participants in a given community or locale to reflect upon a plurality of possible futures that might help them to explore perspectives and corresponding goals surrounding the upgrading of their infrastructures and environments, i.e., to enhance both *social* outcomes and related *design* (slum-upgrading) outcomes. Figure 41 displays this framework graphically.

Figure 41. Synthesising the “SPS-UG” approach (author, 2019).

In light of previous matters discussed in sections 2.1-2.3, I developed the SPS-UG Framework specifically builds upon the work of Mitgutsch and Alvarado and their “Serious Game Design Assessment (SGDA) Framework” (2012). Mitgutsch and Alvarado’s framework was developed as part of the Gambit Game Lab at the Massachusetts Institute of Technology. The SPS-UG is not an objective measurement instrument, but a generic framework to guide the study of how serious game design elements are configured formally and conceptually in relation to the game’s aim and purpose (ibid.).

Mitgutsch and Alvarado identify six essential components of the formal conceptual structure underlying serious games that comprise the SGDA: purpose, content/information, framing, mechanic, fiction/narrative and aesthetics/graphics. The first component is the *purpose* of the game. Serious games are “purpose-based game systems” so the *purpose* should have “pivotal influence over all elements of the game design (Mitgutsch & Alvarado, 2012, p. 4). Thus, the purpose should be reflected in all the other five elements that support the game system: *content/information, framing, mechanic, fiction/narrative and aesthetics/graphics*. The relation among these six core components impacts the coherence and cohesiveness of the formal conceptual design of the holistic game system as shown in Figure 42.

Figure 42. Serious Game Design Assessment Framework Adapted from (Mitgutsch & Alvarado, 2012).

The thesis's SPS-UG Framework is oriented around the same six comprehensive game elements as Mitgutsch and Alvarado's SGDA Framework, which were derived from a comprehensive review of game design, serious game design and game assessment frameworks and mechanisms; however, the SPS-UG framework takes Mitgutsch and Alvarado's SGDA framework, which was developed for generic serious game design purposes, and adapts it for the specific purpose of this research in line with research Aim 4: To develop, implement and reflect on the use of a speculative, participatory, game-based approach to slum-upgrading in order to aid the generation of useful urban slum-upgrading oriented social outcomes and related architectural design slum-upgrading outcomes for disparate stakeholders in marginalised communities, more specifically, dwellers of landfill-oriented slums.

The following sections of this chapter detail how the speculative architecture, participatory design and serious game strategies derived from the literature in Chapter 2 are oriented within the SPS-UG framework in relation to these six basic game elements.

2.4.1.1 *SPS-UG Purpose*

In designing a SPS-UG, I needed to ensure I was very clear about the games purpose. The purpose should be reflected not only in the aim of the game and its topic, but also in the designer's intentions to impact the players in specific ways.

The purpose of the SPS-UG developed in this investigation is to generate useful urban slum-upgrading oriented social outcomes and design outcomes for disparate stakeholders in marginalised communities who are the players. The aim of the game, or the goal the players are driven to reach within the gameplay, should directly reflect this purpose. The SPS-UG should also be clear as to its intentions in terms of the impact or outcomes, so there is no confusion about its objectives from the context of the players. Clarifying these intentions helps ensure that the game has an impact on the player/s in real life situations. If this investigation's SPS-UG has no impact on the player in a real-life context, it misses its pivotal purpose. For this reason, the game's purpose acts as the driving force that shapes the dynamic and the coherence of the game system as a whole.

2.4.1.2 *SPS-UG Content/Information*

Content/information refers to the graphic and audio information, facts and data that are presented to players within the game that orient their gameplay. At a simplistic level, and in line with serious games strategies in general, these relate to basic player information, the names of the characters/players and other supplementary information such as in-game costs of items, etc.—all the data and words provided in the game that are visible and made approachable to the players (Mitgutsch & Alvarado, 2012, p. 4). Strategies derived from the literature which are operationalised as SPS-UG content/information can be seen in Table 4, below.

Table 4. SPS-UG content/information strategies derived from the literature.

SPS-UG Element	Study	SPS-UG Design Strategies	Literature
<i>Content and Information</i>	(Lindley, Sharma, & Potts, 2014, p. 240)	Strategy SA-1: Consider the speculation's connection and position to plurality and temporality.	Speculative Architecture
	(Gaver et al., 2003, p. 240)	Strategy SA-6: Ensure the speculations ask questions through the speculative design language instead of providing solutions, in order to enable open discussion in which diverse perspectives are able to be brought forward, considered and discussed.	Speculative Architecture
	(Auger, 2012, p. 180)	Strategy SA-3: Engage the viewers through typological familiarity in order to form perceptual bridges to ensure that the speculation connects with an identified audience's perceptions of the temporal world around them.	Speculative Architecture
	(Poplin, 2012, p. 198)	Strategy SG-1: Ensure that serious games are designed to be both educational and fun while being designed to interface with slum-upgrading design processes.	Serious Gaming

More specifically the literature review suggests ways in which content/information should be developed for the SPS-UG. The content and information can be understood as being oriented towards opening up space for design ideation, which requires a degree of typological familiarity—the in-game representation of familiar spaces, buildings, artefacts or systems—in order to provoke design thinking and debate amongst players. In addition, content and information relating to the implications or consequences of decisions made in-game by the players can be important—such as cost, spatial requirements or the use of resources necessary for players to form ideas and future visions. This content must be generated from analysis and consultation with the prospective players, in order to ascertain the issues relevant to the SPS-UG framework's purpose.

The literature also suggests that pragmatic contextual factors—such as the exact location of an individual's home or a community space, or the exact cost of a design option—represented in-game might constrain the design process or discussion about the design or socio-political ideas by creating discursive impasses. SPS-UGs are

intended to function as a “priming” activity or a “design orienting scenario” at the pre-design phase. It may be useful for gameplay to gradually introduce typologically familiar elements to help the SPS-UG as a “priming activity” interface with the pragmatic participatory design process.

2.4.1.3 SPS-UG Framing

The framing of the SPS-UG includes ensuring the game is designed for the target group, their play literacy and the broader topic of the game. While the target group and the audience are often addressed as an important issue in serious games design, the play literacy of the target group is repeatedly overlooked, which may be especially important when designing for those with a low level of digital literacy, or when there is a large disparity in abilities amongst players (Mitgutsch & Alvarado, 2012). Strategies derived from the literature which are operationalised as SPS-UG framing can be seen in Table 5, below.

Table 5. SPS-UG framing strategies derived from the literature.

SPS-UG Element	Study	SPS-UG Design Strategies	Literature
<i>Framing</i>	(Tharp & Tharp, 2013, p. 408)	Strategy SA-5: Ensure the design language and the medium of the speculation are appropriate to be both instrumental and externally focussed and discuss both social and design implications.	Speculative Architecture
	(Auger, 2012, p. 140; Knutz et al., 2016; Pickersgill, 2017)	Strategy SA-4: Ensure legitimacy of the speculation is maintained by ensuring internally consistent extensional expectations.	Speculative Architecture
	(Agogu��, Levillain, & Hooge, 2015, p. 417).	Strategy SG-4: Ensure that serious games are used as a means to facilitate collectively creating ideas for the future and communicating a shared understanding of design problems.	Serious Games

The play literacy can especially influence the gameplay experience if the target audience has trouble using the controls, understanding the user interface or recognising the fictional game elements. Ensuring understanding is important as they help ensure

that legitimacy of the representations within the SPS-UG is maintained, by ensuring internally consistent extensional expectations. Mitgutsch and Alvarado argue that serious games should also consider what skills are needed in order to operate the system effectively, how easily those skills can be acquired through game play and how the genre of serious game might cause particular expectations (Mitgutsch & Alvarado, 2012, p. 7). Generally, many serious games try to offer easy access to players, but often lack a balanced and engaging game play experience. Hence, well-balanced and attractive learning challenges are one of the most fruitful potentials of games to foster learning (Gee, 2003).

Based on the literature review in Chapter Two, instrumental speculation is an important consideration as a discussion tool in the design of SPS-UGs; this is because it is externally-focused and not expert-oriented, and it does not look for terminal visions of the future. The framing of the context presented to the players requires careful consideration, including how to utilise the defamiliarisation of issues to reframe discussions or to facilitate the creation of agonistic spaces, in order to provoke exploration of possible futures, conflicting stakeholder perspectives, and corresponding goals surrounding social, architectural and urban issues.

2.4.1.4 *SPS-UG Mechanics*

As discussed in section 2.3.3.1, game mechanics are methods invoked by players and designed for interaction with the game state, thus providing gameplay (Sicart, 2008). The mechanics involve the establishment of the rules that define the possible space for operations in the game world (Hunicke et al., 2004). In the SPS-UG in this research, these align with two main objectives: to provoke dialogue surrounding conflicting stakeholder perspectives (social outcomes; see section 5.2.4.1) and to facilitate upgrading ideation (slum-upgrading outcomes; see section 5.2.4.2). Strategies derived from the literature which are operationalised as SPS-UG mechanics can be seen in Table 6, below.

Table 6. SPS-UG game mechanics derived from the literature.

SPS-UG Element	Study	SPS-UG Design Strategies	Literature
<i>Mechanics</i>	(Frediani, 2016; Hamdi & Goethert, 1997)	Strategy PD-1: Ensure that all participants within a design activity have equal power to determine the outcome of the decisions made, as opposed to merely being informants.	Participatory Design
	(Bowen, 2010; Iversen et al., 2012, p. 87; Sanders, 2001).	Strategy PD-2: Reveal stakeholder's perspectives and assumptions in order to make positions known through design activities and ideation.	Participatory Design
	(Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007)	Strategy PD-3: Develop stakeholder collective knowledge, values and goals by clarifying and refining them to allow their translation from abstract formulations to more concrete design concepts.	Participatory Design
	(Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007)	Strategy PD-4: Ground the participant's everyday knowledge and experience to create common ground or shared language between participants.	Participatory Design
	(Argenton et al., 2014; Bagozzi & Dholakia, 2002; Morschheuser, Maedche, & Walter, 2017; Morschheuser, Riar, et al., 2017)	Strategy SG-5: Promote discourse surrounding goals and values that can lead to better idea exploration, discourse, decision making, and increases in consensus, cooperation and empowerment.	Serious Gaming

The literature review revealed that dialogue surrounding conflicting stakeholder perspectives can be aided by establishing systems for facilitating multi-player interaction through built-in player mechanics. Split-screen approaches enable players to act simultaneously and collectively go through phases of action and reflection. Turns-based multiplayer systems, on the other hand, allow for a sequential process of reflection and action, where one player acts at a time, with the other players acting as observers. The literature suggests that the player interaction facilitated by both of the above can facilitate the creation of “communities of practice” through gameplay and the negotiation of social norms through the establishment of clear in-game communication pathways. Players might also be motivated through simple mechanics, such as time limits or restricted in-game resource allocation such as financial resources

or limited three-dimensional space allocated for visualising their design ideas. Mechanics such as these have been shown to raise conflicts between players.

The SPS-UG approach must also include mechanics that allow players to visualise and communicate their ideation processes to other players in real time for discussion and contestation. These should include allowing for cycles, or “rehearsals”, of action (gameplay) and reflection (discussion) in order to ground ideation and any configured values. The literature suggests that these should aid ideation processes through mechanics that can simulate reality and foster collaboration surrounding the simulation. Players should be permitted to collaboratively conceive pluralistic visions of the future, which the literature shows can aid ideation processes and social discourses surrounding conflict and values.

In conceptualising SPS-UG mechanics, it is also important to consider pivotal in-game objectives, the operation of any rewards systems and the main entertainment-related obstacles/challenges. Contextual factors, such as allocation of site-specific resources, can be built into the game mechanics that embed and highlight real-world systems and dynamics to which the players respond, in terms of social discourse and design-related discourse. Decision-making mechanics, such as “win states”, should also be considered for their relevance.

2.4.1.5 *SPS-UG Fiction/Narrative*

While the “content” of the game holds the provided information and the “mechanic” impacts the gameplay possibilities, the dimension of “fiction and narrative” introduces fictional elements or the overall narrative arc to structure gameplay activities. DiSalvo argues that players should be presented with alternative presents, futures, systems or worlds as a means to provoke values-based discourse (DiSalvo, 2012, p. 52). According to Auger, a “perceptual bridge” should be created between the audiences’ perceptions of their world and the speculative representation, by achieving a blend of factual authenticity and speculative elements in order to root the speculation to people’s everyday experience (Auger, 2012, p. 66). The nature of the perceptual bridge may change throughout the SPS-UG gameplay—as players move through levels with various levels of fictional or non-fictional elements, for example. Strategies derived from the literature which are operationalised as SPS-UG fiction/narrative can be seen in Table 7, below.

Table 7. SPS-UG fictional space/narrative strategies derived from the literature.

SPS-UG Element	Study	Speculative architecture strategies	Literature
<i>Fiction/Narrative</i>	(Dindler, 2010a, p. 73).	Strategy SA-2: Ensure a careful balance of fictional and non-fictional elements.	

2.4.1.6 SPS-UG Aesthetics/Graphics

Aesthetics/Graphics refers to the audio-visual language (aesthetic characteristics, imagery, style preferences, artistic media, and computer graphic techniques) conceptualised, chosen and used by the designers for the visualisation and display of elements involved in the game. The aesthetics and graphics define the overall formal aspects that frame the purpose, the content/information, the framing (target group), the mechanics (instructions, rewards) of the game, and the fiction/narrative (the world and characters of the game). Since the aesthetics/graphics present the game to the player from the first image onward, they play a fundamental role in the introduction of the game's purpose and its impact on the player (Mitgutsch & Alvarado, 2012, p. 7). SPS-UGs should utilise simplistic or stylised 3D representation in order to reduce issues regarding the pragmatic viability of in-game design decisions from the perspective of the participants (McLaughlin et al., 2010, p. 136). Such styles can reduce the computational resources required to run the software, meaning that the software can be executed on computers with lower graphic rendering capabilities. Strategies derived from the literature which are operationalised as SPS-UG aesthetics/graphics can be seen in Table 8, below.

Table 8. SPS-UG aesthetics/graphics strategies derived from the literature.

SPS-UG Element	Study	Speculative architecture strategies	Literature
<i>Aesthetics/Graphics</i>	(McLaughlin et al., 2010, p. 136)	Strategy SG-3: Utilise simplistic or stylised 3D representation in order to reduce issues regarding the pragmatic viability of in-game	Serious Gaming

	design decisions from the perspective of the participants.
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2.4.2 Summary

Figure 43 below illustrates the synthesis of the literature into the SPS-UG framework, as applied to the game elements of purpose, context/information, framing, mechanics, fiction/narrative and aesthetics/graphics and in relationship to Aim 4.

Figure 43. Synthesising the SPS-UG approach, contributing game elements (by author).

This chapter has outlined how the three bodies of literature—namely speculative architecture, participatory design, and serious games—can be integrated to formulate

a new “Speculative Participatory Serious Urban Gaming” (SPS-UG) framework with the aims of enhancing *social* outcomes and related *design* (slum-upgrading) outcomes for urban slum dwellers. The strategies derived from the literature were organised into the game design elements of purpose, content/information, framing, mechanics, fiction/narrative and aesthetics/graphics.

While taking all the elements into account in the SPS-UG framework, Chapter Three, next, discusses the approach and methods used to develop the game and work with it in the three case study communities in India.

3. The Research Approach

Participation without enablement is like trying to drive a car without fuel. And both, without flexibility, are like trying to drive the same car if it is programmed to move in only one direction and always predictably from A to B. The concept of steering becomes a pretence to freedom and the steering wheel no more than a symbol of control.

— (Hamdi, 1991, p. 88)

3.1 Introduction

The research approach adopted of a qualitative Action Research methodology centred on case studies, that utilises participatory design workshops as a research method (Foth & Axup, 2006; Frediani et al., 2011; Groat & Wang, 2002; Pollastri, 2017; Reason & Bradbury, 2001; Sanders, 2008; Silverman, 2015; Swann, 2002). This approach was used to evaluate the SPS-UG framework through the development of an exemplar SPS-UG (detailed in Chapter Four), which was operationalised in participatory gaming workshops. The workshops were conducted within three case studies (CS1-3) in India with each case study exploring the approach with a different landfill-based slum community. CS1 was conducted with the Ghazipur community in Delhi, CS2 was conducted with the Bhalswa community in Delhi and CS3 was conducted with the Shanti Nagar community in Mumbai—in order to produce guidelines for effective practices dealing with similar problems.

Each case study consisted of three phases including *Phase One: Ethnographic Documentation Studies and Analysis*, *Phase Two: SPS-UG Development* and *Phase Three: SPS-UG Workshops*. See Figure 44, below.

Figure 44. The research design.

Phase One included conducting ethnographic research in each community in February 2017 and had two objectives:

O1: to document the context of each of the communities for digitalisation into a virtual game environment;

O2: to gain an understanding of the range of conflicting perspectives regarding upgrading-related issues important to different community members to inform the subsequent design of an SPS-UG that might help in the negotiation of conflicting perspectives and stakeholder ideation.

Phase Two began in March 2017. The objective of Phase Two was:

O3: to develop one SPS-UG for use in participatory workshops within all case study communities.

Phase Two utilised the SPS-UG framework presented in Chapter Two and integrated the data gathered and analysed in the studies in Phase One.

Phase Three was conducted in November and December 2017. The objective of Phase Three was:

O4: to evaluate the SPS-UG developed in Phase Two through participatory design workshops in each case study site in relation to the research question.

Each workshop in Phase Three used a pre-test/post-test experimental research design approach to explore the effects of the SPS-UG approach with the participants'

groups in line with serious games literature (Becker & Parker, 2011; Bellotti, Kapralos, Lee, Moreno-Ger, & Berta, 2013b; Buchinger & Hounsell, 2018; DeSmet et al., 2016; Loh, Sheng, & Ifenthaler, 2015; Morschheuser, Riar, et al., 2017; Neys, Looy, Grove, & Jansz, 2012).

3.2 Epistemological Orientation

3.2.1 Design as Action Research – A Methodological Approach

Action Research focuses on the relevance of insights generated from experience; in the case of this research, this refers to the testing of the SPS-UG with the research communities. Action Research was initially developed to challenge positivistic views of knowledge creation in social science and anthropology (Brydon-Miller, Greenwood, & Maguire, 2003). The goal of Action Research as a methodology is to generate new knowledge through the engagement of researchers in actions and interventions with people and contexts, as opposed to researchers being divorced from the people and contexts (Brydon-Miller et al., 2003; Elden & Chisholm, 1993; Reason & Bradbury, 2001). Denscombe (2010, p. 6) writes that Action Research's purpose is generally to solve a particular problem and to produce guidelines for effective practices dealing with similar problems.

Action Research involves actively participating in a change situation, often via an existing community, whilst simultaneously conducting research. Because of this, Action Research has been shown to be a viable methodology for dealing with “wicked” research problems (Brown, Harris, & Russell, 2010; Kemmis, 2014; Rittel & Webber, 1973), as it tries to support various stakeholders' efforts to define, understand, and articulate their responses to the problem and provide guidance for similar situations, while acknowledging that no two research situations are alike. Even though Action Research is considered a methodology, some call it a “family of practices of inquiry” in order to indicate the ways in which methods may be applied in relation to context and personal inclination (Dick, 2007; Huxam, 2003).

Design activities as a form of inquiry can be considered a form of Action Research (Swann, 2002). A clear link has been highlighted between Participatory Design research and Action Research in the literature (Foth & Axup, 2006; Frediani et al., 2011; Groat & Wang, 2002; Reason & Bradbury, 2001; Sanders, 2008; Silverman, 2015; Swann, 2002). Cal Swann, in his article “Action Research and the Practice of

Design”, argues that both Design Research and Action Research are generative practices aimed at creating change (Swann, 2002), while Foth and Brynskov highlight the distinct similarities and the advantages of combining Action Research and Participatory Design practices to foster civic engagement (Foth & Brynskov, 2016). These include ensuring the desired impact of the design processes is reached, while at the same time, the study may be able to encourage its participants to “determine and critically evaluate a range of open (and perhaps non-design specific) issues if action research principles are used” (ibid.). Because of the nature of design research, the research knowledge created might consist not only of design solutions intended for a given context, but also the production of tools for designing (Wood, 2008), which might include practices or methods for designing or explanations or theories grounded in the analyses of design that can form practice guidelines (Mortati & Cruickshank, 2012). Because of this practice oriented approach, Action Research has been adopted by a number of researchers in architecture, participatory design and experimental design, including slum-upgrading projects (Frediani, 2016; Frediani et al., 2011; Majale, 2008; Pollastri, 2017).

Several ways in which Action Research is a suitable for this research, are summarised in Table 9 below.

Table 9. Synthesising Action Research and design processes.

Study	Action Research Features
(Dick, 2007)	Achieving change is central to Action Research and the research question.
(Dick, 2007)	Action Research is iterative in nature. Critical reflection on action facilitates the creation of knowledge in the form of understanding.
(Coghlan & Brannick, 2005)	Action Research is receptive to the context in which it is conducted, as well as being influenced by participants in the research. Knowledge generated is specific to the context.
(Brydon-Miller et al., 2003)	An Action Research approach rejects the notion of an objective or value-free concept of knowledge. Decisions made by the designer or researcher are based on judgements.
(Dick, 2007; Huxam, 2003)	The research outputs of an Action Research approach are generally emergent, as they are contingent upon the research aims, the research context and the researchers’ interventions and analytical preferences. It is difficult for the researcher to know what methods are best suited for the analysis in advance, as one cannot know what type of data will emerge and become relevant.

3.2.1.1 A Case Study Research Strategy Approach to Action Research

A case study is a “research strategy which focuses on understanding the dynamics present within single settings” (Eisenhardt, 1989, p. 533). Yin, in a frequently cited article on case study research *The Case Study as a Serious Research Strategy*, defines case studies as “an empirical inquiry that investigates a contemporary phenomenon within a real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 1981, p. 9). Groat and Wang simplify this definition, as it applies to architectural research, as “an empirical inquiry that investigates a phenomenon or setting” (Groat & Wang, 2002, p. 346). Yin suggests the importance of differentiation between “experiments” and “case studies”. He argues that “an experiment deliberately divorces a phenomenon from its context” to allow the researcher to focus on specific variables, whereas the case studies are intimately tied to it and advocate for direct observation and “thick descriptions”; they value multiple perspectives of stakeholders and participants; and they prioritise qualitative and interpretive analysis of contexts and situations (Yin, 1981, p. 98).

The case study research approach is fundamental to an Action Research methodology, and it has been widely used for conducting design, co-design and participatory design situations (Dindler & Iversen, 2007; French et al., 2018; Pollastri, 2017; Vaajakallio & Mattelmäki, 2014). This is because the emphasis of Action Research is on knowledge emerging from localised settings, as opposed to abstract knowledge applicable to many settings. In conducting participatory design workshops -focussed case studies as part of an Action Research methodology, this research works with three “communities of inquiry” or groups of individuals who participate in the process of the experimental research (Reason & Bradbury, 2001).

While participation through a community of inquiry is a necessary condition of Action Research, who participates, when, and how can vary. The type and degree of participation may vary for different groups of individuals within the process for various reasons, which reflects the fact that different objectives exist within the same research process (Morse, 1998). These objectives might be to conceive a design as part of a workshop, or they might be research-oriented objectives such as analytical work (Coghlan & Brannick, 2005). In the various phases of this research (see section 3.3.1.1), different actors within a community of practice move between common objectives towards independent goals while fulfilling different roles at different stages.

3.2.1.2 Action Research Through Participatory Design Workshops

“Participatory design workshops” have been used as a method within a case study based Action Research methodology in participatory design research to explore the impact of design and design processes within a given context (Björgvinsson et al., 2010, 2012; Dindler & Iversen, 2007; Luck, 2018; Pollastri, 2017; Sanoff, 2000). Participatory design workshops in a research project generally build on or complement each other, and because of the way this can influence and change programmes and research questions, they tend to be planned and shaped throughout different moments of the research process (Eriksen and Bang 2013). Brandt and Binder, in their article “Experimental Design Research: genealogy, intervention, argument” (2007), argue for the importance of the “experiment” and “program” (or the design brief) within participatory design workshops in experimental design research. They suggest that the architectural program is an important intermediary between the primary research question and the empirical exploration (Brandt & Binder, 2007, p. 4). Participatory design workshops (P/W) are used in this research to explore the SPS-UG framework detailed in the previous chapter (see Figure 45).

Figure 45. Visualising the central role of SPS-UG participatory design workshops with the case study communities.

In this research, participatory design workshops in Phase Three were oriented around a new SPS-UG game. In the context of this research, what was designed was: the tool for the design methodology from the position of the designer in the form of an example SPS-UG; and the architectural outcomes within the SPS-UG workshops when operated by the research participants. The participants undertook the two principal

roles of both designers and users: as the designers they strove to learn the realities of the users' situation; as the users they strive to articulate their desired aims and learn appropriate means to obtain them. By taking on both roles simultaneously, a collaborative and participatory approach to speculation was established in the participatory design workshops.

3.3 Research Design

This chapter has so far discussed the epistemological framing of the research and the research approach of Action Research through participatory design workshops. Action Research and case studies that utilise participatory design workshops as a method frame the inquiry. This section details how this research framing has been operationalised by providing an overview of the research plan.

3.4 The Research Plan

Empirical material for this research is oriented around and informed by case studies (CS1-3) conducted with three landfill-based slum communities in India—Ghazipur, Delhi (CS1), Bhalswa, Delhi (CS2) and Shanti Nagar, Mumbai (CS3). These ran throughout the research process in 2017.

The case studies were conducted in association with the three communities and two external partners—Chintan Environmental Research and Action Group, based in Delhi; and Apnalaya, based in Mumbai—in 2017 in order to explore the SPS-UG framework approach. CS1 and CS2 explored the development and implementation of SPS-UG in practice and were carried out in collaboration with local communities living at the Ghazipur (CS1) and Bhalswa (CS2) landfills in Delhi, India. They were conducted in collaboration with the external partner Chintan Environmental Research and Action Group, who work for environmental justice with a number of marginalised communities in Delhi, with a focus on ensuring equitable and sustainable production and consumption of materials and improved disposal of waste. CS3 explored the development and implementation of the SPS-UG in practice and was conducted in collaboration with the Shanti Nagar community at the Deonar landfill in Shivaji Nagar, Mumbai, India. CS3 was conducted in collaboration with the external partner Apnalaya (“Our Space” in English), who are a non-profit organisation founded in 1973

working with the most marginalised and under-served slums in Mumbai. Detailed accounts of each research context are provided in sections 4.2.1 (Ghazipur), 4.2.2 (Bhalswa) and 4.2.3 (Shanti Nagar).

3.4.1 The Research Phases

Each case study consisted of three phases including *Phase One – Ethnographic Documentation Studies and Analysis*, *Phase Two – SPS-UG Development* and *Phase Three – SPS-UG Workshops*. Phases One and Two are documented in Chapter Four, while Phase Three is documented in relation to each case study as follows: Chapter Five (Ghazipur), Chapter Six (Bhalswa) and Chapter Seven (Shanti Nagar).

3.4.1.1 Phase One - Context Documentation Studies and Analysis

Phase One included using a range of “design ethnography” methods (Crabtree, Rouncefield, & Tolmie, 2012; Lindley et al., 2014) in each community in February 2017 to both document the physical environment and gain an understanding of the range of conflicting perspectives on upgrading-related issues important to a range of community members of each case study context. These are shown in Table 10, below in relationship to the two objectives of Phase One.

Table 10. Phase One data collection purpose and methods – fieldwork 2017.

Location	Date	Purpose	Methods
Ghazipur	Jan 24-Feb 2, 2017	O1 - Document physical environment of Ghazipur.	Hand Drawings, Photographs, Observations and Notes, Videography, Audio Recordings, Mapping
Ghazipur		O2 - Gain an understanding of the range of conflicting perspectives on upgrading-related issues important to a range of community members at Ghazipur.	Interviews, Notes, Audio Recordings
Bhalswa	Jan 24 - Feb 2, 2017	O1 - Document physical environment of Bhalswa.	Hand Drawings, Photographs, Observations and Notes, Videography, Audio Recordings, Mapping

Bhalswa		O2 - Gain an understanding of the range of conflicting perspectives on upgrading-related issues important to a range of community members at Bhalswa.	Interviews, Notes, Audio Recordings
Shanti Nagar	Feb 3 - Feb 8, 2017	O1 - Document physical environment of Shanti Nagar.	Hand Drawings, Photographs, Observations and Notes, Videography, Audio Recordings, Mapping
Shanti Nagar		O2 - Gain an understanding of the range of conflicting perspectives on upgrading-related issues important to a range of community members at Shanti Nagar.	Interviews, Notes, Audio Recordings

The first objective (refer to O1 in Table 10) was to undertake the documentation of the case study site of each of the communities for digitalisation into a virtual game environment. This was conducted in order to identify what content, information, aesthetics and graphics might be appropriate, as well as to ensure the SPS-UG's relevance to the target group and to determine their play literacy and the broader purpose of the game (e.g., the urban issues faced by the community). This process entailed qualitative, ethnographic documentation including photographic documentation, videography, audio recordings, mapping, CAD plan drawings, sketching and note taking. It identified and compared key morphological elements (street/cadastral pattern, plot patterns, building structures and land use patterns) of each research context.

The second objective (O2 in Table 10) was to gain an understanding of the range of conflicting perspectives regarding upgrading-related issues important to different community members. This data was used to inform the articulation of the SPS-UG's purpose, framing, mechanic, and the fictional or narrative elements, as well as to ascertain what site factors were important to community members that might help in the negotiation of conflicting perspectives and stakeholder ideation. Data was gathered through structured interview processes with a sample of key informants—namely the residents in each of the communities in January and February 2017.

The purpose of the interviews was to ascertain what conflicting perspectives exist relating to community upgrading, to identify what problems they perceive as important or prominent in relationship to the upgrading of their community, and what participants

would like to improve within their community in the future (Table 11 and Appendix 1).

Table 11. Phase One interview questions.

Item No.	Structured Interview Item
1	What do you like about your community?
2	What do you dislike about your community?
3	What are the main problems associated with living in your area?
4	If you could change three things about your area what would they be?

Each interview also gathered information about the participants including their age, gender, religious affiliation, how long they had lived in their community, their local origin prior to migration and their primary daily activity. 23 residents of Ghazipur, 22 residents of Bhalswa and 21 residents of Shanti Nagar took part in the Phase One interviews.

A structured interview process was primarily chosen over a survey instrument due to the low levels of literacy within each community. In conducting the analysis of the interview data, a hybrid approach of deductive and inductive coding procedures was adopted to analyse the qualitative data to discern the range of conflicting perspectives of urban upgrading related issues in each research context and ensure rigour (Fereday & Muir-Cochrane, 2006). This approach allowed for analyses to be made between the case study sites, while analysing the salient characteristics within each context. Deductive codes were developed based on needs-hierarchy literature that has been widely adopted in urban-related research (Carmona, 2003, p. 134).

As Carmona (2003) explains, the choices that individuals make in any particular environment are needs-hierarchy based—responsive to the individual’s ego, personality, character, goals and values, available resources, past experiences, life stage, etc. (Carmona, 2003, p. 134). Despite the individualistic and complex nature of human values, goals and aspirations, a number of authors have proposed an overarching hierarchy of human needs that can be used to code the interview data (Lang, 1987, 2006; Maslow, 1968). Such hierarchies typically relate to Maslow’s original work on human motivations (Maslow, 1968), which identified a five-stage hierarchy of basic human needs including physiological needs (warmth and comfort), safety and security needs (feeling safe from harm), affiliation needs (belonging to a community), esteem needs (feeling valued by others) and self-actualisation (e.g.,

artistic expression and fulfilment) (Maslow, 1968). Maslow's hierarchy of needs formed the deductive coding procedure.

The second method used for data coding was an inductive coding procedure. Inductive codes were derived from the dataset: the data was coded in terms of context-specific categories that became apparent through the data analysis process. This combination of deductive and inductive coding allows for unique trends to be identified within each case, as well as those shared between each of the three case study communities. A detailed account of the methods and data collection procedures used with each community can be found in section 4.2.4.

3.4.1.2 *Phase Two - SPS-UG Development*

Phase Two began in March 2017 and included the development of one single SPS-UG that would be used in participatory workshops within each case study site (refer to Table 12). It integrated the data gathered and analysed in the studies in Phase One, within the SPS-UG framework presented in Chapter Two. This process consisted of two stages. Stage One included the creation of three-dimensional digital models and their incorporation into virtual environments to be used in the SPS-UG in accordance with the SPS-UG framework. Stage Two used the interview data, which highlighted important issues or trajectories of urban upgrading from the perspective of the participants in each of the communities, in combination with the data gathered to document the physical environment of the communities, to develop three-dimensional digital models of buildings and spaces, or 3D assets, for use in the development of an SPS-UG. Stage Two included the design of interactive game elements, mechanics and dynamics in line with the SPS-UG purpose of facilitating ideation and negotiation of conflicting perspectives in line with the SPS-UG framework. The cross-platform real-time engine Unity3D was selected as the game development platform as it is a cross-platform all in one editor that supports the creation of multiplayer games more easily when compared with other development platforms. Autodesk 3DS Max was used as the 3D modelling software in developing digital models of spaces and buildings.

Table 12. Phase Two purpose and SPS-UG development methods.

Location	Date	Purpose	Methods
Wellington	March – September 2017	O3 - Develop one SPS-UG for use in participatory workshops within all case study communities.	
Wellington	March – June 2017	Stage One - Develop three-dimensional digital models and their incorporation into virtual environments to be used in the SPS-UG in accordance with the SPS-UG framework and the interview and context analysis.	Digital modelling using Autodesk 3DS Max.
Wellington	June – September 2017	Stage Two - Develop interactive game elements, mechanics and dynamics in line with the SPS-UG purpose of facilitating ideation and negotiation of conflicting perspectives in line with the SPS-UG framework.	Game design using Unity3D.

3.4.1.3 Phase Three - SPS-UG Workshops

Phase Three included eleven SPS-UG workshops that were conducted with the communities in November and December 2017. Four workshops were conducted with the community at Ghazipur, two were conducted with the community at Bhalswa and five were conducted with the community at Shanti Nagar. The number of workshops held with each community reflects the number of participants available to participate in each community. Each of these utilised the SPS-UG developed in Phase Two. The purpose of each of these workshops was to evaluate the ability of the SPS-UG to contribute to aiding the generation of useful urban upgrading-oriented social outcomes and related architectural design outcomes for the community members in line with the research question.

Table 13. Phase Three data collection purpose and methods – fieldwork 2017.

Location	Date	Purpose	Methods
Chintan Community School, Ghazipur, Delhi	8-14 November 2017	O4 - Evaluate the SPS-UG developed in Phase Two through participatory design workshops with the Ghazipur community in relation to the research question.	Four participatory design workshops using the SPS-UG 1-2hrs each, Pretest/Posttest structured interviews 20 mins each, Video recording, Screen capture, Focus Groups 20 mins each.

Dwelling in Bhalswa, Delhi	8-14 November 2017	O4 - Evaluate the SPS-UG developed in Phase Two through participatory design workshops with the Bhalswa community in relation to the research question.	Two participatory design workshops using the SPS-UG, 1-2hrs each, Pretest/Posttest structured interviews 20 mins each, Video recording, Screen capture, Focus Groups 20 mins each.
Apnalaya Community Centre, Shanti Nagar, Mumbai	16-23 November 2017	O4 - Evaluate the SPS-UG developed in Phase Two through participatory design workshops with the Shanti Nagar community in relation to the research question.	Five participatory design workshops using the SPS-UG, 1-2hrs each, Pretest/Posttest structured interviews 20 mins each, Video recording, Screen capture, Focus Groups 20 mins each.

Although various methods and techniques have been used to evaluate the effectiveness of serious games with participants (Arnab et al., 2015; Boughzala, Bououd, & Michel, 2013; Boyle et al., 2012; Loh, Anantachai, Byun, & Lenox, 2007; Loh et al., 2015), a pre-test/post-test experimental design (Dugard & Todman, 1995) is the most widely used approach in serious games research to measure the effects of a serious games method with user groups (Becker & Parker, 2011; Bellotti, Kapralos, Lee, Moreno-Ger, & Berta, 2013; Buchinger & Hounsell, 2018; DeSmet et al., 2016; Loh et al., 2015; Morschheuser et al., 2017; Neys et al., 2012).

Each workshop held as part of Phase Three followed a process of pre-test structured interview data collection, SPS-UG gameplay by the research participants, post-test structured interview data collection and focus group data collection to provide data triangulation (Figure 46) and carefully followed standards of qualitative and ethical participatory design research (Schuler & Namioka, 1993; Simonsen & Robertson, 2012). While the most common method of pre-test/post-test assessment in serious games is by way of a survey/test/questionnaire, structured interviews (Patton, 1991) were used because of the low levels of literacy in each case. These can be found in Appendix 1. This method is frequently employed because it is the simplest to implement, but it relies on the opinions of the player and does not depend on all of the information that can be collected regarding what happened within the game (Bellotti et al., 2013b; Shute, Ventura, Bauer, & Zapata-Rivera, 2009). Each of the 11 gaming workshops was comprised of 4 community members per workshop: 16 residents took

part at Ghazipur (4 workshops), 8 at Bhalswa (2 workshops) and 20 at Shanti Nagar (5 workshops) (see Figure 46).

Similar to Phase One, the purpose of the pre-test and post-test structured interviews was to ascertain what conflicting perspectives exist relating to community upgrading; to identify what problems community members perceive as important or prominent in relationship to the upgrading of their community; and to understand what participants would like to improve within their community in the future, both before and after the SPS-UG process. Repeating the data collection process in Phase One, each interview also gathered information about the participants including their age, gender, religious affiliation, how long they had lived in their community, where they had migrated from and their primary daily activity in order to help contextualise the responses. In conducting the analysis of the pre-test/post-test interview data documenting the conflicting perspectives of urban upgrading related issues, the same deductive and inductive coding procedures were adopted as were used in Phase One.

Focus group discussions—about the participants’ overall experiences with the gaming process, the justification of their game movements, the effect the game had on their creativity and their participation/interaction with other players, and the evaluation of the game in general—were conducted at the conclusion of each workshop to provide supplementary information useful in the data analysis process. Focus groups were chosen over group interviews as they explicitly use group interaction as part of the method. Kitzienger explains that focus groups “encourage participants to talk to one another: asking questions, exchanging anecdotes and commenting on each other's experiences and points of view” (Kitzienger, 1995, p. 311). This makes the method particularly useful for exploring people's knowledge and experiences, and it can be used to examine not only what people think about their experiences with the SPS-UG, but how they think and why they think that way.

Figure 46. Phase Three research procedure.

A number of recording instruments also were used in order to supplement the structured interview and focus group data to aid in the data analysis process. The SPS-UG was played by the participants via a laptop computer in all workshop groups. This was chosen due to its ease of mobility and operability with limited access to electricity sources in some communities, as well as increased graphic rendering capabilities over other platforms such as tablets. The screen video capture software Flashback was used to record the SPS-UG gaming process on screen for each workshop. This software also captured audio recordings of participants playing the game. This included discussions before and between each level played. The second mode of workshop recording was via a video recording of the workshop using a digital SLR camera and tripod positioned to capture all participants and facilitators, their interactions and the computer monitor. A still camera was also used in order to capture key moments within the workshop; however, the still camera's use was kept to a minimum so as to not distract the workshop participants. A detailed account of how the research methods were applied is discussed in relation to the application in Chapters Five, Six and Seven.

Translators were used to translate participants' responses and interactions. During the workshops, unpaid volunteers from both the Chinatan Environmental Research and Action Group in Delhi and from Apnalaya in Mumbai were used as translators. This was beneficial as they had detailed knowledge of the physical, social, cultural contexts of each case study, as well as knowledge of non-Hindi words that were frequently

incorporated into some of the participants' language. They were chosen over paid professionals also because an expert may exert considerable power within a given ethnic group, and the participants may be dependent on maintaining a good relationship with them in order to have their voices heard (Temple & Young, 2004). Translation of the gameplay was conducted by a paid translator after all of the workshops were completed. Researchers in translation and interpretation generally discuss validity in terms of 'correct' interpretations, ethics, matching of social characteristics and neutral stances (Harrington & Turner, 2001; Phelan & Parkman, 1995; Temple & Young, 2004). In order to ensure accuracy of the translation, back translation was used where the translated version of the gameplay was sent to the workshop translator from each of the workshops and checked for errors (Baker, Saunders, & Hussain, 1991). The triangulation of multiple data sources also provided a means of ensuring accuracy of the translations.

The workshop translators in each case also facilitated the workshops. Each facilitator was trained in the use and procedure of the SPS-UG. This included introducing the participant to the process, and ensuring that the facilitators played a minimal role during the gameplay and only responded to questions posed by the participants and only took control of the game system if necessary. I was also present during each workshop to answer any questions the facilitators might have during the gameplay process.

The gathered data—pre-test / post-test interviews, video recordings, photographs, game screen capture and focus group discussions—was analysed using thematic analysis detailed by Braun and Clarke (2006), which has been used by many participatory design researchers (Balestrini, 2017; Charnley, Lemon, & Evans, 2011; Gooch et al., 2018; Kreutz, Derr, & Chawla, 2018) to identify themes or patterns in the data when exploring new participatory design methods. Once the data was collected and transcribed where appropriate, thematic analysis was used to identify, analyse and report patterns (themes) within the data using the coding procedures described above. Thematic analysis was appropriate for a number of reasons. First, it allowed for an inductive-deductive hybrid approach to be used (Fereday & Muir-Cochrane, 2006) in which patterns and themes could be identified from multiple sources of raw data, and it was well suited to the large datasets generated through the documentation of participatory design processes. Second, the themes generated through the data analysis could be used as a further part of the slum-upgrading action.

Third, Braun & Clarke (2006) and King (2004) argued that thematic analysis is a useful method for examining the perspectives of different research participants, highlighting similarities and differences, and generating unanticipated insights.

The Action Research approach usually comprises iterative stages of reflection and action (Foth & Brynskov, 2016). Ideally, the three Phase Three workshops would have been conducted sequentially, with cycles of reflection between each of the case study workshops (the action) so that improvements to the methods and tools used might be made (*ibid.*). However, because of resourcing limitations related to the international travel component of this research, this was not possible. From a participant perspective, each workshop was orientated around cycles of reflection and action, as well as reflection and adaptation of methods to the unique research situations within each case. At the end of the study and after the analysis, research outputs were then fed back to the community members via the external partners. These points are relevant to affecting design and social outcomes as sought by the Aim 4.

3.5 Ethics and Representation

Issues of ethics and the representation of participants' experiences are central to both Action Research and participatory design.

A core principle of Participatory Design has always been to acknowledge participants as experts in their own work situation. This presumes respect for their expertise as well as mutual trust (Simonsen & Robertson, 2012, p. 72). Care was taken to ensure that the trained facilitators and I, as a researcher, remained impartial to the participatory workshop process. This included ensuring that I, as a trained designer, did not to tell users what their work is or what it means to them.

The production of representations of participants' work is critical to Participatory Design (M. Bødker, 2009). For the most part, the SPS-UG allows for participants to graphically represent their own design ideas. The development of the SPS-UG system involved creating 3D spaces and tools that participants could use to indicate desired changes and problems with their urban environment. As all possibilities could not be catered for, effort was made to provide some basic in-game modules (i.e. blank building blocks) that participants could use to represent urban entities that were not specifically catered for in the design.

