

TEACHING INFORMAL URBANISM:

Simulating Informal Settlement Practices in the Design Studio

Ceridwen Owen, Kim Dovey and Wiryo Raharjo

Abstract

Informal settlements have become dominant forms and processes of urban development in many cities, yet the task of helping students engage with design issues in such contexts is fraught with difficulties of access, safety and complexity. Drawing on detailed fieldwork, this paper explores ways in which informal settlement formation can be taught in design studio through the use of games that simulate incremental practices of room-by-room accretion and prospects for transformation. The pedagogical goals are to effect a blurring of authorship and authority, to undermine top-down thinking and to nourish forms of design imagination that unite process and form.

Introduction

Over one billion people now live in 'squatter,' 'slum,' or 'informal' housing settlements globally; a population that is expected to double by 2030 making it the major form of urban design and development globally.¹ The proliferation of such settlements over the past fifty years has been market-driven—employment opportunities generated in cities have not been matched by the capacity of either the state or the market to provide affordable housing for the millions of poorer people attracted to those cities. Half a century of state intervention has failed to halt their growth and they have long been an economically integrated part of nearly all developing cities.² The responses of the state to urban informality range from upgrading and increasing the supply of urban housing, to neglect, to eviction and demolition.³ While governments frame informal settlements as places to be fixed or formalized, there is a need for approaches that recognize the validity and the values embodied in them.⁴

Informal settlements are largely defined as operating outside the formal control of the state. Although it is impossible to separate them from issues of poverty and lack of tenure, it is important to define informality separately from slums and squatting. While a squatter settlement implies a blanket lack of tenure, most informal settlements involve a range of rental, squatting and informal entitlements. The UN defines a slum household as a dwelling with more than three people per room or without access to clean water, sanitation, security, and durable shelter; yet many dwellings in informal settlements have most or all of these.⁵ Many such settlements have developed over time into well-serviced neighborhoods—no longer 'slums' and with varying levels of tenure and formality. Further, while informal settlements are unauthorized and unregulated, it is misleading to see them as unplanned—strategies, processes and construction are different from formal urbanism, but are nonetheless complex and at times sophisticated.

Most of the literature on informal settlements says little about built form, which is treated as a somewhat neutral background to issues of process, economics, tenure, employment, infrastructure and politics. Yet the micro-spatial forms and processes of informal urbanism offer rich ground for architectural investigation and urban design thinking. Without wholesale demolition, the transformation from 'slums' to decent housing is complex and problematic. Most current research suggests transformations must be developed that do not simply replace the informal with a formalized system. The adaptive spatial practices of informal settlements are fundamental to their success in housing the urban poor, and this existing housing,

however inadequate, represents an asset that cannot be replaced without massive subsidy. Understanding and intervening in this context requires thinking sideways, making lateral connections with the settlement form becoming an emergent property of a multiplicity of small acts.

Theoretically, this locates this work within 'assemblage' thinking inspired by the work of Deleuze and Guattari, and focusing on interconnectivity and flows between constituent parts.⁶ Assemblage thinking is also linked to resilience theory, based in complex adaptive systems theory with its focus on complexity, adaptability, unpredictability, and cycles of change.⁷ Assemblage theory can help us understand both the production and upgrading of informal settlements and emergent properties of resilience. It also positions informality as fundamental to understanding the productivity of cities and turns away from any notion that informality is an aberration or a problem that can or should be erased. There is now a considerable history of Deleuzian critique in architecture, much of it focused on either theory or the critique of formal outcomes.⁸ While there is relatively little architectural theory focused specifically on informal morphologies, there is a widespread theoretical interest in the design fields in designing for contingency, dynamism, and change.⁹ Thus, while informal settlements have been largely invisible to the design professions and unstudied in morphological terms, there is now a growing body of research and practice in this area. The key issue here involves a better understanding of urban informality and the relations of formal to informal processes in the context of development issues. In this way, informal settlements become a potent ground to explore and question our framing of urban design more generally. Nabeel Hamdi, for example, has been pivotal in revealing the ways in which micro-spatial practices of urban informality can create widespread transformation through a 'trickle up' effect.¹⁰

While the theoretical issues are important, pursuing them more fully is outside the scope of this article. We also note that, while we explore better ways to teach informal urbanism within the context of the urban *kampung* in Indonesia--as informed by detailed fieldwork in this area--our concern is primarily with architectural education—we do not claim to construct new knowledge on informal settlements or Indonesian urbanism.

There is now a groundswell of socially and politically engaged grassroots practices directed at expanding the horizons of both what constitutes design practice and whom it should empower.¹¹ These initiatives typically emphasize the need for direct action within a framework of participatory practice, with the dual objective of societal and disciplinary transformation. From an educational perspective there is an allied interest in engaging students in 'live' projects.¹² Although the dominant interest is in the creation of built outcomes for a more expansive client base, there are other key educational benefits from the situated learning experience and a more critically motivated imperative to challenge entrenched ideologies and embedded power relations by opening up the curriculum to the contingencies of practice.¹³

Although the majority of projects are focused on exchanges with local communities, the last decade has seen a proliferation of global studios, many of which focus on design interventions in informal settlement communities across the world. The educational experience of immersion in such unfamiliar cultural settings is often profound; yet remote studios are fraught with difficulties of access, safety, and logistics.¹⁴ Further, they are underpinned by complex negotiations between educational, professional, and community objectives and require long-term commitment if they are to resist the tendency for 'design tourism.'¹⁵ Although highly valuable where such studios are carefully designed and facilitated, the

necessary intellectual and financial resources and time commitment determine that such studios will remain a privileged opportunity for the few.

How, then, can one teach about and learn from informal settlement formation without direct experience, and from the 'remote' position of the design studio? Situating the teaching of informal processes in the design studio is particularly problematic. The design studio is widely criticized as the site in which students become inducted into a professional ideology valorizing autonomy and individuality.¹⁶ It is in many ways the antithesis of the production of informal settlements. It is top-down, self-conscious, individual, and focused on integrated formal outcomes. By contrast informal settlements are produced by a process that is bottom-up, piecemeal, collective, unselfconscious, and focused on functional outcomes.

While recognizing the limitations of the design studio context, in this article we explore the potential of design games as pedagogical tactics for teaching about processes of urban informality. We first frame our interest in games and their value in a disciplinary and educational context. We then illustrate this approach in detail through the example of a design studio at the University of Tasmania informed by previous fieldwork and studios in Indonesia with the University of Melbourne and Universitas Islam Indonesia. Finally, we speculate on the broader pedagogical implications of this initiative in the context of architectural curricula.

Design Games

What value do design games hold for the field of architecture and design generally and for education about practices of urban informality specifically? Contemporary interest in games in architecture is primarily focused on the digital arena.¹⁷ For Oosterhuis, designing architecture is literally a game with clearly defined goals (the production of a 'great building'), clearly defined rules (physical, economical, societal), and multiple players (architect and consultants).¹⁸ Less overt and encompassing interests in games emphasize the relationship between the virtual and the real, including socio-spatial relations of virtual communities; the architecture of the virtual world itself, including the question of spatiality in computer games; the city as a space of play, including the opportunities of play as a tactic of urban resistance and transformation; and the use of games for architectural design and urban planning.¹⁹

Our interests are primarily concerned with the use of games in the design education context, although we are also interested in games as a tactic of resistance. Nevertheless, our intended meaning of 'games' here requires some unpacking. A series of themes are commonly employed to differentiate between games, simulations, and their various permutations including winning/participation, playful/serious, imagined/real, process/solution, chance/strategy, simple/complex and loose/structured.²⁰ We use the term 'games' to avoid the quantitative and solution-focused associations of computer simulations; however we reject any narrow definition of games as simply imaginary worlds.

The use of games in education blossomed in the 60s and 70s, particularly with educational innovations in the field of social sciences. Further developments followed in the 90s driven by advances in computing and the internet and there remains persistent interest in the use of gaming and simulation for educational purposes, notably within the fields of business, management and computing.²¹ Games are seen to offer a risk-free environment for experimentation and the opportunity to engage deep learning through immersion in a problem-based context.

It is perhaps for this reason that games have not been widely adopted in design-based fields where problem-based learning is the norm rather than the exception. Hypothetical design studio projects provide similarly risk-free contexts for learning. Further, emerging in the 1970s and 80s in the context of the design methods movement and the allied interests in community design, early design games, such as those developed by Sanoff and Habraken, provided highly structured approaches to problem solving and visibly reduced the complexity of the design task (and the opportunities for design freedom) through the physical limitations of the game board.²²

With the advent of the computer age, there has been a resurgent interest in games as a design tool within both practice and education. One interest extends from the field of evolutionary game theory in biology and the capacity of computers to model complex self-organizing systems.²³ Here, concepts such as ‘swarm intelligence’ can be used to understand and predict behavior in human systems.²⁴ Computers also offer the potential to generate multiple options, or what Leach describes as a ‘search engine’ for design.²⁵ This not only opens up the field of possible solutions, but also enables short feedback loops in which the implications of design decisions can be tested and refined. Finally, and of most interest in relation to this paper, is the capacity of games not only to open up the field of possible solutions, but also to open up the space for collaboration.

Emerging fields such as ubiquitous gaming and pervasive gaming engage multiple players in complex virtual/real space-time games.²⁶ While these are sometimes merely ‘playful,’ or adopt a critical subversive agenda, the opportunities of the expansive game space have also been used to encourage community participation in urban design and planning contexts. The use of games for this purpose is not new and has a long history in the participatory design movement in the late 1960s and 70s in an effort to expand ‘architecture’s public.’²⁷

Hamdi, one of the pioneers of participatory design, sees games as a means to create a ‘shared context’ for work with overt rules and clear communication and an emphasis on process through which solutions ‘emerge.’²⁸ Commonly utilizing a ‘kit of parts’ approach, games such as *Planning for Real* and *GamePAK* are designed to facilitate self-management of planning decisions by communities.²⁹ Other games, such as the *Community Land Use Game (CLUG)* developed in 1972 by Allan Feldt, were designed with an educational objective, combining structured rules and role-play within a real-world context with a primary objective of participation in the process rather than winning or developing solutions.³⁰

Although these games provide a valuable context for our work, it is important to differentiate our position, particularly as it relates to the ‘consensus’ objective of many of these games. The notion of consensus has been widely critiqued in contemporary participatory design approaches, in favor of a more critical, inclusive agenda where dissensus and even conflict are welcomed as a necessary part of the process.³¹ We are, however, interested in the ‘shared context’ for the work and the potential for games to open an alternative space of communication, notably through engaging a narrative dimension that allows us to see from within.³² We are also interested in the focus on process over product and the capacity for solutions to ‘emerge’ through collective authorship, destabilizing the foundation of individual autonomy in the design studio. Nevertheless, solutions do not emerge in a vacuum. Thus we must carefully consider the other dimension of games – the rules and how they influence or control the game.