With regards to selecting participants, the research does not endeavour to select a representative sample of all participants affected by slum-upgrading issues within each case study context. Rather groups of residents within the community were included through the partner organisations.

It was also very important to manage participant expectations with regard to the outcomes of the workshop process. Here, it is important that the goals of the workshop are made clear to all participants (i.e. that the SPS-UG is a tool for exploring ideas, and not for designing interventions that will actually be built). If not carefully managed, participants could experience a tension between embracing creativity and the unknown budget reality of a slum-upgrading project resulting in disappointment and distrust.

3.5.1 Reflexivity, Validity/Transferability and Relevance

In her article *Qualitative Research: Standards, Challenges, and Guidelines*, Kirsti Malterud describes three criteria that should be considered in qualitative research: reflexivity, validity/transferability and relevance (Malterud, 2001, p. 484). Regarding reflexivity, I was aware of the influence of my own position, background and interest in the research setting and outcomes. Regarding validity, I endeavoured to ensure that findings could be transferred beyond the research context and relevance by ensuring that the knowledge that is created through the research process is useful for other practitioners.

Reflexivity requires systematic attention to the context of knowledge construction, especially the effect of the researcher, at every step of the research process. I was actively involved in conducting participatory inquiries in the case studies for this research. My personal background in architecture and urban design influenced my design and use of the participative tools and materials. In the context of using these participatory design processes in the research, I acted at different times, and sometimes simultaneously, as a researcher, a designer and an active participant in the design situations for the empirical cases. Throughout the thesis I attempt to be clear about my role within the cases being studied.

Because this research uses inductive and deductive coding procedures, detailed in Section 3.4.1, the research utilises a process of data triangulation (Cohen, Manion, & Morrison, 2003) to help ensure validity/transferability. Validity and transferability

have to do with transferring the findings beyond the research context. When discussing validity and transferability, Malterud points out that “the findings from a qualitative study are not thought of as facts that are applicable to the population at large, but rather as descriptions, notions, or theories applicable within a specified setting” (Malterud, 2001, p. 486).

In his thesis, I present the participatory design workshop accounts as first-person, step by step, subjective, qualitative recounts of research processes. I have, where appropriate, included my reflections as well as those of participants and collaborators. These descriptions are aimed at contextualising the design situations and decisions made within them in order to make the rationale behind them accessible. A detailed description of the research methods used is also presented in section 3.3 in order to enhance the research transferability. The development of the SPS-UG design framework was described in Chapter Two; I describe the overall methods and processes in section 3.3. In Chapter Four I describe the operationalisation of the SPS-UG framework to design an SPS-UG, as well as how ethnographic methods were used to document the context of each of the communities for digitalisation into a virtual game environment and to gain an understanding of the range of conflicting perspectives regarding upgrading-related issues with the three communities, and in Chapters Five, Six and Seven I describe how the methods were employed in documenting and analysing the SPS-UG workshops.

This research uses inductive reasoning to generate understanding of the use of the SPS-UGs within each case study. This research works qualitatively with the data generated (Cross, 2011), to identify the dominant themes, which are then illustrated with descriptions of salient moments, relevant participant quotations and illustrative graphic media. This study also utilises a process of data triangulation in analysing the SPS-UG workshops in order to increase validity. This is detailed in Section 3.4.1. Cohen, Manion and Morrison define triangulation as an “attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint” (Cohen et al., 2003, p. 254). It is important to cross-check qualitative data from multiple sources in order to search for regularities in the data (Cohen et al., 2003; O’Donoghue & Punch, 2003, p. 78).

In order to improve the reliability of my findings, all case studies were recorded in video and still images, and the player dialogues that occurred in each case study were transcribed. The analysis was undertaken using multiple data formats including video,

photographs, audio recordings, screen-capture data, notes and survey responses. The results have been published in peer reviewed publications, which is another form of external testing and evidence of relevance. Each case study has been carefully documented with detailed descriptions to allow the reader to follow my line of argumentation.

3.6 Summary

The chapter has described the methodology used in exploring the SPS-UG approach through an Action Research methodology of “reflective practice”, which is centred on case studies as a design research strategy. This approach underlies the experimental nature and character of the work and provides a coherent way for discussing how the arguments are connected to the design work and to academic discourses. Finally, the chapter introduced how the SPS-UG approach will be used as a research method through three phases including *Phase One – Context Documentation Studies and Analysis*, *Phase Two – SPS-UG Development* and *Phase Three – SPS-UG Workshops*.

Next, Chapter Four details how the SPS-UG approach was operationalised through the development of an exemplar SPS-UG framework as a computer game I designed that was tested within the three case studies. This SPS-UG framework forms the basis of each of the participatory design workshops.

4. Operationalising the SPS-UG Approach

Compared with games, reality is hard to get into. Games motivate us to participate more fully in whatever we're doing. To participate wholeheartedly in something means to be self-motivated and self-directed, intensely interested and genuinely enthusiastic. If we're forced to do something, or if we do it half-heartedly, we're not really participating. If we don't care how it turns out, we're not really participating. If we're passively waiting it out, we're not really participating.

— (McGonigal, 2011, p. 124)

4.1 Introduction

This chapter details the processes undertaken in operationalising the SPS-UG framework presented in the previous chapters through the process of documenting the case study contexts and the subsequent development of an SPS-UG as a computer game I designed called “*Maslow's Palace*”, which is used to evaluate the research approach within the three case study contexts. In order to develop a SPS-UG approach that is specific to exploring upgrading ideation and conflicting perspectives in the research context, two phases were followed as shown in Figure 47.

The chapter is composed of two primary sections. Section 4.2 details Phase One – the documentation of the research context including the fieldwork procedures and analysis. Section 4.3 details Phase Two – Stage One: the development of three-dimensional game assets and Phase Two – Stage Two: the development of the interactive mechanics and dynamics of the SPS-UG.

Figure 47. Research Phases One and Two detailed within this chapter.

4.2 Phase One: Documentation of the Research Context

This section details the results of the ethnographic documentation of each case study community to:

O2: to gain an understanding of the range of conflicting perspectives regarding upgrading-related issues important to different community members to inform the subsequent design of an SPS-UG that might help in the negotiation of conflicting perspectives and stakeholder ideation.

4.2.1.1 Ghazipur –Documentation of Context

The Ghazipur Landfill area is located approximately nine kilometres east of the centre of New Delhi, Delhi, India as shown in Figure 48 below.

The Ghazipur block, which is bordered by two large drainage canals on the southern and western sides, is shown in Figure 49. Both canals are tributaries of the Yamuna River, the second largest tributary of the Ganges River, which flows through India and Bangladesh. The Ghazipur landfill therefore directly adds to the well-documented pollution of the Ganges by contributing leachate and landfill run-off via this waterway. The Ganges is one of the most sacred rivers to Hindus as well as a lifeline to millions of Indians who live along its course and depend on it for their daily needs.

Approximately half a kilometre north of the Ghazipur Landfill is Asian Highway 2 (AH2) (National Highway 24 Bypass), which spans 13,107 kilometres from Singapore to Khosravi, Iran on Iraq's eastern border. The Ghazipur block also shares its north-eastern border with the border between Uttar Pradesh, which is the most populous state in India, and the National Capital Territory of Delhi (NCT). The NCT union territory and the state of Uttar Pradesh both operate under their own legislature.

Figure 48. Ghazipur, Delhi, India. Satellite image from Google Earth., 2019.

Figure 49. Ghazipur area, Delhi. Satellite image from Google Earth., 2019.

4.2.1.2 *Ghazipur Land Use*

The Ghazipur area includes a number of prominent land use features. The Ghazipur block developed around and is dominated by the landfill, which has been in operation since 1984 and is spread over an area of 11 hectares. According to estimates, there are over 12 million tonnes of waste in the landfill, and it stands 50 metres tall. The landfill therefore exceeds the 15-metre height limit for a landfill imposed by the Municipal Corporation of Delhi (MCD). The landfill surpassed this height restriction in 2002 (Singh, Rohit, Shivangi, & Vipul, 2016). The landfill is a major landmark on the surrounding landscape due to its height. The environs of the landfill are typified by a mixture of industrial activities and farming land uses. Most industrial activities support the farming operations such as meat works and cold storage facilities and poultry and meat markets. Amongst these areas is energy generating infrastructure such as a power station in the southern corner of the Ghazipur block, and a waste-to-energy plant next

to the landfill. A large proportion of the Ghazipur area is occupied by the Delhi IP Extension Metro station, which is still under construction in late 2019. The metro station occupies land that was formerly designated as Ghazipur District Park. When construction began at the end of 2014, a number of residents were forcibly evicted from their dwellings, constructed illegally on the site of the new metro station. The participants of this study inhabit a strip of slum development that is located between the metro station and the dairy farm areas. Peripheral to the Ghazipur block are areas of medium-high density mixed-use residential areas with pockets of both public and private greenspace. The area has a mixture of regular and irregular street grid patterns and is typified by large plot sizes; however, many of these have been illegally or informally subdivided in the process of unregulated development.

Figure 50. Ghazipur land use, 2019.

4.2.1.2.1 *Ghazipur Housing*

Approximately one thousand people live around the landfill's perimeter. The first residents moved to the Ghazipur block when the landfill opened in 1984. Most of these reside on a 50x500m land parcel between the rear wall of the Metro Station to the north

and the indoor dairy farms to the south (see Figure 51). Most houses sit either side of a path that stretches the length of this area, while the southern half of this strip of land is used mainly for waste segregation (Figure 52).

Most homes are constructed of lightweight and recycled materials such as brick, tarpaulins, plastic sheets, cardboard, bamboo, corrugated iron, and blankets (Figure 53 and Figure 54). Other repurposed materials such as timber doors and steel panelling are also commonly used. The dwellings are all single story and are occupied by an average of five people.

The MCD provides running water to each dwelling, which is free if they use less than 2000 litres per month/household. The community is also connected legally to the MCD electricity grid. There is one public toilet facility within the Ghazipur block, which was constructed by the MCD in 2015. The block has one male toilet and one female toilet; however, most residents choose not to use it because of the frequency of harassment by other community members at this location. Alcohol and drug abuse are also a large problem within the community. This is in response to poverty faced by the community and is exacerbated as Uttar Pradesh law permits the sale of liquor twenty-four hours per day, with many stores in close proximity to the community.

Figure 51. Ghazipur. Satellite image from Google Earth. Accessed 2019.

Figure 52, left. Residents cooking next to open drains, Ghazipur, 2017. Photo by Author.

Figure 53, right. Ghazipur dwellings, 2017. Photo by Author.

Figure 54. Delhi Metro Station under construction with residential area in the foreground, Ghazipur 2017. Photo by Author.

4.2.1.3 Ghazipur Livelihood Generation

Approximately one-third of the Ghazipur community works in the informal recycling sector—mainly as waste collectors or in the segregation of collected materials. 47 households do not have anyone working in the informal waste sector; however, many of these non-waste pickers own businesses that serve the needs of the residents on a daily basis, such as tailors, barbers, shopkeepers, or pharmacists (Heller & Mukhopadhyay, 2014). In 2011, there were approximately 500 youth aged between 4 and 18 years living at Ghazipur, and 26% of these are waste pickers themselves

(Chintan, 2011). 32% of these youth attend local schools (Chintan, 2011). While no current census data exists, these are assumed to have grown significantly with the increase in number of dwellings over that time.

Waste picking at Ghazipur is a multi-step process. Waste pickers generally collect mixed waste from the landfill by hand. This is brought down to a number of sorting areas located in vacant lots between the dairy farms (Figure 55) or within the residential area. Plastics, for example, are sorted into 60 different categories. Shoes are collected and sold to brick makers who use them as fuel for their furnaces. Materials are generally sold to a transporter who moves the materials not more than 200m to a larger specialised distributor within Ghazipur, who then sells the materials to external recyclers.

Many residents work in the informal recycling sector from within their homes. This is predominantly dealing with smaller materials such as sorting and cleaning human hair for wig-making (Figure 56) or processing electrical components to obtain valuable metals. A number of community members also work for local garment manufacturers from their homes (Figure 57). For example, some residents collect jeans from a local manufacturer in order to tie cord through the legs before delivering them back to the manufacturer to be distressed and then sold locally and internationally as shown in Figure 57.

The privately-operated waste-to-energy plant operated by IL&FS Environmental Infrastructure & Services Ltd (Figure 58), located on the western edge of the Ghazipur Landfill, employs some of the Ghazipur community members to sort waste within the plant.

Figure 55, left. Ghazipur landfill, dairy farm buildings and dairy cows grazing on the landfill. Ghazipur 2017. Photo by Author.

Figure 56, right. Recycling human hair, Ghazipur, 2017. Photo by Author.

Figure 57, left. Outsourced garment labour, Ghazipur, 2017. Photo by Author.

Figure 58, right. Waste-to-energy Plant, Ghazipur 2017. Photo by Author.

4.2.1.4 Main Slum-Upgrading Issues

Ghazipur residents are subject to threat of widespread displacement and loss of livelihood as a result of privatisation of the waste management sector. Specifically, the waste-to-energy plant causes a number of problems for the community and inhabitants. Recyclable waste, which is collected from the landfill or delivered directly to the plant and incinerated, could otherwise sustain a number of inhabitants. The plant also only employs women from the community, primarily because of drug and alcohol abuse by male residents. Because of this, and because Ghazipur residents do not want to turn down formal employment, children within the community are often unsupervised.

Figure 59. Overlooking garment factories and indoor dairy farms with Ghazipur landfill in the background, 2017. Photo by Author.

A large proportion of the Ghazipur block is occupied by indoor dairy farms (Figure 55). Here, a large number of grain-fed cattle are kept in indoor or underground sheds and service Delhi with milk. Dairy effluent, which is meant to be trucked away from dairy farms for disposal, is typically pumped out of the shed and illegally onto the road into commonly blocked and overflowing open drainage systems, or directly onto the base of the landfill itself. The blocked drains are regularly cleared by diggers working for the MCD, and the cleared excrement is typically left in large piles on the paths and roads. Most people cook outside of their homes next to the open drain, which means that people are cooking next to the piles of drainage cleanings. During the wet season, the dwellings frequently flood, bringing the dairy excrement indoors. Cows are let out of the sheds often, and they can be seen grazing on the landfill within waste sorting areas or in residential areas. Chintan Environmental Research and Action Group has been in discussion with the dairy farm owners to explore composting systems for the excrement. This would allow it to be sold to gardeners and thereby be removed from Ghazipur block; however, this has not gained support from the MCD nor the dairy farm owners. The Ghazipur block also includes a fish market and a poultry market that contribute to the complex environmental problems relating to the disposal of waste products at the landfill.

The Ghazipur block has no safe open public spaces, and is subject to a threat of forced eviction due to a possible further expansion of the metro station in the future.

4.2.2 CS2 – Bhalswa – Documentation of Context

4.2.2.1 *Bhalswa Land use*

The Bhalswa dairy area approximately 15km north of New Delhi, Delhi, Figure 60, is the research context for Case Study Two (Figure 60). It is defined by the drainage canal to the south and west of the site, the Bhalswa Lake to the east and the dairy industry area to the north. The residents of the slum area adjacent to the Bhalswa landfill are the primary stakeholders involved in the research (Figure 61 and Figure 62).

Figure 60. Bhalswa, Delhi. Satellite image from Google Earth., 2019.

The Bhalswa landfill is an un-engineered and unlined landfill that falls into the category of uncontrolled solid waste disposal facility (Singh & Mittal, 2011). The landfill sits on a bend in a canal that flows directly into the Yamuna River, east of Bhalswa Dairy is Bhalswa Lake, one of Delhi's most important waterways, which is being severely degraded because of the effluent/sewage coming from the nearby landfill, dairy farms and residential areas (Singh, 2017). The landfill came into operation in 1993. The landfill occupies 8.5 hectares of land that was once used for sugar cane plantation. The landfill was declared at capacity in 2006; however, the non-availability of land for a replacement location for a new landfill has led the Municipal Corporation of Delhi (MCD) to continue to dispose of municipal waste at Bhalswa.

Figure 61. Bhalswa case study site. Satellite image from Google Earth., 2019.

Figure 62. Bhalswa landfill as viewed from Bhalswa Dairy, 2017. Photo by Author.

The majority of the Bhalswa area is comprised of informal mixed-use residential development. Most current residents of the Bhalswa community were relocated to the community in November 2002 from eleven other jhuggi-jhompri clusters (slums) on the pretext of beautification of the city at the direction of the MCD. Most of these

residents were originally migrants from other areas of India, with most arriving from West Bengal. The resettlement colony is located adjacent to the landfill and is composed of a regular gridded street pattern and an irregular grid slum area closest to the landfill. The land originally was owned by farmers; however, over the past thirty years, the land was divided into smaller parcels and sold predominantly for the unregulated development of medium density residential concrete structures, while the plots directly to the east of the landfill are subject to single-storey informal slum development, as shown in Figure 63. A large portion of the land towards the north of the site is occupied by light industry, which predominantly services the farming and construction industries.

Figure 63. Wider Bhalswa area land use, 2019

Bhalswa has two main types of dwellings: brick and concrete (Figure 64) versus lightweight and makeshift (Figure 65 and Figure 66). The majority of the area is occupied by two and three storey brick and concrete dwellings. Most of these have

street facing shops at ground level. The focus of this case study is on the residents who occupy the slum areas directly adjacent to the landfill. Dwellings in these areas are progressively more lightweight and makeshift as the landfill edge is neared. Dwellings closest to the landfill are constructed of a mixture of reclaimed bricks, concrete, timber, bamboo, cardboard, plastic tarpaulins and blankets. Homes are frequently dug into the ground as this minimises wall heights and therefore reduces construction costs; however, this also makes these dwellings prone to flooding.

Figure 64, left. Bhalswa dwellings as viewed from the landfill, 2017. Photo by Author.

Figure 65, right. Bhalswa dwellings within the slum area next to the landfill, 2017. Photo by Author.

Figure 66. A typical dwelling within the slum area next to the landfill, Bhalswa, 2017. Photo by Author.

4.2.2.2 *Bhalswa Livelihood Generation*

The vast majority of those who reside in the slum areas closest to the landfill work in the informal recycling sector—including children. Waste collection of reusable or sellable materials occurs predominantly at the top of the landfill as the waste is being deposited by trucks that deliver it from the city, Figure 67; however, some “mining” of the landfill also occurs further down with the aid of digging tools to collect sellable items that might have been buried. Generally, over 100 people collect waste at the top of Bhalswa landfill during daylight hours. Much of the collected materials are gathered in large sacks, which are then brought to areas further down the landfill (Figure 68) for sorting into various categories. Sorting is primarily done by women, disabled people and older residents, although some families do this together at the top of the landfill itself.

Figure 67, left. Waste collection at the top of Bhalswa Landfill, Bhalswa, 2017. Photo by Author.

Figure 68, right. Waste sorting, Bhalswa Landfill, 2017. Photo by Author.

4.2.2.3 *Main Slum-Upgrading Issues*

The community adjacent to the landfill is one of the most underserved slums in Delhi. The community lacks basic urban infrastructure such as access to water and electricity, sealed roads, sewage disposal, healthcare access, schools and public toilets or subsidised basic provisions generally provided under the Public Distribution Scheme (PDS) and bus services (Bhalswa Lok Shakti Manch, 2012).

The narrow “road” along which the houses are sited is unsealed and often flooded with a combination of rainwater run-off and leachate from the landfill. During heavy rain the road floods and water, landfill run-off and leachate flow directly into houses. There are no plumbed toilet facilities. Toilets are unplumbed and are often dug into the landfill (Figure 69). These have a tendency to overflow during heavy rain. There is

also the possibility of landslides from the adjacent landfill, where the closest houses are at risk of being buried in garbage.

The most commonly reported danger to human health is from the use of groundwater that has been contaminated by leachate, as Bhalswa sits on the floodplain of the Yamuna River. The landfill is also subject to regular fires that are caused by an accretion and leakage of methane gas from within the landfill. These are a safety hazards for the waste pickers and residents living close to the landfill, as well as for the wider Delhi population due to increased air pollution. The site is also surrounded by a number of sewage ponds, which also add to health risks.

Figure 69. Toilets and storage spaces are located in the cloth covered shacks at the rear of the photo, which are partially dug into the landfill behind, Bhalswa, 2017. Photo by Author.

Waste picking is particularly hazardous at Bhalswa for a number of reasons. Medical waste, including sharps, medicines and chemicals, is openly disposed of at the site. Many waste pickers do not wear footwear while working in the landfill (Figure 70 and Figure 71). Waste pickers who work at the top of the landfill also work on foot around heavy machinery such as trucks and bulldozers that dump and move the waste. A number of waste pickers have been killed after being buried in waste moved by earthmoving equipment. Waste pickers also need to navigate around livestock such as

pigs and cows that live on and consume waste at the landfill. The municipal authorities do not recognise waste pickers as official buyers or sellers of waste, and under the Indian Penal Code 1960, they stand the risk of being arrested if it is proven that what they are engaging in is essentially theft.

Figure 70, left. A child mining the landfill for salvageable items, Bhalswa Landfill, 2017. Photo by Author.

Figure 71, right. Children collecting discarded bricks for local construction from the landfill, Bhalswa Landfill, 2017. Photo by Author.

CS3 - Shanti Nagar – Documentation of Context

4.2.3.1 *Shanti Nagar Land Use*

Shanti Nagar is one of twelve slum-settlements that comprise Shivaji Nagar, located in M-East Ward, Mumbai (Figure 72). Shivaji Nagar is a slum-settlement on pre-existing swamp land next to Mumbai's largest landfill – Deonar landfill (Figure 73 and Figure 74). The area sits in north-eastern Mumbai, between the Mumbai Highway, which bridges the harbour to the south, and the Eastern Freeway to the north. Its boundaries are defined in Figure 72 below.

Figure 72, Shivaji Nagar, Mumbai. Satellite image from Google Earth., 2019.

Shivaji Nagar expanded significantly in the 1970s and 1980s on land surrounding an abattoir south of the area and Mumbai's Deonar dumping ground. The area was specifically designated for slum resettlement projects from other areas in the city (Ermacora & Bullivant, 2016, p. 270). Slum dwellers from Matunga Labour Camp were relocated there in 1968. Additional neighbourhoods within the area were registered officially in 1982. Since the 1960s, Shivaji Nagar has been home to migrant populations that immigrate to the city from different parts of India, as well as those that have been resettled from slums in the city's wider area (Apnalaya, 2017; Tata Institute of Social Sciences, 2015). Because of this, the area is diverse, includes migrant communities from Maharashtra, Uttar Pradesh, Bengal and Gujarat and is composed of predominantly Hindus and Muslims (Apnalaya, 2017). The proportion of

Muslim community is significant, and the area is said to have 101 mosques and madrasas—most of which are Sunni and Tablighi (Figure 75) (Echanove, 2014). The area is now home to approximately 550,000 people.

Figure 73. Shivaji Nagar. Satellite image from Google Earth., 2019. Adapted by Author.

Figure 74. Shivaji Nagar land use, 2019.

Shivaji Nagar covers approximately 135 hectares, of which half has a regular gridded street layout and the other half is characterised as irregular slum development,

constructed outside any planning considerations. In the past 30 years, shops, educational institutions and religious structures have developed in the area. Several parts of the neighbourhood have a large amount of commercial activity. The area includes a number of prominent site features, including a major bus depot and service centre adjacent to the landfill. A widely used open area next to this on the landfill site is used as a community cricket ground.

The “Deonar dumping ground” is a 132-hectare landfill operated by the Brihanmumbai Municipal Corporation or BMC, (also known as Municipal Corporation of Greater Mumbai), and located next to the Shivaji Nagar area. The landfill was opened in 1927 and is the oldest and largest in India (Joelsson & Lord, 2016). The landfill itself is bordered by a canal and a mangrove and wetland system that flow into the southern portion of the Ulhas River estuary, which forms Mumbai Harbour.

Figure 75. Shanti Nagar, Mumbai, 2017. Photo by Author.

Shanti Nagar is subject to a unique range of issues attributed to fluctuating population dynamics, environmental vulnerabilities, legal status, industrial proliferation, security of housing, availability of infrastructure, accessibility to education and health services and urban developmental plans. The M-East Ward area

has the lowest human development index in Mumbai, ranking 24th out of 24 wards (Municipal Corporation of Greater Mumbai, 2009).

4.2.3.1.1 *Shanti Nagar Housing*

Shanti Nagar is not legally a “slum” but rather is officially designated as a “planned resettlement colony” by the BMC; however after decades of neglect the authorities now treat it as, and even call it, a “slum” (Srivastava & Echanove, 2014). The city’s Municipal Corporation, under the Site and Service Resettlement Scheme of the Slum Act, developed the neighbourhood for inhabitants of slum communities that had been displaced, or forcefully evicted, from other areas of the city. Under the scheme, many residents gained occupancy rights of the government-owned land, and relocated households were allotted 10’x15’ plots for self-development (Apnalaya, 2017; Tata Institute of Social Sciences, 2015).

Of all the homes in the area, around 30% are single-storey, 60% are two-storey structures (Figure 77) and about 10% are three-storey (Figure 78). There are approximately 48,500 dwellings in the area. The cost of construction of each house ranges from Rs. 150,000 to Rs. 600,000 per structure. Dwellings fall into three categories. The first category includes so called “kaccha” houses. These are predominantly located in the informal areas of Shivaji Nagar. They are commonly constructed from lightweight materials, such as scavenged timber for framing, and they are typically built on a brick or cement plinth with corrugated iron cladding and roofing. Residents often choose this type in the informally planned colonies, such as Rafi Nagar closer to the landfill, as they have been subject to repeated government demolition of houses. The choice of lightweight and less expensive construction reduces personal financial losses in such circumstances.

Figure 76. Single storey dwellings, Shanti Nagar, Mumbai, 2017. Photo by Author.

Figure 77. Two storey dwellings in Shanti Nagar, Mumbai, 2017. Photo by Author.

Figure 78. Multi-Storey dwellings and the open area of the Deonar landfill being used for recreational purposes. Shanti Nagar, Mumbai, 2017. Photo by Author.

The second category includes “pucca” houses, which are the most common in Shanti Nagar and make up the majority of development. They are typified by steel structural members and timber joists constructed on a concrete slab. Brick walls are commonly used to reduce costs, and these are often rendered with concrete. The third category includes reinforced concrete structures. These are the most expensive and make up a minority of structures within the gridded street zone. Many older structures of this type are altered or repaired with cheaper materials such as corrugated iron or brick.

Figure 79. Shanti Nagar, Mumbai, 2017. Photo by Author.

4.2.3.2 *Shanti Nagar Livelihood Generation*

As the community is well established, livelihoods are generated in a large number of ways in Shanti Nagar. Contractual and temporary casual labour in the industries in adjoining areas is a major source of employment. 34.2% of men work in the construction industry, which constructs or reconstructs approximately 2,500 buildings in Shivaji Nagar alone each year. 34.7% of women do only household work with no payment. 25% of residents attend some form of educational institution. 30% of all men and women above the ages of 14 are pursuing some form of education. The average monthly income reported for men is between Rs. 7000 – 10,000 and for women is Rs. 1000 to 2000. 13.7% of females and 54.6% of men are employed (Apnalaya, 2017). Approximately 4,500 residents engage regularly in waste picking; however, this number is known to fluctuate greatly, as it is often used as an income supplementation strategy (Shetty, 2016). Currently only 500 waste pickers are registered with workers' union Kachara Vahatuk Shramik Sangh (KVSS) and have been provided medical insurance (ibid.). The abattoir is also a means of livelihood for a number of individuals in Shanti Nagar.

4.2.3.3 *Main Slum-Upgrading Issues*

Like Ghazipur and Bhalswa, the landfill is subject to regular fires that are caused by accretion and leakage of methane gas from within the landfill. These fires gain widespread media attention when the smoke blankets the more affluent areas of Mumbai. In 2014, a wall was erected between the landfill and Shivaji Nagar in an effort to stop waste pickers gaining access to the landfill, although this merely results in waste pickers entering via the far side of the landfill.

Access to water is also a well-documented problem in Shanti Nagar, with water infrastructure regularly failing for long periods of time (Khan, 2015). Residents are forced to carry water containers long distances by foot, tuk-tuk or bicycle in order to obtain drinking water.

Due to its designation as an area for slum resettlement, the Shanti Nagar area is very dense and so lacks open public spaces. Community members use a flat area of the landfill as a cricket and general recreation ground.

Figure 80. Open area of the Deonar landfill being used for recreational purposes. Shanti Nagar, Mumbai, 2017. Photo by Author.

4.2.3.4 Summary of Documentation of Context

Table 14 below provides a comparative summary of the salient contextual factors identified through the ethnographic descriptions detailed above.

Table 14. Summary of the key variables identified between the case study sites.

Location	Ghazipur	Bhalswa	Shanti Nagar
Case Study Site Area	112 Hectares	48 Hectares	302 Hectares
Slum Area	3.7 Hectares	6.2 Hectares	2.2 Hectares (Shivaji Nagar total slum area 135 Hectares)
Population	1,000	25,000	6,000 (Shivaji Nagar 600,000 total)
Livelihood generation	Waste picking/self-employed	Waste picking/self-employed	54% men and 13.7% women in formal employment.
Housing Type	Lightweight Single Storey. Found/ recycled materials.	Lightweight Single Storey. Found/ recycled materials.	30% single-storey, 60% two-storey structures, 10% are three-storey. Concrete structures.
Legal Tenure	No	No	Yes
Basic Urban Services	One Public Toilet Electricity Drinking Water	No	Electricity Limited access to drinking water
Road Layout	Informal	Informal	Formal
Urban Environmental Hazards	Lack of basic infrastructure Lack of drainage Dairy farm pollution Poor quality housing Landfill fires	Lack of basic infrastructure Lack of drainage Poor quality housing Lack of sealed roads Landfill fires	Lack of water infrastructure Landfill fires Lack of public open areas
Landfill Area	11 Hectares	8.5 Hectares	132 Hectares
Landfill Type	Un-engineered and unlined landfill	Un-engineered and unlined landfill	Un-engineered and unlined landfill
Waterways	Bordering canals flow into Yamuna River	Bordering canals flow into Yamuna River	Bordering canals flow into Ulhas River estuary

4.2.4 Data Collection for Understanding Conflicting Perspectives

This section details the results of the structured interviews held with each case study community to:

O2: to gain an understanding of the range of conflicting perspectives regarding upgrading-related issues important to different community members to inform the subsequent design of an SPS-UG that might help in the negotiation of conflicting perspectives and stakeholder ideation.

4.2.4.1 Data Collection Procedure

The Phase One Ghazipur structured interviews were conducted with assistance from four Chintan Environmental Research and Action Group staff members who operate the school for waste-picker families at Ghazipur. The interviews were conducted on the roof space of the Chintan-operated school overlooking the landfill within the Ghazipur community (Figure 81). A translator/transcriber was used in each case, as most of the participants did not speak English and most were illiterate.

Figure 81. Rooftop of the Chintan operated school, Ghazipur fieldwork, February 2017. Photo by Author.

Chintan staff had distributed information about the research to the community prior to the interviews being held. 23 interviewees agreed to be interviewed. 15 participants were female. Participants were aged between 16 and 63 years old with a mean age of 27.08 years. All but one participant identified as Muslim. The participants had lived at Ghazipur for between 1 and 25 years with a mean residency of 13.43 years. 18 participants had migrated to Ghazipur from outside of Delhi. Participants held a number of occupations shown in Figure 82 below.

Figure 82. Participant Occupations, Ghazipur, 2017.

The Bhalswa interviews followed a similar process to the Ghazipur interviews. These were also facilitated by Chintan staff who coordinate a community development programme within the Bhalswa community. The interviews were mostly conducted on rooftop spaces of the homes of interviewees closest to the landfill (Figure 83).

A group of 22 participants took part in the interview process. 9 participants were female. Participants were aged between 16 and 60 years old with a mean age of 25.59 years. All but one participant identified as Muslim. Participants had lived at Bhalswa for between 2 and 52 years with a mean residency of 18.77 years. 17 participants had migrated to Bhalswa from outside of Delhi. Participants held a number of occupations shown in Figure 84 below.

Figure 83. Bhalswa fieldwork, February 2017. Photo by Author.

Figure 84. Participant Occupations, Bhalswa, 2017.

The Shanti Nagar interviews were conducted in collaboration with Apnalaya staff in their well-used community centre (Figure 85). A translator/transcriber was used in each case, as most of the participants did not speak English and some were illiterate.

Figure 85. Shanti Nagar fieldwork location, Apnalaya community centre, February 2017. Photo by Author.

21 interviewees took part in the interview process. 8 participants were female. Participants were aged between 14 and 45 years old with a mean age of 19.95 years. All but four participants identified as Muslim. Participants had lived at Shanti Nagar for between 10 and 23 years with a mean residency of 17.38 years. 17 participants had migrated to Shanti Nagar from outside of Delhi. Participants held a number of occupations shown in Figure 86 below.

Figure 86. Participant Occupations, Shanti Nagar, 2017.

4.2.4.1.1 *Ghazipur Perspectives*

As shown in the diagram in Figure 87, the urban issues identified by participants through the interview process at Ghazipur were located predominantly at the lower end of the needs hierarchy with most community problems and desired changes being identified as physiological (basic needs), safety and security, or belonging related. The participants generally did not like many aspects of their community; however, some participants did highlight that they liked the people who live in Ghazipur.

Many dislikes identified were categorised as housing, infrastructure, health, pollution/physical environment issues such as a lack of toilet facilities and adequate housing, the uncleanliness of the community including excessive cow excrement that can be a problem during the wet season, and garbage in residential areas. Some also highlighted social capital related issues such as fighting and harassment. This was prominent amongst the younger respondents of Ghazipur. The lack of toilets was identified as one of the main problems across all interviewees as well as being one of the most widely desired improvements.

The Ghazipur interview process highlighted a large range of desired changes to their environment including the construction of higher quality houses, better sanitation facilities, stopping forced evictions, removal of waste from living areas and a number of social capital related changes, including reduction of harassment by MCD officials, obtaining child support, support of addicts, drug awareness and reducing fighting/conflict within the community.

One major trend identified in the data was that, while the likes, dislikes and main problems were commonly agreed between interviewees, the desired changes—or what the interviewees wanted to do about those problems—varied greatly. This indicates a significant range of conflicting perspectives relating to future upgrading processes.

Figure 87. Thematic analysis of the Ghazipur interview data identifying a range of conflicting perspectives on slum-upgrading issues.

4.2.4.1.2 *Bhalswa Perspectives*

Urban issues identified by the Bhalswa participants were located almost entirely within the physiological and safety categories of the needs hierarchy as seen in Figure 88. This reflects the acute nature of the urban problems and needs of the participants.

The participants identified few aspects that they liked about their community; however, similar to Ghazipur, some participants did highlight that they liked the people who live within in. Dislikes identified were predominantly physiological or safety oriented, such as disliking a lack of access to water and food. Inadequate drainage means that landfill run-off often flows into homes. Lack of sanitation facilities, pollution, as well as open defecation and the prevalence of waterborne diseases associated with the rainy season were also highlighted by a number of participants. The main problems identified by the community generally reflected the attributes they disliked including lack of adequate sealed roads and drainage infrastructure around the perimeter of the landfill and between houses in order to alleviate flooding. Participants also highlighted a lack of potable drinking water and general pollution as being concerns.

There were two main upgrading actions favoured by many community members. The first related to gaining reliable access to potable drinking water through the implementation of water infrastructure. The second was the desired construction of adequate roads and drainage. In line with this, a number of satellite issues were also identified such as strategies to alleviate landfill run-off and leachate.

The analysis indicates a marked similarity between the issues identified by each participant, as well as the similar numbers of likes, dislikes, and desired upgrades identified across the sample as a whole. Most likely this is caused by the acute nature of the problems relating to living in Bhalswa that were common to all participants. It indicates that participants generally displayed a higher level of agreement about upgrading issues and lower degree of conflicting perspectives than within the Ghazipur study.

Figure 88. Thematic analysis of the Bhalswa interview data identifying a range of conflicting perspectives on slum-upgrading issues.

KEY

Category of Issue

- Education
- Social Capital
- Pollution/ Physical Environment
- Health
- Infrastructure
- Housing
- Basic Needs

Frequency

4.2.4.1.3 *Shanti Nagar Perspectives*

Urban issues identified by the Shanti Nagar participants were located across the full range of the needs spectrum with few physiological needs identified, as seen in Figure 89. Participants identified belonging needs being met such as having spaces to meet friends, the respect shown between community members, esteem from playing sports such as cricket and kabbadi with friends, exercising and self-actualisation needs such as reading, drama and gaining an education as enjoyable aspects of their community; however, belonging and safety-related issues such as fighting, harassment and domestic violence were identified as dislikeable attributes of their community, predominantly amongst female participants. General uncleanliness was also highlighted as a disliked attribute. Compared with the other two case study communities, participants identified few problems with their community; however a lack of educational opportunities and a lack of potable drinking water were highlighted by some. Interestingly, participants identified a large range of desired changes to their community. These were located across the full needs hierarchy, covering basic needs, housing, infrastructure, health, pollution/physical environment, social capital and education related upgrades. These included securing access to potable drinking water and health facilities, reducing pollution, facilitating support for alcoholics and addicts, constructing public spaces and playgrounds and increasing access to education.

The analysis shows that the Shanti Nagar participants identified the largest range of likes, dislikes and desired changes of the three case study communities, while identifying few problems that were coded as physiological. It indicates that participants generally displayed a lower level of agreement about upgrading issues and a higher degree of conflicting perspectives than within the Ghazipur and Bhalswa studies. This reflects the longer established and slightly less impoverished nature of the community and possibly indicates the level of agency the community perceives it has in relation to affecting change over their real-world situation. The analysis also reflects the acute nature of some of the urban issues that were identified by the Bhalswa community in terms of the level of consensus that was expressed around these issues.

Assessment of Conflicting Perspectives - Shanti Nagar

Figure 89. Thematic analysis of the Shanti Nagar interview data identifying a range of conflicting perspectives on slum-upgrading issues.

4.2.4.2 Identification of Important Contextual Issues

From this analysis a range of issues was identified across the research sites for incorporation into the SPS-UG approach. Through the mapping and interview process, a number of key relationships were identified as being specific to the Ghaizpur area. These include the slum area's proximity to the Delhi Metro station, waste sorting area, the landfill, public toilets and the dairy farms. These are detailed in Table 15, below.

Table 15. Identification of important contextual issues

Ghazipur	Bhalswa	Shanti Nagar
<ul style="list-style-type: none"> • Waste sorting areas in/near housing • Housing close proximity to landfill • Housing against metro retaining wall • Location of dairy farms, improper effluent disposal • Light industry integration into community • Development of new Metro station • Waste-to-energy plant and associated livelihood/ social issues 	<ul style="list-style-type: none"> • Waste sorting areas in/near housing • Integration of religious sites – Mosques • Housing close proximity to landfill • Landfill perimeter wall • High density housing • Access to bus station • Availability of high-rise/density housing 	<ul style="list-style-type: none"> • Integration of religious sites – Mosques • Landfill perimeter wall • High density housing • Access to bus station • Availability of high-rise/density housing
<ul style="list-style-type: none"> • The landfills and associated sanitation, livelihood and environmental concerns • Landfill fires • Proximity to waterways • Proximity to transport networks • Community halls • Access to hospitals • Access to toilets and sanitation facilities • Access to drinking water infrastructure • Access to schools • Access to public green/ recreational space • Higher quality roads • Waste-to-energy plant 	<ul style="list-style-type: none"> • The landfills and associated sanitation, livelihood and environmental concerns • Landfill fires • Proximity to waterways • Proximity to transport networks • Community halls • Access to hospitals • Access to toilets and sanitation facilities • Access to drinking water infrastructure • Access to schools • Access to public green/ recreational space • Higher quality roads • Waste-to-energy plant 	<ul style="list-style-type: none"> • The landfills and associated sanitation, livelihood and environmental concerns • Landfill fires • Proximity to waterways • Proximity to transport networks • Community halls • Access to hospitals • Access to toilets and sanitation facilities • Access to drinking water infrastructure • Access to schools • Access to public green/ recreational space • Higher quality roads • Waste-to-energy plant

Other key relationships included the waste-to-energy plant, the dairy farms and the poultry and meat markets' connections to the landfill. Furthermore, a number of key relationships were identified as being specific to the Bhalswa area. These include dwellings in the slum area being in close proximity to the landfill—especially

regarding issues of drainage and landslides, pedestrian and vehicle access to the landfill, landfills' proximity to waterways and accessibility of toilets from the slum area. Key relationships identified as being specific to the Shanti Nagar community include access to potable drinking water from dwellings, mosques' relationships to the street grid, the relationship between gridded streets and informal dwelling areas, the bus depot and the cricket grounds and open areas' proximities to the landfill, the landfill's proximity to the mangroves and wetlands and the location of schools within the community.

4.3 Phase Two: SPS-UG Development

This section details how the results detailed within the previous sections were used to develop an SPS-UG for use with each case study in line with objective 3:

O3: to develop one SPS-UG for use in participatory workshops within all case study communities.

4.3.1 Stage One: Development of 3D Assets

As highlighted by the data presented in Section 4.2.4, the case study communities exhibited a range of opinions about the advantages, problems and challenges they face by living in their communities, and what they would like to do about them or improve in the future. Phase two of the SPS-UG development process included the conversion of data gathered in Phase One into three-dimensional models for application within a gaming engine. Phase Two used the interview data, which highlighted important issues or trajectories of urban upgrading from the perspective of the participants, in combination with the data gathered in documenting the physical environment of the communities, to develop three-dimensional models of buildings and spaces, or 3D assets, for use in the development of an SPS-UG.

The cross-platform real-time engine Unity3D was selected as the game development platform as it is a cross-platform all in one editor that supports the creation of multiplayer games. Autodesk 3DS Max was used as the 3D modelling software in developing digital models of spaces and buildings.

A low-polygon style of 3D modelling, with limited digital texturing, was chosen as the graphic style (McLaughlin et al., 2010, p. 136). This was chosen for three reasons. The first is that the literature review showed that using simplified or stylised 3D

representation styles reduces player confusion regarding the pragmatic viability of in-game (Wattanasoontorn, 2013). The second is that high detail modelling is time consuming, which is a significant factor within research-oriented game development with limited resources. The third is that lower polygon counts allow for faster real-time rendering and therefore allow for a game to run on a computer with low graphics processing capabilities such as a laptop. This is an important factor when using games as part of fieldwork where all equipment needs to be transported and access to IT resources is limited.

One SPS-UG was developed to be used in conducting all participatory design workshops across all three research case studies. This presented a challenge, as a common game environment needed to be able to be used to facilitate ideation and the negotiation of perspectives within all communities and between all participants, while having the ability to prompt debate surrounding context specific issues—or create a perceptual bridge between the game and the player’s real-world experience in each case context (Auger, 2013, 2013).

In order to achieve this a number of strategies were used. First, buildings and spaces were categorised as either “generic” or “site-specific”. Real-world spaces designated as “generic” are those in which a large number of typologically similar buildings exist. These include buildings and spaces that are typologically common to each of the three case study communities—such as the landfill, waste sorting areas, houses or shops. Those designated as “site-specific” could be considered unique to the built environment of a specific community. These include buildings such as the waste-to-energy plant at Ghazipur or the bus terminal at Shanti Nagar, for example. Here, references to specific buildings and spaces within the interview data were used to inform judgements on the level of “uniqueness” of site-specific buildings and spaces for three-dimensional development and inclusion in the SPS-UG. These were then classified into the categories of housing, public spaces, public buildings, infrastructure and commercial spaces.