Sanoff identifies a range of games that can be employed in the design studio context to facilitate understanding of complex contexts.³³ He suggests three types with distinct purposes—consensus decision-making games to build empathy and understanding, design choice games to question assumptions and personal values and evocative games to stretch the imagination. These categories are not discrete and there are many hybrids. Common to most games is a process that emphasizes structure, speed, and the importance of debriefing as well as a context that compresses time and reduces variables to essential characteristics.³⁴

These types of games can be construed along a spectrum from the highly structured, overt rules of the consensus decision-making games (under which games such as *CLUG* and *gamePAK* sit) to the loosely structured evocative games that seek to foster creative insight. Evocative games include a range of devices including poems, photographs, and vocabulary that aim to question the familiar and liberate design thinking through play. From an educational perspective, play and humor are recognized as offering numerous advantages including motivating students to learn, fostering interaction between students and teacher, promoting peer collaboration, reducing stress, sharpening perceptions, and improving decision-making. However, there is a transformative dimension of play that is not so easily understood. As Borden argues, play is ‘serious fun’ but it is no laughing matter and is fundamental to exploring emotions, letting go and testing social boundaries.³⁵ In this way play is frequently employed as a tactic of urban resistance, whether through the paper games of Constant’s ‘New Babylon,’ the bodily reclaiming of urban spaces of exchange as spaces of play, or by transcending the virtual/real through pervasive gaming play.³⁶

Through play we discover not only what the rules of the game are, but also how to break them. Thus, it is not the transparency of the rules of the game that is important in creating a level playing field, but rather the dimension of play that opens the field up to continual transformation. Rules become provocations.

In games, it is the relationship between rules and play, rationality and emotions, structure and chance that offer new ‘ways of looking’ at the world.³⁷ For Hamdi, this interplay between top-down planning (the rules of the game, logic, analysis of facts) and bottom-up practice (trial by error, emotions, intuition) is also a necessary condition for progressive urban development.³⁸ For our purposes design games offer new ways of looking by rendering both the strange (practices of urban informality) familiar and the familiar (practices of design) strange. Thus, they are designed to build empathy and understanding, question assumptions, and stretch the imagination within a framework of ambiguous control, authority, and authorship.

The Informal Settlements Games

The focus of the studio games presented here is on engaging students (remotely) with practices of urban informality. The scenarios are hypothetical and the objectives and outcomes of the studio only directed towards pedagogical ends. Nevertheless, the studio remains grounded within a particular context and is based in part on detailed fieldwork on informal settlements in Yogyakarta conducted as part of PhD research by Raharjo.³⁹ These settlements, known as ‘urban *kampungs*,’ are the form of housing in which the majority of Indonesian families reside. The quality of housing and access to infrastructure is highly variable. Larger masonry dwellings with legal access to water, sewerage, and electricity co-exist with structures that are little more than shacks relying on public sanitary facilities and wells shared between several dwellings. Tenure is also ambiguous and highly complex, with individual dwellings commonly housing more than one family. The urban morphology is

characteristically labyrinthine and seemingly chaotic in contrast to the ordered morphology of the streets.

The irregularity of the morphology of the *kampung* is in marked contrast to the hierarchical socio-political system comprising a two-tiered formal administration system of *Rukun Warga* (RW) and *Rukun Tetangga* (RT) underpinned by an informal network of ‘wards’ or ‘cells.’ These are arguably the most significant in *kampung* social structure with members supporting each other in everyday practices, commonly sharing food, general household chores, and childcare.⁴⁰ While highly structured, the socio-political system is similarly characterized by complex inter-relationships between formal and informal structures and negotiations between state policies, community obligations, and individual freedoms.⁴¹ Although RWs and RTs fulfill a function of governance, these units are primarily social rather than political.⁴² *Rukun* is a Javanese concept of social organization based on harmony, solidarity, and communality. Thus, in addition to assisting the city government with its activities, the primary goal of the RWs and RTs is to foster this spirit of collaboration, known as *gotong royong*. In fact, it is the practice of *gotong royong*, rather than geographic location or social or economic status, that is seen to be fundamental to the identity of people as *wong kampung*.⁴³

The social structure of the *kampung* has a strong relationship with its manifestation in built form. Most activity occurs in the alleyways and small lanes as a reflection of both the communal lifestyle of the *kampung* members, as well as the poor lighting and small size of dwellings.⁴⁴ The density of development necessarily results in overlapping activities that involve complex negotiations and ambiguous relationships between private and public space. Nevertheless, these apparently fluid spatial practices are underpinned by enduring social hierarchies and gender divisions.⁴⁵

The urban *kampung* forms the broad context for our games conducted with fourth year architecture design students at the University of Tasmania. The games were conducted in three consecutive stages.⁴⁶ The first two stages—incremental housing and space/time games—were initiated by studio leaders as a pedagogical tactic to teach students about processes of urban informality. The third stage—settlement planning games—were initiated and developed by students as a design tactic to develop propositions in response to a studio brief.