The adjacencies between each of the classified spaces within each community were then documented and mapped. The “site-specific” and “generic” examples of housing, public spaces, public buildings, infrastructure and commercial spaces were composited with these mappings in order to create a virtual environment that was typologically familiar to all communities in terms of its overall urban form.

4.3.1.1 *Housing*

The dwellings digitised into 3D assets fall into three categories in line with those identified through the documentation of the research contexts in Section 4.2.4. These include light-weight, single-storey structures typically found in informal slum areas of the three communities, two-storey concrete dwellings and commercial structures and multi-storey, high-density residential buildings. All housing types were classified as “generic” as all dwelling types are found in all communities. Through this conceptual framing of real-world spaces, the SPS-UG allows a reframing of the structures of meaning in a context, creating a filter to pragmatic impasses that can often thwart negotiation processes (Dindler, 2010a, p. 84; Iser, 1993). The generic classification means that no one person is able to recognise their own home within the SPS-UG environment and therefore be protective of it; however, in maintaining typological familiarity, building components such as floors, walls, windows, doors and awnings were modelled with reference to real-world structures. These were then composited onto a variety of buildings in order to establish typologically familiar, yet not context-specific, digital models.

Table 16. Development of 3D Assets - Housing

Location	Category	Type	Description	Context Image	Example
Ghazipur (CS1)	Light-weight single-storey dwelling.	Generic	Timber framing, brick plinth, iron or scavenged brick cladding.
Bhalswa (CS2)	Light-weight single-storey dwelling.	Generic	Timber framing, brick plinth, iron or scavenged brick cladding.
Bhalswa (CS2)	Dwelling/Commercial.	Generic	Two-storey. Commercial and residential. Structural steel, brick, iron and concrete.

Shanti Nagar (CS3)	Light-weight single-storey dwelling.	Generic	Timber framing, brick plinth, iron or scavenged brick cladding.
Shivaji Nagar (CS3)	Dwelling/ Commercial.	Generic	Two-storey. Commercial and residential. Structural steel, brick, iron and concrete.
Shanti Nagar (CS3)	Dwelling/ Commercial.	Generic	Two-storey. Commercial and residential. Reinforced concrete structures.
Shanti Nagar (CS3)	Multi-storey residential building.	Generic	Multi-storey residential. Reinforced concrete structures.

4.3.1.2 Public Spaces

The development of public space assets followed a similar development process as was followed for housing development. All public space elements were designated “generic”, as the types of spaces such as landfills, waste sorting areas and waterways are common features shared among all sites.

Table 17. Development of 3D Assets – Public Spaces

Location	Category	Type	Description	Context Image	Example
Bhalswa (CS2)	Landfill	Generic	Landfill. Multi-layered, access roads to summit for trucks. Major landmark. Housing adjacent.

Ghazipur (CS1)	Landfill	Generic	Landfill. Multi-layered, access roads to summit for trucks. Major landmark. Housing adjacent.
Shanti Nagar (CS3)	Landfill	Generic	Landfill. Multi-layered, access roads to summit for trucks. Major landmark. Housing adjacent.
Ghazipur (CS1)	Waste Sorting Area	Generic	Mixed use waste-sorting area. Pile of waste sorting bags for collection.
Bhalswa (CS2)	Waste Sorting Area	Generic	Mixed use waste-sorting area. Pile of waste sorting bags for collection.
Shanti Nagar (CS3)	Park /Greenspace	Generic	Greenspace. Small spaces amongst dwellings and commercial buildings. Some larger areas next to public buildings.
Shanti Nagar (CS3)	Cricket Pitch	Generic	Cricket pitches on the open ground areas of the Deonar landfill
Ghazipur (CS1)	Waterways	Generic	Canals and wetlands.
Bhalswa (CS2)	Waterways	Generic	Canals and wetlands.

Shanti Nagar (CS3)	Waterways	Generic	Canals and wetlands.
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4.3.1.3 Public Buildings and Infrastructure

The development of public buildings and infrastructure 3D assets are categorised as a mixture of generic and site-specific. Infrastructure such as roads, toilets, water infrastructure and hospitals are designated as generic while entities such as local schools, community meeting halls (Shanti Nagar) and the metro station (Ghazipur) are modelled to be site-specific.

Table 18. Development of 3D Assets – Public Buildings and Infrastructure

Location	Category	Type	Description	Context Image	Example
Shanti Nagar (CS3)	School	Site-specific	Bharal Nagar Urdu High School.
Shanti Nagar (CS3)	Mosque	Generic	Mosque constructed from reinforced concrete and cinderblock. Iron roof. Orientated towards Mecca.
Shanti Nagar (CS3)	Community meeting hall	Site-specific	Two-storey, constructed from reinforced concrete and cinderblock. Iron roof.
Shanti Nagar (CS3)	Water infrastructure	Generic	Water collection tank. Tap access as specific locations within the community.

Shanti Nagar (CS3)	Hospital	Generic	Multi-level reinforced concrete hospital.
Ghazipur (CS1)	Water infrastructure	Generic	Water collection tap. Tap access at specific locations within the community.
Ghazipur (CS1)	Metro-rail station	Site-specific	Large concrete station. Dwellings next to boundary wall due to forced evictions for construction.
Ghazipur (CS1)	Toilet	Generic	Gated toilet block built by municipal corporations. Blockwork with iron roof.
Shanti Nagar (CS3)	Wall	Site-specific	Concrete barrier wall to limit access to landfill. Sections of wire fencing.

4.3.1.4 Commercial Activities

Commercial activities such as shops are mostly designated as site-specific as they were highlighted in the context documentation and interview analysis as causing a number of tensions within the communities—such as the dairy farms or the waste-to-energy plant at Ghazipur, for example. Shops and market stalls are designated as generic, as similar examples are found within each research context and were not specifically prominent within the data.

Table 19. Development of 3D Assets – Commercial Activities

Location	Category	Type	Description	Context Image	Example
Shanti Nagar (CS3)	Shop	Generic	Food and fabric shops. Blockwork with iron roof.
Ghazipur (CS1)	Stall	Generic	Market stall. Timber structure with canvas or iron cladding.
Ghazipur (CS1)	Waste-to-energy plant	Site-specific	Waste-to-energy complex. Main landmark. Fenced off from wider community.
Ghazipur (CS1)	Dairy farm	Site-specific	Single and double-storey dairy farm buildings. Reinforced concrete and masonry.
Ghazipur (CS1)	Garment factory	Site-specific	Garment factory buildings. Single and double-storey. Drying area between buildings.
Shanti Nagar (CS3)	Bus terminal	Site-specific	Bus depot. Fenced from rest of the community.

4.3.1.5 Compositing Urban Form for SPS-UG's

Similar to the challenges faced in the development of digital models for individual buildings, in designing the virtual urban form of the SPS-UG environment for this research, I was presented with two challenges. The first was how to create a virtual environment that “defamiliarises” the research context to open up “discursive space”

and aid negotiation and critical ideation discussions through a consideration of a plurality of future possibilities (Bell et al., 2005; Lindley et al., 2014, p. 240). The second was how to ensure a coherent and typologically familiar virtual environment is presented that is legitimate in terms of being internally consistent and having extensional expectations that are relevant to all players across the three case study communities (Auger, 2012, p. 140; Knutz et al., 2016; Pickersgill, 2017).

4.3.1.5.1 *Compositing Urban Morphology and Contextual Issues*

A strategy to address these issues was adopted in which the morphological elements of each research context identified in section 4.2 were woven together with issues identified through the interview process, and this configuration was then populated with the 3D digital assets documented throughout this section. This roots the virtual environment in the familiar while providing novel configuration of contextual elements (Dindler, 2010a, p. 75; Malmgren, 1985, p. 18). In line with the world creation literature presented in chapter two (Dindler, 2010a; Goodman, 1978; Malmgren, 1985), the novel configuration is composed of *parts* (areas such as neighbourhoods or larger areas of a particular land use), *subclasses* (generic buildings or spaces), and *features* (site-specific real-world buildings, spaces and relationships). Key *parts*, *subclasses* and *features* from the analysis of the interview data for the compositing process are detailed in Table 20.

Table 20. Parts, Subclasses and features for compositing urban morphological and contextual issues in the SPS-UG.

Parts	Subclasses	Features
Urban form, land-use patterns, grain, road and pathway configurations	Dwelling types and development patterns;	Key site-specific urban nodes such as mosques, schools and greenspaces
Topography	Commercial zones and patterning	Key site-specific adjacencies such as housing proximity to the landfill
Canals, highways and commercial activities providing site boundaries;	Connection to open public spaces	
	Canals, highways and commercial activities providing site boundaries	
	Mixed use	
	Transportation/public utilities	

The *parts*, *subclasses* and *features* were then recomposed into novel configurations using strategies of weighting and deformation (Figure 90). *Weighting* was judged based on the prominence of key contextual features and land use compositions within each case study site (i.e. the landfill being central to all communities) as well as the importance of issues identified through the interview data (i.e. the recently constructed Delhi metro station in relationship to the threat of forced eviction for Ghazipur residents). Deformation was also used as a world-making strategy through the compositing of the three case study sites. This occurred at the urban scale as well as through the compositing of *parts*, *subclasses* and *features*. This is intended to act as a defamiliarisation strategy to distort perspectives leading to new-world formations, ideation and negotiation of perspectives. It also allowed for key real-world systems and adjacencies to be embedded within the virtual environments, while maintaining defamiliarisation.

Figure 90. Exemplar diagram of a virtual SPS-UG environment.

4.3.2 Stage Two: Development of Interactive Mechanics and Dynamics SPS-UG

4.3.2.1 *Purpose/Aim/Goal*

The previous two phases were operationalised as a SPS-UG computer game I designed, which I call “*Maslow’s Palace*”. The name was chosen in alignment with the deductive coding used to analyse the hierarchy of needs within each community. The game represents urban design issues in Ghazipur, Bhalswa and Shanti Nagar with the purpose of revealing disparities of views and opinions within the communities to help them move toward a common vision regarding their urban design challenges. The game sought to expose these differences and to foster empowerment by enabling groups to better understand each other’s points of view regarding a range of problems to help them collaborate better in the future. The goal of the game is for players to collaboratively design speculative community upgrades through five levels of gameplay (Malone, 1981) that ascend in representational realism. Players collaboratively respond to increased numbers of challenges, typologically familiar entities and details of context as the game unfolds (Auger, 2012, p. 180). In this way, *Maslow’s Palace* functions as a focussed “priming’ activity, as a precursor to pragmatic participatory slum-upgrading design processes to reveal stakeholder positions, values, and explicit, observable, tacit and latent knowledge (Iversen et al., 2012; Sanders & Dandavate, 1999) through consideration of alternative presents, futures, systems or worlds to provoke values-based discourse (DiSalvo, 2012, p. 52), using the SPS-UG as a “boundary object” in the creation of low fidelity digital prototypes (Björgvinsson et al., 2012; Brandt et al., 2008). It has the goal of facilitating ideation and the negotiation of conflicting perspectives through collaborative learning and collective tinkering within cycles of experiencing, reflecting and testing (Jarvis, Holford, & Griffin, 2003; Kebritchi & Hirumi, 2008).

4.3.2.2 *Framing*

The target group of the SPS-UG is residents of the three case study communities. Residents in each community had a range of digital literacy levels. Some community members had very little computer knowledge, while some were quite familiar and regularly play smartphone-based digital games. Because of the disparities in digital literacy, a comprehensive tutorial system was needed to ensure a level playing field so that disparities in digital literacy did not affect gameplay or player discourse. To

achieve this, the first two levels of *Maslow's Palace* focus on players learning the game mechanics, such as navigation of the user interface, avatar movement, using the inventory system and the mechanics involved in collaboratively completing levels. Subsequent levels introduce more typologically familiar elements and other game mechanics.

Legitimacy in terms of internally consistent extensional expectations (Pickersgill, 2017, p. 78; Walton, 1993) was ensured via the digitisation processes of the physical context outlined in section 4.2.2. *Maslow's Palace* is framed to allow for instrumental speculation as a discussion tool, as opposed to terminal visions of the future, and it is externally focussed and not expert-oriented. Here the players are given agency to design speculative urban environments within the in-game context, as opposed to merely using a terminal speculative design as a discursive provocateur.

Defamiliarisation strategies (Bell et al., 2005), such as the use of fictional game entities and compositing strategies, were used to reframe discussions or to facilitate the creation of “agonistic spaces” (DiSalvo, 2010). Level One is designed to be situated at the less plausible end of the temporality spectrum, representing a significant departure from reality. This is designed to remove the pragmatic discursive impasses entangled with real-world issues and foster collaboration between participants through an abstract task. Contextual factors, such as the exact location of an individual's home or community spaces, which might constrain the design process or discussion about the design or socio-political ideas by creating discursive impasses, are minimised. Subsequent levels gradually introduce more familiar contextual elements such as familiar buildings, spaces and real-world adjacencies. Level five includes a simple in-game economy and a range of typologically identifiable site features, buildings and spaces to which the participants respond (Auger, 2012, p. 180).

4.3.2.2.1 *SPS-UG Level Progression*

Table 21 below summaries the level progression of *Maslow's Palace*, which is followed by detailed descriptions of each level.

Table 21. Maslow's Palace Level Progression Summary

	Plausibility	Aim	Features	Screenshot
Level One	Low Un-identifiable blocks. No Context.	Players experiment and familiarise themselves with core game mechanics such as player movement, inventory navigation, door opening and game piece/ building placement and demolition.	A basic inventory of blank blocks of various sizes and shapes, as well as a pre-placed array of destroyable blocks that players can imbue with their own meanings.
Level Two	Low Unidentifiable context. Housing modules only.	Players experiment and familiarise themselves with core game mechanics including module placement in relationship to other players actions.	A basic inventory of blank blocks of various sizes and shapes, placeable housing modules, as well as a pre-placed array of destroyable blocks that players can imbue with their own meanings.
Level Three	Low Some identifiable buildings.	Players experiment with module housing and public building placement in relationship to other players' actions.	An inventory of housing and public space modules as well as blank blocks of various sizes and shapes, that players can imbue with their own meanings.
Level Four	Medium Some identifiable buildings and spaces.	Players discuss the importance of particular site features in relation to in-game actions.	An inventory of housing and public space modules as well as blank blocks of various sizes and shapes. Some existing site contextual site features to respond to.
Level Five	Medium-high. Identifiable buildings and spaces.	Players discuss the relationships between site problems and desired changes.	An inventory of housing and public space modules as well as blank blocks of various sizes and shapes. In-game economy, typologically identifiable site features, buildings and spaces.

In Level One, players are introduced to an abstract game level (Figure 91), where they may experiment and familiarise themselves with core game mechanics such as player movement, inventory navigation, door opening and game piece/ building placement and demolition. This level is visually designed to be situated at the less plausible end of the temporality spectrum (Voros, 2003), representing a significant departure from reality with the goal of levelling socio-cultural structures and enabling discourse through the collaborative learning of the game mechanics (Arnab et al., 2015; Kebritchi & Hirumi, 2008). It is also designed to slowly introduce players to

game functionality in order to remove any advantage a player might have over another from being familiar with computer games. Players are provided with a basic inventory of blank blocks of various sizes and shapes, as well as a pre-placed array of destroyable blocks that players can imbue with their own meanings. This is designed to allow players space to experiment and “play” with the software before they are required to make more refined decisions in later levels (Brandt, 2006). The level introduces the core game mechanic of unanimity—whereby each player must locate their avatar next to the gate in order for the level to be completed once they are satisfied with all changes made to the game map, thus requiring negotiation in order to reach this state.

Figure 91. Level One – Maslow's Palace.

Level Two (Figure 92) is very similar to Level One; however, a new rule is introduced in which each player must construct a house for themselves within the playable space on the game map in order to complete the level. This is intended to introduce a degree of ownership and associated tension to create agonistic space (DiSalvo, 2010) and generate negotiation and cooperation between the players through a pluralistic future lens (Rosenbak, 2019, p. 159).

Figure 92. Level Two – *Maslow's Palace*.

Level Three (Figure 93) builds on the rules of the previous two levels and adds two new features with which players can experiment—new buildings/spaces located in the inventory and dynamic world events to which the players must respond. In this level, in addition to constructing one house per player, players must collectively decide on and construct five buildings or spaces within the game environment chosen from the inventory. Players are provided with a selection of shops, sanitation facilities, hospitals, mosques and parks in addition to the blank blocks available in the previous levels. Dynamic world events in the form of landslides (responding to the frequent landfill landslide events that take place within the selected communities) may be triggered by the game players.

Level Four (Figure 94) builds on the mechanics of Level Three but adds a great degree of editable context in the form of familiar building typologies to provoke players to identify with and discuss controversies and conflicting ideas through the collaborative design exercises (Björgvinsson et al., 2012) and aid grasping of the knowledge values of other participants (Sanders & Dandavate, 1999; Visser, 2009). The level also provides very little open space into which players can build, requiring that they demolish existing context in order to modify the environment. Additional buildings and spaces are also added to the inventory. These include drinking water tank infrastructure, toilets, schools, trees, community meeting halls and markets.

Figure 93. Level Three – Maslow's Palace.

Figure 94. Level Four– Maslow's Palace.

Level Five (Figure 95) represents the most realistic of all five levels. Level Five aids players to “reveal” their perspectives and assumptions through proposing in-game design ideas in order to make positions known through design activities and ideation. It then encourages them to “develop” these through collaboratively clarifying and refining them to allow their translation from abstract formulations to more concrete design concepts. Finally it encourages them to “ground” the construction of concepts that are combinations of various participants’ ideas and experiences into a scenario

that they collectively believe will work, and to use the environment of *Maslow's Palace* to “prototype” design ideas in relation to their real-world experience (Clement & Besselaar, 1993; Iversen et al., 2010, 2012; Kensing, 2003).

In this level, the game map has been carefully designed to integrate a large number of contextual issues from each of the three case study sites. These have all been designed to include familiar urban adjacencies and relationships to which players must respond and have been designed to create a fictionalised speculative representation of all three communities to which participants may respond. In this level players are required to construct a total of 20 buildings—responding to the size and complexity of the level or other game pieces from the inventory—in addition to constructing a house for each player in order to complete the level. This level is also designed to provoke collaboration and discussion by incorporating a basic economy, with all players sharing a collective “bank account” balance representing a resource the use of which they must collectively negotiate. Each inventory building costs an arbitrary amount of 10 rupees, while each demolition costs a further 10 rupees. The inventory in Level 5 is extensive, including all of the building modules from previous levels and the addition of restaurants, walls, cricket pitches, roads, houses, apartments, and recycling plants.

Figure 95. Level Five— *Maslow's Palace*.

4.3.2.3 *Mechanics*

Navigation of the game interface is controlled by computer mouse only to reduce user interface complexity. Player movement is defined by a baked navigation mesh (nav-mesh) constructed through Unity3D's navigation system. Players can direct their characters around this nav-mesh by clicking on the desired area of the map. Inventory items and menus are accessed via mouse click. A turns-based multiplayer mechanic was chosen to allow for cycles of experiencing, reflecting and testing (Jarvis et al., 2003; Kebritchi & Hirumi, 2008).

Through an inventory system, participants are provoked to address and discuss issues such as access to adequate housing stock, water and electricity infrastructure, sanitation facilities, adequate roads and drainage, availability of public and community spaces, health facilities and schools. Players are instructed via in-game prompts (Appendix 2) to construct a home for each player, as well as to design the area around it to incorporate necessary changes, wants and needs. Each level is completed when all players are satisfied with the chosen actions within a particular level by moving their character to a specific area of the map. This mechanic requires players to reach a state of unanimity, argue for their decision preferences and negotiate compromises. It therefore seeks to provoke discussion about differences in norms, values and understandings of social and urban design orientated issues to better understand each other's points of view regarding a range of problems (Iversen et al., 2012; Sanders & Dandavate, 1999).

Employing agonistic and adversarial design theory of DiSalvo, the game purposefully provokes contestation of ideas between participants and acts as a "boundary object" between disparate participants to facilitate finding mutual ground (DiSalvo, 2012). The game functions as a boundary object, as it provides open-ended and ambiguous space to create low fidelity prototypes, and it then invites players to imbue them with meaning potentially unforeseen by designers through in-game role play (Barley, Leonardi, & Bailey, 2012). In line with this view, I loosely defined the narrative of the game, as I hoped to keep the design space as an unstable construct to permit players to offer different interpretations (Doležel, 1998; Malmgren, 1985). A simple in-game economy is designed to allow for the exploration of tensions regarding the allocation of collective resources. Playful game elements such as explosion effects triggered when buildings are deleted are designed to create an element of "fun", while

in-game events such as landslides, designed to mimic the landfill landslide threat within each community, are designed to create tension between players.

Each level follows a similar rule structure in order to orient the collaborative gameplay activities, which is graphically communicated to players. The following built-in game rules are designed to fulfil the necessary conditions for ideation and the negotiation of conflicting perspectives:

1. Participants play in sequence (turns-based). Each player starts their turn by selecting their avatar. Players may have multiple turns per level.
2. Players make modifications to the game map urban environment based on their wants/needs in their (real) community, and the number of houses and other modules required to be placed. This rule is designed to cause a degree of tension amongst the players, as they cannot just move directly to the end of the map to complete the level.
3. Once a player is happy with the changes made to the game environment, they place their character within the exit zone.
4. Once all players' characters are located in the exit zone the level is completed.
5. Players are able to ask questions regarding the game, during the process of play, to the game facilitator.

4.3.2.4 *Aesthetics/Graphics*

As described in section 4.3, the computer game *Maslow's Palace* adopted a low polygon style in order to reduce player confusion regarding the pragmatic viability of in-game design outcomes as well as to reduce development cycle time (Wattanasoontorn, 2013). In line with this style, the game is rendered with minimal use of 3D textures (Gai & Wang, 2016). The scene lighting utilises a mixture of real-time and baked lighting. Baked lighting is used for much of the lighting to create local ambience, rather than fully featured lights, while real-time lighting is kept to a minimum to reduce rendering calculations at run-time (McLaughlin, Smith & Brown, 2010, p. 133).

The game utilises a primary colour based user interface that is designed to be complementary to the low-polygon style in order to create cohesiveness (Gai & Wang, 2016). The user interface is also designed to enhance “playfulness”, which the literature review showed to be conducive to aiding ideation processes (Gordon &

Baldwin-Philippi, 2014a; Poplin, 2012). Player characters are designed to be gender neutral. A player selection menu is designed in order to give players agency over their in-game avatar.

Information and content is presented in *Maslow's Palace* in two ways—graphically and in text form (Figure 96 and Figure 97) (McLaughlin, Smith & Brown, 2010, p. 133). Text information includes in-game instructions, which are given to players in English and Hindi to orient play activities as well as user interface information roll-overs to detail names of entities and costs of in-game items (Bogost, 2007). Text-based instructions also utilised simple graphic design language widely used in public signage for non-text based communication. In cases of low levels of literacy, workshop facilitators can give these instructions verbally. Graphic or three-dimensional information includes spaces, buildings and graphic user interface elements such as inventory items. Images are used where possible on in-game buttons to describe their functionality.

Figure 96. In-game instructions in English and Hindi, *Maslow's Palace*.

Figure 97. In-game instructions in English and Hindi, Maslow's Palace.

Fictional elements are used throughout the game, which operate as defamiliarisation elements or “playful” game entities in line with the game’s framing outlined above. These are primarily located in peripheral areas of the game map in order to dislocate the play experience from reality, in order to create playful or irreverent spaces conducive to the reconceptualisation of values, yet not affect the serious content of the game or the relationships between game entities that are designed to scaffold discourse (Auger, 2013; Iversen et al., 2012).

4.4 Summary

This chapter has presented a range of conflicting perspectives across each of the research contexts in terms of the participants’ perceptions of the communities and what they would like to upgrade in the future. The perspectives identified in the Ghazipur community identified some pressing contextual issues that were important to community members that had consensus, while a range of other issues were identified as being important to only one or a few members. The perspectives identified within the analysis of the Bhalswa data showed that the acute nature of the problems associated with their living situation was indicated through a small range of perspectives at primarily the physiological and safety levels of the needs hierarchy. Those identified with the Shanti Nagar community, which is subject to less acute urban

issues, identified a large range of future upgrading options across the full range of the needs hierarchy.

This analysis and documentation of the research contexts informed the development of 3D game assets as generic entities or site-specific features. References to specific real-world buildings were used to create a perceptual bridge between the digital assets and the player's real-world experience in each case context. A strategy was adopted in which the morphological elements identified for each research context were woven together with issues identified through the interview process, and this configuration was then populated with the 3D digital assets.

The chapter then detailed the operationalisation of the virtual environments, utilising the SPS-UG framework detailed in Chapter Two, into an exemplar SPS-UG through the development of interactive game mechanics, in line with current serious game development practices detailed in Chapter Two, which orientate the collaborative gameplay activities. It detailed the SPS-UG's level progression and its consideration in terms of the SPS-UG framework presented in Chapter Three. This resulted in the computer game *Maslow's Palace* that is designed specifically for the contextual factors identified through the Phase One ethnographic documentation (section 4.2) and to aid both social and design outcomes with design strategies distilled and incorporated from Chapter One.

Next, Chapters Five, Six and Seven will present an analysis of the gameplay workshops that were held with the three case study communities that utilised the SPS-UG approach and method outlined in this chapter and a discussion of the social and design outcomes within each case in line with the research question.

5. Case Study One-Ghazipur

“We made sure that if a few of us placed houses in a specific area that there should be public toilets, parks, restaurants, hospital—all the things to live in a community.”

— (Participant Three, Group Four, Ghazipur Workshops, 2017)

5.1 Introduction

The previous chapters detailed the theoretical underpinnings, the research contexts and the research methods used to operationalise the SPS-UG framework within the development and application of an SPS-UG computer game I designed called “*Maslow’s Palace*”. This chapter reports on the findings of the Ghazipur case study (CS1), which evaluated Maslow’s Palace as a tool and method of participatory design engagement. The chapter details the primary design inquiries and conducts thematic analysis of the pre-test and post-test structured interviews and workshop recordings and observations. This chapter contributes toward:

Aim 4: To develop, implement and reflect on the use of a speculative, participatory, game-based approach to slum-upgrading aid the generation of useful urban upgrading oriented social outcomes and related architectural design slum-upgrading outcomes for disparate stakeholders in marginalised communities, more specifically, dwellers of landfill-oriented slums.

Chapters 5-7 all respond to this Aim 4 focussing on each case study community.

5.1.1 Summary of Case Study One – Ghazipur

This chapter summarises the experience and evaluation of the Phase Three participatory design workshops utilising the SPS-UG approach with the Ghazipur

community in accordance with the methods of data collection and analysis detailed in Chapter Three (Figure 98). To respond to the research question, data was gathered through the coordination and recording of a series of four participatory workshops using *Maslow's Palace*, held with residents of the Ghazipur community in collaboration with the Chintan Environmental Research and Action Group between 8 and 14 November 2017.

Figure 98. CS1 – Ghazipur located within the visual timeline of the research methodology.

The thematic analysis of the workshop data resulted three *socially*-orientated outcomes:

- revealing conflicting perspectives;
- aiding cooperation and understanding;
- dissemination of workshop outcomes and experiences.

The analysis also exposed four examples of *design*-oriented slum-upgrading consensus:

- the importance of housing being in close proximity to the landfill;
- the community problems associated with lack of security of tenure;
- the role of the waste-to-energy plant within the community; and
- the importance of location and use of public spaces and amenities.

Finally, the chapter discusses the role of speculation in aiding the exploration of ideas and conflicting perspectives and the relationship between the speculative and the real and how this relationship can be affected by the actions of the workshop facilitator.

5.2 Case Study: Ghazipur

5.2.1 Aim of the Workshops

The four CS1 participatory design workshops were conducted with the Ghazipur community from 8-14 November 2017. Each aimed to explore, but was not limited to, a range of key slum-upgrading related issues identified by the community during Phase One that were embedded into the design of the game (SPS-UG) *Maslow's Palace*. Specifically, the workshops aimed to aid the Ghazipur participants in upgrading ideation and exploring conflicting upgrading perspectives, with the aid of the Chintan Environmental Research and Action Group, to create solidarity through a recognition of difference via conceiving a plurality of possible futures.

5.2.2 Ghazipur Participants

A total of four participatory design workshops were conducted with the Ghazipur community, involving sixteen participants (four per workshop). The Ghazipur community members were informed of the workshops in advance by the Chintan Environmental Research and Action Group via a series of community meetings. The participants voluntarily attended the workshops, and were not explicitly the same participants as recruited for Phase One—although eight participants who participated in the Phase One initial survey also participated in the Phase Three workshops. The participants who participated were aged between 19 and 40 years old with a mean age of 26.75 years. Due to a number of factors, including the prevalence of addiction for men and other related social issues within the community, all participants were female. The majority (10) of the participants were Muslim migrants to the community from Kolkata, with the remainder arriving from other areas of Delhi (5) or nearby Uttar Pradesh (1). Participants had all resided within the community for between 3 and 22 years, with a mean of 15.8 years.

Although participants involved with the workshops shared a common purpose (slum-upgrading), they all had different motivations and expectations regarding the

project, which were initially discussed as part of a group discussion and welcome session that was held before the workshops. Some participants reported being interested in how they could improve their own home, while others were interested in how the whole community could be upgraded. All participants engaged in the formal or informal recycling sector in some capacity. Twelve participants identified their occupations as waste pickers, two engaged in waste sorting in the informal recycling sector and two were employed in the local waste-to-energy plant. All participants' homes were located in the informal housing cluster adjacent to the recently constructed Delhi metro station located on the Ghazipur District Park site. A table of participant demographics in relationship to their workshop group number is shown below.

Table 22. Demographic information about workshop participants – Ghazipur, Delhi.

Grp. No.	Part. No.	Age	Sex	Digital Literacy	Religion	Year Arrived	Arrived from	Occupation
1	1	30	F	Medium	Muslim	2007	Kolkata	WTE plant worker
1	2	26	F	High	Muslim	1995	Nandiram (West Bengal)	Waste picking
1	3	35	F	Low	Muslim	2002	Loni (Uttar Pradesh)	Waste picking
1	4	40	F	Low	Muslim	2002	Seemapuri (Delhi)	Waste picking
2	1	22	F	Low	Hindu	1997	Khichdhipuri (Delhi)	Waste picking
2	2	20	F	Low	Muslim	1997	Seemapuri (Delhi)	Waste picking
2	3	19	F	Low	Muslim	2014	Jahangirpuri	Housewife
2	4	22	F	Low	Muslim	2007	Kolkata	Waste picking
3	1	40	F	Low	Muslim	1997	Kolkata	Waste picking
3	2	22	F	Low	Muslim	1997	Seemapuri (Delhi)	WTE plant worker
3	3	22	F	Low	Muslim	2007	Kolkata	Housewife
3	4	22	F	Low	Muslim	1997	Kolkata	Waste picking
4	1	24	F	Low	Muslim	1995	Kolkata	Housewife
4	2	25	F	Low	Muslim	2008	Laxmi Nagar (Delhi)	Waste picking
4	3	24	F	Low	Muslim	1997	Kolkata	Waste picking
4	4	22	F	Low	Muslim	1997	Kolkata	WTE plant worker

5.2.3 Workshop preparation process

The Ghazipur workshops were held within the Chintan Environmental Research and Action Group operated school within the Ghazipur community, adjacent to the

landfill, the Delhi metro station and the slum area (Figure 99, Figure 100 and Figure 101).

The Ghazipur workshops were organised and facilitated by three male staff members and one female staff member from Chintan Environmental Research and Action Group. The facilitators were trained in the use of *Maslow's Palace* and its objectives before the workshops, and they were given a specific set of workshop and facilitation instructions to follow (Appendix 3). They were instructed to let the participants play the game by themselves and only provide assistance if a participant specifically asked for help. The sixteen participants were divided into four workshop groups (see Table 22. above). Within these groups the facilitators conducted the pre-test structured interviews (Appendix 4). Upon completion each group played *Maslow's Palace*. Each gameplay session took between 45 and 90 minutes. Upon completion, the facilitators conducted the post-test structured interviews.

Figure 99. Chintan School location of the Ghazipur workshops. November 2017.

Figure 100. Entering the Chintan School, the location of the workshops, Ghaizpur, November 2017.

Figure 101. Participants of the Ghazipur Workshops, November 2017.

The participatory workshop space is diagrammed in Figure 102, below. *Maslow's Palace* was played by the participants on a laptop, which recorded screen capture

footage of the gameplay, with participants sitting on the ground (Figure 103). A digital SLR camera recorded video images the workshop procedure, while the researcher recorded photographs and observations.

Figure 102. Floorplan of workshop space.

Figure 103. Ghazipur Workshop 2 participants playing Maslow's Palace, November 2017.

5.2.4 Findings

A level by level summary of workshop outcomes is provided in Table 23 below. This is followed by findings of the thematic analysis of the workshop data. Firstly, qualitative assessment of *social outcomes*, in terms of slum-upgrading ideation resulting during gameplay is presented (section 5.2.4.1). This is followed by an assessment of slum-upgrading outcomes, in terms of generating consensus around particular *design outcomes* (slum-upgrading ideas) resulting during gameplay is presented (section 5.2.4.2).

Table 23. Maslow's Palace workshop outcomes – Ghazipur.

	Group 1	Group 2	Group 3	Group 4
Level 1	<ul style="list-style-type: none"> • Facilitator Influence Evidence: Facilitator reinforced that the game was for community development purposes. • Disparities in digital literacy resulted in some participants progressing through the game levels at different speeds, and thus resulting in less discussion and collaboration. 	<ul style="list-style-type: none"> • Collective Tinkering (J. E. Innes & Booher, 1999, p. 9) Evidence: Participants built with the abstract blocks for longer than the other groups, taking turns and “designing” with them. • Facilitator reinforced that the game was for community development purposes. 	<ul style="list-style-type: none"> • Collective Tinkering (J. E. Innes & Booher, 1999, p. 9) Evidence: Participants built with the abstract blocks for longer than the other groups, taking turns and “designing” with them. • Collective Tinkering Evidence: Conducted “area cleaning”, which they described as the “removal of waste [the pink blocks] before they could build homes”. 	<ul style="list-style-type: none"> • Collective Tinkering (J. E. Innes & Booher, 1999, p. 9) Evidence: Participants built with the abstract blocks for longer than the other groups, taking turns and “designing” with them.
Level 2	<ul style="list-style-type: none"> • No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> • No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> • Perceptual bridging (Auger, 2012) Evidence: Conducted “area cleaning”, which they described as the “removal of waste [the pink blocks] before they could build homes”. 	<ul style="list-style-type: none"> • No slum-upgrading or social issues were discussed.
Level 3	<ul style="list-style-type: none"> • No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> • No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> • Speculative urban arrangements function as a “diagram” Evidence: The importance of centrally locating public amenities—particularly toilets, hospitals and schools, as well as community meeting buildings and public spaces during game play in Level Two. 	<ul style="list-style-type: none"> • Speculative urban arrangements function as a “diagram” Evidence: The importance of centrally locating public amenities—particularly toilets, hospitals and schools, as well as community meeting buildings and public spaces during game play in Level Two.

Level 4	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed.
Level 5	<ul style="list-style-type: none"> Facilitate collectively creating ideas for the future and communicating a shared understanding of design problems (Agogu�, Levillain, & Hooge, 2015, p. 417). Evidence: The importance of their homes being in close proximity to their place of work for income security, reducing costs and supervising children. 	<ul style="list-style-type: none"> Facilitate collectively creating ideas for the future and communicating a shared understanding of design problems (Agogu�, Levillain, & Hooge, 2015, p. 417). Evidence: The importance of their homes being in close proximity to their place of work for income security, reducing costs and supervising children. 	<ul style="list-style-type: none"> Facilitate collectively creating ideas for the future and communicating a shared understanding of design problems (Agogu�, Levillain, & Hooge, 2015, p. 417). Evidence: The importance of their homes being in close proximity to their place of work for income security, reducing costs and supervising children. 	<ul style="list-style-type: none"> Participants forming a “hybrid-reality” debate Evidence: The importance of their homes being in close proximity to their place of work for income security which was conducive to conflict resolution and consensus building (Boroushaki & Malczewski, 2010).
	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> Revealing conflicting perspectives (Bowen, 2010; Iversen et al., 2012, p. 87; Sanders, 2001). Evidence: Discussed issues of security of tenure and the probability of being evicted from the site in relationship to the development of the new Metro Station. 	<ul style="list-style-type: none"> Revealing conflicting perspectives (Bowen, 2010; Iversen et al., 2012, p. 87; Sanders, 2001). Evidence: the pros/cons of the waste-to-energy plant for the wider community/ generation of livelihood using the game as a “prop” explore each other’s perspectives <ul style="list-style-type: none"> Discussed issues of security of tenure and the probability of being evicted from the site in relationship to the development of the new Metro Station. 	<ul style="list-style-type: none"> Discussing the need for community spaces Revealing conflicting perspectives (Bowen, 2010; Iversen et al., 2012, p. 87; Sanders, 2001). Evidence: Discussed issues of security of tenure and the probability of being evicted from the site in relationship to the development of the new Metro Station/ possibility of moving back to rural villages. <ul style="list-style-type: none"> Demolished the metro station. Suggested action in the form of lobbying local politicians for help in gaining alternative modes of employment and childcare.
Pre-test/Post-test Findings	<ul style="list-style-type: none"> Developing and Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Evidence: Solidarity around access to hospitals 	<ul style="list-style-type: none"> Developing and Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Evidence: Solidarity around access to hospitals 	<ul style="list-style-type: none"> Developing and Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Evidence: Solidarity around housing proximity to landfill <ul style="list-style-type: none"> Solidarity around reducing pollution 	<ul style="list-style-type: none"> Developing and Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Evidence: Solidarity around access schools
Focus Group Findings	<ul style="list-style-type: none"> No discursive findings of note. 	<ul style="list-style-type: none"> No discursive findings of note. 	<ul style="list-style-type: none"> Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Evidence: Gaining further understanding of each other’s perspectives and that 	<ul style="list-style-type: none"> Gameplay was fun for imagining community development (Poplin, 2012).

			<p>the game made them feel comfortable expressing their opinions and development of Social Capital (Björgvinsson, Ehn, & Hillgren, 2010; Hillgren, Seravalli, & Emilson, 2011).</p> <ul style="list-style-type: none"> • Appreciative of the small working groups, as they found it more comfortable to express their opinions (Agogué, Levillain, & Hooge, 2015, p. 417). 	
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5.2.4.1 *Social Outcomes*

5.2.4.1.1 *Revealing Conflicting Perspectives*

In most instances where groups had detailed debate stemming from in-game action, agreement was reached around those issues. This was observed to happen more readily when participants were discussing smaller, more tangible issues such as the placement of public toilets and hospitals or the need for houses to be close to the landfill. The transcript excerpt detailing the interactions of Group Two participants playing Level Four of Maslow's Palace evidences this process below:

Participant Two: "I think we should have houses there [by the landfill]. Better ones than we have now."

Participant One: "Yes, but we need to have no floods. That's how people get sick. So maybe not so close."

Participant Three: "But that is far away from the toilets at Ghazipur. We [the houses] should be closer."

Participant One: "Yes there, I think that is good. This will be better for our Ghazipur".

Participant Three: "Yes, and far from the sorting area."

Participant Two: "Yes, but not far from the landfill."

As the variables that could be introduced surrounding these issues were limited, these spatial discussions were easily defined, and thus the pros and cons are easily weighed by participants, resulting in swift resolution of conflict and negotiation; however, in some cases, even small in-game design decisions provoked urban development-focussed conflict and debate that was not easily negotiated into

consensus—such as when discussing the role of community spaces in Group Four or the merits of the waste-to-energy plant for the wider community in Group Three. Additionally, in many instances, participants’ “biggest urban issues” became orientated towards future action. Before the gaming process, these groups were likely to identify “lack of employment” as the main community issue; however, after the workshop they were more likely to identify specific solutions as a main issue, e.g. “the need to live close to the landfill” or “access to schooling so youth can gain better employment”. The proposal for “potential solutions” may indicate an increase in agency over their situation.

The workshop unearthed some conflicts and differences in opinion within the workshop participants. The primary urban development related conflict of Group Three centred upon the role of the waste-to-energy plant within the community and the tensions it created in different ways for different community members relating to livelihood generation and social and family pressures. This was exhibited within level five. While this stalemate was not resolved by the participants, the exploration using the urban environment of the game as a prop for discussion allowed the participants to explore each other’s perspectives, and incorporate them into their own interpretations of the situation to find common ground.

5.2.4.1.2 Evaluation of participant cooperation and understanding

In focus group sessions held after the workshop, participants of Group Three reported gaining further understanding of each other’s perspectives, and that the game made them feel comfortable expressing their opinions, as they knew other participants would understand their points if they could make them visually.

*“I liked it [Maslow’s Palace]. Could show them [the other participants] where the houses go and what it would be like.”
(Participant Three, Group Three)*

*“It was fun to plan how the community could be.” (Participant Two,
Group Four)*

Of particular note is the increase in detail in which the participants expressed their “main urban issues”, when discussing them after the gameplay process. Post-test, participants were listening to others and incorporating information expressed by others into their own interpretations of situations, as well as making personal discoveries through ideation processes during gameplay. When conflict arose—generally around a more complex issue such as livelihood generation and security—peripheral issues or other facets of the issue were voiced and explored, allowing participants to gain a better understanding of each other’s perspectives through discussion.

Participants exhibited collective learning (Jabbar & Felicia, 2015; Boyle, Connolly, Hainey, & Boyle, 2012; Whitton, 2011) about each other’s positions, which can lead to strengthening of relationships and a building of trust and social capital (Dalisay, Kushin, Yamamoto, Liu, & Skalski, 2015; Molyneux et al., 2015). All groups found common ground around a number of slum-upgrading issues that they thought might be able to work in the future (detailed in Section 5.2.4.2). By seeing the differences and commonalities in a tangible way, visualised and illustrated through the workshop game, participants could take in the information in a different way (visually). Participants of Group Three also noted they were especially appreciative of the small working groups, as they found it more comfortable to express their opinions. The participants also reported on the workshop experience as valuable and enjoyable.

5.2.4.1.3 *Dissemination of workshop outcomes and experiences*

Learning and knowledge produced from the workshops were shared by others beyond the immediate group; Chintan agents reported that participants discussed issues raised during the workshop with them after the workshop. While no follow up actions at the conclusion of the workshops were planned to be conducted by the principal investigator, at the conclusion of the workshop, a copy of *Maslow’s Palace* was given to Chintan Environmental Research and Action Group. Chintan staff expressed their interest in conducting future workshops between themselves and the community members using *Maslow’s Palace*, in order to distil more concrete plans for future action. Similar to the findings of Gordon and Baldwin-Philippi the staff members reported that it was useful to have an entertaining task to do (the game) whilst having development-focussed conversations, because it put everyone at ease (Gordon & Baldwin-Philippi, 2014a). The gaming process also allowed participants to explore

each other's perspectives and highlight points of tension regarding urban development issues, which may help them respond to future scenarios—particularly the threat of forced eviction due to the possible expansion of the metro station. Further workshops using *Maslow's Palace* conducted between the community and other NGOs and politicians in the future, facilitated by Chintan, may help.