Stage 1 – incremental housing game

One key difference between informal and formal design is that informal settlements (including urban *kampungs*) often emerge in the interstices of the formal city—waterfronts, railway, and freeway easements, vacant sites, escarpments—where formal settlement is banned or impractical.⁴⁷ For the purpose of this game we have simply invented a riverbank site that is largely vacant at the start (Figure 1). This site of about a hectare is based on typical riverbank squatter housing in Indonesia; a road passes through the site and an elevated freeway passes above it. The site plan is reproduced on a pile of A3 sheets with a key showing the scale of an average one-room house—basically a square with a single doorway. The key also includes a shop (hatched), small guard house or security shelter (*Pos Ronda*), and open space. Students are divided into groups of up to sixteen who are seated around a table; every student has a 2B pencil, eraser, red pen, green pen, and one site plan. The game proceeds by each student being asked to locate a single room house anywhere they like on the site within the following strict rules:

1. Every house must approximately replicate the model in scale and shape
2. One house at a time

3. Never block the entrance to an existing house
4. Pass the plan immediately when told

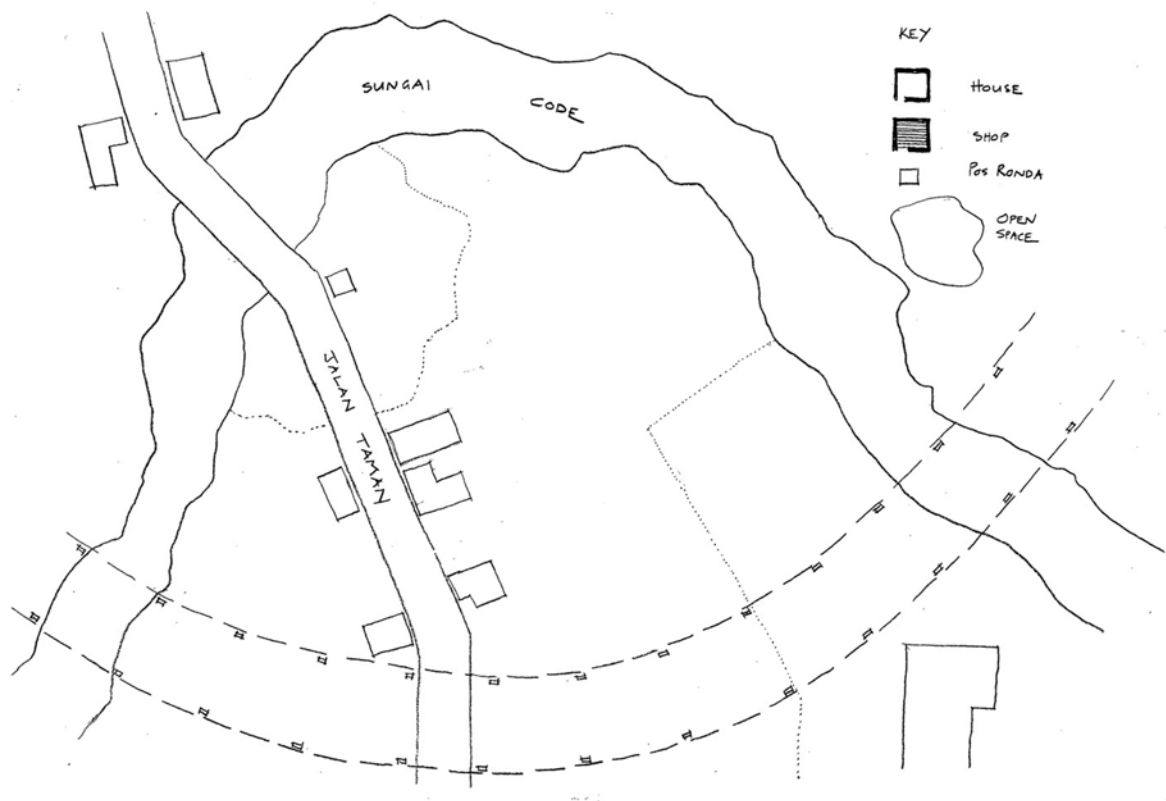


Figure 1. Incremental housing game, base plan. (Drawing by Owen.)

Students are asked to draw the house in pencil with very little thought, and then to pass the map to the person on their left. While students often begin by 'building' on the road or the river there is no instruction to do so. They are told that they have just five seconds to locate and design each house before they pass the plan again; if they have not built their house in five seconds then they must pass the plan without adding to it. After proceeding for about ten rounds this generally produces a certain amount of chaos. Students are being asked to design in a manner that violates almost everything they have been taught. They do not have time to be self-conscious and it is difficult for pre-formed ideologies to take root. Some students will simply keep their plan for the time they think it deserves. This chaos, including the ways that some students violate the rules, is an important part of the process. We reinforce our authority as teachers by a return to the strict five-second rule.