219

5.2.4.2 *Slum-Upgrading Outcomes*

The workshop process produced a number of slum-upgrading ideas, as well as agreements and disagreements surrounding urban issues faced by the Ghazipur communities. These included participants exploring importance of housing being in close proximity to the landfill, identifying the community problems associated with lack of security or tenure, debating the role of the waste-to-energy plant within the community and illustrating the importance of location and use of public spaces and amenities.

These are reflected in the pre-test / post-test analysis of the structured interview data shown in Figure 104, below. The analysis indicates some increase in solidarity surrounding access to hospitals, the need for houses to be close to the landfill for income security, the reduction of pollution and access to schools. Similar to the pre-test responses, all groups expressed a large range of perspectives surrounding the desired changes for their environment. The responses were also deductively coded often as physiological, safety and security and belonging, with few esteem and self-actualisation responses.

Figure 104. Pre-test / Post-test analysis of Ghazipur workshop groups. The diagram indicates some consensus building surrounding proximity to the landfill as a main slum-upgrading issue (right) as opposed to a variety of issues being identified before the SPS-UG process (left).

5.2.4.2.1 *The importance of housing being in close proximity to the landfill*

All workshop groups raised the importance of their homes being in close proximity to their place of work—being either in the informal recycling sector or next to the waste-to-energy plant. The most noticeable observation common to all of the Ghazipur workshop groups was that in gameplay, they all located their homes, and other interventions, as close as possible to the landfill (Figure 105). In each group, this was discussed as a direct response to issues of income security, while acknowledging the negative health implications that come with living next to the landfill. All groups noted that the community's access to the solid waste stream is reliant upon their immediate and continued presence within the Ghazipur site.

“If we are evicted, we have no way to earn money... We need to make sure we live close to the landfill and have access to waste... But we need our children to go to school so they do not have to do this dirty work for their children.” (Participant Four, Group Three)

It was also discussed amongst groups two and three that positioning of homes near the landfill cuts down commuting time and costs, as well as the ability to be close to their children, who are often left at home unsupervised—especially for those mothers who work in the waste-to-energy plant, and other community members whom they rely upon for support.

“Living close to landfill ensures the ability to take care of income and children. That's why I built the buildings there. We need to make this place better.” (Participant Two, Group Three)

These discussions indicated that the participants were responding directly to and considering the real-world implications of their in-game decisions. This was reflected in the post-test-interview responses, where after playing the game, participants were more likely to identify proximity to the landfill as a main community issue—indicating some creation of solidarity through a recognition of difference amongst participants.

Figure 105. Workshop Group Three, Ghazipur.

5.2.4.2.2 *The community problems associated with lack of security or tenure*

Participants discussed issues of security of tenure and the probability of being evicted from the site in relationship to the development of the Delhi metro station. This was collectively demolished by the participants of Group Four—with each participant destroying a small part of it and therefore indicating a degree of unanimity (Figure 106), while it was left there and only discussed by the other three groups. None of the groups discussed any advantages of the new metro station for their community, nor any disadvantages of removing it.

Figure 106. Group Four, level five, *Maslow's Palace*. Ghazipur, November 2017. Participants removed the existing metro station, responding to the threat of forced eviction within their community.

In response to this issue, participants of Group Four discussed the possibility of moving back to rural villages if they were forcefully evicted; however, Participant Three noted that this was problematic as many of the rural villages in Uttar Pradesh and West Bengal were in drought and there was no food or work for them if they returned—and thus, such a move would place undue stress on the rural communities.

“We could go back to the village. Some people have already gone after the construction of the metro station.” (Participant Three, Group Four)

“They (Uttar Pradesh and West Bengal) are in drought. There is no rain and there is no food.” (Participant Two, Group Four)

This process indicated that talking about an urban problem within the game can help participants consider alternatives to issues they face that are not necessarily spatial in nature.

5.2.4.2.3 *The role of the waste-to-energy plant within the community*

Groups debated the role of the waste-to-energy plant within the community, as an urban entity that provides a means of livelihood, but also one that causes social strain for some community members—as the plant only employs women due to drug and alcohol issues within the community; however, participants acknowledged that the plant endangers livelihood-generating opportunities for others due to decreased access to solid waste streams for informal recycling. The participants of Group Four suggested action in the form of lobbying local politicians for help in gaining alternative modes of employment. It was also agreed in Group Four that access to child care would reduce strain on working mothers, and it was suggested that Chintan could help with this process. Here participants exhibited collective planning for future actions outside of the workshop. This is a key indication of strong consensus building in Group Four and was provoked by the fictional representation of the community within the game. Here the spatial representation of the waste-to-energy plant within the game served as a marker to provoke discussion surrounding a non-spatial issue, child care. Instead of participants being required to “design” the space around it, they were permitted to merely contemplate its existence, which allowed them to discuss tangential issues to the workshop’s main tasks.

5.2.4.2.4 *The importance of location and use of public spaces and amenities*

Participants in groups three and four highlighted the importance of centrally locating public amenities, particularly toilets, hospitals and schools, as well as community meeting buildings and public spaces during game play in Level Two. Participants in Group Four highlighted the importance of community meeting spaces and orientated their plans around central meeting spaces, such as schools or meeting halls, as this was important to them as central focal points within their community. Other amenities were placed peripherally to these elements to be accessed by all community members (Figure 107).

Figure 107. Group Four, Level Five, *Maslow's Palace*. Ghazipur, November 2017. Participants designing community meeting spaces and public spaces close to their homes and work areas.

In Group Four, participants were observed collectively deliberating in a “hybrid-reality” state (Ylipulli et al., 2017) —where speculative in-game issues and actions were hybridised with real-world issues and actions. The transcript excerpt detailing the interactions of Group Four participants playing Level Four of *Maslow's Palace* evidences this process below:

Participant Two: “We should build the meeting room close to the houses and to work. Over there.”

Participant Three “No.”

Participant One: “No. There is no room for it there. There are all of the houses.”

Participant Three: “But if we build that there, we will have to demolish a house that someone lives in.”

Participant Two: “But we need one.”

Participant One: “But there is already a school there. We should use that. We are in the school now. We could meet here.”

Participant Two: “A meeting hall would be better. Then we can use it when school is underway as well.”

Participant Three: “We could move our houses, and group them together. Then we can make space there for a hall.”

Participant Four: “What if they (the government) tells us to leave? Then we have no houses. That might happen soon.”

Participant Two: “But if we can have meetings then we can plan.”

Participant Four: If I move my house, I cannot afford to build it again. We should use the school.”

Participant One: “Yes that is a good idea.”

Participant Two: “Okay, but we need to make sure that the school is in Ghazipur. By those houses (points). Then we can build the toilets, and all use them.”

Participant Three: “Okay but we should talk to them, to make sure it is okay. The school might not let us.”

Participant One: “Yes.”

Participant Two: “Okay we will do that.”

This exchange between participants was observed to be conducive to conflict resolution and consensus building, allowing participants to introduce more facets of issues—such as community access, forced eviction, real world affordability of options, position in relationship to other needed community spaces and consultation to ensure the proposed spaces (schools) could be used for their intended in-game purpose (community meetings). In this way participants were able to gain a deeper understanding of each other’s perspectives on a number of real-world issues.

5.2.5 The role of “speculation” in aiding the exploration of conflicting perspectives and ideation

The Ghazipur workshops indicated the role of speculation as a tool for provoking discourse and engagement in community design workshops. In line with Innes and Booher (1999), in many of their most productive moments, participants engaged not

only in discussing scenarios, but also in a kind of collective, speculative tinkering—such as destroying typologically-familiar buildings or constructing smaller, less-significant items while other issues were discussed by the group. Similar to the findings of Devisch et al, these heterogeneous actions were sometimes combined with discourse until they created significant development of the scenario that they collectively believe will work or “collective reflection” (Devisch et al., 2016). For example, participants in Group Three spent a substantial amount of time building with the inventory blocks collaboratively during Level One, as opposed to moving quickly through the level as the other three groups did. This enabled participants of this group to take turns designing, sharing experiences and building rapport with one another before moving on to other levels of the game in which they would make more detailed design decisions.

Digital literacy parity allowed some groups to progress to experimentation within the game more evenly, such as groups 2-4, as they learned the game system at similar rates, which opened up new avenues for discussion in earlier levels, as well as increased “collective tinkering” with fictitious and realistic spatial systems conducive to consensus building. Disparities in digital literacy (Mitgutsch & Alvarado, 2012), such as Group One, resulted in some participants progressing through the game levels at different speeds, and thus resulting in less discussion and collaboration. Higher levels of collective tinkering resulted in more ideas being generated, more in-depth conversations and more frequent perceptual bridging—with more real-world issues being raised (e.g. Group Three). Perceptual bridging is a creative act (Auger, 2012, p. 180); therefore, a more relaxed environment is more conducive to higher perceptual bridging, which can lead to a more effective workshop.

In line with the findings of Dindler and Blythe and Wright, fictional elements permitted participants to project metaphorical or real-world issues and personas onto game entities, to enable more clearly defined parameters for discourse—such as someone actually living in an in-game house (Blythe & Wright, 2006; Dindler, 2010b). Speculative urban arrangements of in-game buildings allowed participants to focus on the relationship between buildings and spaces, as opposed to their exact location—allowing the game response to function as a “diagram”, which could interface with traditional participatory design methods and practices. For example, Group Two constructed their homes within the boundary of the landfill within level five to indicate the importance of this proximity (Figure 108).

Figure 108. Group Two, Level Five, *Maslow's Palace*. Ghazipur, November 2017. Constructing housing within the landfill boundary—the in-game outcome functioning as a diagram.

Similar to the findings of Boroushaki and Melczewski, consensus building happened more readily when participants were discussing smaller scale, more tangible issues such as the placement of a toilet—as opposed to issues such as livelihood generation, which resulted in more facets of the issue being revealed rather than consensus being delivered (Boroushaki & Malczewski, 2010). The variables in small scale spatial discussions were more easily defined by the participants, and the pros and cons could be more easily weighed, such as in the example given in Section 5.2.4.2.4 above.

5.2.6 The relationship between the speculative and the real

Throughout the workshops, it became clear the fictional and nonfictional elements within the game were inextricably linked—and that often assumed the same role in the eyes of the participants. Similar to the findings of Dindler (2010b), it may be noted that the participants readily conflated elements from everyday experiences with game elements and transformed them into new configurations that incorporated their own perspectives and those of others (such as projecting real issues onto fictional in-game urban elements). To this end the fluid nature of this state of hybridity created an environment where participants felt comfortable debating urban development issues.

From this state, participants were able to iteratively scaffold arguments and ideas through subsequent levels of realism to help visualise (Billger et al., 2017), reflect (Gordon & Baldwin-Philippi, 2014b) and communicate (Sanders & William, 2002) real-world urban issues to one another.

In some instances, the fictional and nonfictional game elements were discussed in the way in which they had been designed; and in others the participants projected new interpretations and meanings onto them. In doing so, participants formed “perceptual bridges”—or links between their in-game experiences and real world experiences—when responding to both fictional and nonfictional elements and spatial arrangements within the game. For example, during Level One, participants of Group Three conducted “area cleaning”, which they described as the “removal of waste before they could build homes”. Here the participants perceived the pink cubes within the level as “waste” (i.e. actual garbage in their community) and therefore ascribed a nonfictional, metaphorical identity to a fictional game element. In doing so the “perceptual bridge” grounded the speculation through extensional referents and connected it to the temporal world around them. This was also shown multiple times in each group throughout the later levels of gameplay where participants formed perceptual bridges between nonfictional game elements—such as the new metro station or the location of in-game housing with reference to real-world housing.

The introduction of real-world issues to the workshop by participants was also affected by the workshop facilitator. At the beginning of groups one and two, the facilitator explained the game was for community development purposes, which prompted participants to form perceptual bridges between the most abstract levels and real-world issues at an earlier stage, than if they had not been prompted as to the purpose of the game.

*“It is to teach you how to support each other. What it’s teaching you is that when you help each other everything becomes easier”.
(Facilitator, Group One)*

“This is to design a new Ghazipur”. (Facilitator, Group Two)

This instruction by the facilitator allowed participants to begin to discuss urban development issues earlier, and in some cases in more depth, but reduced “collective

tinkering” or playing with fictional elements in earlier levels. This differed from groups three and four, where participants were given no extra instructions by the facilitator outside of the in-game instructions.

Schön (1983) uses the term “problem setting” to stress that design must simultaneously strive to develop as well as address the “problem”. *Maslow’s Palace* helped the participants of the workshops to explore particular design problems within the game, as well as acting as a discursive provocateur to aid participants to raise different attributes of contextual problems. A strength of the speculative approach to urban gaming is, therefore, to provoke discussion surrounding what Holt et al. (1985) term “the imaginative leap beyond what already exists”. The leap, however, is not one of fantasy, but a product of future users exploring how their urban environment could plausibly be. Data generated throughout the gaming process consequently allows for the creation of a “pseudo-ethnography”—one focussed on the “culture” of discussing and identifying urban related avenues for change rather than focussed on tangible outcomes; this emphasis can be invaluable to future pragmatic design and development processes.

5.2.7 Summary

The Ghazipur workshop had many benefits including the rapidity of the workshops, when considering the number of ideas explored by participants in a short time period and benefits such as enjoyment, creativity and engagement for the participants.

One of the main benefits of the gaming process was rapidity of the workshops, when considering the number of ideas explored by participants in a short time period. The workshop permitted a large range of ideas to be explored in reasonable detail. As all group sessions took no more than two hours to complete, this compares favourably with other participatory design techniques dealing with communities of this size and with issues of this scope and complexity. Most participants reported enjoying the workshop and particularly enjoyed being able to show each other their ideas and experiment with ideas as a group (Poplin, 2012)—as opposed to the decisions they make being understood as final.

While the workshop did not produce feasible urban development ideas for the most part, all groups explored urban issues and created a diverse range of responses raised by the game and other workshop participants from the perspectives of built form,

political and economic considerations and social implications—indicating that the game is conducive to provoking a far greater range of urban focussed discourse than simply formal or spatial issues. While there were ordering systems present at the urban scale—such as participants considering proximities of buildings or spaces in relationship to one another as opposed to whether or not individual buildings were beneficial or not by themselves—formal architectural choices within the game remained limited, mainly because of the abstract nature of the game scale in architectural design, even though it was possible for participants to zoom in for more detail. Urban organisation—particularly the relationships between certain urban elements like schools, toilets and places of work—dominated the formal outcomes of the inquiry. Level Four generated no discussion around social or upgrading issues in any of the groups. This was seemed to be in relationship to the limited amount to buildable terrain within the level. Participants seemed to focus more on meeting the game objectives in terms of the required number of buildings, as opposed to experimenting with arrangements.

The workshop created three ideas for action, indicating that the fictional approach may be useful for generating real-world development ideas and may be able to interface with traditional participatory design strategies and processes in a more conventional manner. These included 1) the lobbying of politicians and NGOs for help with access to alternative means of income generation and child support, 2) the exploration of moving back to rural villages due to the threat of forced eviction and 3) the use of a centrally-located school for further meetings to help address community issues; however, only the first and third ideas were universally accepted by the group, as the second was found to be flawed after debate within the workshop group.

6. Case Study 2 – Bhalswa

“We need to live here. There is nowhere for us. We help each other here when it is hard.”

— (Participant Two, Group One, Bhalswa Workshops, 2017)

6.1 Introduction

The previous chapter detailed the research findings of the Ghazipur case study through a thematic analysis of participatory design workshops utilising the SPS-UG approach with the Ghazipur community. This chapter reports on the findings of the Bhalswa case study (CS2), which evaluated *Maslow’s Palace* as a tool and method of participatory design engagement. The chapter details the primary design inquiries and conducts thematic analysis of the pre-test and post-test structured interviews and workshop recordings and observations. This chapter contributes toward:

Aim 4: To develop, implement and reflect on the use of a speculative, participatory, game-based approach to slum-upgrading in order to aid the generation of useful urban slum-upgrading oriented social outcomes and related architectural design slum-upgrading outcomes for disparate stakeholders in marginalised communities, more specifically, dwellers of landfill-oriented slums.

6.1.1 Summary of Case Study Two - Bhalswa

This chapter summarises the experience and evaluation of the Phase Three participatory design workshops utilising the SPS-UG approach with the Bhalswa community in accordance with the methods of data collection and analysis detailed in Chapter Three (). To respond to the research question, data was gathered through the

coordination and recording of a series of four participatory workshops using *Maslow's Palace*, held with residents of the Bhalswa community in Delhi, in collaboration with the Chintan Environmental Research and Action Group between 8 and 14 November 2017.

Figure 109. CS2 – Bhalswa located within the visual timeline of the research methodology.

The thematic analysis of the workshop data revealed three *socially*-orientated outcomes:

- conflict as a generator of creative solutions to problems;
- the benefits of cooperative weighing of pros and cons;
- participants galvanising around matters of concern.

The analysis also revealed three *design*-oriented (slum-upgrading) outcomes:

- the importance of the construction of higher quality housing;
- the importance of access to basic infrastructure;
- the adaption of the digital SPS-UG context to explore ideas.

Finally, the chapter discusses how participants used stories of experiences as a means to explore social and spatial tensions and ideas as well as the challenges of conducting ICT-based participatory design workshops within marginalised communities.

6.2 Case Study: Bhalswa

6.2.1 Aim of the Workshops

The participatory design workshops were conducted with the Bhalswa community between 8 and 14 November. Each aimed to explore, but was not limited to, a range of key slum upgrading-related issues identified by the community during Phase One, which were embedded into the design of the game *Maslow's Palace*. Specifically, the workshops aimed to aid the Bhalswa participants in upgrading ideation and exploring conflicting upgrading perspectives with the Chintan Environmental Research and Action Group to create solidarity through a recognition of difference via conceiving a plurality of possible futures.

6.2.2 Bhalswa Participants

A total of two workshops using *Maslow's Palace* were conducted, comprising four members each. Participants were selected on a voluntary basis by Chintan staff and were not explicitly the same group of participants as recruited for the Phase One analysis stage—although four participants who participated in the initial survey also participated in the workshops. The eight participants who took part in the workshops were recruited by Chintan's local community coordinator in advance. Some participants were waste-pickers affiliated with the local school for waste-picker children; some were those who lived next to the landfill; and some lived in the more formal community on the main road. Any further participants who wished to participate while the workshop was in progress were also welcome to be included in a subsequent group—as many wished to have their voices heard. As the workshop was conducted in a private home, this was difficult to control. Many community members were interested in the workshop and would walk into the room where the workshop was being conducted (see Figure 111). The participants were aged between 25 and 60 years old with a mean age of 35 years of age. Effort was made to recruit an even number of male and female participants; however, due to a number of factors including addiction and other related social issues within the community, all participants but one were female. All participants were Muslim migrants who had migrated to Delhi from Kolkata (5), Shantri Peuk (1), Jhangi Puri (1) or Uttar Pradesh (1). Participants had

lived within the community between 15 and 40 years with a mean of 21.8 years. A table of participants is shown below (Table 24).

Table 24. Demographic information about workshop participants – Bhalswa, Delhi

Grp. No.	Part. No.	Age	Sex	Digital Literacy	Religion	Year Arrived	Arrived from	Occupation
1	1	26	F	Low	Muslim	2002	Shantri Peuk	Waste picking
1	2	25	F	Low	Muslim	2002	Kolkata	Waste picking
1	3	33	F	Low	Muslim	1992	Kolkata	Waste picking
1	4	29	M	Low	Muslim	2002	Kolkata	Waste picking
2	1	42	F	Low	Muslim	2002	Kolkata	Waste picking
2	2	30	F	Low	Muslim	1987	Kolkata	Waste picking
2	3	35	F	Low	Muslim	1997	Uttar Pradesh	Waste picking
2	4	60	F	Low	Muslim	1977	Jhangi Puri	Waste picking

6.2.3 Workshop Preparation Process

The Bhalswa workshops were held within a home Participant Three of Group One next to the landfill (Figure 110 and Figure 111), as this was the only space available within the slum area to conduct the workshop. This was a space in which participants stated they felt comfortable. Although it may have introduced a power imbalance in workshop Group One. However no findings suggest that this was the case.

Figure 110. The location of the Bhalswa workshops. November 2017.

Figure 111. Participants of the Bhalswa Workshops, November 2017.

The Bhalswa workshops were organised and facilitated by six staff members from Chintan Environmental Research and Action Group. The facilitators were trained in the use of *Maslow's Palace* and its objectives before the workshops, and they were given a specific set of workshop and facilitation instructions to follow (Appendix 3). They were instructed to let the participants play the game by themselves and only provide assistance if a participant specifically asked for help. The eight participants were divided into two workshop groups (see Table 24, above). Within these groups the facilitators conducted the pre-test structured interviews (Appendix 4). Upon completion each group played *Maslow's Palace*. Each gameplay session took between 45 and 90 minutes. Upon completion, the facilitators conducted the post-test structured interviews.

The participatory workshop space is shown in Figure 112 and Figure 113 below. *Maslow's Palace* was played by the participants on a laptop, which recorded screen capture footage of the gameplay, with participants sitting on the ground. A digital SLR camera recorded video the workshop procedure, while the researcher recorded photographs and observations.

Figure 112. Floorplan of workshop space.

Figure 113. Bhalswa Workshop 2 participants playing Maslow's Palace, November 2017.

6.2.4 Findings

A level by level summary of workshop outcomes is provided in Table 25 below. This is followed by findings of the thematic analysis of the workshop data. Firstly, qualitative assessment of *social* outcomes, in terms of slum-upgrading ideation resulting during gameplay, is presented (section 6.2.4.1). This is followed by an assessment of slum-upgrading outcomes, in terms of generating consensus around particular *design* outcome slum-upgrading ideas resulting during gameplay (section 6.2.4.2).

Table 25. Maslow's Palace workshop outcomes – Bhalswa

	Group 1	Group 2
Level 1	<ul style="list-style-type: none"> • Facilitator Influence Evidence: The facilitator showed the participants how to move their participants to the end of the level. Each participant did this without experimenting with the game mechanics 	<ul style="list-style-type: none"> • Facilitator Influence Evidence: The facilitator showed the participants how to move their participants to the end of the level. Each participant did this without experimenting with the game mechanics
Level 2	<ul style="list-style-type: none"> • Facilitator Influence Evidence: The facilitator showed the participants how to move their participants to the end of the level and build houses. Each participant did this without experimenting further with the game mechanics 	<ul style="list-style-type: none"> • Facilitator Influence Evidence: The facilitator showed the participants how to move their participants to the end of the level and build houses. Each participant did this without experimenting further with the game mechanics
Level 3	<ul style="list-style-type: none"> • No slum-upgrading or social issues were discussed 	<p>Revealing conflicting perspectives (Bowen, 2010; Iversen et al., 2012, p. 87; Sanders, 2001) and Perceptual bridging (Auger, 2012) Evidence: Discussion of the challenges of waste segregation encroaching on living areas, and that it would be better if this was conducted further from homes</p>
Level 4	<ul style="list-style-type: none"> • Revealing conflicting perspectives (Bowen, 2010; Iversen et al., 2012, p. 87; Sanders, 2001) and perceptual bridging (Auger, 2012) - Evidence: Conflict as a generator of creative solutions. Projecting real-world residents into the game, and using that in combination with the lack of available space to build in-game structures as the parameters of the design problem. Solution: Constructing homes on a hillside • The importance of better water infrastructure 	<ul style="list-style-type: none"> • Revealing conflicting perspectives (Bowen, 2010; Iversen et al., 2012, p. 87; Sanders, 2001). • Evidence: Conflicts regarding positioning of toilets and how the construction of adequate drainage systems should take place in relation to homes. Solution: Constructing a toilet on a series of pylons • The importance of better water infrastructure
Level 5	<ul style="list-style-type: none"> • Perceptual bridging (Auger, 2012) Evidence: The group orientated themselves by exploring the level by pointing out all of the familiar site features to all participants and discussing the value of each in turn. • The importance of housing in proximity to other community members' homes and the landfill • The importance of better water infrastructure • Adapting the digital SPS-UG environment to represent spaces not designed into the game level—such as the 	<ul style="list-style-type: none"> • Perceptual bridging (Auger, 2012) Evidence: The value of housing in close proximity to hospitals • The importance of better water infrastructure • Moving real-world houses in order to construct adequate roads and drainage

	open ground to the north of the community's houses.	
Pre-test/Post-test Findings	<ul style="list-style-type: none"> • Developing and Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Evidence: Solidarity around improved access to drinking water	<ul style="list-style-type: none"> • Developing and Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Evidence: Solidarity around improving housing quality <ul style="list-style-type: none"> • Solidarity around improving drainage systems and roads • Solidarity around gaining access to hospital treatment <ul style="list-style-type: none"> • Creating “meaningful alternatives” (Leong & Iversen, 2015) through collaborative, participatory storytelling (Baumann, Caldwell, Bar, & Stokes, 2018; Baumann et al., 2017). Evidence: Describing the challenges of waste segregation encroaching on living areas
Focus Group Findings	<ul style="list-style-type: none"> • Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Evidence: Participants suggested that exploring ideas in the adapted SPS-UG environment allowed them to understand each other's ideas	<ul style="list-style-type: none"> • Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Evidence: Participants stated that they enjoyed the workshop and the game was useful for communicating ideas to other players.

6.2.4.1 *Social Outcomes*

6.2.4.1.1 *Conflict as a generator of creative solutions to problems*

The introduction of fictional game spaces into debates combined with personal experiences of real world spaces and situations, provided new ways for participants to engage in, as well as back out of, conflict. These novel combinations functioned not only as a way to test potential upgrading ideas but also as ‘agonistic space’, where the participants did not reach consensus surrounding an idea and helped participants explore those ideas. For example, Group One began Level Four with a discussion centred on the existing context presented in the game and the inventory items that were available to the group. Participant One pointed out that there was no available free space in the game environment.

“There is nowhere to build.” (Participant One, Group One)

“We can’t destroy those houses. People live there.” (Participant Four, Group One)

“Well we have to build them somewhere. Maybe we destroy them.”
(Participant Three, Group One)

This moment represented an impasse, where participants were projecting real-world residents into the game, and using that in combination with the lack of available space to build in-game structures as the parameters of the design problem.

Participant Four proposed that houses be built on the hill overlooking the existing development, so that new houses would not be flooded and the existing buildings would not need to be destroyed, adding a further real-world parameter of flooding, which does not exist within the game, to the design problem (Figure 114).

“If we build them up there, there will be less water.” (Participant Four, Group One)

This action was then carried out by Participant Three.

Participant Two stated:

“We can’t get though there. There’s no path. We should build our houses in the valley and make a road.”

Participant Two then built their house in the valley. Participant Three stated the houses were still “*close to work*” indicating the participants were perceiving the hills as the landfill itself. Participant Four suggested:

“We can walk up the hill. It’s better than having water in our houses, and the garbage can fall on us”.

All participants agreed.

Figure 114. *Bhalswa Workshop One, Level Four outcome. Participants' outcome as a result of cooperative weighing of pros and cons of design options, November 2017.*

This example indicates a cooperative weighing of pros and cons. The tension around housing positioning allowed for creative problem solving and an interesting design solution that fostered cooperation. This example demonstrates a “hybrid reality”, where the participants drew design considerations from both the real and speculative game world (Ylipulli et al., 2017). Participants drew on their knowledge of the game and real-world urban problems such as flooding and landfill run-off to arrive at a creative solution to a problem that was found after an impasse was reached. This indicates agency (Ibrahim & Alkire, 2007), consensus building (Boroushaki & Malczewski, 2010) through prototyping (Sanders & Stappers, 2014) and creative thinking.

Expectedly, as participants played through *Maslow's Palace*, they had more discussions surrounding realistic attributes in later levels. Conflicts resulted in participants gaining insights into each other's points of view through discussion centred on in-game actions.

Group Two, for example, faced a number of conflicts within the workshop that centred on the positioning of toilets and how the construction of adequate drainage systems should take place in relation to homes. The participants could not find space within their game level to build toilet facilities. Group Two created a solution to the problem of flooding by constructing a toilet on a series of pylons—after arguing about

participants' houses occupying all of the available space within the game, as exemplified in the exchange below (Figure 115).

"There's no room. Your house is there. We need a toilet as there is none in Bhalswa. Move it." (Participant One, Group Two)

"Why don't we build on the hill? It will be quiet there." (Participant Two, Group Two)

"No. Just move your house. You always think about yourself only." (Participant One, Group Two)

"I'll build one then you build one." (Participant Four, Group Two)

Okay, only if we can also have water there." (Participant One, Group Two)

"See like this, these are steps, we can walk up." (Participant Three, Group Two)

Figure 115. Bhalswa Workshop Two, Level Four outcome. Participants' outcome as a result of a solution to a conflict, November 2017.

6.2.4.1.2 *Galvanising around Matters of Concern*

One attribute highlighted in the data is the similarity between the pre-test and post-test responses to the main urban issues expressed by the participants, shown in below.

Figure 116. Pre-test / post-test analysis of Bhalswa workshop groups. The diagram indicates some solidarity surrounding access to drinking water, the construction of adequate housing, better drainage and access to hospitals.

AFTER MASLOW'S PALACE WORKSHOP

Group One

Group Two

Access to schools
Access to schools
Build a park

Working better together/teamwork
to achieve goals

Better quality housing
Adequate housing
Better quality housing

Stop landslides
Stop flooding
Adequate roading
Road
Access to hospitals
Access to toilets
Access to drinking water
Access to drinking water
Access to drinking water
Better drainage/stop flooding
Adequate roading
Road drainage/flooding
Access to hospitals
Access to hospitals
Access to hospitals
Access to toilets
Access to toilets
Access to drinking water
Access to drinking water

The urban issues that participants identified as most important in both the pre-test and post-test interviews were predominantly located in the physiological and safety and security end of the spectrum, and they were thematically similar, i.e. both workshop groups identified similar issues in both interview rounds, which relate to the acute urban issues faced by the community, such as lack of access to drinking water, lack of drainage to stop rainwater and leachate entering dwellings.

However, post-test interview data suggests that the participants formed some solidarity through the process of completing the workshop activities. For example, while issues such as access to drinking water in workshop Group One, and access to hospitals, better drainage/stopping flooding and the construction of better-quality houses were identified in both pre-test and post-test interviews, there were more common concerns by all participants in post-test interviews.

6.2.4.2 *Slum-upgrading Outcomes*

The workshop process produced a number of ideas, explorations and agreements surrounding urban issues faced by the Bhalswa community detailed in the sections below. These included access to better housing, the construction of adequate drainage systems and access to hospitals and are reflected in the pre-test post-test analysis of the structured interview data shown above in .

6.2.4.2.1 *The construction of higher quality housing*

Both workshop groups raised the importance of housing being in close proximity to the landfill, for both a sense of community—i.e. not being moved to a resettlement colony—and to ensure access to the solid waste stream for livelihood generation. They also highlighted the importance of other community amenities for increasing their quality of life within the community, such as public toilets, hospitals, schools and community meeting spaces such as parks.

“We need to live here. There is nowhere for us. We help each other here when it is hard.” (Participant Two, Group One).

“We need to have hospitals. My child gets sick. He is left at home when I work in the landfill when he is sick, and I cannot look after him. If the hospital was close to home, he could get better and I could earn money for my family doing this work [waste picking].” (Participant Three, Group Two).

Similar to the Ghazipur workshops, at least one member from both groups immediately formed a strong perceptual bridge (Auger, 2013) between Level Five and the real world by pointing out familiar site features unprompted. Group Two initially explored the placement of buildings within the initial field of view of Level Five (Figure 117). The group quickly orientated themselves, with the help of Participant Two stating: *“The houses should be by the landfill”*. Each participant placed their house in turn next to the landfill represented in the level. Participants then began discussing the different inventory items available and their relevance to their community. The discussion was directed by Participant Two, who had control of the mouse, pointing at each of the items in order to read the rollover caption with the help of the facilitator. The participants then discussed the degree to which they wanted those buildings or facilities in their representation of the Bhalswa community within the game. This discussion indicates a high level of perceptual bridging. The participants built roads right next to the housing area they had created—although the roading modules were not placed in a conventional fashion; they were piled on top of one another. This was prioritised and shows a link between their survey results and their actions within the game, as adequate roading was a predominant issue.

Figure 117. Group Two, Level Five, *Maslow's Palace*. Ghazipur, November 2017. Participants designing housing, community meeting spaces and public spaces close to their homes and work areas.

6.2.4.2.2 *Access to basic infrastructure*

One of the most widely discussed topics amongst both workshop groups was the provision of basic infrastructure such as access to safe drinking water and the construction of drainage systems to prevent storm water and leachate from entering dwellings. Access to drinking water was highlighted by participants in both groups in the pre-text and post-test interviews. Participants responded to the need for basic infrastructure in-game by constructing water tanks in both Levels Four and Five. Little discussion surrounded these actions as participants were seemingly in agreement. Likewise, while better quality housing was acknowledged to be important, it was widely accepted amongst participants that inadequate drainage was one of the most pressing concerns the community faced. This concern was highlighted in the pre-text / post-test interviews as well as discussed within both workshop groups. Group Two also discussed during Level Five that houses would need to be moved in order to construct adequate drainage and roading infrastructure. In response to this tension, Group Two explored a range of ideas within the game by clearing an area of the map of buildings and using that area to design new configurations.

6.2.4.2.3 *Adapting the digital SPS-UG context to explore ideas*

During workshop Group One, Participants Two and Four proposed the improvement of the Bhalswa area through the provision of adequate drainage systems instead of just improving housing. Participant Two argued that they liked their houses where they were already, and they “*just needed a better road*” (Participant Two, Group One). This assertion was rejected by participants one and three, arguing that “*we need better houses to keep water out*” (Participant Three, Group One). Participants discussed using the vacant land currently behind their own homes in the real world (Figure 118) as a site for new homes that could have adequate roading and drainage systems built on them away from the landfill edge. As no such space existed within the digital game, participants adapted the digital game environment by collectively clearing buildings from an area of it and exploring ideas for upgrading action through a negotiation of values within this cleared area that represented a real-world space (Figure 119, Figure 120 and Figure 121).

Figure 118. Aerial image showing the undeveloped parcel of land (top, centre) behind the Bhalswa slum community. Image via Google Earth, 2019.

Figure 119. The game environment area that the participants of Group One cleared to explore upgrading ideas.

Although the participants acknowledged that they did not own the land and building houses there would be difficult without consent from the landowner, the participants of Group One revealed during the workshop that exploring the ideas in this space allowed them to understand each other's ideas better. When asked why it was so useful, Participant Two replied:

“Because we can just build things. No one said we couldn’t, so I found out why [Participant Two] wanted to stay” (because of the threat of eviction if they move to someone else’s land). (Participant Two, Group One).

Figure 120. The game map before Group One’s gameplay, Bhalswa, 2017.

Figure 121. The workshop outcome of Group One, Bhalswa, 2017.

In this way, the participants could sketch ideas within the SPS-UG environment and collectively tinker (J. E. Innes & Booher, 1999) with ideas that were provoked by the

game environment, augmented with participants' experiences and stories and refined in the digital environment. This allowed for the participants tacit knowledge—that which cannot readily be expressed in words but can be aided by exploration of ideas—to be revealed.

6.2.5 Challenges with working with the most marginalised

Events within the two Bhalswa workshops highlighted three challenges in conducting digital participatory design workshops with marginalised communities.

The first challenge that was faced in conducting the workshops at Bhalswa related to finding an appropriate workshop location. As the Bhalswa community had no publicly accessible meeting space, it was decided that a participant's home was to be used as the workshop location. Holding the workshop in participant's home resulted in a number of concerns—such as an inability to hold the workshops in a neutral space, where no one participant had more power over that space than others due to its location. These concerns were mitigated to some extent by ensuring that all participants were comfortable taking part within the space beforehand. All reported that they felt comfortable in the space, or that it did not affect the way they interacted within other participants within the workshop. The space also created challenges regarding the conducting of digitally-based participatory workshops in locations with unreliable electricity connections and frequent power cuts. While the power cuts ultimately did not affect the workshops, power cuts did happen frequently throughout both workshops and resulted in the computer's battery taking over, while power was restored. The power cuts did serve as a minor distraction for participants, predominantly due to the loss of lighting within the workshop space. Issues such as these have been recently discussed where Racadio, Rose, & Kolko and Xu & Maitland stress the importance of contingency planning when conducting participatory design activities with low resource communities (Racadio, Rose, & Kolko, 2014; Xu & Maitland, 2019).

A second challenge related to conducting workshops in communities facing a number of acute issues. During the focus group session after workshop Group Two, a community member who was not part of the workshop, entered the workshop room and began talking to one of the participants. It became clear that all of the workshop

participants were very distracted from this point. When asked, the facilitator stated that it was not important, and that the workshop should continue. Soon after, some of the participants began leaving. When asked again, the workshop facilitator stated that a community member had passed away during childbirth. While this event did not affect the workshop results apart from the final focus group session, as the workshop had concluded, it does highlight one of the challenges of conducting workshops with the most marginalised communities. It was clear the participants and the workshop facilitators valued the workshop process, and that they wanted to continue even in the most adverse of circumstances. It was also challenging, as the facilitators, who were also working as translators, filtered workshop information to the researcher in order for the workshop to continue.

The third challenge related to the actions of the workshop facilitators. During workshop Group Two, the facilitator took control of the game for periods of time due to the low levels of digital literacy exhibited within the group. In this workshop, instead of helping the participants navigate the game interface, the participants instructed the facilitator as to what they wanted to enact within the game. This process had two results. Participants would sometimes object to the action proposed before it had been enacted, and the facilitator sometimes influenced in-game actions as exemplified in the exchange between participants and the facilitator below:

“We should build a toilet as close as possible to the houses, so we don’t have to walk so far.” (Participant Two, Group Two)

“No! We need to move all of the houses further away. If we do this, they won’t be flooded. We should move both away for our children.” (Participant Four, Group Two)

“Yes, if you do that, then you won’t get sick. We [Chintan] can help and so can Safai Sena [the local waste pickers collective]. We should put them here.” (Facilitator, Group Two)

While useful conversation took place between the participants, the facilitator was much more a part of the workshops than in Group One that was led by the participants. This resulted in less discussion amongst participants than in Group One and draws

parallels with what Cooke and Kothari describe as “facipulation” (Cooke & Kothari, 2001).

6.2.6 Experiential stories as a means to explore social and spatial tensions and ideas

The discussion amongst participants during gameplay in *Maslow’s Palace* was not guided through pre-determined themes; instead, the participants introduced topics and incidents they found meaningful and the developed these into what Leong and Iversen describe as “meaningful alternatives” (Leong & Iversen, 2015). These were in relationship to the overall focus of the workshop (i.e. slum-upgrading) and in response to the in-game workshop actions by themselves and others to form what Foth and Brynskov describe as meaningful civic engagement (Foth & Brynskov, 2016).

The interactions between participants evolved through collaborative, participatory storytelling (Baumann, Caldwell, Bar, & Stokes, 2018; Baumann et al., 2017) about real world experiences within a “hybrid-reality” (Ylipulli et al., 2017) that was an assemblage of virtual (in-game) and real-world components. The participants in both workshop groups proposed events to add to the “story” that evolved through gameplay, which were created collectively to describe specific real-world situations with reference to the speculative digital world of the game (i.e. a hybrid-reality). An example of this is illustrated in section 6.2.4.1.1 where participants projected real-world people into the game and used those as discursive parameters. In doing so this adaptive narrative framing allowed participants to step in and out of the game and provided each participant with new ways to subvert past legitimacies (Pickersgill, 2017, p. 78; Walton, 1993) and socio-cultural structures (Arnab et al., 2015; Kebritchi & Hirumi, 2008) through actions within “temporary worlds [the game world] within the ordinary world [the real world context of Bhalswa], dedicated to the performance of an act apart [the gameplay]” (Huizinga, 1955, p. 10). In another example, Participant Two of Group Two described the challenges of waste segregation encroaching on living areas, and that it would be better if this was conducted further from homes, in response to landslide debris within Level Three (Figure 123, below).

“We need to move all of the sorting away from homes. Two weeks ago, during the rain, the foil [collected aluminium foil for recycling] was washed through my door. This takes so long [to clean up]. If we

move all of this and make an area for it where it can stay, then we won't have this problem. See like this. Can you remove all of these?" [the participant instructed the facilitator, who had control of the mouse, to delete in-game debris]. "Then make the houses there with no waste. And that [sorting area] can be over there, maybe with containers" (Participant Two, Group Two).

Figure 122. Phase Three research procedure. Bhalswa, Group Two.

In the case study, the effects of telling stories within the Bhalswa groups produced a range of outcomes as described below.

- Participants' personal experiences were embedded within the stories they told or descriptions they gave, such as those that embody the participants' own experiences, and tacit and latent values and needs. Through this process, participants were afforded opportunities to communicate their own insights and supplemental information to the gameplay in an informal manner. This may encourage participants to raise personal or sensitive topics that might otherwise be hard to share in a face-to-face interaction with unfamiliar people, where a power imbalance may be present between participants.
- "Meaningful alternatives" (Leong & Iversen, 2015) for slum-upgrading action were envisioned through the cooperative evolution of stories.
- By envisioning future scenarios or exploring problems through collaborative, participatory storytelling (Baumann et al., 2018, 2017) a continuous interplay between the imagination and facts is enabled.

6.2.7 Summary

As evidenced by the analysis in this chapter, the slum-upgrading challenges faced by the Bhalswa community are acute, but the SPS-UG workshop process provided a number of both *social*-oriented outcomes and *design*-oriented (slum-upgrading) outcomes. In some instances, it helped disparate stakeholders to explore possible futures both within the game and as discourse between participants, and it helped to reconcile conflicting stakeholder perspectives and corresponding goals surrounding social and urban issues.

The social outcomes and the design/slum-upgrading outcomes arising from the Bhalswa workshops were linked by the exploration of conflict (social issues) and which enabled creative solutions to problems. The case study provided new insights into the value of participatory storytelling (Baumann et al., 2018, 2017) about recollections of real-world experiences within a “hybrid-reality” (Ylipulli et al., 2017) which were created collectively to describe specific real-world situations with reference to the speculative digital world of the game. The case study also showed how the SPS-UG process also allowed participants to generate consensus around specific slum-upgrading ideas in some instances and galvanise around broader matters of concern when individual differences were harder to reconcile. The slum-upgrading outcomes were also aided by the participants’ abilities to adapt the game environment of *Maslow’s Palace* to represent spaces that were not originally built into the game, and thus explore ideas that were not considered through the development of the game.

However, while the participants arrived at a number of positive outcomes, the case study highlighted some of the challenges faced in conducting ICT-based participatory workshops with marginalised communities, including finding an appropriate workshop location, adapting processes as required, unforeseen challenges—such as sudden bereavements within the community.

The case study also illustrated the importance of understanding how the facilitator’s actions can affect the interactions between participants, how the participants utilise digital tools and the workshops outcomes—particularly in low-resource communities with low levels of digital literacy.

7. Case Study Three – Shanti Nagar

In the beginning I just wanted to play [Maslow's Palace]. But then I saw the building and how we can change the community and the area. That is what we should do.

— (Participant Four, Group Five).