After about twenty houses have been built we stop the process and draw everyone's attention to a dotted line that marks a pre-existing property boundary that is now to be enforced. Students are told that this boundary encloses government land and they are to mark a high wall along this dotted line and demolish anything that has already been built within that territory. No more houses may be built there and any that are built are to be immediately demolished—the erasers are out on most plans.

The game recommences until a further twenty houses have been built (100 seconds). Students are then asked to attach a small shop to an existing house. Henceforth shops will be

added roughly after every twenty houses. Frequent pauses in the process are required in order to prevent some students holding onto a plan that they want to spend time on. After twenty more houses, students are asked to find a location for shared open space (green pen) and connect it with paths to both the river and road. With about fifty houses this now makes the settlement large enough to apply for the status of a recognized neighborhood (RT), an important step in gaining informal tenure. Students are asked to mark an RT boundary around the whole *kampung* (red dotted line) and to build a *Pos Ronda* (security shelter) at the main entry path from the road. The process continues with a pause after roughly each ten to twenty houses. The teacher's authority is used to prevent the hoarding of plans, however we also implement a strategy for undermining authority within the studio. This generally consists of two teachers contradicting each other so that authority becomes ambiguous.

After about fifty houses have been built we declare a flood—every house within five meters of the river edge must be erased. We make no comment and answer no questions about what should happen on such land in the future. At subsequent intervals, new open spaces and shops are added. When the site begins to become crowded we announce that there has been an earthquake. We point out that part of the site is a former rubbish tip (marked with a faint dotted line) and every house that has been constructed on top of it has collapsed and must be erased. We make no comment and do not answer questions about what should happen with this site in the future.

As the settlement grows larger it becomes subdivided into two official neighborhoods with a new *Pos Ronda* (red square). As the settlement becomes more substantial students are advised they can extend existing houses with an additional room rather than a new house. At different times students are asked to find a site for a mosque (double size), church (double size), washhouse and well (one for each twenty houses), additional shops (attached to houses), and more open space. This stage concludes when students are asked to retain the plan they have ended up with and find a site for a community building (about double house size) adjacent to an open space. The public pedestrian network, including access to all houses and open space, is then hatched (green) to clarify the spatial structure of the emergent settlement. Students are then asked to gather in groups of four to five and conduct a critique of each of their plans—they are asked to select one for the full group discussion and to list the criteria they had used to choose it.

All of the emergent plans were chaotic but often far less so than the real settlements they simulated (Figure 2). Given the five-second limit, two main approaches to the placement of dwellings were identified: students either tried to draw a minimum of lines by joining up existing houses, or they looked for open spaces for freestanding houses. The resultant plans reflect both the informality of the process and a level of formality in which a certain alignment of houses emerged early and was then adopted by most subsequent designs. The selection of the 'best' projects by students tended to focus on the effectiveness with which they had been adapted to communal facilities and spaces rather than the potential resilience of the settlement in relation to natural disasters. The flood, earthquake, and former rubbish tip are all examples taken directly from fieldwork in Yogyakarta sites—both residents and students often rebuilt on the earthquake and flood zones.



Figure 2. Incremental housing game, sample of student selections (Drawings copyright the University of Tasmania.)

A common reflection from students was that the process enforced a fundamentally different way of thinking and designing:

(It) forced me to think communally – not to need to control the process or to look at and design the whole space at one time.

(It) forced participants into ‘the shoes’ of the conceptual *kampung* residents. Made us look/experience the world differently.⁴⁸

This repetition of the word ‘forced’ reflects the fact that we used our authority as teachers to stop students reflecting for more than a few seconds on the location and orientation of each house. Students were prevented from investing any sense of self in the design, but they were also relieved of any responsibility for the outcome since the plans had no authorship—no design authority. The widespread resistance to the five-second rule suggests that a well-entrenched ideology was challenged and it tended to re-emerge as soon as the process was halted:

After a time it became easier to draw and move on until it came to the point where we were asked to erect a building of significance such as a mosque or a *Pos Ronda*. It was at these points that I found myself ‘caring’ and tidying up the rest of the plan to my own liking.

Stage 2 – space/time game

Stage 2 is a role-play game, designed to help students understand something of the complex negotiations over forms of inhabitation within informal settlements—particularly the contested use of public space under conditions of high density. Students randomly select one

of eight fictitious character narratives, each representing a household within a particular morphology, and are assigned an existing single-room house in a cluster of six (with five other different narrative scenarios).

Students are provided a map of the existing enclosing walls, land uses, well locations, and compass orientation (Figure 3). Each character narrative outlines a series of desired spatial changes including 'claims' of public space for a variety of activities as well as the storage of goods and materials. Students are then given fifteen minutes to design their desired forms of habitation in plan, with no consultation of other 'residents.' Each cluster of students are then asked to compile these in one plan. This requires negotiation and modification in cases where 'neighbors' had laid claims to the same outdoor space. Latecomers and teachers were assigned characters as outsiders with more tenuous claims to occupation, requiring negotiation for a position within an existing cluster.

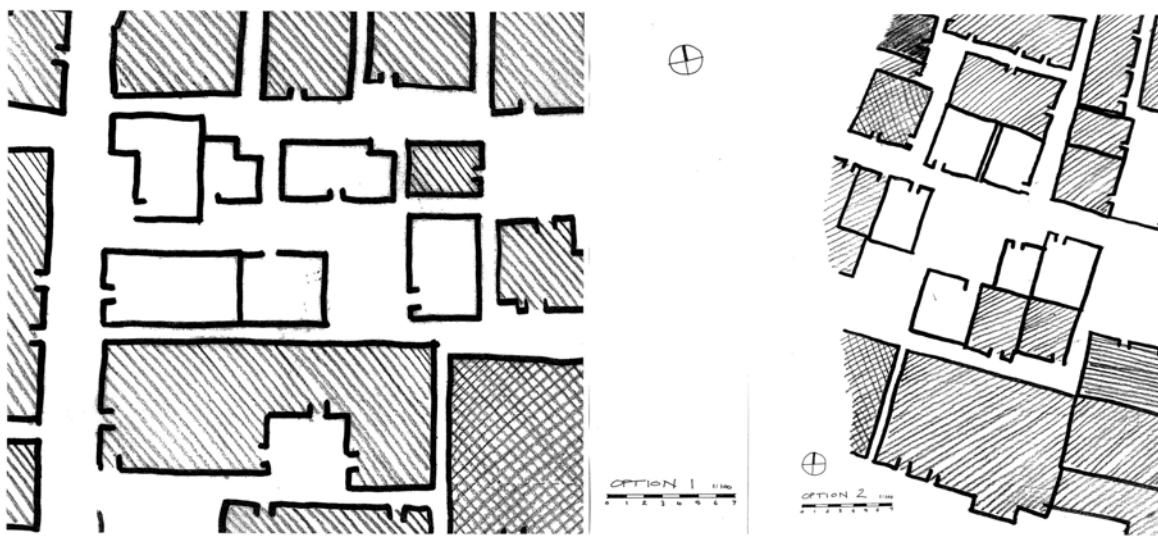


Figure 3. *Space/time game, base plans.* (Drawing by Owen.)

This game was designed to introduce students to a range of micro-spatial modes of thought, design and negotiation that are a key part of the informal settlement process. They quickly became aware that there was not enough available space to house all of the families separately, and that multiple uses of space needed to be negotiated. While entrenched norms of occupation were evident in some schemes, resulting in high-density dormitory-type accommodation, most students designed space-time assemblages that accommodated multi-functionality through boundaries comprised of loose objects rather than fixed walls (Figure 4). Particular conflicts emerged between the need for storage, washing, and ventilation. The process revealed the value and necessity of the alleys to fulfill these roles and the collective negotiations often led to the relocation of extensions to other areas.



Figure 4. *Space/time game, sample of student submissions.* (Drawings copyright the University of Tasmania.)

Again, for students, this game tended to open up issues of power:

The negotiation of space was definitely the most interesting part of the exercise, deciding who had the most authority and social importance to take over a space.

Students were now encouraged to pursue self-interest, albeit in the guise of the roles they had been given:

The second game was much more personal and we all became attached to our characters and a bit defensive of their needs and their space... Everyone was more personally proud and involved with the second game.

This game involved a distinct change of scale and, while the particular motivating desires may have been fictitious, it inducted students into detailed negotiations of the kind that characterize high-density living conditions:

... students found it much easier to comprehend living and spatial arrangements by making up personal histories, inventing children and occupations and debating amongst themselves as the given characters. I think this says something about architecture itself between the top-down and bottom-up approach and discovering a certain comprehension about the issues and questions that one is faced with when designing for someone other than themselves.

(It) encouraged you to ‘inhabit’ the place and the character, so that quality of space became important and the lives of the inhabitants became more real.

Another student described this game as a “great process that forced us to work as a community.” This time the ‘force’ did not come from the authority of the teacher but from the condition of high-density living. Working as a community, however, did not imply harmony:

I believe the key for success for this activity was the conflict it conceptually invoked between residents (students). Emotions that can potentially shape these settlements, particularly at a micro level, were made clear in this exercise. Greed, survival, interaction, territory, public, private, generosity, family etc.

‘Community’ dynamics in negotiating competing claims for territory varied substantially between groups. In some cases students deferred authority to a nominated RT leader. In other clusters, where compromise could not be negotiated, students employed a tactic of self-exclusion by relocating dwelling entrances, literally turning their back on their ‘neighbors.’ Although most students felt that their individual designs were enriched through the required temporal and spatial overlapping, they also employed multiple tactics to shore up self-interest, including reinventing character narratives and optimizing bargaining potential through inflating initial claims.