7.1 Introduction

The previous chapter detailed the research findings of the Ghazipur and Bhalswa case study through a thematic analysis of participatory design workshops utilising the SPS-UG approach with the Ghazipur community. This chapter reports on the findings of the Shanti Nagar case study (**CS3**), which evaluated *Maslow's Palace* as a tool and method of participatory design engagement. The chapter details the primary design inquiries and conducts thematic analysis of the pre-test and post-test structured interviews and workshop recordings and observations. This chapter contributes toward:

Aim 4: To develop, implement and reflect on the use of a speculative, participatory, game-based approach to slum-upgrading in order to aid the generation of useful urban slum-upgrading oriented social outcomes and related architectural design slum-upgrading outcomes for disparate stakeholders in marginalised communities, more specifically, dwellers of landfill-oriented slums.

7.1.1 Summary of Case Study Three – Shanti Nagar

This chapter summarises the experience and evaluation of the Phase Three participatory design workshops utilising the SPS-UG approach with the Shanti Nagar

community in accordance with the methods of data collection and analysis detailed in Chapter Three (Figure 123). To respond to the research question, data was gathered through the coordination and recording of a series of four participatory workshops using *Maslow's Palace*, held with residents of the Shanti Nagar community in collaboration with Apnalaya, a non-profit who work closely with the community, between 16 and 23 November 2017.

Figure 123. CS3 – Shanti Nagar located within the visual timeline of the research methodology.

The thematic analysis of the workshop data revealed two *socially*-orientated outcomes:

- aiding the discussion of sensitive topics;
- helping participants reflect on their workshop experiences in relation to their real-world experience through “recursive engagement” (Teli, Bordin, Blanco, Orabona, & Angeli, 2015).

The analysis also revealed three *design*-oriented (slum-upgrading) outcomes:

- gaining better access to educational institutions;
- decreasing pollution;
- gaining access to higher quality public and recreational spaces.

Finally, the chapter discusses how playful interaction resulted in cooperation between participants, how the SPS-UG process increased some forms of social capital and how this specifically benefitted the youth involved in the workshops and how the

SPS-UG aided “participatory visioning” (McCormick, 2013; Quist & Vergragt, 2006; Ryan, 2013)

7.2 Case Study: Shanti Nagar

7.2.1 Aim of the Workshops

The participatory design workshops were conducted with the Shanti Nagar community between 16 and 23 November 2017. Each aimed to explore, but was not limited to, a range of key slum-upgrading related issues identified by the community during Phase One, which were embedded into the design of the game *Maslow’s Palace*. As shown in Chapter Four, these included issues relating to access to potable drinking water, reducing pollution, increasing educational opportunities and the development of public and recreational spaces. Specifically, the workshops aimed to aid the Shanti Nagar participants in upgrading ideation and exploring conflicting upgrading perspectives with the Apnalaya community to create solidarity through a recognition of difference via conceiving a plurality of possible futures.

7.2.2 Shanti Nagar Participants

A total of five workshops were conducted in Shanti Nagar using *Maslow’s Palace*, involving 20 participants (four per workshop). Most participants were affiliated with Apnalaya in various capacities; however, most had been part of their youth community engagement programme. Some participants were concurrently volunteering with Apnalaya to help them conduct their own research into the hardships faced by the community (such as access to potable water) and so were embedded in development issues faced by the community. Some were involved in youth programmes such as those dealing with domestic violence. Some participants were involved in drama schools in the area, while others had limited or no connection with the organisation. None of the participants were engaged in waste-picking directly, although many of them had family members involved in the practice. Most participants had at least some degree of high school level education. Participants were comprised of a group of youth aged between 16 and 21 years old with a mean age of 17.25 years. All participants were Muslim who had lived in Shanti Nagar since birth. 11 participants were female and 9 were male. Ten of the participants had previously been involved in the Phase

One study. Most participants largely lived close to or within the grid street resettlement area of Shanti Nagar, while some lived close by in the adjoining colonies of Bainganwadi, with two participants living in the slum area of Rafiq Nagar. All of these areas suffer similar issues (such as access to potable water), as they are the least established within the wider community. A table of participants is shown below.

Table 26. Demographic information about workshop participants – Shanti Nagar, Mumbai

Grp. No.	Part. No.	Age	Sex	Digital Literacy	Religion	Year Arrived	Arrived from	Occupation
1	1	21	m	High	Muslim	N/A	N/A	University Student
1	2	21	m	High	Muslim	N/A	N/A	Mechanic
1	3	18	m	High	Muslim	N/A	N/A	Student
1	4	20	m	High	Muslim	N/A	N/A	Dance Instructor
2	1	17	m	High	Hindu	N/A	N/A	Student
2	2	17	m	High	Muslim	N/A	N/A	Student
2	3	16	f	Medium	Muslim	N/A	N/A	Student
2	4	17	m	High	Muslim	N/A	N/A	Student
3	1	16	f	High	Muslim	N/A	N/A	Student
3	2	16	m	High	Muslim	N/A	N/A	Student
3	3	16	m	High	Muslim	N/A	N/A	Student
3	4	16	f	Medium	Muslim	N/A	N/A	Student
4	1	17	f	Medium	Muslim	N/A	N/A	Student
4	2	16	f	Medium	Muslim	N/A	N/A	Student
4	3	17	f	Medium	Muslim	N/A	N/A	Student
4	4	16	f	Medium	Muslim	N/A	N/A	Student
5	1	16	f	Medium	Muslim	N/A	N/A	Student
5	2	19	f	Medium	Muslim	N/A	N/A	Student
5	3	17	f	Medium	Muslim	N/A	N/A	Student
5	4	16	f	Medium	Muslim	N/A	N/A	Student

7.2.3 Workshop Preparation Process

The Shanti Nagar workshops were held within the Apnalaya Community Hall in Shanti Nagar (Figure 124 and Figure 125).

Figure 124. The location of the Shanti Nagar workshops. November 2017.

Figure 125. The Apnalaya Community Hall, Shanti Nagar, Mumbai, December 2017.

The Shanti Nagar workshops were organised and facilitated by three staff members from Apnalaya—two male and two female. These staff members worked closely with the community on a range of community development issues and were therefore familiar to all participants. The facilitators were trained in the use of *Maslow's Palace* and its objectives before the workshops, and they were given a specific set of workshop

and facilitation instructions to follow (Appendix 3). They were instructed to let the participants play the game by themselves and only provide assistance if a participant specifically asked for help. The twenty participants were divided into five workshop groups of four participants each (see Table 22.). Within these groups the facilitators conducted the pre-test structured interviews (Appendix 4), after which each group played *Maslow's Palace*. Each gameplay session took between 45 and 90 minutes. Upon completion, the facilitators conducted the post-test structured interviews.

The participatory workshop space is diagrammed in Figure 126 and shown in Figure 127, below. *Maslow's Palace* was played by the participants on a laptop, which recorded screen capture footage of the gameplay, with participants sitting on the ground. A digital SLR camera recorded video the workshop procedure, while the researcher recorded photographs and observations.

Figure 126. Floorplan of the Shanti Nagar workshop space.

Figure 127. Shanti Nagar Workshop 2 participants playing Maslow's Palace, November 2017.

7.2.4 Findings

A level by level summary of workshop outcomes is provided in Table 27 below. This is followed by findings of the thematic analysis of the workshop data are presented in the sections below. Firstly, qualitative assessment of *social* outcomes, in terms of slum-upgrading ideation resulting during gameplay, is presented (section 7.2.4.1). This is followed by an assessment of *design* (slum-upgrading) outcomes, in terms of generating consensus around particular slum-upgrading ideas resulting during gameplay (section 7.2.4.2).

Table 27. Maslow's Palace workshop outcomes – Shanti Nagar

	Group 1	Group 2	Group 3	Group 4	Group 5
Level 1	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> Collective Tinkering (J. E. Innes & Booher, 1999, p. 9) Evidence: Participants helped each other learn the navigation interface. 	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed.

Level 2	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> Collective Tinkering (J. E. Innes & Booher, 1999, p. 9) Evidence: Participants helped each other learn the inventory interface. 	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed 	<ul style="list-style-type: none"> Collective Tinkering (J. E. Innes & Booher, 1999, p. 9) Evidence: Participants helped each other learn the inventory interface. 	<ul style="list-style-type: none"> Collective Tinkering (J. E. Innes & Booher, 1999, p. 9) Evidence: Participants helped each other learn the inventory interface.
Level 3	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> Revealing conflicting perspectives (Iversen et al., 2012) – and Perceptual bridging (Auger, 2012) Evidence: The importance of better public toilets. <ul style="list-style-type: none"> The importance of mosques 	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed
Level 4	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed 	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed.
Level 5	<ul style="list-style-type: none"> Collective Tinkering (J. E. Innes & Booher, 1999, p. 9) Evidence: Participants spent time demolishing large portions of the map “for fun”, but it restricted in-game financial resources. 	<ul style="list-style-type: none"> Collective Tinkering (J. E. Innes & Booher, 1999, p. 9) and perceptual bridging (Auger, 2012) - Evidence: Development of a cricket pitch. 	<ul style="list-style-type: none"> Collective Tinkering (J. E. Innes & Booher, 1999, p. 9), Revealing conflicting perspectives (Iversen et al., 2012) and perceptual bridging (Auger, 2012) - Evidence: Discussion of LGTBQIA+ rights in relationship to the positioning of toilets within the community. <ul style="list-style-type: none"> The construction of recycling centre in Shivaji Nagar to alleviate pollution. Development of a playground and public spaces. 	<ul style="list-style-type: none"> Collective Tinkering (J. E. Innes & Booher, 1999, p. 9) and perceptual bridging (Auger, 2012) - Evidence: The cricket pitch area could be developed for housing and schools. <ul style="list-style-type: none"> Development of a playground and public spaces Participants spent time trying to walk their avatars into the water and demolishing large portions of the map “for fun”. 	<ul style="list-style-type: none"> Developing and Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Evidence: The workshop group asked to play the level again as they were not satisfied with their outcomes Perceptual bridging (Auger, 2012) - Evidence: Housing needs to be in close proximity to schools.
Pre-test/Post-test Findings	<ul style="list-style-type: none"> Developing and Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Evidence: Reduce solidarity around pollution/area cleanliness. Solidarity around 	<ul style="list-style-type: none"> Developing and Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Evidence: Reduced solidarity around drug problems. Participants identified a large 	<ul style="list-style-type: none"> Developing and Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Evidence: Participants highlighted the need for schools in their community. 	<ul style="list-style-type: none"> Developing and Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Evidence: Participants highlighted the need for schools in their community. 	<ul style="list-style-type: none"> Developing and Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Evidence: Participants highlighted the need for public

	increased access to drinking water.	range of issues in the post-test analysis as being important to them.			spaces in their community.
Focus Group Findings	<p>Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) Playful public participation (Krek, 2008)</p> <p>Evidence: Gaining further understanding of each other's perspectives and that the game made them feel comfortable expressing their opinions and development of social capital.</p> <ul style="list-style-type: none"> Appreciative of the small working groups, as they found it more comfortable to express their opinions. 	<ul style="list-style-type: none"> Developed Social Capital (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) <p>Evidence: <i>Maslow's Palace</i> had increased their interest in technology and community development.</p>	<ul style="list-style-type: none"> Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) <p>Evidence: The workshop also gave participants a sense of purpose in terms of upgrading goals.</p>	<ul style="list-style-type: none"> No slum-upgrading or social issues were discussed. 	<ul style="list-style-type: none"> Grounding Knowledge, Values and Goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) <p>Evidence: Participants also indicated that they valued the SPS-UG participatory process by suggesting more community members should be involved in the workshop.</p> <ul style="list-style-type: none"> Developed Social Capital (Björgvinsson, Ehn, & Hillgren, 2010; Hillgren, Seravalli, & Emilson, 2011). <p>Evidence: <i>Maslow's Palace</i> had increased their interest in technology and community development. Participants also called for more dialogue between themselves and older community members, as well as officials, to further improve learning between different stakeholder groups.</p>

7.2.4.1 Social Outcomes

7.2.4.1.1 Aiding the discussion of sensitive topics

The SPS-UG approach aided participants to discuss sensitive or controversial topics. When conflict arose between participants—often around more complex socio-political issues, such as livelihood generation and security of tenure or the placement of toilets within the community in relationship to gender or LGBTQTIA+ rights—peripheral issues or other facets of the issue were voiced and explored.

For example, debate within workshop Group Three centred on the positioning of toilets within game Level Five. After some discussion with the rest of the group, Participant Four, a single man, proposed building a toilet close to the homes of other participants for convenience of access:

“It will be simpler for each person to reach the toilet” (Participant Four, Group Three).

However, this positioning was rejected by the two female participants within the group. Participant Two stated:

“We should put it in the back of the area, because it won’t look nice near the houses” (Participant Two, Group Three).

After some probing by the two male participants, it was discussed that the underlying reason for wanting the toilet further away was due to the stigma surrounding menstruation. Participants discussed why the stigma exists.

One of the male participants, who identified as homosexual, raised the issue of the prevalence of violence against the LGBTQIA+ community around public toilets. He offered that:

“Toilets should have good views and cameras to catch violence” (Participant Three, Group Three).

“We decided to place the public toilet in the middle, so it would be simpler for each person to reach the toilet, but [P2] said we should place the public toilet at the back of the area because it would not look nice in the middle and because of women’s issues [menstruation]. (Participant Three, Group Three).

All participants of Group Three then agreed to design a park that had good visibility with public toilets as a central component of the composition.

During the focus group discussion after the workshop, participants reported that the workshop made them feel comfortable expressing their positions, as well as enabling

them to understand the perspectives and positions of others that they had not taken into consideration before.

“I didn’t think about it [what I was saying]; I just talked about it. I don’t usually talk about it. That is not good to talk about normally” (Participant Three, Group Three).

“I didn’t know these things happen. I can see how that sort of fighting and bullying is bad for Shivaji Nagar” (Participant Two, Group Three).

7.2.4.1.2 Reflecting through Recursive Engagement

Reflecting on “matters of concern” (Forlano & Mathew, 2014, p. 20) through “recursive engagement” (Teli et al., 2015) in order to link the design activities to wider societal possibilities (Marttila, Botero, & Saad-Sulonen, 2014) helped the groups to widen their perspective on what they are concerned about (Kelty, 2008) and to carefully consider their positions and the positions of others.

After Level Five, the Group Five participants stated that they were not completely happy with their workshop outcome, as some of the design moves that they made within the game meant that they did not have enough in-game resources to action some of their desired changes.

“We were playing. I wasn’t thinking about using the money. Then we ran out” (Participant Two, Group Five).

“We could try things, but we ran out of money. So we need to try again (Participant Four, Group Five).

In this instance, the workshop group asked to play the level again. During the second round of play, participants were observed collaborating more to enact more clearly defined design strategies than in the first round, as can be seen in Figure 128 and Figure 129 below.

Figure 128. Iteration one. Shanti Nagar, Group Five.

Figure 129. Iteration two. Shanti Nagar, Group Five.

This allowed participants to reflect on their past actions and the actions of others. While no additional issues were raised, the recursive process enabled the participants to refine emergent values and translate them into more concrete design ideas. In this way, the participants acted within cycles of “doing and reflecting” or “joint reflection-in-action” (Argyris & Schön, 1978; Büscher et al., 2004; J. E. Innes & Booher, 1999; Polanyi, 1967; Vaajakallio, 2012).

7.2.4.2 *Slum-upgrading Outcomes*

The workshop process produced a number of ideas, explorations and agreements surrounding urban issues by the Shanti Nagar community. These included access to schools, environmental concerns relating to garbage, position/lack of public toilets, access to public spaces, and social issues such as drug and alcohol abuse and their related effects. While the workshop did not produce feasible urban development ideas for the most part, all groups explored urban issues and created a diverse range of

responses raised by the game and other workshop participants from the perspectives of built form, political and economic considerations and social implications detailed in the sections below.

These are reflected in the pre-test and post-test analysis of the structured interview data shown in Figure 130, below. The analysis indicates some solidarity surrounding access to drinking water for all workshop groups and lack of access to public toilets for Group Three. Similar to the pre-test responses, all groups expressed a large range of perspectives surrounding the desired changes for their environment. The responses were also categorised more often as self-actualisation and esteem out of of the Maslow's Hierachy deductive codes, than for those gathered from Ghazipur and Bhalswa which tended to be categorised as physiological or safety and security.

Assessment of Conflicting Perspectives- Shanti Nagar

Figure 130. Pre-test / post-test analysis of the Shanti Nagar workshop groups. The diagram indicates some solidarity surrounding access to drinking water for all workshop groups and lack of access to public toilets for Group Three.

AFTER MASLOW'S PALACE WORKSHOP

Group One

Group Two

Group Three

Group Four

Group Five

to meet friends
friends

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g water
king water

7.2.4.2.1 Access to schools

One of the most widely discussed topics amongst all five workshop groups was the provision of schools within the Shivaji Nagar area, specifically high schools and access to tertiary training. Access to education was highlighted by participants in groups one, four and five in the pre-test / post-test analysis, as well as in the game actions of all five workshop groups. During focus group discussions, participants reiterated the importance of education:

*“We need schools. If we have education then we can help our family”
(Participant Three, Group Three).*

Likewise, while better quality housing was acknowledged to be important, it was widely accepted amongst participants that inadequate drainage was one of the most pressing concerns the community faced, which was highlighted in the pre-test and post-test interviews as well as discussed within both workshop groups. Group Four also discussed that houses would need to be in close proximity to educational institutions. This group suggested that the current cricket pitch area northwest of the site could be used as an area for the development of housing and schools.

7.2.4.2.2 Environmental Concerns Relating to Garbage

One of the most prominent outcomes of the workshop was in relationship to environmental concerns relating to waste. Workshop groups three, four and five discussed the prominence of waste in and around living areas during various game levels. Participants discussed a number of strategies for dealing with this problem. For example, participants in Group Three explored the reduction of housing density and the construction of a recycling centre in their community to alleviate the disposal of waste around housing areas (Figure 131):

“There are so many houses. Between the houses is where the garbage is. If they were apart, it would be cleaner” (Participant Two, Group Three).

“But what are we going to do with the waste? Look outside. There is so much. We need to put it somewhere” (Participant Four, Group Three).

“And where will the people from those houses live?” (Participant Two, Group Three).

“What is this? We could build a recycling centre close by” (Participant Four, Group Three).

Figure 131. Level Three research procedure. Shanti Nagar, Group Three.

During focus group sessions, participants of Group Three highlighted that more recycling within the community would alleviate some of the issues regarding waste disposal:

“When I was playing the game, there was a recycling centre—which is not at all in Govandi [Shivaji Nagar], so I feel there should be a recycling centre in Govandi. A lot of people waste a lot of things—plastics, metals, cups, glasses, clothes—so I feel there should be a recycling centre for the wealth of the community. I didn’t think about that before” (Participant Three, Group Three).

7.2.4.2.3 Access to Public Spaces

One of the most widely discussed topics amongst the workshop groups was gaining access to a range of public spaces. This included the development of a cricket pitch (Group Two) and a playground (Group Three) Group Four combined the development

of public space as a central component to their in-game scheme, and also included housing, waste recycling facilities, access to water and public toilets (Figure 132).

*“We need more trees. They can be for shade. And there we also need access to water. And close to home so we don’t have to walk a long way”
(Participant One, Group Three).*

Figure 132. Level five outcome, Workshop Group Four. Shanti Nagar, Group Three.

These reflected a range of opinions identified by the participants in the pre-test / post-test analysis.

7.2.5 The Role of Playfulness

The SPS-UG approach is a “playful” activity within a certain structure, i.e. the game rules, and resonates with what Krek (2008) terms “playful public participation” (Krek, 2008); however, as noted by Brandt et al. (2008), these structures or rules are not always fixed or followed by participants. In the Shanti Nagar workshops, the participants moulded the rules, as well as the framing of the game as it progressed. Thus, the participants expanded the game world in a number of ways so that there were not only related to making in-game moves or imagining things within the rules of the

game. The participants of Group Four spent time trying to walk their avatars into the water surrounding Level Five, as well as demolishing large portions of the game environment. Participant Two suggested all of the avatars should be “drowned in the water” (Participant Two, Group Four). Participant Two told one of the other participants to get her avatar to push hers into the water—something that is impossible to do within the game.

“Use yours to push me into the water” (Participant Two, Group Four).

“Come on, help me blow this all up” (Participant Two, Group Four).

“If we blow it all up, we can put a zoo with animals” (Participant Two, Group Four).

“Okay I’ll do this bit” (Participant One, Group Four).

“So, the animals go here?” (Participant One, Group Four).

“Yes” (Participant Two, Group Four).

“I’ll build a fence” (Participant Three, Group Four).

“Then we can see them every day” (Participant One, Group Four).

“Yes” (Participant Two, Group Four).

“Lions!” (Participant One, Group Four).

“And fish. Because we’ll all be in the water!” (Participant One, Group Four).

“So, the zoo needs to be there. By the water. We can use this [points to park module in inventory]. The lions go in there” (Participant Two, Group Four).

“But they need water too” (Participant One, Group Four).

When asked during the focus group why she wanted to push her avatar into the water, Participant Two stated that it was because *“it was fun”* (Participant Two, Group Four). This might be due to age being a factor, when compared with the participants of the Ghazipur and Bhalswa workshops who were older.

In another example, Participant One, Group One demolished large portions of the game environment shown in Figure 133. When questioned by the other participants as to why he did this, he said: *“I liked blowing them all up! It was fun”* (Participant One,

Group One). This action resulted in tension with other participants, as Participant One used up all of the available financial resources within the game.

Figure 133. Participant of Group One playing Level Five, Shanti Nagar. Left image via Google Earth, 2019. Right image by author.

The participants were aware that the ideas they developed within *Maslow's Palace* were not realistic, in the sense that they could not be constructed exactly as they were envisioned—or at all; however, the ideas they generated provided the springboard for discussing the qualities of experience that would be desirable. While a zoo in terms of the way it was described in the workshop was not feasible, it was indicative of a desire for more recreation and public space to meet friends. Through this exchange, participants also expressed agency (Ibrahim & Alkire, 2007) over the game system by altering the rules of the game to discuss aspects that they found interesting or enjoyable, which resulted in playful interaction and cooperation. This agency is possibly the result of the participants of the Shanti Nagar workshops having a higher level of digital literacy than participants in the other two groups. This was evidenced by Participant Two, Group One asking: “Do you play *Clash of Clans*?” (Participant One, Group One)—a mobile strategy game—indicating some digital gaming amongst the participants.

Playful actions such as these raise the question of how to interpret the slum-upgrading results of the workshop. Can these results be considered the serious opinions of the participants, or just results of the game? For example, a choice to demolish the majority of the buildings and reconstruct a few typologically unfamiliar spaces could be viewed as the playful approach of a participant trying to test a more extreme

possibility, or it could be classified as their opinion and wish for a solution to the current situation.

7.2.6 Increasing Social Capital through Participatory Gaming

It has been shown throughout this case study how, as a result of processes of infrastructuring—or providing conditions needed for social change and aligning inscribed “norms” (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007) and values across contexts through socio-material negotiations—participants developed various forms of social capital (Björgvinsson et al., 2010; Hillgren et al., 2011). This included the form of new bonds and ties among participants as a result of playful interactions (Narayan, 1999); the “collaborative learning” of the game (Gordon & Baldwin-Philippi, 2014a) such as digital gaming and digital collaboration literacy (DiSalvo, Louw, Coupland, & Steiner, 2009); and capacities such as decision-making, planning and execution (Merkel et al., 2007).

The experience of the SPS-UG workshops showed that a sense of meaningful civic engagement (Foth & Brynskov, 2016) can foster engagement when the participants feel like their efforts can have a positive impact. The workshop also gave participants a sense of purpose in terms of upgrading goals:

“I wish I could live in the game and make my community like that how I want it that easily” (Participant Three, Group Three).

“According to the game with shops and clean streets I want it [Shanti Nagar] to be like that as well” (Participant Four, Group Three).

Participants also indicated that they valued the SPS-UG participatory process by suggesting more community members should be involved in the workshops:

“Can the community play? We should have this here [in the Apnalaya Community Centre] so everyone can use it” (Participant Four, Group Five).

Social capital, as described before, refers to the set of relationships that have developed around shared values, norms and trust (J. Coleman, 1988). The interventions studied here enabled social interactions, fostering the development and strengthening of ties and bonds. In the Shanti Nagar workshops, the approach saw the development of a number of shared values (Leong & Iversen, 2015) amongst disparate participants, e.g., consensus building (Borouhaki & Malczewski, 2010) around issues such as access to school, environmental concerns relating to garbage and access to public spaces.

7.2.7 Digital Participatory Workshops with Marginalised Youth

The Shanti Nagar workshops raised a number of important considerations regarding conducting digital participatory workshops with marginalised youth—as the participant range was between 16 and 21 years of age, which differs from the age groups of the Ghazipur and Bhalswa case studies.

In contrast to the Ghazipur and Bhalswa cases, all participants of the Shanti Nagar workshops exhibited a high level of digital literacy, with most participants owning smartphone devices, as well as many having access to computers through Apnalaya's community centres throughout Shanti Nagar. This aspect undoubtedly resulted in some degree of familiarity with gaming environments. The participants progressed quite quickly through the game levels, but as previously described, they were observed “playing” with the game system, experimenting with its game mechanics and altering its rules during the course of the workshops. This resulted in limited collective learning regarding basic navigation of the game interface, but substantial collaboration and discussion regarding in-game slum-upgrading design.

Two female workshop participants expressed that designing in *Maslow's Palace* had increased their interest in technology and community development, and that they now would like to explore how to make better use of technology for both leisure and skills development.

“This made me want to make a better community.... I liked the computer to show my group my ideas” (Participant Three, Group Two).

“In the beginning I just wanted to play [Maslow’s Palace]. But then I saw the building and how we can change the community and the area. That is what we should do” (Participant Four, Group Five).

Some of the participants also called for more dialogue between themselves and older community members, as well as officials, to further improve learning between different stakeholder groups. Participant Three, Group Five stated during the focus group session:

“We want to do these things, but we can’t build them. We need money and the politicians have the money. We need to talk to them about these things with the community” (Participant Three, Group Five).

7.2.8 SPS-UG Participatory Visioning

Within the Shanti Nagar workshops, the participants speculated on a number of participatory visions (McCormick, 2013; Quist & Vergragt, 2006; Ryan, 2013) of the future. Envisioning these hybrid-realities helped expand the conversation beyond practices of sharing suggestions for in-game actions, to include real-world descriptions of contextual issues, spaces and socio-political factors in which these practices do or could take place—such as those described in sections 7.2.4.1.1.. As cognitive tools, visualisations present working ideas and concepts for personal use, or facilitate a discussion among peers or with external stakeholders.

Overwhelmingly, the visions of the future that the participants described through the workshops were concerned with the way they and others could live in their communities—instead of the buildings or spaces they would want. In order to do this, participants created a range of hybrid-realities that were composed of digital representations of game spaces, as well as verbal recollections of real-world spaces and experiences with people, systems or situations. This type of “participatory visioning” (McCormick, 2013; Quist & Vergragt, 2006; Ryan, 2013) extends the speculation within the game to a variety of actors and practices, and engages directly with conflicts and divergence in processes of imagining future worlds.

7.2.9 Summary

As evidenced by the analysis in this chapter, the slum-upgrading challenges faced by the Shanti Nagar are varied, but the SPS-UG workshop process provided a number of both *social*-oriented outcomes and *design*-oriented (slum-upgrading) outcomes. In some instances, it helped stakeholders explore different perspectives on sensitive topics.

The chapter highlighted that in some instances, due to the level of agency (Ibrahim & Alkire, 2007) the participants expressed over the game system through the workshop, a number of ideas were created for upgrading action, galvanised around “matters of concern” (Forlano & Mathew, 2014, p. 20) including gaining better access to educational institutions, reducing pollution related to living near the landfill and gaining recreational and public spaces for their community. Further, by reflecting on “matters of concern” (ibid) through “recursive engagement” (Teli et al., 2015) in order to link the design activities to wider societal possibilities (Marttila et al., 2014), the SPS-UG allowed some participants to reflect on their past actions and the actions of others, and translate them into more concrete design ideas.

The digital participatory workshops enabled youth to exert agency over the game system by altering the rules of the game to discuss aspects that they found interesting or enjoyable and in some cases to reframe the gameplay for fictional means. While this resulted in playful interaction and cooperation (Gordon & Baldwin-Philippi, 2014a; Krek, 2008) between participants; some of their actions raised questions including the reliability or applicability of the serious opinions of participants, and how such information might be used in terms of design outcomes. This was most likely due younger participants of the Shanti Nagar workshops when compares with the Ghazipur and Bhalswa participants.

The case study also provided new exploratory insights into how the SPS-UG approach can help increase social capital (J. Coleman, 1988) through socio-material negotiations, form bonds and ties among participants as a result of playful interactions (Poplin, 2012), and enhance the development of skills capacities (Devisch et al., 2016), e.g., digital gaming and digital collaboration literacy, such as decision-making and increased participant interest in technology and community development, in some instances.

8. Discussion: SPS-UG as an Enabler of Social and Design Outcomes

“We want to do these things, but we can’t build them. We need money and the politicians have the money. We need to talk to them about these things with the community”

— (Participant Three, Group Five, Shanti Nagar).

8.1 Introduction

This thesis argued that when marginalised communities can confront and explore conflicting perspectives, values, assumptions and goals through negotiation within participatory design processes, their ability to harness the collective intelligence of people to work towards a range of social and design outcomes can be enhanced. The research posited that speculative architecture, which has been predominantly only internally valuable to architectural discourse and largely unexplored as a participatory design strategy, can be orientated to be purposefully public-facing to engage non-expert participants in slum communities in crafting and discussing speculations about their futures. When combined with a participatory, serious gaming approach participatory design tools can be designed to generate social and design outcomes with slum communities.

In this thesis, I have explored how speculative architecture, participatory design and serious gaming approaches can be brought together to enhance *social* outcomes and related *design* (slum-upgrading) outcomes for urban slum dwellers. I detailed a new approach that synthesises strategies derived from a review of speculative architecture, participatory design and serious games into a framework I call Speculative Participatory Serious Urban Gaming or “SPS-UG”, and I explored it in practice through a computer game I designed and tested in three case studies. The three case

studies in urban India, CS1 (Ghazipur, Delhi), CS2 (Bhalswa, Delhi) and CS3 (Shanti Nagar, Mumbai), focussed on how the SPS-UG operationalised as the computer game *Maslow's Palace* might be used to help enhance social outcomes and related slum-upgrading outcomes for members of these slum communities. Each of these case studies provided insights into how the approach can aid an exploration of possible futures, conflicting stakeholder perspectives, and corresponding goals surrounding social and slum-upgrading issues with community members.

The goal of this chapter is to discuss these experiences and findings in relation to the principal research question stated in Chapter One:

Research Question: How can speculative architecture, participatory design and serious gaming approaches be brought together to enhance both *social* outcomes and related *design* (slum-upgrading) outcomes for urban slum dwellers?

A further goal is to discuss these experiences and findings in relation to the literature reviewed in Chapter Two and how they contribute in particular toward Aim 5:

Aim 5: To generate insights, guidelines and recommendations for the future practice of a speculative, participatory, game-based approach in similar contexts.

8.1.1 Summary of the Discussion

This chapter discusses the key components of the principal research question through a critical examination and comparison of the findings detailed in Chapters Five, Six and Seven, in relation to the reviewed literature outlined in Chapter Two, in order to make judgments about the commonalities and differences with existing approaches, and the significance and implications of the findings.

Section 8.2 discusses how the SPS-UG approach contributed to the enhancement of *social* outcomes in each of the research contexts. It compares the findings with current approaches for exploring conflicting participant perspectives and assumptions, and it explores successes and challenges in collectively “revealing” (Bowen, 2010; Iversen et al., 2012, p. 87; Sanders, 2001), “developing” (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) and “grounding” (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) stakeholder knowledge, goals and values.

Section 8.3 discusses how the SPS-UG approach contributed to enhancing engagement with the *design* issues surrounding slum-upgrading by utilising a “tool-to-think-with” (Iversen et al., 2012, p. 97), designed to promote upgrading ideation, frame the consideration of alternate views and possible futures, and scaffold discussions about what the future might look like through visual representation of possible design alternatives. It discusses how the SPS-UG approach facilitated pluralistic slum-upgrading visions of the future as a key instrument to “defamiliarise” (Bell et al., 2005, p. 150) situations—to open up space for thinking about sensitive upgrading topics through “collective tinkering” (Innes & Booher, 1999, p. 9) and “perceptual bridging” (Auger, 2012)—and how these speculations are legitimised by the participants in relation to their real-world experience (Auger, 2012, p. 140; Knutz et al., 2016; Pickersgill, 2017). Finally, it discusses opportunities for the SPS-UG approach and interface with slum-upgrading processes outside of the scope of this research.

Section 8.4 gathers and discusses key methodological insights, discusses the challenges faced when working with communities while pursuing social and slum-upgrading outcomes using the SPS-UG approach, and it explores the successes and challenges of the methods used.

8.2 Enhancing *Social Outcomes* via the SPS-UG approach

The introduction of this thesis discussed how when marginalised communities have the opportunity to confront and explore conflicting perspectives, values, assumptions and goals through negotiation within participatory design processes, the ability to “harness the collective intelligence” of people to work towards collective action can be enhanced (Davis & Garb, 2017, p. 77). Creating a broader understanding of these opportunities amongst stakeholders can help to create a more level playing field when working towards upgrading goals. The upgrading of slum communities requires both social outcomes as well as design outcomes; however, Chapter Two identified a lack of research addressing how *social outcome* and *design outcome* participatory design processes can be explored simultaneously. This thesis investigated how this dual outcome can be encouraged through a speculative, participatory, serious gaming approach.

This section discusses three key interdependent factors that have not previously been brought together in the context of speculative, participatory, serious games,

which have been found to contribute to *social outcomes* through the SPS-UG approach using the computer game *Maslow's Palace*:

1. The SPS-UG helped to draw out participants' knowledge, values and goals by creating temporary worlds and perceptual bridging and facilitating social interaction and collaborative learning (Bowen, 2010; Iversen et al., 2012, p. 87; Sanders, 2001).
2. The SPS-UG helped participants develop knowledge, values and goals by exploring conflicting perspectives and/or building on and/or developing ideas (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007).
3. The SPS-UG encouraged the participants to ground their experiences and reconceive knowledge, values and goals (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007) through bricolage and the collaborative testing of prototypes (Sanders & Stappers, 2014) with reference to the real world within the digital medium of a gaming environment.

8.2.1 Factor 1: Temporary Worlds and Perceptual Bridging

The SPS-UG helped to draw out participants' knowledge, values and goals by creating temporary worlds and perceptual bridging and facilitating social interaction and collaborative learning.

The “temporary worlds” created by the SPS-UG within each workshop allowed the processes and artefacts related to the SPS-UG and the workshop to be less likely to appear to be “owned” by one participant at the expense of others, and they functioned as a catalyst and container for imagination (Baumann et al., 2018, 2017). These temporary worlds ranged from the fictional worlds—for example in Shanti Nagar workshop two, where participants playfully debated wanting a zoo within their community—to hybrid-reality worlds (Ylipulli et al., 2017) composed of speculative digital representations of game spaces as well as verbal recollections of real-world spaces and experiences with people, systems or situations. These types of temporary

worlds were found to be useful for participants to express ideas and desires for their communities in different ways and were facilitated by the digital medium of the serious game that incorporated speculative and participatory features.

Temporary worlds also allowed for the construction of an “agonistic” participatory environment (DiSalvo, 2010). In some cases, this helped participants discuss different views on “matters of concern” (Forlano & Mathew, 2014), while also accepting other views as ‘legitimate’ (Björgvinsson et al., 2012; DiSalvo, 2012)—such as the Ghazipur Group Four participants debating the importance of community meeting spaces, or the Bhalswa Group One debating the lack of available space to develop within the game. These participant understandings are useful for participants to carry into further participatory action either as part of a facilitated project or as a catalyst for bottom up action to enact desired slum-upgrading.

Throughout the SPS-UG process it became clear the speculative and real-world elements within the game were inextricably linked. Similar to the findings of Clarke et al., 2018; Gerber, 2018 and Jones, 2019 in relation to “participatory speculation” using low-fi prototypes, it may be noted that the participants readily conflated elements from everyday experiences with game elements and transformed them into new configurations that incorporated their own perspectives and those of others—such as projecting real issues onto speculative in-game urban elements and arrangements (Clarke et al., 2018; Gerber, 2018; Jones, 2019). To this end the fluid nature of the hybrid-reality created an environment where participants felt comfortable raising, and subsequently debating, urban development issues and to “sketch” (Johansson, 2005, p. 17) future, speculative ideas to illustrate and evaluate current slum-upgrading and social problems their communities face. From this state, participants were able to iteratively scaffold arguments and ideas through subsequent levels of typological familiarity to help visualise, reflect and communicate real-world urban issues to one another. Similar to the findings of Barley, Leonardi, & Bailey, in some instances, the fictional and nonfictional game elements were discussed in relation to the way in which they had been designed, and in others the participants imbued them with new meanings—particularly the basic building blocks within the earlier levels of *Maslow’s Palace* (Barley et al., 2012). This evidences the value of providing participants with “generic” in-game artefacts that they can appropriate as they see fit, as it is impossible to account for all interpretations within the SPS-UG design process.

Most other approaches to urban and slum-upgrading approaches to serious games have focussed on realistic representations of urban spaces and systems. For example, the following all focus on realistic representations: the commercial-off-the-shelf (COTS) game *Cities Skylines* (2016) as applied by Norra Djurgårdstaden, *Block by Block's* serious application of the sandbox videogame *Minecraft* to slum-upgrading and public space development, *YouPlaceIt!* (2018), which utilises a Public Participation Geographic Information System (PPGIS) to enable stakeholders to communicate and resolve specific urban planning issues (Poplin & Vemuri, 2018), and Markopoulou et al. (2018) who utilise a virtual and augmented reality-based approach to serious games in a slum-upgrading context in Mumbai. Other examples, such as *Block'hood* (2017) sourced simulation-based serious game oriented towards ecological urbanism, take a more speculative approach to convince players of a particular message or viewpoint (i.e. a social outcome) and are mostly abstract and not situated within an existing urban condition and so are limited in their ability to generate social outcomes (Markopoulou, Ingrassia, Chronis, & Richard, 2018, p. 226).

Differing from other approaches to urban and slum-upgrading approaches to serious games that focus on realistic representations of urban spaces and systems, my design for Malsow's Palace presented a novel configuration of the three case study contexts that was composited of *parts* (areas such as neighbourhoods or larger areas of a particular land use), *subclasses* (generic buildings or spaces), and *features* (site-specific real-world buildings, spaces and relationships) that provide participants with typologically familiar elements. The intent of this was to "defamiliarise" the research contexts to open up "discursive space" and aid negotiation and critical ideation discussions through a consideration of a plurality of future possibilities (Bell et al., 2005; Lindley et al., 2014, p. 240), as opposed to either just facilitating decisions on spatially orientated slum-upgrading issues, or just generating slum-upgrading social discourse between participants.

The findings showed that this approach was successful in simultaneously generating a range of social outcomes and design-related slum-upgrading outcomes. While this novel configuration could have possibly introduced tensions regarding participant wishes to respond accurately to realistic site representations, interestingly, no tensions were observed during any workshop group from the three case studies relating to rejection of the speculative configuration of the three communities presented within *Maslow's Palace*. This, in combination with the results of the workshops, indicates the

success of the approach of using novel configurations in combination with typologically familiar elements (Auger, 2012, p. 140; Knutz et al., 2016; Pickersgill, 2017) within the SPS-UG environment in order to facilitate social and design-related slum-upgrading outcomes.

The research also showed that the strategy of “perceptual bridging” (Auger, 2013)—i.e. the connections that participants made between entities in the SPS-UG digital environment and the real world, which increased through the levels of gameplay—helped to connect the game experience to the real-world experiences of the participants. This was highlighted through the participants recognising and discussing particular site features within the SPS-UG while also offering extensional real-world referents (such as verbal recollections of spaces and experiences) to construct consistent possible speculations made of both speculative components and real-world referents (Pickersgill, 2017, p. 78). This corresponded to a number of detailed real-world slum-upgrading and socially-oriented discussion topics amongst workshop groups. In line with Coulton et al. and Morschheuser et al., these constructions were seen to have positive leaning and cooperative effects (Coulton et al., 2014; Morschheuser, Riar, et al., 2017).

Participants also formed “perceptual bridges” when responding to both fictional and nonfictional elements and spatial arrangements within the game. For example, during Level One, participants of Ghazipur workshop Group Three conducted “area cleaning”, which they described as the “removal of waste before they could build homes”. Here the participants perceived the abstract pink cubes within the level as “waste”, and therefore they ascribed a nonfictional, metaphorical identity to a fictional game element. Similarly, participants frequently projected personas, uses and identities onto game objects and then used these to form new or additional discursive parameters. For example, participants suggested that the houses within the game belonged to real people on numerous occasions. This aspect became a design consideration for participants in a number of instances, where the real-world implications of their design decisions were considered within the context of the game. Additionally, in many instances, participants exhibited an ability to push metaphorical meanings or extra criteria onto game objects, such as perceiving people not within the workshop as living within the buildings within the game, and thus not demolishing certain generic buildings within the game. Assertions such as these added further discursive considerations to the organisational problems faced by participants of the

workshop. This permitted the participants to have more complex social-oriented and upgrading-oriented discussions.

Perceptual bridging was, however, found to be able to be affected by a number of factors within the workshops. Groups with lower levels of digital literacy—such as CS1 (Ghazipur, Delhi) and CS2 (Bhalswa, Delhi)—experimented more with in-game systems in earlier, less complex levels, while those groups with overall higher levels of digital literacy—such as CS3 (Shanti Nagar, Mumbai)—experimented with in-game systems more in later, more complex levels. Higher levels of digital literacy allowed participants to begin experimenting within the game more quickly, which opened up new avenues for discussion in earlier game levels, as well as increased “collective tinkering” (Innes & Booher, 1999, p. 9) with fictitious and realistic spatial systems. Higher levels of collective tinkering resulted in better conflict resolution, more in-depth conversations and more frequent perceptual bridging—with more real-world issues being raised.

In line with Innes and Booher, the case studies also revealed the importance of ensuring adequate facilitation (J. Innes & Booher, 2010) of the SPS-UG workshop process, as the actions of facilitators can affect the effectiveness of the creation of temporary worlds and perceptual bridging to result in workshop outcomes. The introduction of real-world issues to the workshop by participants was also sometimes affected by the workshop facilitator. In the CS1 (Ghazipur, Delhi) case study, the facilitator explained the game was for community-development purposes to two of the workshop groups, which prompted participants to form perceptual bridges between the most abstract levels and real-world issues at an earlier stage than those groups that had not been prompted as to the purpose of the game. This allowed participants to begin to discuss urban development issues within earlier levels of *Maslow's Palace*, and in some cases in more depth, and as a result reduce the amount of time that participants spent playing with fictional elements or collaboratively learning the game mechanics.

8.2.1.1 *Social Interaction and Collaborative Learning*

Social interactions are essential for the development of social norms and social cohesion (Consolvo, McDonald, & Landay, 2009; Schultz et al., 2007) and are a critical component of community building (Carroll & Rosson, 2013; Hayes, 2011).

Through social interactions members of a community form bonds with other members and build social capital (Dalisay et al., 2015; Molyneux et al., 2015; Putnam, 2000).

The findings suggest that participatory design processes within the SPS-UG workshops were driven by social interaction, as most participants learned together to create, develop, express and evaluate their ideas and visions. It has been shown throughout the case studies that as a result of processes of “infrastructuring”—providing conditions needed for social change and aligning inscribed norms and values across contexts through socio-material negotiations (Björgvinsson et al., 2010; Hillgren et al., 2011)—most participants developed various forms of social capital (Dalisay et al., 2015). As indicated through participant reflection within the workshops, the workshops also gave some participants a sense of purpose in terms of upgrading goals—as detailed in Section 7.2.6. The social interactions between participants, and the resulting discussions, increased some participants’ engagement with the workshop in general, as well as allowing them to establish a “moral proposition” (Iversen et al., 2012, p. 87), as detailed in Section 2.2.2.3, surrounding their ideas, values and goals.

Similar to the findings of Iten & Petko, enjoyment appeared to be a contributing factor to participating engagement and social interaction (Iten & Petko, 2016) within the SPS-UG. This in turn helped to open discursive pathways between participants, allowing them to feel more comfortable raising and exploring ideas. Through playfulness, the participants also expressed agency over the game system by altering the rules of the game to discuss aspects that they found interesting or enjoyable. This resulted in playful interaction and cooperation and in some cases novel ideas for upgrading.

For some groups in CS1 (Ghazipur, Delhi) and CS2 (Bhalswa, Delhi), participants learned to play the SPS-UG at a similar rate, without large differences in learning, because participants shared similarly low levels of digital literacy. This was conducive to the sharing of ideas, as each participant developed a similar level of expertise of the gaming task and created a space of collaboration and inclusiveness. However, the “collaborative learning” of the game (Gordon & Baldwin-Philippi, 2014a) was affected by the participants’ reliance on the workshop facilitator in the CS2 Bhalswa workshops where the facilitator took control of the game for periods of time due to the low levels of digital literacy exhibited within the group. This lessened the possibility of increasing digital collaboration literacy (DiSalvo, Louw, Coupland, & Steiner,

2009) and building capacities such as collaborative decision-making and planning (Merkel et al., 2007).

Conversely, high levels of digital literacy in the CS3 (Shanti Nagar, Mumbai) participants resulted in participants progressing comparatively quickly through the game, as they did not have to help each other learn the basic game interface mechanics. As previously described, participants in some of the CS3 Shanti Nagar workshops were observed “playing” with the game system, experimenting with its game mechanics and altering its rules during the course of the workshops. This resulted in limited collective learning regarding basic navigation of the game interface, but it resulted in substantial collaboration and discussion regarding design. Some of the CS1 Ghazipur workshop groups exhibited disparities in digital literacy, which resulted in some participants progressing through the game levels at different speeds, and thus less discussion and collaboration.

8.2.2 Factor 2: Developing Participants’ Knowledge, Values and Goals

The SPS-UG helped participants develop knowledge, values and goals by exploring conflicting perspectives and/or building on and/or developing ideas.

Once knowledge, values and goals were revealed, the SPS-UG process helped the participants develop these by building on and/or developing ideas and/or exploring conflicting perspectives through reflection and discussion surrounding collaborative design activities. This aided participants in honing their collective preferences and ideas through “participatory speculation” (Clarke et al., 2018; Gerber, 2018; Jones, 2019).

Through this process, the SPS-UG allowed participants to find visual “common language” (S. King et al., 1989) in the form of 3-dimensional representations of design ideas that supported collaboration among participants with different skills and backgrounds, which enabled the refinement of emergent values and the ability to begin translating them towards more concrete design ideas.

As has been shown, “matters of concern” were sometimes contested throughout the SPS-UG process. One aspect of participation, which made confrontation between conflicting perspectives and assumptions inevitable within some of the SPS-UG workshops, is that the participants brought to the workshops their personal beliefs. The SPS-UG facilitated the creation of “negotiating space” (Hillier, 2003; Till, 2005, p.

34), which allowed participants to explore and reframe diverse opinions and aspirations based on their personal beliefs and thus deepen their understanding of the self, others, norms and institutions.

Results suggest that when conflicts arose, peripheral issues or other facets of the issue were voiced and explored, allowing for some participants to gain a better understanding of each other's perspectives through discussion and to develop shared values and norms. This was generally around more complex socio-political issues such as livelihood generation, security or the placement of toilets within the community in relationship to gender or LGBTQIA+ rights as debated within CS3 (Shanti Nagar, Mumbai) workshop Group Three. Integrating speculative processes with the serious game approach to participation was also successful in helping some participants feel comfortable raising and discussing sensitive topics with strangers, as well as engaging in conflict. For example, CS3 (Shanti Nagar, Mumbai) Group Three, Participant Three said during the focus group that it was "important for the participants to talk about and share opinions; otherwise nobody knows why you need something. Participants also noted they were especially appreciative of the small working groups, as they found it more comfortable to express their opinions.

Participants projected personas, uses and identities onto game objects and then used these to form additional discursive parameters. This helped them contextualise the discussions, while the fictional nature of some in-game entities allowed them to distance themselves from the conflict. For example, some participants suggested the idea that the houses within the game belonged to real people, and it would be "bad to destroy someone's house" when deciding when to build a new road (CS3 Participant Two, Group 3). This aspect became a discursive consideration for participants for both social and design discussions, where the real-world implications of their in-game decisions were considered within the context of the game. This added discursive considerations to the organisational problems faced by participants in-game and facilitated more complex discussion.

Through each of these examples, participants explored conflicts in a state of "agonistic pluralism" in "agonistic space" (Section 2.2.4.2), where the different stakeholders do not necessarily reach a consensus surrounding a social or design issue, but rather the SPS-UG revealed some conflicts and agreements, and helped multiple opposing views to co-exist within a common language.

8.2.3 Factor 3: Grounding Participants' Knowledge, Values and Goals through Bricolage

The SPS-UG encouraged the participants to ground their experiences and reconceive knowledge, values and goals through bricolage and the collaborative testing of prototypes with reference to the real world within the digital medium of a gaming environment.

The importance of grounding the workshop experiences in participants' everyday knowledge, values, goals and experience—through bricolage and cycles of reflection and action to create common ground or shared language between participants for future slum-upgrading action—is emphasised in Chapter Two (Brandt, 2006; Brandt & Messeter, 2004; Brandt et al., 2008; Dindler & Iversen, 2007). Aiding stakeholders to question their values and goals and even reconceptualise their original values during the SPS-UG process is a good start, but the values and goals are only grounded when stakeholders can negotiate this new-found conceptualisation successfully within their everyday experience (Iversen et al., 2012, p. 97).

Grounding was achieved in the SPS-UG process through a process of “bricolage”—the construction of concepts that are combinations of various participant ideas and experiences into a scenario that they collectively believe will work—and the negotiation between “blue-sky conceptualising and pragmatic issues of development and implementation” (Büscher et al., 2004) within cycles of “doing and reflecting” (Argyris & Schön, 1978) or “joint reflection-in-action” (J. E. Innes & Booher, 1999). Specifically, the knowledge values and goals of participants were grounded in the users' experiences through creative artefacts produced by the participants during each workshop through “collective tinkering” (Innes & Booher, 1999, p. 9) with matters of concern”.

8.3 Enhancing *Design* (Slum-Upgrading) Outcomes via SPS-UGs

While the SPS-UG approach was successful in generating a range of social outcomes through its speculative, participatory and serious game framing, it was also simultaneously successful in generating a number of design-related slum-upgrading outcomes for the workshop participants. This section discusses two key interdependent

factors that have been found to contribute to *social outcomes* through the SPS-UG approach using the computer game *Maslow's Palace*:

8.3.1 Factor 1: Hybrid-Realities as a Means to Define Design Parameters

As well as being useful in helping participants arrive at social outcomes, the construction of hybrid-realities was particularly useful in helping participants to discuss a range of slum-upgrading ideas composed of speculative digital representations of ideas and real-world suggestions for action.

All workshop groups in each case study explored slum-upgrading issues, created a diverse range of in-game slum-upgrading responses and, in some instances, discussed the practical, socio-political, economic considerations and the implications of each. These findings indicate that the game is conducive to provoking discourse and generating consensus around a range of social as well as design-related slum-upgrading issues that might be used to interface with future slum-upgrading projects.

Participants in each workshop group debated a range of design-related slum-upgrading issues including the importance of housing in close proximity to landfill in relation to income security, strategies for resolving the problems associated with a lack of security of tenure and impending forced eviction, the positive attributes and detrimental effects of infrastructure (such as waste-to-energy plants on livelihood generation) and social tensions and the importance and provision of centrally located public spaces and amenities within communities. These design-related slum-upgrading issues were often deliberated in a “hybrid-reality” by the participants in order to define all of their parameters. For example, CS1 (Ghazipur, Delhi) workshop Group Four debated the role of the waste-to-energy plant within the community when constructing their living areas within *Maslow's Palace*. It was argued that while this plant provides a means of livelihood, it causes social tensions as only women are employed due to drug and alcohol issues within the community, and it also endangers livelihood-generating opportunities for others due to decreased access to solid waste streams for informal recycling.

The hybrid-realities were also composited of verbal recollections within a design context of real-world spaces and experiences with people, systems or situations—such as in Ghazipur Group Four where design considerations are drawn from both the real

and game world regarding the importance of centrally locating public amenities (Section 5.2.4.2.4). These types of temporary worlds were found to be useful for participants to express ideas and desires for their communities in different ways and were facilitated by the digital medium of the serious game that incorporated speculative and participatory features.

The extensional referents of slum-upgrading discussions in some instances resulted in participants suggesting out-of-game actions to improve their current situations. For example, participants in CS1 (Ghaizpur, Delhi) workshop Group Four suggested that lobbying local politicians might help them gain alternative modes of employment, as well as access to childcare to reduce strain on working mothers. Chintan, the facilitating organisation for the CS1 Ghazipur and CS2 Bhalswa workshops in Delhi, is currently helping them work towards these outcomes. Here the SPS-UG approach helped the participants action collective planning for future actions outside of the workshop.

8.3.2 Factor 2: Spaces to Think Within

The findings suggest that *Maslow's Palace* was effective in creating spaces for participants to collectively think within—allowing participants to simultaneously discuss and debate a large number of design orientated issues, develop understanding around sensitive social topics and resolve conflicts through iterative ideation and discussion.

Similar to the findings of Bell, Blythe, & Sengers and Leong & Iversen, if all participants were in agreement about a design situation or idea in the SPS-UG, then they focussed on clarifying and refining values around a “matter or concern” through discussion and trying out different spatial alternatives (Bell et al., 2005; Leong & Iversen, 2015). For example, CS3 (Shanti Nagar, Mumbai) Group Five designed a new residential area that had access to hospitals, schools, toilets and water supply that was centred on a community mosque, through a recursive process.

Through the negotiation of design alternatives—the personal with the social, and the individual with the collective participants’ goals—assumptions and aspirations were revealed through what Till describes as the “political space” of participatory design (Till, 2005, p. 34). Through the “negotiating space” the design processes within

the SPS-UG produced a foundation for examining and reconstructing social and political conditions through design, as well as for imagining the political and social conditions that might be (DiSalvo, 2012, p. 119).

8.4 Methodological Insights into the SPS-UG approach

8.4.1 Evaluation of the Approach

The findings suggest that the approach of integrating speculative, participatory, and serious urban design game approaches for the generation of *social* and *design* (slum-upgrading) outcomes for slum communities has been successful. The qualitative Action Research approach method (Foth & Axup, 2006; Frediani et al., 2011; Groat & Wang, 2002; Pollastri, 2017; Reason & Bradbury, 2001; Sanders, 2008; Silverman, 2015; Swann, 2002) allowed for a deeper understanding of the processes within the SPS-UG workshops, as well as facilitating the collection of data from a range of sources and opportunities for outcomes to be delivered back to the community. It also allowed diverse stakeholders to collaborate; however, these experiences have also revealed a range of challenges that must be considered when working in this way, as well as a number of key limitations of the SPS-UG as it is presented in this research that must be noted. The following sections will discuss key strengths and opportunities, followed by key challenges and limitations.

8.4.2 Key Strengths and Opportunities

First, one of the main strengths of the methods adopted in this research is that by not being overly fixated on producing a “*design outcome*” as part of the participatory workshop, participants’ tacit and latent feelings and values (Bowen, 2010, p. 2; Sanders, 2001) are incorporated into discussion; this is also due to the informal nature of the gameplay. The SPS-UG approach functioned successfully as a tool for capturing and understanding not only explicitly articulated information from participants, but also forms of tacit or experiential knowledge expressed by participants organically throughout the course of the workshop process that align with findings expressed by other researchers (Björgvinsson, Ehn, & Hillgren, 2012; Pollastri, 2017, p. 64). In this way the SPS-UG approach has value as a participatory design “icebreaker”—in a way that does not have any immediate implications based on the actions of participants.

Second, the nature of the data recording—specifically the screen capture software—allows for data to be captured somewhat covertly so participants’ actions are not affected by the recording process. The nature of this data collection, combined with its strength of revealing tacit and latent knowledge through gameplay, was instrumental in helping to create an environment conducive to participants raising and discussing sensitive or controversial ideas, developing preliminary planning proposals and more clearly defining urban problems to interface with future design processes. Data generated throughout the gaming process consequently allows for the creation of a “culture” of discussing and identifying urban related avenues for change rather than focussed on tangible outcomes; this emphasis can be invaluable to future pragmatic design and development processes. Because of these factors, the SPS-UG approach also compared favourably with other participatory planning methods in terms of cost, time and benefits such as enjoyment, creativity and engagement. One of the main benefits of the gaming process was the rapidity of the workshops when considering the number of ideas explored by participants in a short time period.

Third, the Action Research approach allowed for the researcher to establish partnerships to conduct action and research simultaneously, aiding in providing means of community improvement, and fostering change by expanding the collective capabilities of the participants through collective learning and creating some ideas for slum-upgrading action. Following this approach—implementing the SPS-UG framework through the game *Maslow’s Palace* that I designed—the case studies became unique opportunities to enact and evaluate factors that contribute to community engagement with digital approaches to slum-upgrading participation, while addressing both *social* and *design* (slum-upgrading) issues.

8.4.3 Key Challenges and Limitations

While beyond the scope of this investigation, ultimately, the SPS-UG approach aims to introduce the game outcomes directly into the real urban processes they address. The conditions of each context—such as its existing decision-making mechanisms, rules and regulations, or the balance of power between the involved parties—may either support or hinder the link between the play process and the reality that the SPS-UG process aims to influence. In addition, challenges are reflected in internal dynamics such as disparities in digital literacy or imperfect compromises that

result from negotiations. Acknowledging the limitations of the approach is essential for forecasting the possible impact of an SPS-UG as accurately as possible, as well as reducing hindrances it might face in future applications in different contexts.

8.4.3.1 *Limitations of Context and Application*

The research is limited in terms of the stakeholders and actors it engaged. As the focus of this research was to explore how the SPS-UG process might enhance both *social* outcomes and related *design* (slum-upgrading) outcomes for urban slum dwellers, there is scope for further research to explore how these outcomes can be translated from the SPS-UG workshops to a pragmatic slum-upgrading project. The research approach is also limited in terms of the actors that it involved, as it did not include actors such as local government officials, city planners, architects or development agencies.

The thesis explored one example of an SPS-UG within three different landfill-based informal settlements. The results of this research are largely limited to these contexts. While the game is suitable for these three related contexts, the game is context-specific, and therefore might be difficult to use in sites significantly outside of the contexts of the research case studies. The research does, however, highlight the importance of the ethnographic analysis of context (Section 4.2) to ensure that key contextual factors and challenges are understood by the researcher before the SPS-UG design process and that they are sufficiently integrated into the operationalisation of the SPS-UG framework in order to enable the social and slum-upgrading outcomes seen in this research.

8.4.3.2 *Limitations of Methodology*

As discussed in Chapter Three, the Action Research approach usually comprises iterative stages of reflection and action (Foth & Brynskov, 2016). Ideally, the three Phase Three workshops would have been conducted sequentially, with cycles of reflection between each of the case study workshops (the action) so that improvements to the methods and tools used might be made (ibid.). However, because of the location of the case studies and the resourcing limitations related to the international travel component of this research, this was not possible. From a participant perspective, each

workshop was orientated around cycles of reflection and action, as well as reflection and adaptation of methods to the unique research situations within each case. The adaptation of the method limited my ability to develop the processes between cycles, which would have resulted in an iterative SPS-UG design process, where feedback and experiences of each workshop could have been used to inform further SPS-UG developments before subsequent workshops and mitigate some of the other limitations; however, this did not limit the research method's ability to respond to the research question.

The case studies did also uncover some limitations with regards to myself being an outsider to the communities. As the research was conducted via the use of translators, I was not able to understand all conversations that happened within each workshop in real time, as at times, the translators could not keep up with the speed of the workshop conversations. While every effort was made to understand all workshop details, this limited my ability to respond to certain circumstances as a researcher in real-time—such as during CS2 Bhalswa, Delhi workshop Group Two relating to the bereavement of a community member.

The research methodology also resulted in limitations regarding the technical development of the SPS-UG. Due to the resources available to me as a PhD researcher, I needed to undertake the ethnographic documentation and analysis as well as the SPS-UG development myself to reduce the cost of the development. However, this resulted in a substantial investment in terms of time. This interoperation may be a limitation for others looking to utilise the SPS-UG approach to develop their own games. As discussed in Chapter Two, this is the reason that many look to utilise an approach to participatory design and slum-upgrading that repurposes commercial-off-the-shelf (COTS) games such as *Minecraft* or *Cities Skylines* as a cost- and time-saving strategy. However as Poplin and Ulrich and Henrik-Helms argue, COTS games are hindered by the fact that they are designed for entertainment—not participatory design processes (Poplin, 2011; Ulrich & Henrik-Helms, 2017). Their use has been shown to confuse players involved in the participatory process and also rely on a combination of verbal or written external workshop instructions provided by a facilitator to structure the gameplay activities, which can lead to negative issues regarding clarity of instruction (Ibid). Further, while incorporating appropriate parts of the SPS-UG framework into the use of COTS game might have some benefits such as resource savings, the results of this research is limited to conducting the three SPS-UG phases in full.

8.4.3.3 *Bridging the Gap Between Priming and Generating Slum-Upgrading*

As introduced in Chapter One, this research explores specifically how the SPS-UG approach can *prime* participants for a slum-upgrading process by enabling an exploration of possible futures, conflicting stakeholder perspectives, and corresponding goals surrounding social, architectural and urban issues. While each case study did result in a number of social and design-related slum-upgrading outcomes, this limitation in scope raises the question of how outcomes achieved through the SPS-UG workshops might be later translated into implementable, slum-upgrading outcomes or be used to evaluate design outcomes.

The question of who takes responsibility for the eventual outcome of a slum-upgrading project and its implementation can be problematic for collaborative creative processes, especially in relation to some of the risks involved in a slum-upgrading process, such as social inequality, funding, safety and hygiene considerations, and a broad range of other social, material and political uncertainties. Conventionally, the local and national governments, sometimes together with development organisations and communities, take on the responsibility of slum-upgrading. Including these actors in the slum-upgrading process is important, but as discussed in Chapter Two, it raises questions regarding how to navigate the control of “expert” participants, such as design professionals or politicians, in order to include them in the SPS-UG process to facilitate ‘genuine’ participation by all stakeholders and ensure positive outcomes (K. Bødker et al., 2004).

Including expert actors in order to bridge the gap between priming and slum-upgrading projects also raises questions regarding biases in facilitating the SPS-UG process when considering how SPS-UGs might be developed or facilitated by range of external stakeholders with various slum-upgrading agendas. As with the use of any participatory design tool, there is the danger of biases (Holden et al., 2014; Kalir, Fahy, Kupperman, Schiff, & Stanzler, 2018)—symptomatic of the various ambitions of those involved in the slum-upgrading project—to infiltrate the SPS-UG development process. These might include the SPS-UG designer privileging certain development outcomes through its design, or disproportionately including certain stakeholders’ opinions that were gathered through the ethnographic documentation and analysis phase in its design. Care must also be taken to ensure the minimisation of biases from

the point of view of the workshop facilitators—such as privileging one participant’s voice over another—as well as from the point of view of analysis—such as privileging one workshop outcome over another. This is especially important when attempting to bridge the gap between the SPS-UG process and implementing slum-upgrading projects.

The SPS-UG process is a form of design participation intended to be applied at an early stage to slum-upgrading projects. During SPS-UG gameplay, participants construct speculative digital models orientated towards future slum-upgrading projects. As pointed out by Hayes, it is important to manage the expectations of the workshop participants in terms of the pragmatic viability of these in-game models (Hayes, 2011) by enabling transparency from the beginning, making sure participants are aware of the limitations of the outcomes achieved within a workshop. In line with the findings of von Heland et al., ensuring that participants know what the next steps are after the SPS-UG process is important to reduce the possibility of confusion, disappointment and tension amongst participants and project facilitators (von Heland et al., 2015).

As highlighted in Chapter Seven, the playful actions observed during participatory workshops raise the question of how to interpret the implications for slum-upgrading and how these observations and outcome might be used. Can these results be considered the serious opinions of the participants or just results of the game? For example, a choice of the demolition of the majority of the buildings and reconstruction of a few typologically unfamiliar spaces could be viewed as the playful approach of a participant trying to test a more extreme possibility or classified as their opinion and wish for a solution to the current situation. One possible solution would be an option at the end of play that gives the participant the possibility of marking the result as actual intent or playful possibility in order to provide clarity within the data analysis process and ensure more accurate translation of the SPS-UG outcomes to future slum-upgrading projects.

8.5 Summary

This chapter has presented a discussion of the methodological approach adopted in the thesis within the context of the research results. In summary, the SPS-UG approach explored through Action Research has provided successful methods to investigate

three case studies where different urban informal settlement communities in India engaged in the SPS-UG workshops.

The strengths of the method have been discussed in terms of having helped participants to gain opportunities to achieve familiarity with other stakeholders' knowledge, values and goals relating to slum-upgrading in each community through a novel speculative framing of real-world issues and to develop ideas for future design-related slum-upgrading action and ease of data collection, when compared with other participatory planning methods in terms of cost, time and benefits, such as enjoyment, creativity and engagement.

However, there have also been challenges and limitations, such as the limitations of context and application, how the gap between priming activities and real-world project implementation might be bridged, issues of accountability regarding the project implementation, managing participant expectations and potential bias when developing and implementing the SPS-UG approach.

Next, Chapter Nine will answer the research question, outline the implications of the research contributions for architecture and outline areas for future research.

9. Conclusion

The primary motivation driving this research was to explore the potentials of combining speculative architecture, participatory design, and serious gaming as a means to enhance both social outcomes and design-related slum upgrading outcomes for urban informal settlement dwellers.

This thesis has reinforced previous studies that show that when marginalised communities can confront and explore conflicting perspectives, values, assumptions and goals through negotiation within participatory design processes, the ability to harness the collective intelligence of people to work towards collective action can be enhanced. In this thesis, I have explored how speculative architecture, participatory design and serious gaming approaches can be brought together to enhance opportunities for both *social* outcomes and related *design* (slum-upgrading) outcomes for urban slum dwellers. I detailed a new approach that synthesises these three fields into a framework I call Speculative Participatory Serious Urban Gaming or “SPS-UG”, and I explored it in practice through a computer game “Maslow’s Palace” that I designed and tested in three case studies. The three case studies, CS1 (Ghazipur, Delhi), CS2 (Bhalswa, Delhi) and CS3 (Shanti Nagar, Mumbai), focussed on how the SPS-UG operationalised as Maslow’s Palace might be used to help enhance social outcomes and related slum-upgrading outcomes for members of the communities.

The discussion of the research findings indicates that participants can be stimulated by the SPS-UG approach to share diverse opinions and aspirations and thus deepen their understanding of self, others, norms and institutions. I posit that the SPS-UG can function as a catalyst for the transformation of physical urban environments and socio-cultural contexts.

This chapter concludes the thesis by answering the research question, outlining the implications of the research contributions and outlining areas for future research.

9.1 Reflection on the Research Questions

The research was guided by one primary research question:

Research Question: How can speculative architecture, participatory design and serious gaming approaches be brought together to enhance both *social* outcomes and related *design* (slum-upgrading) outcomes for urban slum dwellers?

Because the research question implicates a synthesis of three bodies of literature, it was important to pose five research Aims:

Aim 1: To identify how “speculative architecture” has enabled an exploration of possible futures, conflicting stakeholder perspectives, and corresponding goals surrounding social, architectural and urban issues.

Aim 2: To document how “participatory design” has enabled an exploration of possible futures, conflicting stakeholder perspectives, and corresponding goals surrounding social, architectural and urban issues.

Aim 3: To question how “serious games” have enabled an exploration of possible futures, conflicting stakeholder perspectives, and corresponding goals surrounding social, architectural and urban issues.

Aim 4: To develop, implement and reflect on the use of a speculative, participatory, game-based approach to slum-upgrading in order to aid the generation of useful urban slum-upgrading oriented social outcomes and related architectural design slum-upgrading outcomes for disparate stakeholders in marginalised communities, more specifically, dwellers of landfill-oriented slums.

Aim 5: To generate insights, guidelines and recommendations for the future practice of a speculative, participatory, game-based approach in similar contexts.

This thesis has answered the Research Question and responded to the Aims by making several original contributions.

- 1) This thesis contributes an original Speculative, Participatory, Serious, Urban Gaming (SPS-UG) framework for the design and orchestration of “priming” participatory design workshops that help participants arrive at a range of social and slum-upgrading outcomes. This framework is constructed from a review of speculative architecture, participatory design and serious games literature. Each review contributes a number of strategies that have been utilised by other researchers when exploring different approaches—for example at the intersection of participatory design and speculative architecture in a non-serious games context. In particular, the framework shows how speculative architecture, which has been predominantly internally valuable to architectural discourse, can be purposefully public-facing and engage non-expert participants in slum communities in crafting and discussing speculations about their futures. The framework shows how participatory design tools can be used to generate social and design outcomes and extends the serious games literature by showing how in-game visualisations create a “common language” between participants to discuss values, assumptions and goals. The research discussion contributes recommendations and guidance stemming from the analysis of experiences of implementing the framework in three contexts. The framework can be implemented by a range of community groups and organisations to guide and scaffold participatory processes. As shown in Chapters Five, Six and Seven, the three case studies themselves resulted in a number of positive social and design-related slum-upgrading outcomes for the communities of Ghazipur, Bhalswa and Shanti Nagar. The SPS-UG approach’s success is evidenced in part by the ongoing use of Maslow’s Palace as a participatory communication tool by the Chintan Environmental Research and Action Group with the Ghazipur and Bhalswa communities in Delhi and by Apnalaya with the Shanti Nagar community.
- 2) The research unpacks and extends a set of definitions and themes that contributes to discourse about “participatory speculation”. The research extends and refines the concept of “perceptual bridging” that I adopted from the speculative design literature by showing how the concept can be used to

describe the connections that participants made between speculative entities in the SPS-UG digital environment and the real world.

- 3) The research extends the concept of “temporary worlds” through the definition of “hybrid-realities” composed of speculative digital representations of game spaces, as well as verbal recollections of real-world spaces and experiences with people, systems or situations through the process of “perceptual bridging”. The research showed how the temporary worlds within the SPS-UG game space can help the participatory processes to be less likely to appear to be “owned” by one participant at the expense of others and function as a catalyst and container for imagination to aid both social and design-related slum-upgrading outcomes amongst participants of the SPS-UG workshops and scaffold discussions about what the future might look like through visual representation of possible design alternatives.
- 4) The research contributes to discourse by gathering and discussing key methodological insights relating to the implementation of the SPS-UG framework, the challenges faced when working with communities while pursuing social and slum-upgrading outcomes whilst exploring the SPS-UG approach, and the successes and challenges of various methods used in the different contexts detailed within this thesis.

Taken together, these findings serve as a foundation for future studies in participatory slum-upgrading that is concerned with the transformative power of participatory speculation within serious games. The investigations documented through this thesis advance the research and practice of participatory slum-upgrading, speculative architecture, participatory design and serious games beyond the boundary of current knowledge. The results of this research might be applied within a number of fields including architecture and urban design, slum-upgrading and development studies, speculative design and games studies.

9.1 Recommendations for Future Research

The findings in this thesis suggest a number of potential future research directions: expanding the SPS-UG framework, developing common platforms, and developing tools for workshop documentation and analysis systems.

9.1.1 Expanding the SPS-UG Framework

This thesis has contributed a methodological and strategic framework for Speculative, Participatory, Serious Urban Gaming. While the framework has been successfully applied in the Ghazipur, Bhalswa and Shanti Nagar communities, there is an opportunity to further validate the framework by testing it in the context of different communities and social contexts. Some further research questions arising from this thesis include:

- How can the SPS-UG approach be used to engage local government or other design professionals with local communities?
- What is the optimal number of participants that could be involved in each phase?
- How best can groups using the approach share learning experiences and evidence between projects?
- How might a common game platform be developed that can be used in most slum-upgrading applications?
- What is the optimal way for the priming exercise to bridge into slum-upgrading action?
- How can the SPS-UG framework be used to create template-based game editors to reduce the design time and expertise needed to develop an SPS-UG?
- How might analysis and documentation tools be embedded into SPS-UG design?

The Shanti Nagar community in coordination with Apnalaya continued to apply the SPS-UG approach within their community centres to facilitate ongoing slum-upgrading discussions after the field studies had been completed. This creates an opportunity to investigate how the communities galvanise around the approach and matters of concern over a longer time. Research on these new instantiations of the SPS-UG approach may help to further address some of the questions raised.

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APPENDIX 1

Phase One: Maslow's Palace Workshops

Understanding Conflicting Perspective on Slum-Upgrading Issues

INTERVIEW QUESTIONS

Age:

Gender:

Religious affiliation:

How long have you lived in Ghazipur/Bhalswa/ Shanti Nagar?

If you have lived elsewhere please specify where and when:

Primary daily activity (please circle): work/school/other

If work what type of work:

Site Specific/Amenity

Identify three spaces in Ghazipur/Bhalswa/Shanti Nagar you spend the most time in. (Prompt) Where do you play, meet friends, do other activities etc? (Number 1,2,3 and locate on the map provided).

What do you like about those spaces? (open ended)

What do you dislike about those spaces? (open ended)

What are the main problems associated with living in Ghazipur/Bhalswa/Shanti Nagar?

If you could change three things about Ghazipur/Shanti Nagar what would they be? (Number 1,2,3 and locate on the map provided).

APPENDIX 2

Maslow's Palace In- Game Instructions

Take turns. Click on your character to start your turn.
Explore the world.
Right click to destroy objects.
Make sure everyone is standing next to the gate to open it.

बारी बारी से। अपनी बारी शुरू करने के लिए अपने चरित्र पर क्लिक करें
दुनिया को खोजें।
वस्तुओं को नष्ट करने के लिए राइट क्लिक करें
सुनिश्चित करें कि सभी इसे खोलने के लिए फाटक के बगल में खड़े हैं

Maslow's Palace in-game instructions screen shot – Level One

In this level, you must make sure that every player has a house. Discuss with the other players where you will place your house, and why you placed it there. Make sure everyone is standing next to the gate to open it.

इस स्तर में, आपको यह सुनिश्चित करना होगा कि प्रत्येक खिलाड़ी के पास एक घर है। अन्य खिलाड़ियों के साथ चर्चा करें जहाँ आप अपना घर रखेंगे, और आपने इसे क्यों रखा है। सुनिश्चित करें कि सभी इसे खोलने के लिए फाटक के बगल में खड़े हैं

Maslow's Palace in-game instructions screen shot – Level Two

*In this level, you must make sure that every player has a house.
Discuss with the other players where you will place your house, and why you placed it there.
Your group must also place 5 game pieces.
Make sure everyone is standing next to the gate to open it.*

इस स्तर में, आपको यह सुनिश्चित करना होगा कि प्रत्येक खिलाड़ी के पास एक घर है।
अन्य खिलाड़ियों के साथ चर्चा करें जहाँ आप अपना घर रखेंगे, और आपने इसे क्यों रखा है।
आपके समूह को 5 खेल के टुकड़े रखनी चाहिए।
सुनिश्चित करें कि सभी इस खोलने के लिए फाटक के बगल में खड़े हैं।

Maslow's Palace in-game instructions screen shot – Level Three

*In this level, you must make sure that every player has a house.
Discuss with the other players where you will place your house, and why you placed it there.
Your group must also place 5 game pieces.
Make sure everyone is standing next to the gate to open it.*

इस स्तर में, आपको यह सुनिश्चित करना होगा कि प्रत्येक खिलाड़ी के पास एक घर है।
अन्य खिलाड़ियों के साथ चर्चा करें जहाँ आप अपना घर रखेंगे, और आपने इसे क्यों रखा है।
आपके समूह को 5 खेल के टुकड़े रखनी चाहिए।
सुनिश्चित करें कि सभी इस खोलने के लिए फाटक के बगल में खड़े हैं।

Maslow's Palace in-game instructions screen shot – Level Four

In this level, you must choose where to build your house.
Design the area around your house to include things you need. Talk to the other group members about your decisions. Place the most important closest to your house. In this level, everything costs money.
Make sure everyone is standing next to the gate to open it.

इस स्तर में, आपको यह चुनना होगा कि आपका घर कहाँ बनाना है।
अपने घर के आस-पास के क्षेत्र को डिजाइन करें ताकि आपको चीजों को शामिल किया जा सके। अपने समूहों के बारे में
अन्य समूह के सदस्यों से बात करें। आपके घर के नजदीक सबसे महत्वपूर्ण जगह रखें।
इस स्तर में, सब कुछ पैसे खर्च करते हैं
सुनिश्चित करें कि सभी इसे खोलने के लिए फाटक के बगल में खड़े हैं

Maslow's Palace in-game instructions screen shot – Level Five

APPENDIX 3

Phase Three: Maslow's Palace Workshops

Understanding Conflicting Perspective on Slum-Upgrading Issues

FACILITATION INSTRUCTIONS TO FACILITATORS

This research involves groups of 4 participants playing the turns based multiplayer game “Maslow’s Palace” and completing an interview before and after the gaming process. The questionnaire contains a number of 5-point Likert scale questions as well as a number of open ended questions. After this process, participants will enter focus group stage, which will involve asking them a number of open ended questions about the gaming process.

Introduction

Inform participants of what they will do within the workshop. Ask participants about their expectations and field any questions they might have about the process. Ensure all participants give verbal consent to the workshops and that they understand how the workshop will be recorded (photos, notes, video, screen capture) and what will happen to the workshop data and how it will be analysed.

Research Procedure

1. Complete **Sections One** of the interview with each participant before the game is introduced. This process will take 5 minutes per participant. Record on the sheet provided.
2. Complete **Section Two** of the interview schedule once the game has been introduced, participants have been put in teams and they have been given the required game background surrounding the problems that will be addressed. This process will take 10 minutes.
3. The participants then asked to play the game. With participants’ informed consent, a video camera will capture the game play sessions setting in order to provide a detailed documentation of the whole process. Screen capture software will also be used to record the game screen. This process will take 20 minutes. Ensure to only interject in the gameplay if participants have specific questions about the game content. Encourage them to solve problems regarding learning the game interface themselves. Only help if absolutely necessary. Do not suggest any design ideas or discussion topics within the game.
4. Complete **sections Three and Four** of the interview schedule with participants. This is to be completed before any further discussions take place after the gaming process. This process will take 10 minutes per participant.
5. After the completion of Sections Three and Four, the facilitator will initiate a brief group discussion about the participants' overall experience with the gaming process, the justification of their game movements, the effect they had on their creativity and their participation/interaction with other players. They will also be asked to evaluate game in general. All informal discussions will be transcribed, and participant’s responses to the interview together with the video recordings will be thoroughly examined in order to evaluate the effectiveness of the game as a consensus generating mechanism. This process will take 15 minutes per workshop group/

Workshop Conclusion

Thank participants for their participation. Ask the participants if they have any questions about the workshop. Reiterate what will happen to the workshop data and how it will be analysed. Provide contact information to Chintan and Apnalaya and inform participants that they can contact the researchers through the partner organisations if they would like their data withdrawn from the study.

APPENDIX 4

Phase Three: Maslow's Palace Workshops

RESEARCH PROCEDURE

This research involves groups of 4 participants playing the turns based multiplayer game “Maslow’s Palace” and completing an interview before and after the gaming process. The questionnaire contains a number of 5-point Likert scale questions as well as a number of open ended questions. After this process, participants will enter focus group stage, which will involve asking them a number of open ended questions about the gaming process.

Research Procedure

6. Complete **Sections One** of the interview before the game is introduced. This process will take 5 minutes.
7. Complete **Section Two** once the game has been introduced, participants have been put in teams and they have been given the required game background surrounding the problems that will be addressed. This process will take 10 minutes.
8. The participants are asked to play the game. With participants’ informed consent, a video camera will capture the game play sessions setting in order to provide a detailed documentation of the whole process. Screen capture software will also be used to record the game screen. This process will take 20 minutes.
9. The **Sections Three and Four** of the interview schedule will be completed before any further discussions take place after the gaming process. This process will take 10 minutes.
10. After the completion of Sections Three and Four, the facilitator will initiate a brief semi-formal group discussion about the participants' overall experience with the gaming process, the justification of their game movements, the effect they had on their creativity and their participation/interaction with other players. They will also be asked to evaluate game in general. All informal discussions will be transcribed, and participant’s responses to the interview together with the video recordings will be thoroughly examined in order to evaluate the effectiveness of the game as a consensus generating mechanism. This process will take 15 minutes.

INTERVIEW QUESTIONS

Section One: Basic Information (5 minutes)

Age:

Gender:

Religious affiliation:

How long have you lived in Shivaji Nagar/ Ghazipur/ Bhalswa?

If you have lived elsewhere please specify where and when:

Section Two: Before gaming process (10 minutes)

These questions are answered by participants before the game is played, i.e., after the introduction phase of the game and once players have been assigned to a group.

- 1) What are the three most important issues/problems in the game?
- 2) Why are these most important issues/problems?
- 3) What are the three least important issues/problems in the game?
- 4) Why are these least important issues/problems?
- 5) I feel like my ideas and thoughts will be taken into account by the rest of the group.

Strongly Disagree

Strongly Agree

1

2

3

4

5

- 6) I feel like my group members will share similar views as myself.

	Strongly Disagree		Strongly Agree
	1	2	5
7) How well do you know the other members of your group?			
	1	2	5
8) Completing Maslow's Palace successfully can be considered a goal. For this goal, please estimate this goal is to your group :			
	1	2	5
9) Completing Maslow's Palace successfully can be considered a goal. For this goal, estimate how important this goal is to you :			
	1	2	5

Section Three: After gaming process (10 minutes)

These questions are answered by participants after the gameplay is completed.

Sections Three and Four will take approximately 10 minutes.

- 1) What were the three most important issues/problems in the game?
 - 2) Why were these the most important issues/problems?
 - 3) What were the three least important issues/problems in the game?
 - 4) Why were these the least important issues/problems?
 - 5) I feel like my ideas and thoughts were taken into account by the rest of the group.
	Strongly Disagree		Strongly Agree
	1	2	5
6) There was good cooperation between group members.			
	1	2	5
7) Group members shared similar views as myself.			
	1	2	5
8) The gameplay allowed our group to reach consensus/talk about issues in our community			
	1	2	5
1) Completing Maslow's Palace successfully can be considered a goal. For this goal, please estimate this goal is to your group :			
	1	2	5
2) Completing Maslow's Palace successfully can be considered a goal. For this goal, estimate how important this goal is to you :			
	1	2	5
1) Playing Maslow's Palace helped me think about our own community:			
	1	2	5

Section Four: Reflection on the gaming process

This section asks question about the process overall (all 5-point Likert scale questions)

- 1) I understood the objectives of the game.
Strongly Disagree Strongly Agree
1 2 3 4 5
- 2) I found the game difficult to play.
Strongly Disagree Strongly Agree
1 2 3 4 5
- 3) I found the game interface easy to use.
Strongly Disagree Strongly Agree
1 2 3 4 5
- 4) The workshop coordinator gave me adequate instructions on how to play the game.
Strongly Disagree Strongly Agree
1 2 3 4 5
- 5) We had enough time to play the game.
Strongly Disagree Strongly Agree
1 2 3 4 5
- 6) I enjoyed the workshop.
Strongly Disagree Strongly Agree
1 2 3 4 5
- 7) We all know that all members are jointly committed to performing their parts of the common task.
Strongly Disagree Strongly Agree
1 2 3 4 5
- 8) We all know that all members are jointly committed to contributing to the common success.
Strongly Disagree Strongly Agree
1 2 3 4 5
- 9) We all know that all members are jointly committed to helping each other.
Strongly Disagree Strongly Agree
1 2 3 4 5
- 10) We all know that all members are jointly committed to achieving the common goals.
Strongly Disagree Strongly Agree
1 2 3 4 5

Focus Group Questions (15 minutes)

- 1) Was agreement reached within the group?
- 2) How was agreement reached?
- 3) How did you use the game visuals/space to help you discuss problems or issues with other players?
- 4) Do you have any other comments?

APPENDIX 5

Digital Link To Maslow's Palace.

A link to a downloadable version of Maslow's Palace can be found at the following location:

<https://app.box.com/s/9a92h7ya5klyczq2kwaurc5hehe60ad2>

APPENDIX 6

Maslow's Palace Workshop Transcripts

Ghazipur Workshop Group One

Workshop Transcript

Pre-Gameplay

Facilitator	Okay so we are playing this by Hamish.
Facilitator	First we choose the players. Is that right?
Hamish	Yes.
Facilitator	It is to teach you how to support each other. What it's teaching you is that when you help each other everything becomes easier.
Participant One	Okay.
Participant Three	Yes that sounds good.
Facilitator	So we choose your colours.
Facilitator	How wants to be red?
Facilitator	Anyone?
Facilitator	How about you?
Participant One	Okay.
Facilitator	Next is green.
Participant Two	Yes me.
Facilitator	Blue?
Participant Three	Okay,
Facilitator	Good. Last is yellow.
Participant Four	That is me.
Facilitator	So now we play this game.
Participant Two	What do we do?
Facilitator	It will tell you. First you all have your colours. Then you take turns and use this mouse to choose things like this. This one is for busting things. Then you go through the door like this. Understand?
Participant Four	So we use this and share?
Facilitator	Yes take turns and pass it to her when you are done.
Participant Two	Okay and then we go through the door?
Facilitator	Yes.
Facilitator	Okay now we start.

Level One

Facilitator	There are your colour people. Each of you has one. Red, green, blue, yellow. Remember which is your one.
Participant Two	Yes, you told us that already.

Facilitator	Okay so this is the game. You need to move your person through the door and clear all of the garbage from your Ghazipur.
Participant One	Okay so do I go first?
Facilitator	Yes. Use this to choose you person. Then press it where you want to go.
Participant One	Okay. Like this?
Facilitator	Yes.
Participant Two	Okay I get it.
Participant Three	You have to bust all of the rubbish.
Participant One	Okay. I'll clean it. This is like the Ghazipur.
Participant Four	I don't see.
Facilitator	She is pressing this to do it.
Participant Four	Oh I know.
Participant One	Now where?
Participant Two	There.
Participant One	Okay. This is hard to do.
Participant Two	Do I do it now?
Participant One	Here.
Participant Two	This is how I choose it.
Participant Two	It move so fast.
Facilitator	Here, I will move it back for you.
Facilitator	That's it.
Facilitator	Now try it again.
Participant Two	Okay I see.
Participant Two	Now I bust these?
Participant One	Yes like me.
Participant Two	There are no more.
Participant One	Put it over there.
Participant Two	Your go.
Participant Three	Do I just go? There are no more so I just finish it.
Facilitator	Yes. That is good.
Participant Four	I will do that.
Participant Four	There.
Facilitator	That is it. Now they go to the next one where you'll do more of Ghazipur.