Stage 3 – settlement planning games

In Stage 3 a plot of land adjacent to the case-study community is declared available for new development. Students in small groups are asked to develop urban and architectural propositions for such a settlement, consistent with existing informal processes and with associated scenarios for funding, tenure and procurement. This stage resembles a more traditional design studio and in many cases it provoked a reversion to a more formal design and planning process. Several groups, however, found ways to work with both formal and informal processes and designs to produce community plans that incorporated both the informality of single-room accretions and the logic of an open-space network accessing community facilities through student-initiated games.

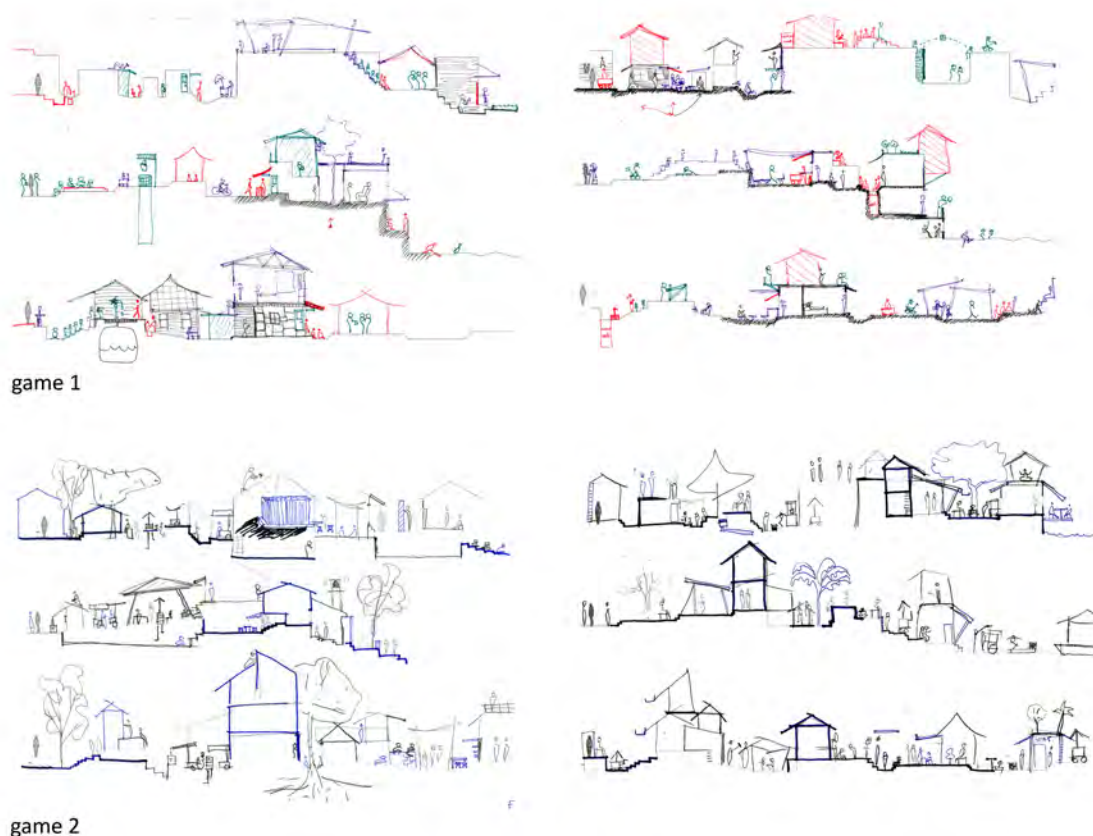


Figure 5. Section game by Ellie Eade, Em Slevin and Bee Newman. (Drawings copyright the University of Tasmania.)

The ‘section game’ involved an adaptation of the incremental housing game, but using a section instead of a plan as the base (Figure 5). Here, the focus on built structures and open

spaces in the space/time game is extended to include consideration of micro elements—trees, taps, and benches—and re-locatable elements—such as food carts and clothes washing—by asking participants to add building elements using pencil, pen, or thick marker to show whether additions were to be ‘fleeting,’ ‘flexible,’ or ‘fixed.’ Participants are also given options to adapt existing forms through ‘erasing,’ ‘relocating,’ or ‘resizing’—a house becomes a shop, or becomes relocated, or becomes public—recognizing the dynamic and fluid nature of these settlements.

The game was employed reflexively through multiple iterations to analyze particular tendencies. Subsequent games employed plan and model variations to further interrogate how and why particular formations develop—how rules are constructed, assumed, and how and when they are bent (Figure 6 and Figure 7). Through a series of iterations games culminated in a ‘rule set’ that groups then employed to develop urban plans for the site.