Level Two

Facilitator	Now you do some more. There are houses. One, two three, four.
Participant Two	So we place the houses?
Facilitator	Yes. You put them where you want.
Participant One	First we need to move the rubbish. Those ones are there too.
Participant Two	Okay I will put mine there. It doesn't matter.
Participant One	Yes that can go there.
Participant Two	How?
Facilitator	You use this like your person. Then chose it. Then put it there with this again.

Participant Two	Okay. Now here.
Participant One	Mine will go near to yours.
Participant One	Here like this. That is what it is already like.
Participant Two	That doesn't make sense.
Participant Three	Over here.
Facilitator	Yes all together if that is what you want.
Participant Four	Okay me too. Is this the one?
Facilitator	Yes. Choose that one.
Participant Four	Now do I do it like this?
Participant Four	Ohh I can't find it.
Facilitator	Here I will find it for you.
Facilitator	There it is.
Participant Four	I did it. Now I put it there? Yes?
Participant One	Yes like last time you know.
Participant Two	This is like Ghazipur. The houses are there.
Participant Three	It opened.
Facilitator	Yes there are more. It is starting.

Level Three

Participant Three	It looks the same. Are you doing it again?
Facilitator	Now there are more. See. Shop, toilet, hospital, Mosque, park. And these are the same. You have to choose where they go.,
Participant Two	There are houses like the other time.
Facilitator	Yes. That is the same.
Participant One	We need a hospital. That is the most important.
Participant Four	Yes.
Participant One	Close in the middle. It is not too far away.
Participant One	When our children get sick they can't get better. There is none.
Participant Two	Put it there.
Participant One	Yes in the edge.
Participant Three	Then where are the houses?
Participant Two	Close by. Then we don't have to walk as far.
Participant One	But bust all of those first.
Participant Two	Like this.
Participant Four	Next the trees. That is what we don't have. It it is that it won't be dirty like it is now. Over there.
Participant Two	Yes that's good too.
Participant One	But a toilet? There is only one in Ghazipur now.
Participant Four	That can be too. That is good.
Participant Two	We can have more than one. Over there.
Participant Three	Three?
Facilitator	Is that what your want?
Participant One	Yes there are not many in Ghazipur. It is too far away.
Facilitator	Is it safe?
Participant One	No there is lots of violence and drunks there.

Participant Two	Not a safe place.
Participant One	That is why there is more needed.
Participant Two	More there.
Participant Four	And a Mosque too. That is important.
Participant Two	It is already near Ghazipur.
Participant Three	This house is here.
Participant One	Yes close by too. That's good. Near the toilet.
Participant Two	Is it done?
Participant Three	Yes. Now to the end?
Facilitator	Yes like the last one.
Participant One	There.
Participant Three	Mine is there.
Participant Four	That is a good Ghazipur to be.
Participant Two	Yes with the things that we need.
Facilitator	Next is another one where you will do more.
Participant Two	The same?
Facilitator	No it is different.

Level Four

Facilitator	Now there is more. It is like the last one, but there is water, toilets, school, tree, meeting, market and some other things.
Participant One	There is also houses like before.
Facilitator	Yes you do that one each time new.
Participant Three	Where do we do them? There is all those buildings already.
Facilitator	You all have to choose.
Participant Two	Do we bust them?
Facilitator	Yes you choose.
Participant Two	Okay. This is where is diary is.
Participant Three	Yes bust that.
Participant One	The school is most important. We need that.
Participant Two	Yes.
Participant Four	That should be there in Ghazipur.
Participant One	Here?
Participant Three	Yes.
Participant One	Should we bust this?
Participant Three	Yes.
Participant One	This is the school.
Facilitator	That looks good. What about the Chintan school?
Participant Two	That is not a study school. This is what we need so they don't work in the plant and get better jobs.
Participant Three	That is best.
Facilitator	What else does it need?
Participant One	Water. This is by the house. That is here.
Participant Two	More.
Participant One	Like this?

Participant Two	They need to be in more places for the people to use most.
Participant One	Yes.
Participant One	This is also our Chintan? Than can be there for a school.
Facilitator	Yes that is a good idea.
Participant One	Okay here.
Participant Two	That is where we are.
Participant Three	There is water now.
Participant Four	Where are we?
Participant Four	Yellow is here. Like that. Close to the Chintan. But we also need a toilet like last time.
Participant Three	Okay yes. Like before we can put it in our Ghazipur.
Participant One	This house goes there.
Participant Four	Where?
Participant One	You can do it. Over there.
Participant Four	Yes.
Facilitator	You do it.
Participant One	Its nice
Participant Two	Mine too.
Participant Two	That is good. Now put green over there.
Participant Three	A market. We never did that one and it is important for Ghazipur.
Participant Two	Where.
Participant Three	It should be close. We have places, but more is better I think so.
Participant Two	But it is not that big.
Participant Three	This can go there.
Participant Two	There should be another one over there.
Participant Three	Yes to there.
Participant Two	Okay.
Participant One	What are these?
Facilitator	Squares.
Facilitator	Do we need them?
Participant One	I don't know. We bust them.
Participant Four	We are done I think.
Facilitator	Move your people to the space like the other time.
Participant Two	Just mine.
Participant Two	There.

Level Five

Facilitator	Now this is the Ghazipur. I will show you the places. This is the landfill, there is the metro.
Participant Two	Plant?
Facilitator	Yes.
Facilitator	Some houses and Mosque and some road. Now you must choose what you want for your Ghazipur. It writes what you need. See here.
Participant Three	Yes.

Facilitator	There are more. See. Market, hall, shop, hospital, toilet, water, cricket, school, tree, wall, tree, somethings, plant, mosque, playground, road, part, building, house and that.,
Participant Four	That is some.
Participant One	This is the landfill. We should put the houses here. Close to the work.
Participant Two	Yes that would be best.
Participant One	We need to make sure we can work there.
Facilitator	But what about your health.
Participant One	If we don't work there we can't have both.
Participant Two	Yes it is important.
Participant Three	Then a hospital like before. That is what we need.
Participant One	Here?
Participant Three	Yes close to the landfill. That is important. But we need support for it. How do we pay?
Participant One	We can get the card to help. But it is not that easy.
Participant Three	We have tried to do that before with Chintan. We had a card but not all of us.
Facilitator	But it is better with a hospital than with no hospital.
Participant One	Yes.
Participant One	I will put my house there at Ghazipur.
Participant Two	This is the plant. So it should be there.
Participant One	There is good.
Participant Two	Next a toilet. That is what we need like the other one.
Participant Three	More.
Participant Two	Yes I think it would be three. That would be best.
Participant One	And a plant.
Participant Two	There it is.
Participant One	And if there was more we could have more jobs.
Participant Three	But we need more schools. We cant take them with us.
Participant One	Yes so we have a school too. Then we have more jobs for our Ghazipur.
Participant Two	Lazy drunk men.
Participant One	That is hard.
Participant Three	They are there?
Participant One	Yes. They can just go there and then they are all close.
Participant One	Water too. Like before. Do we do this again?
Facilitator	Yes, it is new so do it again.
Participant One	Do many there.
Participant Two	Trees. We need more of those in Ghazipur.
Participant Two	Yes there.
Participant Two	Shops.
Participant Three	Yes.
Participant Two	This is good.
Participant Three	All the houses are in.
Participant One	Yes.
Facilitator	Good. Did this help?
Participant One	Yes to talk about our Ghazipur.

Focus Group

Facilitator	Was agreement reached within the group?
Participant Three	Yes.
Participant Four	Yes we all agreed. We all did things together and agreed.
Facilitator	How was agreement reached?
Participant One	We talked about it. If someone wanted to do something they would say and then we would talk..
Participant Four	Yes.
Facilitator	How did you use the game visuals/space to help you discuss problems or issues with other players?
Participant Three	Like that. It was better than just talking.
Participant Two	It was fun. I hadn't done that before.
Participant One	It was good to talk about problems in Ghazipur.
Facilitator	Do you have any other comments?
Participant Two	No it was good.
Participant Three	Yes fun.

Ghazipur Workshop Group Two

Workshop Transcript

Pre-Gameplay

Facilitator	Are you ready?
Facilitator	This is called Maslow's Palace.
Participant One	What?
Facilitator	Maslow's Palace.
Participant One	Okay.
Facilitator	This is to design a new Ghazipur. What you want in it.
Facilitator	First we choose colours.
Participant One	I will be red.
Facilitator	Green?
Participant Two	Yes.
Facilitator	You can be blue and you yellow.
Facilitator	Next we play the game. You use this things to play. This is the mouse. You have turns like this. Press this to make choices. Then you go through the door.
Participant One	Fine.
Participant One	Do I use it first?
Facilitator	Yes.
Facilitator	Press this.
Facilitator	It is starting.

Level One

Facilitator	Your colours are here. Those are yours.
Participant One	Okay. I will move them.
Participant One	To here.
Participant Two	Now me?
Participant Two	Yes okay.
Participant Three	Here?
Participant One	Yes.
Facilitator	Is that it?
Participant Three	Yes.
Participant Four	Okay.
Facilitator	That is the end of this.
Facilitator	Now you move. That is done.
Participant One	Where do they go?
Facilitator	To the next one.

Level Two

Facilitator	Now there is houses for you to put in your game.
Facilitator	Use this to do it.
Participant Two	But first we bust these.
Participant Two	To make a room.
Facilitator	Yes.
Participant Four	They are going.
Participant Three	On fire.
Participant Two	Is that enough?
Participant Four	Yes it is. The house can be there. That's it.
Participant One	Will I put my house?
Facilitator	Yes.
Participant One	This is yours.
Participant Four	Okay.
Participant Four	How do I do it?
Facilitator	Move it like this. Press this to choose it and move it. Then to make it.
Participant Four	Yes.
Participant Three	This is here.
Participant Three	And yours too. I think that is it.
Participant Two	I don't know.
Facilitator	That correct.
Facilitator	Now make them all over to that area.
Participant One	Mine is there.
Participant Four	There. Is that it?
Participant Three	Yes.

Level Three

Facilitator	Next we have more.
Facilitator	The same as that but we have a shop, toilet, hospital, mosque and park and trees. There is the same houses.
Participant Two	Do I begin?
Facilitator	That is right.
Participant Two	I think we need a toilet the most at Ghazipur. There is not many at Ghazipur.
Participant One	Yes that is important.
Participant Two	Somewhere close.
Participant One	But how can it be?
Participant Two	Can it be for the women. That helps lots of problems.
Participant One	That would be best.
Participant Two	Here?
Participant One	Yes I think that.
Participant Two	And another.
Participant Three	Put this house next to it.
Participant One	We all go there.

Participant Two	Yes.
Participant Three	And a hospital.
Participant One	Yes.
Participant Three	There.
Participant Two	We already have a mosque.
Facilitator	But where should it be?
Participant Two	It doesn't matter.
Participant One	Just put it there.

Level Four

Participant Four	This is not the same.
Facilitator	Now there is water tank, toilets, school, some trees, meeting, market and some other things but still houses like before okay?
Participant Three	There is a landfill.
Participant Two	The mountain?
Participant One	It is small. Is there enough?
Participant Two	Where does it go? I think this is like the metro.
Participant One	There is no metro.
Participant Two	There.
Participant One	No.
Facilitator	What will you do?
Participant Four	The school is most important.
Facilitator	Where do you put it?
Participant Four	Now it is too far and there are not that many. We need more close that we can use.
Participant Two	There are some.
Participant Four	But can you use them?
Participant Two	Some can.
Participant Three	But not everyone.
Participant Four	So we need more for our children and older ones.
Participant One	Yes.
Participant Four	There.
Participant Two	Then water too.
Participant Four	Some more.
Participant Two	Another.
Participant Three	Put it on top. Then you don't bust them. They can be together.
Participant One	A tree.
Participant Three	On top too.
Participant Two	That can't be there. It doesn't go.
Participant One	But it can.
Participant Two	Where?
Participant One	On top.
Participant Two	And a house too?
Participant Three	Yes of course.

Participant Two	I think we should have houses there [by the landfill]. Better ones than we have now.
Participant One	Yes, but we need to have no floods. That's how people get sick. So maybe not so close.
Participant Three	But that is far away from the toilets at Ghazipur. We [the houses] should be closer.
Participant One	Yes there, I think that is good. This will be better for our Ghazipur.
Participant Three	Yes, and far from the sorting area.
Participant Two	Yes, but not far from the landfill.
Participant Four	All of them together.
Participant Two	Make sure there is distance.
Participant Three	Is that all?
Participant Two	Yes.
Participant Four	My colour is there.
Participant Two	Yes.

Level Five

Facilitator	These are the things in Ghazipur.
Facilitator	This is the landfill and the metro station and plant, here close to the landfill and some Ghazipur houses here next to it.
Participant One	So what do you do?
Facilitator	First is market, then meeting, shop, see this things, hospital, toilet, tank, cricket, school, restaurant, tree, wall, tree, some things, building, apartment, park, road, playground, mosque, plant.
Participant Two	Yes, a mosque. This is close. And then a school is next.
Participant Three	Yes.
Participant Two	We put a school close to it.
Participant Four	That is in Ghazipur.
Participant Three	Where is the water?
Participant Two	A meeting. This is where we are.
Participant Four	Okay.
Participant Three	Yes too?
Participant Four	No more plants.
Participant Three	Yes, then that is more work for us.
Participant Two	It is there.
Participant Three	It went away.
Facilitator	Does Ghazipur have a park?
Participant Three	Yes, but not now.
Participant Two	A park can be there too.
Participant Two	Next to our Ghazipur.
Participant One	The house is needs to be near the landfill. \
Participant Two	Yes mine too.
Participant Three	Not there. That was a mistake.
Participant Three	That's better.
Participant Four	There.
Participant Two	Then we need to stop those.

Participant Three	A wall.
Participant Two	Where?
Participant Three	Yes there. I think here too.
Participant Two	This makes your Ghazipur.
Facilitator	Then you move your colours.
Participant Two	Okay I will.
Participant Three	It is there.
Facilitator	Good.

Focus Group

Facilitator	Was agreement reached within the group?
Participant One	Yes.
Participant Two	Yes we agree that there are problems.
Facilitator	How was agreement reached?
Participant Three	By playing the game.
Participant One	Yes and we talking about the problems and what can be done about them in Ghazipur.
Facilitator	How did you use the game visuals/space to help you discuss problems or issues with other players?
Participant Two	To show them how it should be.
Participant Three	Yes, to show where the things are. Buildings and what the problems are.
Facilitator	Do you have any other comments?
Participant One	I think it was good for us. But also we need to talk to everyone about it not just four. That way will help us.

Ghazipur Workshop Group Three

Workshop Transcript

Pre-Gameplay

Facilitator	This is the game
Facilitator	First we choose the players.
Facilitator	Who wants to be red?
Participant One	Me.
Facilitator	Green?
Participant Two	Yes.
Facilitator	Blue?
Participant Three	Yes.
Participant Four	You are yellow.
Facilitator	Okay choose this one.
Facilitator	Okay so you take turns. Use this to choose things with this button. Use this button to bust things and then you all go through the door together. Yes?
Participant Two	Yes.
Facilitator	Okay now you start. Push that button.
Facilitator	See through the door all together. Yellow, blue, green, red. One, two, three, four.

Level One

Facilitator	Four player's 1-2-3-4 each of them have a different colour level 1.
Facilitator	Imagine that they're going to Delhi.
Facilitator	Before they reach Ghazipur that's what it looks like.
Facilitator	This used to be a house.
Facilitator	What needs to be done first – obviously cleaning.
Participant Two	It's like a jungle – it's all rubbish.
Facilitator	What should they do first?
Participant One	Clean up the area first. There is lots of rubbish.
Facilitator	So let's clean – we're cleaning.
Facilitator	Look it's done. You removed the rubbish (pink boxes)
Facilitator	Look it's clean now in this Ghazipur.
Facilitator	Each of these houses have a different colour – which colour do you want to pick for your house (Participant One).
Facilitator	I was asking you P1.
Participant One	I'll choose the red one.
Facilitator	The red needs to go onto the empty space to make a house. You can put it there with this button.
Participant Two	I will have yellow.
Facilitator	Whose one is yellow? Where are you going to put it?
Participant Two	I'll put it over here next to your house. Yes that is good.
Facilitator	But you could put it alone?
Participant Two	I will clean some more here so it is not by my house.

Participant Three	I will put blue here.
	I think that is good (placing blue house near others).
Participant Four	It opened by itself (the door)
Participant Three	Nobody helped – it opened by itself (the door)

Level Two

Facilitator	What it's teaching you is how to support each other.
Facilitator	What its teaching is that when you help each other everything becomes easier.
Facilitator	So let's look at the next one.
Facilitator	In the next stage you have to do the same thing.
Facilitator	Whatever we cleaned is there again so we have to clean it first.
Facilitator	And now we need to make a house here.
Facilitator	Now they need to go from here to there (player.
Facilitator	Do you want some cold drink?
Facilitator	Now look the red ones reached.
Facilitator	So we'll make a house for the red player.
Facilitator	Look there's a house already made.
Facilitator	We'll sit it in this corner and well make a house here.
Facilitator	The house is built.
Facilitator	We'll take the yellow one.
Facilitator	Did you understand?
Participant Two	Yes.
Facilitator	So what we did – this is what our life is like.
Facilitator	Whatever we've (done/experienced) so far is what shown.
Facilitator	We'll put that one there.
Participant Four	These are all matching houses.
Facilitator	Now we'll make one on this side.
Facilitator	First we'll just make houses.
Facilitator	And the house is made.
Facilitator	Now look my Ghazipur is ready.
Facilitator	Now over here ... somethings.

Level Three

Participant One	Look different buildings. What are these?
Participant Three	A toilet. Yes we need that.
Facilitator	Yes there are different buildings now. You can choose them and put them how you want it to be like.
Participant Two	Okay yes I like the park. We do not have anything like this in Ghazipur. It is all dirty. Some place to be outside.
Participant One	I want the hospital first. We need that it is the most important.
All	Agreement.
Participant Three	Yes that can go in the middle and we put our houses there.
Participant Four	Yes close to it. I will put mine here.
Participant One	Okay. Yes and a toilet. Where should we put that? Our toilet it far away.
Participant Three	Let me try.
Participant Four	Okay. Yes and a toilet. Where should we put that? Our toilet it far away.
Participant Three	I will put the toilet over here. Not so close.
Participant Two	Yes that is good.

Participant Four	And the Mosque. That can go there. But not so close to the hospital.
Participant One	Yes there.
Participant Three	I will put my house here near to your house too.
Participant Three	I think a shop is good. But not an alcohol shop. That will make a big problem for us.
Participant Two	Yes the alcohol shop is too close.
Participant Two	I still need to put my house.
Participant Three	Okay here.
Participant Two	Okay but first I make one more grass.
Participant One	No that is on my house.
Participant Two	Okay over here. Yes that is where it should go.
Participant Four	That is better.
Participant One	Maybe we need more shops. Over there. The shops let us buy things and maybe there will be some more jobs for us.
Participant Three	Can we have a school?
Facilitator	There is not a school in this game.
Participant Three	Okay hopefully soon.
Participant Two	I think that hospital is good. But there isn't that much area here. Where are the roads?

Level Four

Facilitator	There is a school now.
Participant Three	Yes good. We should have a school
Participant One	But there is no space. There are all of the buildings there.
Participant Two	Yes where do we put them.
Participant Four	Maybe we bust them.
Participant One	Oh yes. If we move them or break them then we can build what we want.
Participant Two	But we bust those houses to build our houses.
Participant One	Yes let us bust them.
Participant Three	Okay lets move these.
Participant Three	More. That one too.
Participant Two	Okay that is good. We can fit a market there.
Participant Three	But the school first. That is what we need.
Participant One	Yes the school can go there. Then they can go there when we work.
Participant Two	We need support for more schools. We have Chintan, but not more.
	How will we have high school?
Participant One	Make another school. That can the high school there. Then that will work.
Participant One	Water.
Participant Two	Yes we need water. A few places.
Facilitator	You have taps already. Do you need to put more here?
Participant Two	Yes. Most do not work for us but some do.
Participant One	There are close by our houses.
Participant Four	Maybe we put them by the school.
Participant One	Yes and by the houses.
Participant Four	I will put mine there.
Participant Two	Okay
Participant Three	Okay I will put mine too.
Participant One	Some trees.
Participant Two	Yes. Around the houses.
Participant Three	Like before the metro.
Participant One	Here?
Participant Three	Yes and there.

Participant Two	Yes.
Participant One	Now to the door?
Facilitator	Yes if your are complete it is open.
Participant One	Okay.
Participant Two	I think it is good.
Participant Four	I'll move mine next.
Participant Two	Okay here it is.

Level Five

Facilitator	But what he asked he made something else for else for that.
Facilitator	Now look that's Ghazipur.
Facilitator	It's made like this
Facilitator	Now I'll show you what's in Ghazipur and we've reached Ghazipur.
Facilitator	That's your university.
Facilitator	That's the landfill.
Facilitator	That's the plant.
Facilitator	And over here he's written what you need.
Facilitator	So where do you want the house do you want it with the landfill?
Facilitator	With the school or with the plant or somewhere else?
Participant Four	The (waste-to energy plant) labourers should live by the plant.
Participant Four	Those who don't work can be put somewhere else
Facilitator	Can I ask you one question?
Facilitator	Before plants were placed in Ghazipur how many people used to work here (in the landfill)? Did all of them work here?
Participant Two	Yeah all of them were working there.
Facilitator	In the plant not even half of Ghazipur's people are able to work there.
Participant One	No, more people work there.
Participant Two	No more than half do.
Facilitator	If the plant didn't come it would stay a shithole.
Participant Three	Imagine if there was not plant and it was just the landfill.
Participant Three	If the landfill closes tomorrow then the plant also closes and visa versa.
Participant One	The waste from the plant goes into the landfill.
Participant Two	We want to keep the plant and the landfill
Participant Four	If we are evicted, we have no way to earn money... We need to make sure we live close to the landfill and have access to waste... But we need our children to go to school so they do not have to do this dirty work for their children.
Facilitator	Both are important to think about in terms of your health
Facilitator	What I would say is to get rid of both. Wouldn't that be better?
Participant Two	Living close to landfill ensures the ability to take care of income and children. That's why I built the buildings there. We need to make this place better.
Participant Three	In each house what will we do with work? What is the benefit of that? We would have no way to earn money.
Participant Two	There will be election soon and we can ask for more work and for them to clean the area.
Participant One	Who should we vote for?
Participant Two	Someone who will help us. But you have to give him money.
Participant Three	Okay so we'll have both? We want both the plant and the landfill.
ALL	Yes.
Facilitator	Okay what else do you want in Ghazipur?
Participant Two	We need what's most important which is a toilet.

Participant Three	Someone that takes a lot of salary.
Participant Three	No they're government people.
Facilitator	This sir wants to know what other stuff you want in Ghazipur.
Facilitator	So this is the toilet.
Participant Two	I think it should be over there. Near the houses.
Facilitator	What about the hospital.
Participant Two	It should be placed right in the middle.
Participant Two	We want a school for the kids. I think it needs to be there.
Participant Three	There's one nearby.
Participant Two	But still I want a school so they don't have to walk far.
Facilitator	It's not a tuition school it's a primary school.
Participant One	At least they'll study.
Participant Three	At least they'll be nearby.
Facilitator	Do you want a water tank?
Participant Two	Yes!
Facilitator	Where should it be?
Participant Three	On the left side. Over there.
Participant Two	It should be in between the hospital and the school.
Participant Two	One plant is enough.
Facilitator	We're having a look at what you have and what you don't have.
Facilitator	Mosque.
Participant Four	Everyone says we already have one.
Facilitator	Do you want a hall?
Participant Two	I want a park.
Participant Three	Put it behind the toilet.
Facilitator	Shall we have another tree?
Participant Two	We need a market to have fun.
Participant Three	Groceries where are we going to go?
Participant Three	We got everything but where are we going to eat? To have fun?
Facilitator	Where shall we put the market. In the middle?
Participant Three	If it's in the middle it will be good for everyone.
Facilitator	We'll put it with the park
Facilitator	Now we're going to the next level. Why do you want a market though?
Participant Two	Where are we going to go shopping though.
Participant Two	Well we can go anywhere to get groceries though.
Participant One	Oh look its going now. And the third one?
Facilitator	The third ones coming too.
Facilitator	This is one type of training for you guys.
Facilitator	As in if somebody comes to you and asks you what you have.
Facilitator	Sometime you feel like whoever comes fills their bag and runs away.
Participant Three	That's everyone's thought.
Participant Two	That's not everyone's thought though
Facilitator	This game helps you put your situation in front of somebody else.

Focus Group

Facilitator	Was agreement reached within the group?
Participant Four	I think yes.
Participant One	Yes we did. But sometimes no about everything.
Participant Two	Yes we disagree sometimes. But we agree on the problems in Ghazipur.
Facilitator	How was agreement reached?
Participant Three	By playing this games.
Participant Two	Yes we showed them like a drawing.

Facilitator	How did you use the game visuals/space to help you discuss problems or issues with other players?
Participant Two	It helped us show them not just talk about things.
Participant Three	Yes.
Facilitator	Do you have any other comments?
Participant One	It was good. I liked the busting of the blocks and the making houses and things. It was good.
Participant Two	Yes we thought about the problems which is not that much in Ghazipur.

Ghazipur Workshop Group Four

Workshop Transcript

Pre-Gameplay.

Facilitator Yes here. And you there.

Facilitator This is choosing your colours so you can play.

Facilitator One, two, three, four. Red, green, blue, yellow. Okay?

Participant Two They are ours?

Facilitator You each have one.

Participant Three Okay.
So this writes that you each use it, then the next person. And you use this mouse to do it. Select this button to select things and this one is to bust them. You finish when you go through the door.

Participant Three What door?

Facilitator You will see.
Do you understand?

Participant Three Yes.

Level One

Facilitator You can hold this.

Participant One Okay. How?

Facilitator Here like this. And use this button.

Facilitator Select your colour.

Participant One Where?

Participant Three That one. Like before.

Facilitator Yes. Then press where you want to put it.

Participant One Where is that?

Participant Two By the door.

Participant Three There.

Participant One It's going.

Participant Two Good.

Participant Two Can I?

Participant Two Together.

Participant Three Okay there.

Participant Four It's moving. Ah it's opened.

Participant One Is that all?

Facilitator Now we do more.

Level Two

Facilitator	Next we do this but with houses.
Participant One	The same?
Facilitator	Yes, but you choose where your house goes.
Participant One	Do I use it now?
Facilitator	Yes.
Facilitator	You put your house.
Participant One	But I move here?
Participant Three	Yes.
Participant One	It is difficult.
Participant Four	Now me.
Participant Three	These should all be together.
Participant Two	Yes. Put them there.
Participant Three	Then we don't walk as far.
Participant Two	Close.
Participant One	Where is our Ghazipur?
Participant Four	Is it done?

Level Three

Participant Two	What is this?
Facilitator	These are what you have. See this shop, toilet, hospital, mosque, park.
Participant Three	I'll remove these things.
Participant One	A park is what should be there.
Participant Two	Is that the most important I don't think.
Participant Four	A hospital.
Participant Two	Yes that is most important.
Participant Four	There is not one in Ghazipur. When the children get sick we can't go.
Participant One	Where is that?
Participant Two	Put it there first.
Participant Three	That is big.
Participant Four	Then where are the houses?
Participant Two	They are there by the landfill.
Participant One	How do I do this?
Participant Two	This button.
Participant One	I can't see it.
Participant Three	It's gone.
Facilitator	Here.
Participant Two	That is past.
Participant One	There.
Participant One	We need a toilet.
Participant Four	Put it next to the hospital.
Participant Two	Yes.
Participant Four	A mosque there.
Participant Two	That is good.
Participant One	Red is there.

Participant Two	Hurry up.
Participant Three	What?
Participant Two	Yours needs to be there to finish.
Participant Three	Oh.

Level Four

Participant Three	Read it again.
Facilitator	There are these things. There is water, toilets, school, tree, meeting, market and some other things.
Participant One	My one is red.
Participant Two	They are together.
Participant One	I'll break them.
Participant Three	No you have to choose.
Participant Four	What are they?
Participant Three	Houses.
Participant Two	All the things from Ghazipur are here.
Facilitator	Ohh so you understand.
Participant One	Is it my turn?
Facilitator	Yes.
Participant One	That made space.
Participant Three	Is that the landfill?
Facilitator	Yes.
Participant Two	We should build the meeting room close to the houses and to work. Over there.
Participant Three	No.
Participant One	No. There is no room for it there. There are all of the houses.
Participant Three	But if we build that there, we will have to demolish a house that someone lives in.
Participant Two	But we need one.
Participant One	But there is already a school there. We should use that. We are in the school now. We could meet here.
Participant Two	A meeting hall would be better. Then we can use it when school is underway as well.
Participant Three	We could move our houses, and group them together. Then we can make space there for a hall.
Participant Four	What if they (the government) tells us to leave? Then we have no houses. That might happen soon.
Participant Two	But if we can have meetings then we can plan.
Participant Four	If I move my house, I cannot afford to build it again. We should use the school.
Participant One	Yes that is a good idea.
Participant Two	Okay, but we need to make sure that the school is in Ghazipur. By those houses. Then we can build the toilets, and all use them.
Participant Three	Okay but we should talk to them, to make sure it is okay. The school might not let us.
Participant One	Yes.
Participant Two	Okay we will do that.

Participant Three	But also water. That is by the houses.
Participant Four	And the meeting.
Participant Two	We need to move this.
Participant Three	Put it here.
Participant Four	There or here?
Participant One	Over there.
Participant Four	Put your colour here.

Level Five

Facilitator	So it works the same as before.
Facilitator	So some of the things.
Participant One	Water.
Facilitator	There are some of the things in Ghazipur.
Participant Three	Landfill.
Facilitator	Yes. Plant, metro, houses and some things.
Participant Two	Some here.
Participant Three	The houses should be here. All of the things to make a Ghazipur.
Participant Two	Yes, they need to be close.
Participant Four	The metro is bad for us.
Participant Three	Yes that is why they left. Tell him to bust it.
Participant Two	Yes.
Participant Three	We could go back to the village. Some people have already gone after the construction of the metro station.
Participant Two	Yes, but it is far and no work.
Participant Two	They are in drought. There is no rain and there is no food.
Participant Three	But is it better? Will they move us? This is a problem.
Participant One	We don't know.
Participant Two	That's why we need to be close so they can move us.
Participant Four	Okay put the house there first. We make our Ghazipur here so it is harder.
Participant Three	This hospital. That is what is needed in our Ghazipur.
Participant Two	Yes on there.
Participant One	I should do my one.
Participant Three	Where?
Participant One	It goes over there.
Participant Four	No, no, no.
Participant One	Why?
Participant Three	There is room for the dairy and to walk.
Participant Two	Why is there a dairy?
Participant Three	Is it my turn?
Participant Four	We need to help with our children. Who will look after them?
Facilitator	The Chintan school helps?
Participant Four	Yes up not always.
Facilitator	All the children can come.

Participant Three	Not the older ones.
Facilitator	We can talk to (NGO) about schools. But I'm not sure.
Participant Four	Will anything happen?
Facilitator	Talking is good. It might happen.
Participant Three	Where will the school be?
Participant Two	No so close.
Participant One	Then put that there.
Participant Four	Yes in between.
Participant Two	Toilets too.
Participant Four	It is floating.
Participant Three	On top.
Participant Two	See this is far.
Participant Four	We move this pant.
Participant One	That is best.
Participant One	The houses should be beside them.
Participant Two	And then the plant over there.
Participant One	Red is there.
Participant Three	Apartment?
Participant Two	That is not needed.
Participant Four	Put it far away.
Participant Two	With those ones.
Participant One	That's too many.
Participant Three	A mosque too.
Participant Two	Now green is here.
Participant Three	I think that is good.
Participant Two	It is done.
Participant Three	Yes.
Participant Three	Now your turn to stop.
Participant Four	Give it to me.
Participant Four	Its colours.

Focus Group

Facilitator	Was agreement reached within the group?
Participant Two	Yes mostly.
Participant One	Yes. We agree.
Facilitator	How was agreement reached?
Participant One	First we played the game and then we talked about it.
Participant Two	But not always.
Participant Three	Sometimes they just did things. But then we could change things like the school.
Participant Four	Yes that was how.
Facilitator	How did you use the game visuals/space to help you discuss problems or issues with other players?
Participant One	I showed them.
Participant Two	Yes we showed them what we wanted to do.

Facilitator	Do you have any other comments?
Participant Four	No.
Participant Two	It would be good to have more of the Ghazipur community play this game. There is not may people here. That will helps. Some other people have other problems that we don't have .

Bhalswa Workshop Group One

Workshop Transcript

Pre-Gameplay

Facilitator	Are we okay?
Participant Three	Yes.
Facilitator	Okay, this game is called Maslow's Palace, yes?
Facilitator	I will help you understand.
Facilitator	First we will choose the colours. This one is red. Then green, blue yellow, yes?
Facilitator	Each of you has one. We will go you to you. Red, green, blue, yellow.
Facilitator	This is the game. Each has 5 levels. We will start with level one.
Facilitator	So you take turned. Click on your character to start your turn. Explore. Right click with this mouse to bust objects. Then do to this gate, see, to open it. All of you do that when you are finished.
Participant Two	Yes.

Level One

Facilitator	This is first going to help you learn.
Facilitator	So your turn now. Who starts?
Participant One	Okay.
Participant One	Ohh I choose this.
Participant One	It's not working.
Participant One	It's not.
Facilitator	You have to remove it.
Participant One	How?
Facilitator	Use this one.
Participant One	Do I do it for each?
Facilitator	Yes to remove them.
Participant One	I understand.
Participant One	Then what?
Facilitator	Move it to that area.
Participant Three	Okay now what.
Participant Three	It's there.
Participant Three	It's closed.
Facilitator	You all need to do it.
Participant Three	I haven't.
Participant Three	There.

Level Two

Facilitator	See each of the four players. This time we have the houses.
Participant One	Okay. But there is no space.
Facilitator	First you need to make space.
Participant One	I will move these like before.
Participant Two	Leave some.
Participant One	There.
Participant One	I think it is in the corner.
Participant Three	No. That doesn't make sense.
Participant Two	Over in that one.
Facilitator	Now you move to the end.
Participant Two	That is the same.
Participant Three	Let her do it.
Participant Two	Why are you doing it?
Participant Three	Do you want to put it there too?
Participant One	But not on top.
Participant Two	The house will be there.
Participant Four	That's all of them.

Level Three

Participant Two	There is more now.
Facilitator	Yes, this is a shop, toilet, hospital, mosque, park and trees and some blocks.
Participant Three	What was this?
Facilitator	Toilet.
Facilitator	There is houses here too. Each of you need this okay?
Participant Two	Yes we need houses.
Participant Two	Do I begin?
Participant Three	Okay.
Participant Two	Where is the road? That's what is needed.
Participant Four	All of this is a road.
Participant Two	This is a hospital first.
Participant Three	Yes. That is needed most.
Participant One	We'll clear this.
Participant Four	Put the yellow house there.
Participant Two	But also the toilet.
Participant Three	Yes a toilet.
Participant Four	Where will it be?
Participant Two	By the hospital.
Participant Four	Take it further back.
Participant Four	Yes yes there.
Participant Three	What was this one?
Facilitator	Mosque remember.
Participant Three	No.

Participant Three	That should be there.
Participant Four	Yes very important.
Participant Two	And the toilet over there. Close to the houses, by the edge.
Participant One	Not too close.
Participant Two	Enough.
Participant Four	Some trees.
Participant Three	That is in that park bit is what it can be.
Participant One	Yes.
Participant One	This is the house. I'm there now.
Participant Two	Don't bust it for some reason.
Participant Four	Yes.
Participant Three	Move it.
Participant Four	No it is fine.
Participant Three	No to the end.

Level Four

Participant Two	What are the new things.
Participant Three	Tree
Facilitator	Yes there are these things
Facilitator	Water tanks.
Participant Three	Yes!
Facilitator	Toilets, school, tree, meeting hall, market, and some blacks. There is the houses.
Participant Two	Good.
Participant One	There is nowhere to build.
Participant Four	We can't destroy those houses. People live there.
Participant Three	Well we have to build them somewhere. Maybe we destroy them.
Participant Four	If we build them up there, there will be less water.
Participant Three	We can't get though there. There's no path. We should build our houses in the valley and make a road.
Participant Two	We can walk up the hill. It's better than having water in our houses, and the garbage can fall on us.
Participant Three	We should put water there. Then we don't have that problem.
Participant One	I'll do it.
Participant Three	There.
Participant Four	Toilets next.
Participant Two	Not only one.
Participant Two	Put it there.
Participant Three	It's on top of that house. Next to it.
Participant One	Then they can't walk over.
Participant Two	They should all be in a line.
Participant Four	Put yours there.
Participant Two	Okay.

Level Five

Facilitator	These are the new things. There is a market, meeting hall like before, shop, toilet, water, cricket, school, restaurant, tree, wall, buildings, park, road, playground for children, mosque, plant, blocks.
Participant Two	That is a lot of things.
Participant Three	Where do we put them?
Participant Four	We can change it.
Facilitator	Yes change it like you want Bhalswa.
Participant Two	This is important.
Participant Three	We need to use that ground.
Participant Four	Yes there is nothing there.
Participant Three	Just waste.
Participant One	But that is not open.
Participant Two	It can be used. We should try.
Participant Three	Where is it?
Participant Four	There. Bust all of that there.
Participant Three	Yes. More?
Participant Four	What do you think?
Participant Three	First the houses.
Participant Two	We just need a better road.
Participant One	Yes. That is here. That way.
Participant Three	Then the houses are there.
Participant Two	You do them all.
Participant Three	That way.
Participant Four	A toilet is next. That is what is not in Bhalswa.
Participant Two	There.
Participant Three	What is these things?
Facilitator	Trees.
Participant Three	Yes. But under there. That is nice.
Participant Two	A hospital. Not here but close.
Participant Three	Where is the landfill?
Facilitator	There.
Participant Three	Then over there. Not so close.
Participant Two	Yes.
Participant Three	We need to keep the water out of the houses.
Participant Four	There, a wall.
Participant Three	Now to the end.
Participant Four	What are you doing?
Participant Three	That's not it.
Participant Two	Yes.
Participant One	It's not there.
Participant Two	It is now.
Participant One	It's done.

Focus Group

Facilitator	Was agreement reached within the group?
Participant Two	We showed the things that were needed in Bhalswa. Like water. That is what is needed most we all agree.
Participant Three	Yes that is important.
Facilitator	How was agreement reached?
Participant Two	Talking.
Participant Three	Yes we talked about it.
Facilitator	How did you use the game visuals/space to help you discuss problems or issues with other players?
Participant Two	It helped me show them what I wanted.
Participant One	I liked it. But it was quite hard moving fast.
Facilitator	Do you have any other comments?
Participant One	Yes, more time would have been better. It was quite fast.
Participant Two	Yes, I enjoyed it but that would help.

Bhalswa Workshop Group Two

Workshop Transcript

Pre-Gameplay

Facilitator	Okay sit down.
Facilitator	Are you ready?
Facilitator	We will do a game called Maslow's Palace.
Facilitator	We'll think about a new Bhalswa. What it will be like.
Facilitator	First this is where we choose the colours. Yes? Each of you will have one.
Facilitator	Who is red?
Facilitator	You can be.
Facilitator	Green?
Participant Two	Okay.
Facilitator	Blue?
Participant Three	Yes.
Facilitator	You are yellow.
Facilitator	Remember those are yours.
Facilitator	Next we play the game Maslow's Palace. You use this things to play. This mouse and you have turns like this and pass to her. Press this button to make choices. Then you go through the door.
Facilitator	Understand?
Participant Two	Yes.
Participant Four	Okay.
Facilitator	Now it is time to start.
Facilitator	Press that button.

Level One

Participant One	How do I do it?
Facilitator	First you have to bust those rocks.
Participant One	How?
Participant One	It's too fast. It's gone.
Facilitator	Here let me see.
Facilitator	There it is.
Facilitator	Press this button on them. See it's gone.
Participant Three	How?
Facilitator	This one.
Participant Three	Oh.
Facilitator	So you need to make a path?
Participant Three	Why?
Facilitator	So that you can go to the door.

Facilitator	You move your colours.
Participant Three	Is that how it ends?
Facilitator	Yes you all go together to the next one.
Participant One	There. Is that good?
Facilitator	Yes.
Participant Two	Is that correct?
Participant One	Yes, it is moving.
Participant Three	Good.
Participant Three	Where did it go?
Participant Two	Over there.
Participant Three	I can't find it.
Facilitator	Here I can help.
Participant Three	This is hard.
Participant Four	No.

Level Two

Facilitator	Good so you all did it together. Understand?
Participant Two	Yes it opened together.
Facilitator	Next there is houses So you can choose where to put it. Use this button. But still make a space.
Participant One	I will remove them.
Participant Two	There in each corner.
Participant One	That makes a room.
Participant Four	That is many.
Participant Three	I want to do some.
Participant Two	Put it in the corner near there.
Participant Three	Here?
Participant Three	Here?
Participant Two	Okay fine there is okay.
Participant One	It is on the gate. No.
Participant Three	Put that house there.
Participant One	Hurry up.

Level Three

Facilitator	There is these now.
Participant One	What?
Facilitator	There are more buildings now.
Facilitator	See.
Participant One	Yes.
Facilitator	Now a shop, a toilet, a hospital, a mosque, a park and some boxes.
Facilitator	You have to choose what you want.
Participant Two	Do we put them there?

Facilitator	Yes.
Facilitator	You have to decide together where they go and what is important to Bhalswa.
Participant Three	We need a hospital the most.
Participant Two	No a road.
Participant One	Yes.
Participant Two	There is too much water.
Participant Two	If we has a proper road it would be better. And no sorting.
Participant One	Yes.
Participant Two	We need to move all of the sorting away from homes. Two weeks ago, during the rain, the foil was washed through my door. This takes so long. If we move all of this and make an area for it where it can stay, then we won't have this problem. See like this. Can you remove all of these?
Participant Two	Then make the houses there with no waste. And that can be over there, maybe with containers.
Participant Four	Yes that is good. Behind.
Participant One	What about that button. Does that work?
Participant Two	That is better than before.
Participant One	The hospital is there too.
Participant Three	No there.
Participant Four	Let me do it.
Participant Two	No that's better.
Participant Four	Yes there.
Participant Four	A toilet too.
Participant Three	We have that.
Participant Four	No a better one. With water.
Participant Three	Move your colour.
Participant Two	Who?
Participant One	Her.
Participant Two	It's there.

Level Four

Participant Two	What is now?
Facilitator	There is more now.
Participant Two	The same?
Participant Three	That's funny.
Facilitator	Now there is a water tank, a toilet, school, tree, meeting hall, market and a box.
Participant One	Where to we put them?
Facilitator	There. You have to decide.
Participant Two	In there?
Facilitator	Yes. So you might have to bust things.
Participant Three	What are they?
Participant Four	It doesn't matter.
Participant One	Okay they can go there.

Participant Three	The houses are the same.
Participant Two	Can they go there?
Participant One	On top?
Participant Two	They are in a pile.
Participant One	There's no room. Your house is there. We need a toilet as there is none in Bhalswa. Move it.
Participant Two	Why don't we build on the hill? It will be quiet there.
Participant One	No. Just move your house. You always think about yourself only.
Participant Four	I'll build one then you build one.
Participant One	Okay, only if we can also have water there.
Participant Three	See like this, these are steps, we can walk up.
Participant Two	That is too many. How to you go there?
Participant One	Just go up. It doesn't matter.
Participant Three	It will work.
Participant Two	There is the water.
Participant Four	That can be down there by the houses.
Participant Two	Yes.
Participant Three	Hurry up.

Level Five

Facilitator	In this one there is more. Let me show you. There are your colours. Then see the landfill yes? And a road, and a plant, the houses. Then you decide what you want your Bhalswa to be like.
Participant Two	The houses should be by the landfill.
Participant One	That is best.
Participant Three	Where is the road?
Participant One	There.
Participant Two	That doesn't make sense.
Participant Three	How can we have a road with the houses?
Participant Two	But there is the water. How do we stop it?
Participant Three	It is there.
Participant Three	But if there is houses there is water.
Participant Two	We need that most.
Participant Four	Okay go straight there.
Participant Three	They have to be busted.
Participant Two	Where to though?
Participant Three	The can't be there. How do you make a good road?
Participant Two	If we build them there then they don't need fixing.
Participant One	Yes.
Participant Three	They should be there. So then they can have a hospital.
Participant Three	We need to have hospitals. My child gets sick. He is left at home when I work in the landfill when he is sick, and I cannot look after him. If the hospital was close to home, he could get better and I could earn money for my family doing this work.
Participant Two	Yes that is important.

Participant Three	It is very.
Participant Two	Over there.
Participant Two	No there.
Participant Two	Closer.
Participant Two	What else is there to do?
Facilitator	Have a look at this thing.
Participant Two	This?
Facilitator	Market.
Participant Two	Yes.
Facilitator	Meeting hall. Shop. Hospital. Toilet. Water tank.
Participant Three	Yes. That is very important for us.
Facilitator	I know.
Participant Two	We should build a toilet as close as possible to the houses, so we don't have to walk so far.
Participant Four	No! We need to move all of the houses further away. If we do this, they won't be flooded. We should move both away for our children.
Facilitator	Yes, if you do that, then you won't get sick. We can help and so can Safai Sena. We should put them here.
Participant Three	We need water. They need to be there. By the houses.
Participant Two	Yes.
Participant Three	And there.
Participant Two	This?
Facilitator	Cricket.
Participant Four	Laughing.
Participant Two	This?
Facilitator	School.
Participant Two	Yes that is needed. Where do you think?
Participant Three	Close to the landfill. By the Bhalswa.
Participant Two	Yes.
Participant Four	Not that close.
Participant Two	This?
Facilitator	Restaurant, tree, wall, tree, building those three, park.
Participant Two	Yes. Where?
Participant Three	There.
Participant Two	Good.
Participant Two	This is?
Facilitator	Road.
Participant Two	This is by the houses.
Participant Two	This?
Facilitator	Playground.
Participant Two	This is for the children yes?
Facilitator	Yes.
Participant Two	That is close to the landfill.
Participant Two	This?
Facilitator	That is the Mosque.
Participant Four	Ohh yes. That is there. In the middle.
Participant Two	Good idea.

Participant Four	Yeah I know.
Participant Two	And this?
Facilitator	Recycling plant.
Participant Four	No.
Participant Two	I know what these are.
Participant Three	You have to be there too.
Participant Two	I'm coming.
Participant Three	There.

Focus Group

Focus Group of Bhalswa Group Two was not conducted.

Shanti Nagar Workshop Group One

Workshop Transcript

Pre-Gameplay

Participant One	Okay to is it this one?
Participant Three	Yes.
Participant One	This one?
Participant Three	Yes.
Participant One	What colours will we be?
Participant One	I'll just do it.
Participant Two	Fine.
Participant Two	There.
Participant One	Now we go forward and reach the gate.
Participant Three	Stop doing that.

Level One

Participant One	So they look like this. I think we click this to break it.
Participant Three	We must. There is no way around.
Participant Two	Try this.
Participant Four	I'll play too.
Participant Two	Go.
Participant Two	You need to get rid of those things. Bring them here.
Participant One	How will it break?
Participant Three	There.
Participant One	Click this button.
Participant Two	We need to put them all by the gate.
Participant Three	How are your going to break it?
Participant Two	It's walking funny.
Participant One	No look here.
Participant Two	That's no it.
Participant Two	There.
Participant Three	By the gate.
Participant Four	Oh.

Level Two

Participant Two	Now what?
Participant Three	Is it the same.
Participant Four	No, didn't you read the instructions?
Participant Two	There's buildings.

Participant Four	Houses.
Participant Three	Oh.
Participant Two	Bust them all.
Participant One	I will.
Participant One	This is yours.
Participant Three	Yes it is. The house can be there. That's it.
Participant Two	How do I do it?
Participant Four	Just press that.
Participant One	Is that enough?
Participant Four	Yes.
Participant One	Yes.
Participant Four	Okay.
Participant Two	How do I do it?
Participant Four	Over there. Press that like before.
Participant Four	Mine is there.
Participant Two	There. Is that it?
Participant Four	Yes.

Level Three

Participant Two	This is different. There are more now.
Participant Three	Yes a toilet.
Participant Two	And a hill. Both sides.
Participant Four	Where will it be?
Participant Two	Ohh what is this?
Participant Three	We will have to bust it all.
Participant One	There is so much.
Participant Two	Hurry up.
Participant One	There take it further back.
Participant One	Yes yes there.
Participant Two	Toilets.
Participant One	Yes. That is needed most.
Participant Three	We'll clear this.
Participant Four	Put the yellow house there.
Participant Two	But also the toilet.
Participant Three	There is a road there.
Participant One	This is a hospital first.
Participant Two	We all need to do a house. Otherwise we can't finish.
Participant Four	Yes we need houses.
Participant One	Do I begin?
Participant Two	Okay.
Participant Three	Where is the water? That is what we need.
Participant Two	There. Your turn.
Participant Four	Thank you.
Participant Four	Mosque remember.

Level Four

Participant One	My one is red.
Participant Two	They are together.
Participant One	They should go.
Participant Two	No you have to choose.
Participant Three	What are they?
Participant One	Houses.
Participant Three	Ohh so you understand.
Participant Three	Is it my turn?
Participant Two	Yes.
Participant One	That made space.
Participant Two	But not for everyone.
Participant Three	So we need more for our children and older ones.
Participant Two	Yes.
Participant One	There.
Participant Three	Then water too.
Participant Two	Some more.
Participant One	Another.
Participant Three	Put it on top. Then you don't bust them. They can be together.
Participant Two	A tree.
Participant Four	Where to we put them?
Participant Two	There. You have to decide.
Participant Four	In there?
Participant Three	Yes. So you might have to bust things.
Participant One	What are they?
Participant Two	It doesn't matter.
Participant Three	Okay they can go there.
Participant Four	The houses are the same.
Participant Two	Can they go there?
Participant One	On top?
Participant Two	Finally.

Level Five

Participant Two	What are you doing?
Participant Two	That is too much.
Participant One	Oh. Sorry.
Participant Two	There is meant to be a school.
Participant Two	They should all be in a line.
Participant Two	A market can go there.
Participant Three	There. No that's too much.
Participant Four	Put yours there.

Participant Two	Okay.
Participant Four	Okay.
Participant One	I'll do it.
Participant Three	There.
Participant Four	Toilets next.
Participant Two	Not only one.
Participant Two	Put it there.
Participant Three	It's on top of that house. Next to it.
Participant One	Then they can't walk over.
Participant Three	Yes too?
Participant Four	No more plants.
Participant Three	Yes, then that is more work for us.
Participant Two	It is there.
Participant Three	It went away.
Participant Three	Where is the landfill?
Participant Two	There.
Participant Three	But there should also be a park.
Participant Two	Yes for the cricket!
Participant Three	A meeting hall is here at Apnalaya.
Participant Two	Yes that looks like it.
Participant One	Hurry up.
Participant Two	It walks so slowly.

Focus Group

Facilitator	Was agreement reached within the group?
Participant Four	Yes I think it was good.
Participant Two	You busted a lot and then we ran out. I didn't agree with that.
Participant One	I liked blowing them all up! It was fun.
Participant Two	Yes, but it didn't help.
Participant One	I didn't know.
Participant Three	So we didn't always.
Participant One	If we tried again maybe.
Facilitator	How was agreement reached?
Participant Three	For some things we talked about them. But some we just showed.
Participant Two	Yes, showing was the easiest.
Participant One	I should have talked more.
Participant Two	Maybe we work as a team more.
Facilitator	How did you use the game visuals/space to help you discuss problems or issues with other players?
Participant Two	I liked seeing everything.
Participant One	I don't understand the first levels, but I can see the last one.
Participant Three	Good for showing.
Facilitator	Do you have any other comments?
Participant Two	It was fun playing with them.

Participant One

Yes I would play again.

Shanti Nagar Workshop Group Two

Workshop Transcript

Pre-Gameplay

Participant One	Which one do you want?
Participant Two	That one.
Participant One	You?
Participant Two	Yes.
Participant Three	What colours will we be?
Participant One	There it is.
Participant Two	Fine.
Participant One	I think we have to read this.
Participant One	Done?
Participant Two	Yes.

Level One

Participant Two	Which one is yours?
Participant One	Red
Participant Two	So we all go to that thing?
Participant Three	Yes.
Participant Two	Oh
Participant Three	That's is.
Participant Four	Bust them.
Participant Two	Why?
Participant Three	Because you can.
Participant One	That doesn't make sense.
Participant Two	Break them.

Level Two

Participant Three	Just go over there to the next level yes?
Participant One	You should break that first.
Participant Three	Go over there now.
Participant One	There is only one way/
Participant Two	Its by the edge.
Participant Three	That wasn't smart.
Participant Two	Just don't do that. That's not the way.
Participant Four	It's the blue one that is yours.
Participant One	No blue. That one.
Participant Two	That's not your house.
Participant Four	Where should I put it.

Participant Two	Here
Participant One	I don't want to break it.
Participant Two	There put it over it.
Participant One	Don't break the house.
Participant Three	I didn't drop it. It wasn't meant to be like that.
Participant Two	Okay I'm coming. It is done.
Participant One	It will only open when we are all there.

Level Three

Participant Two	Oh those are different.
Participant One	Stop that.
Participant Three	But not everyone.
Participant Two	There is a hospital. That should be first.
Participant Three	There.
Participant Four	Then water too.
Participant Two	But there is none.
Participant One	But it can.
Participant Three	Where?
Participant One	No there silly.
Participant Four	Okay they can go there.
Participant Two	The houses are the same.
P5	It over at the end.
Participant One	On the bottom.
Participant Three	That can't be there. It doesn't go. Put the mosque there and it will be good.
Participant Two	It should only be there though.
Participant Three	Behind.
Participant Four	We have to get rid of this though.
Participant One	Put it by the water.
Participant Two	There is more needed.
Participant Four	Where is the water.
Participant Two	It's okay but could be better.
Participant Four	Like that.
Participant One	Have a look at this thing.
Participant Two	Yes.
Participant Four	This is yours.
Participant Two	It's not there yet.

Level Four

Participant One	There is more now look. Water and a school.
Participant Two	But some it the same.
Participant Two	It's small though.
Participant One	But there's no room. I think we have to choose.

Participant Three	You all have to choose.
Participant Three	Do we break them down?
Participant One	Yes I think so.
Participant Four	There, is that the landfill?
Participant One	Yes bust that.
Participant Two	The toilet is the most important for the community.
Participant One	Yes.
Participant Four	There should be many of them.
Participant Two	Here?
Participant Three	Yes.
Participant Two	Should we bust this?
Participant Three	Yes.
Participant One	This is the water tank.
Participant Four	That looks good. What about the school?
Participant Two	Yes that is a good idea.
Participant One	Okay over there.
Participant Two	What is that there?
Participant Three	There is water now.
Participant Four	Where were those guys?
Participant Four	I think that hall should be there.
Participant Three	Okay, yes like before.
Participant One	I think your house will fit there.
Participant Four	Where?
Participant One	You can do it. Over there.
Participant Two	This is no what is was meant for. The tank can be on the road I think.
Participant Three	No.
Facilitator	What else does it need?
Participant One	More water.
Participant Two	More? We already have lots.
Participant One	Like this?
Participant Two	Yes.
Participant One	Its nice
Participant Two	Mine too.
Participant Two	That is okay. But it's not as good as before. You removed too many.
Participant Three	We don't have a, what it that?
Participant Two	Market.
Participant Three	Yes one of these.
Participant Two	But it is not that big.
Participant Three	This can go there.
Participant Two	No there.
Participant Three	Are you sure?
Participant One	Yes. Put your house then we are done I think.
Participant Four	We are done I think.
Facilitator	Move it over there you know.
Participant Two	No you.
Participant Two	There.

Level Five

Participant Two	There are lots of these things in Govandi.
Participant One	Just move the mouse to them so we can see.
Participant One	So what do you do?
Participant One	Market, then meeting, shop, see this things, hospital, toilet, tank, cricket, school, restaurant, tree, wall, tree, some things, building, apartment, park, road, playground, mosque, plant.
Participant Two	Yes a Mosque first like that other one.
Participant Four	Yes.
Participant One	But it should be a toilet near to there.
Participant Four	That is by Govandi.
Participant Three	Where is the cricket?
Participant Two	It should be there. That is the most fun.
Participant Four	But is it important?
Participant Three	First we need to bust.
Participant Four	Watch out for the money.
Participant Three	Your using it.
Participant Two	Put the cricket there.
Participant Three	Not yet.
Facilitator	Does this Govandi have a park?
Participant Three	Yes, but not now.
Participant Two	A park can be over there.
Participant Two	Next to those factories.
Participant One	A playground goes with it too.
Participant Two	Yes, bu my house.
Participant Three	Not there. I didn't mean that.
Participant Three	That's better.
Participant Four	But the road too.
Participant Two	Then the shops.
Participant Three	More toilets.
Participant Two	Where?
Participant Three	Yes there. I think here too.
Participant Two	This makes it good I think. It has most of the things that we need.
Facilitator	Move that box.
Participant Two	That's my house.
Participant Three	That was funny. He didn't get there though.

Focus Group

Facilitator	Was agreement reached within the group?
Participant Three	Yes we made a good Govandi. Particularly the last one. That is how it should be.
Participant Two	Yes, I think it was good too.

Participant One	Sometimes we didn't agree though. But we talked about it.
Participant Two	Yes talking was important.
Facilitator	How was agreement reached?
Participant Three	Talking about it. And showing also.
Participant Two	Sometimes we didn't. But that's okay. We can do different things sometimes.
Participant One	But we would just talk about them.
Facilitator	How did you use the game visuals/space to help you discuss problems or issues with other players?
Participant Two	It was good to see the things. We could show you what we wanted.
Participant Three	I liked the explosions. They were my favourite part.
Participant One	Me too.
Participant Four	Yes, but I think there needed to be more roads. That is what it is like here.
Participant Three	That would help.
Facilitator	Do you have any other comments?
Participant One	I think it was good. I would like to do it again.
Participant Two	Yes.

Shanti Nagar Workshop Group Three

Workshop Transcript

Pre-Gameplay

Participant Two	All four players' names in over here.
Participant Three	Put Yasmin here, there's two e's in my name.
Participant Two	What is this?
Participant One	If anything comes in the way.

Level One

Facilitator	Red green and yellow look like this, if anything in the way click right and break it.
Participant Three	And we need to go forward to reach the gate
Participant One	Go there's nothing there.
Participant One	I'll play too, I know how to play.
Participant Two	You do it.
Participant Three	You need to bring it here.
Participant Two	Okay do it.
Participant Two	How will we break it?
Participant Three	Well click this button.
Participant One	Well ask that.
Participant Two	Do you want to drown him in water?
Participant Three	We need to take them all by the gate.
Participant Two	So how are going to break it (the gate).
Participant One	With the middle button.
Participant Two	Should I click the middle one?.
Participant One	What about the side button (telling him to do it).
Participant Three	If you want to break it then you break it like this.
Participant One	So you break it from here right.
Participant Two	I don't want to play anymore.
Participant Four	Oi don't swear it me.
Participant One	It's running.
Participant Three	Help me.
Participant Two	Show me there (that part of the map).
Participant Two	Drown my son (character) too.
Participant Three	No look here (to stop side-track).
Participant One	Okay fine go straight.
Participant One	No but first drown him.
Participant One	It opened.
Participant Two	One by one kill them in the water.

Level Two

Participant Two	My one's going to be red.
Participant Three	Shut up (continues explaining the rules).
Participant Two	They're all going together.
Participant Three	Now its player ones turn.
Participant Two	The red one.
Participant One	Okay understand you break (explode/slang) this.
Participant Three	Ohh so you understand.
Participant One	Take mine forward, straight..
Participant One	My ones green.
Participant Three	My ones blue.
Participant Three	Okay lets continue (insulting tone).
Participant Three	You just need to break everything.
Participant Three	You broke them all?
Participant Four	What are these guys going to break man?
Participant One	You're and idiot.
Participant Three	Just go away, why are you breaking all of these.
Participant Two	He's telling us the colour.
Participant One	Yellow.
Participant Three	There's no house.
Participant Four	Kill him.
Participant Three	So you just need to break all of these?
Participant One	Now it's my turn.
Participant Three	Now this one you need to stand it next to the gate.
Participant Three	Now this green one we want to put it next to the gate.
Participant Two	Where is my house going to be?
Participant One	Hey go get him.
Participant Three	Who's going to go first?
Participant One	The blue one.
Participant Three	Where should I put it.
Participant One	It should only go there.
Participant Three	It's in the corner.
Participant Four	Put hers in the middle.
Participant One	Ahead.
Participant Three	Wait wait wait wait.
Participant Three	Now this one is your house (pointing to screen).
Participant Four	Quickly quickly set his house on fire.
Participant Three	Your house is this one.
Participant Three	Tell me where do you want it.
Participant Two	I want it there in the corner.
Participant One	Over here?
Participant Two	Yeah there.
Participant Three	Take it there.
Participant Two	Yip do it
Participant Two	Chuck it in the water.

Participant One	Take it there in the corner.
Participant Two	Put it in the water.
Participant One	Put it in the corner near there.
Participant One	Here?
Participant Three	Here?
Participant Two	Okay fine take it over there.
Participant One	Haha it's at the gate.
Participant Three	Where's your house.
Participant Three	She's going to drown it.
Participant Three	She walks in style (the character).
Participant Three	Your house is half drowned.
Participant Three	We have to remove this.
Participant Two	Come let's take them into the water.
Participant Three	Put it there.
Participant One	Here or there?
Participant Three	Here?
Participant Three	You go there.
Participant One	Now Juliette's going to come running.
Participant Three	Oh shit what if she drowns.
Participant Four	Suicide.
Participant Three	Do we start from here?
Participant Three	Read it.

Level Three

Participant Two	It is very easy.
Facilitator	There are more now.
Facilitator	Make sure you read the things. There are lots.
Participant Two	Closer.
Participant Three	What else is there to do?
Participant One	Have a look at this thing.
Participant Four	It should only go there.
Participant Two	Ahead.
Participant Three	We have to remove this.
Participant Two	Come let's take them into the water.
Participant Three	Put it there.
Participant One	Put hers in the middle.
Participant Three	It's in the corner.
Participant Four	On top too.
Participant Two	That can't be there. It doesn't go.
Participant One	But it can.
Participant Three	Where?
Participant Two	Okay they can go there.
Participant Three	The houses are the same.
Participant One	Can they go there?

Participant Two	On top?
Participant Four	They are in a pile.
Participant Three	Yes it is. The house can be there. That's it.
Participant One	Will I put my house?
Participant Two	Yes.
Participant Four	This is yours.
Participant One	Okay.

Level Four

Participant Two	Yes there are these things
Participant Two	Water tanks.
Participant One	Yes!
Participant Four	There are some.
Participant Three	But can you use them?
Participant Two	Then water too.
Participant One	Some more.
Participant Four	Another.
Participant Three	Yes.
Participant Two	There.
Participant One	Some can.
Participant Three	But not everyone.
Participant One	There needs to be another school.
Participant Two	But not there.
Participant Three	Why not?
Participant Two	It doesn't fit.
Participant One	Yes.
Participant Three	No but the houses.
Participant Two	Oh.
Participant Four	There needs to be more water too. That is the biggest problem in Govandi.
Participant Three	Yes.
Participant Four	We are finished though.
Participant One	That was fast.

Level Five

Participant One	All the things from Mumbai have come.
Participant Three	Read it again.
Participant Three	We need to decide where our house goes.
Participant Three	If I put my house there I have to decide what is around my house (do I want a grocery store).
Participant Three	And for all these things we have to pay money.
Participant One	It looks like a film.
Participant Two	Come lets go inside.

Participant Three	Ohh I've got 1000 rupees.
Participant Three	What the guy said is that we need our house somewhere and we need to decide what things we would like around it – park etc.
Participant Three	And what is this?.
Participant Three	Between us we've only got 980 rupees only.
Participant Four	If we break something it costs 10 rupees and if we make something it also costs 10 rupees.
Participant One	What is that.
Participant Three	Its all edible food.
Participant Two	It's a market.
Participant Three	This is the market so we'll break this area.
Participant Two	Please don't break the market.
Participant Four	Break something.
Participant Four	Get rid of the tree instead.
Participant One	Whatever you do don't break the market.
Participant Three	Now I need to place my one.
Participant Three	Where?.
Participant Two	Put it in the corner.
Participant Two	No no forward.
Participant Four	We need space to still walk through.
Participant Four	Just chick it there.
Participant One	Is it my turn?.
Participant Two	No that should be the playground.
Participant Four	Oi don't break them all it will create too much waste.
Participant Three	Now we have this much area.
Participant Three	My house have come here (hovering over house).
Participant Two	There is so much garbage.
Participant Two	How do we move it?
Participant Three	Put it in the landfill
Participant One	But they always bring it out.
Participant Two	They have to.
Participant Two	There are so many houses. Between the houses is where the garbage is. If they were apart, it would be cleaner.
Participant Four	But what are we going to do with the waste? Look outside. There is so much. We need to put it somewhere.
Participant Two	And where will the people from those houses live?
Participant Four	What is this? We could build a recycling centre close by.
Participant Three	Still breaking things) Participant One says that's enough.
Participant Three	One will go here and one will go here.
Participant Three	We'll clear this path.
Participant Three	We'll put the yellow house.
Participant One	Whose house?.
Participant Two	The yellow ones house.
Participant Three	This is my house right?.
Participant Three	This is number 4.
Participant Three	Pick up all your things and settle over here.
Participant Four	And so you put your house here.

Participant One	Oh but there's a market there.
Participant Two	Worried that building a house will destroy the market.
Participant Two	Where my house.
Participant Three	Over there.
Participant Four	Move the market.
Participant Four	Ill put the rest of my money towards that.
Participant Three	Mosque.
Participant Two	Do it for the mosque (destroy).
Participant Four	But there's a mosque already there right?.
Participant Two	Yeah toilet.

Focus Group

Facilitator	Was agreement reached within the group?
Participant One	Yes, we made a Govandi that we like.
Participant Two	It made a big difference seeing what the community could be like
Facilitator	How was agreement reached?
Participant One	We talked about things as a group.
Participant Three	But sometimes we just did things.
Participant Three	So somethings were not at all as a group.
Participant Four	But the most important things were.
Participant Two	Yes.
Facilitator	How did you use the game visuals/space to help you discuss problems or issues with other players?
Participant Three	Yes it helped me see where the buildings go and how they go together.
Participant One	Yes it was very helpful.
Facilitator	Do you have any other comments?
Participant Three	We need schools. If we have education then we can help our family.
Participant Two	Yes that is what is needed most.
Participant Three	When I was playing the game, there was a recycling centre—which is not at all in Govandi [Shivaji Nagar], so I feel there should be a recycling centre in Govandi. A lot of people waste a lot of things—plastics, metals, cups, glasses, clothes—so I feel there should be a recycling centre for the wealth of the community. I didn't think about that before.
Participant Three	I wish I could live in the game and make my community like that how I want it that easily.
Participant Four	According to the game with shops and clean streets I want it to be like that as well.

Shanti Nagar Workshop Group Four

Workshop Transcript

Level One

Participant One	This is what they are. What don't they look different?
Participant Three	We must. There is no way around.
Participant Two	Try this.
Participant Four	I'll do it.
Participant Two	So we all have to go there?
Participant Three	Yes.
Participant Two	Oh
Participant Three	There.
Participant Two	Which is yours? I can't tell them apart.
Participant One	That one.
Participant Three	Oh.
Participant One	That was fast.

Level Two

Participant One	You have to read it.
Participant Two	I did.
Participant One	No to her. She cant understand.
Participant Three	Yes.
Participant Two	It says there are houses now and we all need one see.
Participant Two	Then it's the same as before.
Participant Three	Thank you.
Participant One	Do we bust these?
Participant Two	It didn't tell us.
Participant One	I think we can.
Participant Two	Put yours there.
Participant Three	Then we can line them all up like a road.
Participant Two	That's nice.
Participant Three	Yes, and then come to the end with us.
Participant Four	So that we are all there and it will open.

Level Three

Participant Two	This one says there are more buildings a things. And we need five of them and then go to that door again.
Participant Three	Okay.
Participant One	We should do the houses first.

Participant Two	Yes that is important.
Participant Three	Then we can put the others around it I think.
Participant One	I'll put this house there.
Participant Three	Good idea.
Participant Two	Here?
Participant One	Yes I think that.
Facilitator	But where should it be?
Participant Two	It doesn't matter.
Participant One	There should be a mosque in the middle not a house.
Participant Three	And a hospital.
Participant One	Yes.
Participant Three	There.
Participant Two	We already have a mosque.
Participant Two	Then change it for a shop.
Participant Three	Put this house next to it.
Participant One	We still all have to go there.
Participant Two	What do these do. We didn't use them.
Participant One	Yes that is important.
Participant Two	Somewhere close.
Participant One	Put this there.
Participant Two	Can that be for all of us?
Participant Four	That's the point.

Level Four

Participant Two	This one has different stuff, but it's the same as before.
Participant Three	Okay.
Participant Two	What are those hills?
Participant One	That's hard. Do we do it different?
Participant Two	Yes I think.
Participant Three	Where do we start?
Participant One	Over here?
Facilitator	We should start with the water. That's what he wants.
Participant Three	Yes!
Participant Two	Good.
Participant One	I don't think there is enough room.
Participant Two	We will make some.
Participant Two	Can't they be there?
Participant One	No first do the meeting room.
Participant Four	Tell me where do you want it
Participant Three	What is yours?
Participant One	My one is red.
Participant Two	They are together.
Participant One	I'll bust them up though.
Participant Three	No you have to choose.

Participant Four	What are they?
Participant Three	Blocks I think. I'm not certain what they do.
Participant Two	More of the water tanks can be there.
Participant One	Ohh so you understand.
Participant One	It's your turn now.
Facilitator	There you are.
Participant One	That made a lot of room. Now trees can be there.
Participant Three	Is that the landfill?
Facilitator	I think so.
Participant Three	Those are rocks. Like a cliff.
Participant One	Then the market underneath.
Participant Four	Yes move it up the stairs.
Participant Two	On to the green bit.
Participant Three	Okay there it's done.
Participant One	Nearly there.

Level Five

Participant One	Have you read it yet?
Participant Two	No.
Participant Two	So now we need 20 and there is Rupees I think.
Participant Two	I think we need to make a park. Like a middle bit for the people.
Participant Three	Yes, with trees.
Participant Two	So should we bust these bits first?
Participant One	Yes. It can go there. From there.
Participant Two	Yes. It can go there. From there.
Participant One	We need more trees. They can be for shade. And there we also need access to water. And close to home so we don't have to walk a long way.
Participant Two	That's like the cricket ground.
Participant One	Yes!
Participant Three	Then we could use it too.
Participant One	No just for cricket.
Participant Two	But when we put the houses, the school needs to be close so they can walk to it.
Participant Four	The houses should be there, all around.
Participant Two	No in the middle.
Participant One	If they are all together it won't be as dirty.
Participant Two	That doesn't make sense.
Participant Three	Yes. Then everyone can clean.
Participant Two	Use yours to push me into the water.
Participant Two	Come on, help me blow this all up.
Participant Two	If we blow it all up, we can put a zoo with animals.
Participant One	Okay I'll do this bit.
Participant One	So, the animals go here?
Participant Two	Yes.

Participant Three	I'll build a fence.
Participant One	Then we can see them every day.
Participant Two	Yes.
Participant One	Lions!
Participant One	And fish. Because we'll all be in the water!
Participant Two	So, the zoo needs to be there. By the water. We can use this. The lions go in there.
Participant Four	But they need water too.
Participant Four	You can't put it on top of anything though.
Participant One	I think that's good.
Participant Three	We should go to the end now.
Participant Four	Yes.
Participant Two	Yes I'm bored.
Participant Two	You'll find it there.
Participant Two	Finally.
Participant Four	Yes he's there that sir.
Participant Two	Let's do something else.

Focus Group

Facilitator	Was agreement reached within the group?
Participant Two	Sometimes we agreed. But sometimes we didn't.
Participant Three	Yes not always.
Participant One	We don't need a zoo. But it was fun to do.
Facilitator	How was agreement reached?
Participant Two	I don't know. I didn't think about it.
Participant Three	We talked.
Participant Four	Yes. We talked to each other about the game things.
Facilitator	How did you use the game visuals/space to help you discuss problems or issues with other players?
Participant Four	It was good to show them what it could be like.
Participant Three	Yes sometimes it is hard to see what you mean. But we could show it.
Participant Four	I liked the colours, how it looked.
Facilitator	Do you have any other comments?
Participant One	Yes it was helpful to see the community. I liked breaking the boxes and making the people walk.
Participant Two	It was fun to try to push it in the water. That was the best part.
Participant Three	Don't be serious.
Participant Two	It was fun though.

Shanti Nagar Workshop Group Five

Workshop Transcript

Level One

Participant Three	Lets start.
Facilitator	Don't go there go here wait wait.
Facilitator	The red ones yours right?
Facilitator	Your ones red.
Facilitator	So your red one you need to bring it here and the break that.
Participant Four	Break that.
Participant Three	Is there danger in this?
Facilitator	No.
Participant Two	How do we go forward?
Facilitator	Wait wait how to go forward wait wait wait.
Facilitator	If you want to go forward then you need to click this and then it will go there.
Facilitator	Now you wall need to stand in one line.
Participant Four	Okay give it to me I'll do it.
Facilitator	Its player number twos turn.
Participant Three	To player number 2 - its your turn.
Participant Two	That's mine, green ones yours.
Facilitator	Whose is the green one?
Participant Two	It's hers.
Facilitator	You can break those rocks in front of you as well it's your choise ladies.
Participant Three	I'm going to break these.
Participant One	It's gone ahead.
Participant Two	That's it.
Participant Three	I'll get the rock.
Facilitator	Right click.
Participant Three	It's done.
Facilitator	Is it done? Then go ahead.
Facilitator	Don't touch that.
Participant Two	Click it again.
Participant Four	I'm not going to click it.
Participant Two	Click it.

Level Two

Participant Four	Yip we need to make our own houses and we need to discuss whose house will stay and where it will go.
Facilitator	Wait wait wait first player one.
Facilitator	Facilitator, red colours house is this one, where do we want to take it?
Participant One	All here here here here.

Facilitator	Facilitator, there's surface there. Do you want to put it on the surface or the water?
Facilitator	Okay we'll put it on the side.
Participant One	So its made.
Facilitator	Do you understand?
Facilitator	And well do that for all four.
Participant Three	Go it's your turn.
Facilitator	Now look at yours.
Facilitator	Make sure that the middle space is empty.
Facilitator	Don't drop it into the water.
Facilitator	Now you want to take your red one and put it that way by the gate.
Participant Four	So by the gate.
Facilitator	Yep by the gate.
Facilitator	Now look it stopped you will have to break it.
Facilitator	Be careful you don't want to break your own.
Facilitator	Go back a bit.
Facilitator	Now the first ones on so now player two.
Facilitator	You need to choses where your spot will be.
Participant One	First break the rocks then put it there.
Participant Three	Don't do that the house will break.
Participant Three	You silly girl.
Facilitator	Leave it leave it.
Facilitator	You guys need to think carefully and locate your houses.
Facilitator	You can stroll around and go as well.
Facilitator	If you click it once it should go to the main gate.
Facilitator	Please break the stone over there.
Facilitator	Player number three blue.
Facilitator	First where are you going? Wait.
Facilitator	Where do you want your? Here.
Participant Two	Here
Facilitator	There you don't want to break the stone there.
Participant One	Here lift your house up.
Facilitator	Don't break the house.
Participant Three	We didn't drop a house we dropped a stone here.
Participant Four	Just go from here we want to go to the next level right?
Participant Two	Why don't you break the rock.
Participant Four	Go forward now.
Participant Three	Open the gate I'm coming.
Participant Four	The gate will only open when four people are there.

Level Three

Facilitator	This now has some more things for you. Make sure you have a look and read it.
Participant One	We know.
Participant Two	Yes.

Participant Three	We need more close that we can use. But there should be schools there.
Participant One	There are some.
Participant Two	But can you use them?
Participant Three	Some can.
Participant Four	But not everyone.
Participant Two	There.
Participant One	Then water too.
Participant Three	Some more.
Participant Two	Where is the water.
Participant One	Its nice
Participant Two	Mine too.
Participant Three	You can do it. Over there.
Participant Two	Yes.
Participant Two	You do it.
Participant Three	This house goes there.
Participant One	Where?
Participant Two	Make your house.
Participant Four	That will do.
Facilitator	Are you finished?
Participant One	Yes.
Participant Two	Go over there then.

Level Four

Participant Two	There's no space.
Facilitator	That's the challenge.
Participant Two	That's hard.
Participant Three	I want it there in the corner
Participant One	Over here?
Participant Two	Yeah there
Participant Two	Can they go there?
Participant One	On top?
Participant Four	Tell me where do you want it
Participant Three	What are they?
Participant Two	It doesn't matter.
Participant Three	Okay they can go there.
Participant One	The houses are the same.
Participant Three	Yes.
Participant Two	Now to the door?
Participant Three	Yes if your are complete it is open.
Participant Two	Okay.
Participant One	I think it is good.
Participant Two	I'll move mine next.
Participant Two	Okay here it is.

Participant Three	Here?
Participant One	Yes and there.
Participant Four	Take it there
Participant Two	Yip do it
Participant Three	Okay there it's done.
Participant One	Look at him walk.

Level Five

Facilitator	This level is interesting – read it.
Facilitator	Did you understand, this whole town is already made for you. All four of you have 1000 you have 1000 it's not like that.
Facilitator	That 1000 everybody has to collectively use it. It depends on you how you want to use it.
Participant Three	So there will be an expense when the house it broken.
Facilitator	All four of you are in a line.
Facilitator	Suppose if you want to break anything, if you want to break it you will have to pay for labourers, you will need cars and to clean it you will need money. So if you want to break it will cost you 10 rupees.
Facilitator	If you want to get anything.
Facilitator	Suppose if you want a hospital or a water tank or a shop or a market there a road park school all of them are for 10 rupees, if you want to buy it is will cost you 10 rupees.
Facilitator	04:39, Facilitator, so first each of you make your own house
Facilitator	And whatever you want around your house. What do you want around your house a toilet water tank?
Participant Four	Hospital.
Facilitator	So you want a hospital you want a school you want a park for the kids.
Facilitator	You place them as you wish.
Facilitator	Look the park will take this much space.
Facilitator	Clear the surface a bit.
Facilitator	So in that space you can put whatever you want and settle your house there.
Facilitator	First destroy a whole area.
Facilitator	For 500 rupees destroy the whole area.
Participant Two	We'll destroy the bigger places first.
Participant Two	Because it will cost 10 rupees.
Participant Three	Look at the place first and then decide.
Participant Four	Break all of this.
Participant Three	Where am I going to get big ones from? These are all small.
Participant Three	Can we move the wires?
Facilitator	No.
Facilitator	If the wires go away then how is there going to be electricity, there's nothing for electricity there then.
Participant Three	But it will get empty right?
Participant Two	Remove this.
Participant Two	Remove that again.

Participant Four	Attack what's below.
Participant Three	You have brains.
Participant Four	Yeah I do.
Participant Four	Don't break anything for no reason.
Participant Three	I'm not breaking anything for no reason.
Participant Three	Will it be done?
Participant Four	We want to go to the gate.
Participant Two	It's over there.
Participant Three	What your colour – your ones red.
Participant Two	It's her turn let her play.
Participant Three	Yeah it's her turn.
Participant Two	Zoom in so we can see more.
Participant Two	It will go there.
Participant Two	Stop stop stop.
Participant Three	First move the house.
Participant One	Go here go there.
Participant Three	Allah she broke it.
Participant Three	Show me I'll do it.
Facilitator	Allah, you made a house and broke it.
Participant Four	No she didn't make one yet she just made some space.
Facilitator	take it up.
Participant Two	What are you doing?
Facilitator	Go further up.
Participant Four	Okay now you want to make a house right?
Participant Three	Tell me where you want it.
Participant Four	Let her make it.
Participant Two	Why are you doing it?
Participant Two	You'll find it there.
Participant Two	Do you want to put it here.
Participant Four	You can't put it on top of anything.
Participant Two	Put it on the side.
Participant Four	Not behind.
Participant Four	The house will come here.
Participant Four	We'll have to break this right.
Participant Three	You're out.
Participant Four	Who's next?
Participant Two	You should have broken that.
Participant Four	Take the mouse further back and go there.
Participant Four	Give me the mouse.
Participant Three	Do we want to go by the house are by the gate.
Participant One	By the gate.
Participant Four	Should I break this.
Participant Three	Yes.
Participant Four	Do we want to go by the gate?
Facilitator	You want to go by the gate.
Participant Three	I'll do it.

Facilitator	We want to go the end gate.
Facilitator	That's the starting gate.
Facilitator	That's the starting gate and that the last.
Participant Three	How are you going to take it there?
Participant One	Put it next to it put it in the corner.
Participant Two	Where are you taking it?
Participant Three	It's my turn give it to me.
Participant Three	Here take it.
Participant Three	Oh no wait a second.
Participant Four	Oi don't take it in your hand.
Participant One	Put it further there.
Participant Three	Stop stops stop.
Participant Three	That's enough for now I'm telling you.
Facilitator	You need space to go forward as well don't you.
Participant Four	That's the thing but look at this.
Participant Three	We'll have to jump on top of everyone's houses.
Facilitator	We'll have to shove through to get anywhere.
Participant Four	It will go there by itself.
Participant Four	It will go to its destination by itself.
Participant Three	Give it to me.
Participant Three	Do I not have a house?
Participant One	Go here.
Participant Two	14:17, Participant Two, what did you break?
Participant Four	Is it online?
Facilitator	Yeah it will be on the PC.
Participant Four	Okay.
Participant Four	So is it not online though?
Participant One	It will be on the PC so you four can come and play on it.
Participant Four	What level are you on.
Participant Three	Allah it's finished.
Participant Two	Well done.
Participant Three	It's finished.
Participant Three	Nobody told us that we shouldn't go outside of the gate.

Level Five

Participant Three	Whatever space we had in the last one it's the same.
Participant Two	Oh it's more than last time.
Participant One	Break them both.
Participant Four	Listen.
Participant Three	Tell me where I should put it.
Participant Four	Don't keep it that far away.
Participant Three	It's in the middle.
Participant Four	And what.
Participant Four	Don't break it.

Participant Four	We need to make it again and then go.
Participant Two	Lower.
Facilitator	First all four of you make your house ad then go to the gate.
Participant Three	No if we go to the gate then the gate will open.
Participant Four	First we need to make your house.
Participant Four	Select that.
Participant Three	I don't understand any of this.
Participant Three	Take it.
Participant Three	Go a bit more forward.
Participant Three	More.
Participant Three	There more space go.
Participant Three	A little bit that way.
Participant Three	Move.
Participant Four	Put the blue to the side.
Participant Four	That's it that's good.
Participant Three	It's done.
Participant Three	A bit more a bit more.
Participant Three	Stop.
Participant Two	It's to big.
Participant Three	Take it to the corner. Stop.
Participant Four	Let's take a school.
Participant Two	Put the toilet there.
Participant Two	Close to the school.
Participant Two	That's enough put it there.
Participant Two	Go further.
Participant One	Further from the hospital.
Participant Four	Its water are they going to drink salty water?
Participant Two	Put them closer to the water.
Participant One	Are you going to drink salty water? Does she think its lemonade?
Participant Two	You should have taken it further that way.
Facilitator	You guys have spent the least.
Participant Four	You need to go further that way, the toilet or nothing will fit there.
Participant Four	Do them all.
Participant Three	I want to finish them all.
Participant Three	You broke my house.
Facilitator	Even your 10 rupees is gone.
Participant Four	We'll take the toilet.
Participant Three	Look how much it's come to this side.
Participant Three	What else do we want to take?
Participant Three	Market.
Participant Three	Market what are you going to eat?
Participant Three	We'll put the market in the middle.
Participant Two	There's heaps of space we'll put it in the middle.
Participant One	Where did it go?
Participant Four	Put it in the middle.
Participant Four	Why did you take the market take the shop.

Participant Four	Do you want it?
Participant Three	There's no more money money's gone.
Participant One	We'll we're going to have to break that .
Facilitator	What is it?
Participant Four	It's the mosque.
Participant Three	We were going to make it.
Participant Three	Don't put it there.
Participant Two	It will fit.
Facilitator	No it won't fit.
Facilitator	Wait because your arrows there it will fall there.
Participant Three	Go away.
Participant One	Just spending all the money.
Facilitator	Break it.
Participant Two	If we break the middle one it will fit.
Participant One	We still need money to get to the gate.
Participant Four	We don't need money to get to the gate.
Participant Four	Take a water tank.
Participant Four	No over there.
Participant Four	In front of the school.
Participant Three	I think this is an area to eat.
Participant Four	Oi don't take it over there.
Participant Two	Take it.
Participant Two	The park is too big.
Participant Four	Whatever is big should go there.
Participant Two	It hasn't gone look there.

Focus Group

Facilitator	Was agreement reached within the group?
Participant Three	Mostly.
Participant Two	Yes on most things but not on everything.
Facilitator	How was agreement reached?
Participant Three	Someone would do something, then we would say whether it was a good thing for Govandi or not. Then we sometimes tried again.
Participant One	Yes, we did it as a group.
Facilitator	How did you use the game visuals/space to help you discuss problems or issues with other players?
Participant Two	The game helped me see what the community is like.
Participant Four	Yes, at so I could show them what I wanted. Then we could all talk about it.
Participant Two	Yes that was what was the most help.
Facilitator	Do you have any other comments?
Participant Four	Can the community play? We should have this here so everyone can use it.
Facilitator	Yes it is going to be here.
Participant Four	That is good.

Participant Four	In the beginning I just wanted to play]. But then I saw the building and how we can change the community and the area. That is what we should do.
Participant Three	We want to do these things, but we can't build them. We need money and the politicians have the money. We need to talk to them about these things with the community.
Facilitator	Yes, that it w good idea. This is the start. The community will help.
Participant Three	Yes that is the most important, with Apnalaya.
Facilitator	Yes.