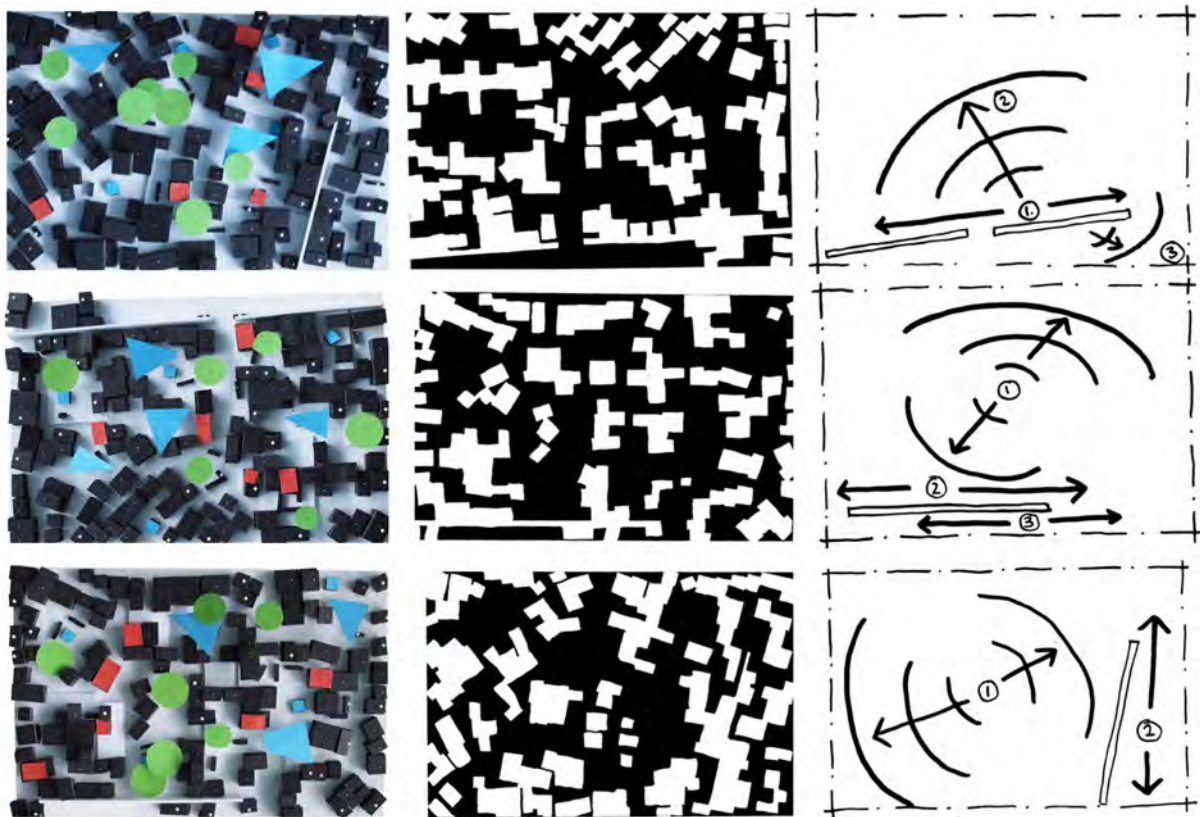


Figure 6. Model game, iteration A, B, and C by Ellie Eade, Em Slevin and Bee Newman. (Photos and drawings copyright the University of Tasmania.)



Game 1:

The first game played had no particular rules, each player instinctively placed houses down in any order or area, but not next a same colour - presumably for the visual "look". This though provided a mixture of shape, size and form, which was a good rule. This game did not show any open space, so it was decided the next game needed such a rule.



Game 2:

The second game played had some defined pathways and connections added to link important paths and nodes of the Simultra and Kricak sites into Bina Karya. It was also determined that more density was needed and houses should be layered. From this game it was observed that some areas had no "back" space which commonly occurs in kampung, this was to be a new rule for the next game.



Game 3:

The third game tried to include a couple of significant paths throughout the site, but also some flexibility for open space and less "gridded" layout. "Back" space was also provided through a rule that houses should be placed around courtyards. It was also determined that



Game Pieces:

	Well		One Person
	Shop		Two People
	Laundry		Three People
	Pos Ronda		Four People
	Community Building		Five People
	Child Care		Six People
	Industry		Seven People
	Medical		Eight People
	Religious		Nine People
	Middle Income		Ten People



Figure 7. Typological model game by Nikki Holdsworth, Hannah Gora and Liz Walsh. (Photos and drawings copyright the University of Tasmania.)

Variations of the space/time role-play game were commonly employed as a means to test the spatial flexibility of resultant plans and to develop detail design solutions for individual dwellings. In one group, students adopt a looser and more speculative approach to role-play through the use of narrative, weaving the stories of three individuals—‘the *waria*⁴⁹,’ ‘the worker,’ and ‘the activist’—who are simultaneously fictitious characters and conceptual figures for informal settlements as complex, dynamic assemblages:

The worker gathers stones and stories. He is both public and private, philanthropic and entrepreneurial, multiple and one, humble and hopeful, physical and metaphysical, real and projected, primitive and enlightened, transgressive and abiding, he is an assemblage.

Incorporating elements of both top-down and bottom-up approaches, the ‘kit of parts’ game is a model-based game designed to test the viability and flexibility of a series of pre-conceived components comprising the ‘mesh’ (ventilated/shaded indoor/outdoor space), the ‘plinth’ (raised masonry element providing access and symbolizing permanence), and a selection of demolition materials. The game is played at the micro-scale of a small cluster of dwelling units and employs character narratives as the catalyst for development. Only two rules are enforced: no building may occur on top of the mesh and each dwelling must touch another (Figure 8).



Figure 8, *Kit of parts game* by Bek Verrier and Gabby Philips. (Photos copyright the University of Tasmania.)

Options are further limited by the boundaries of the ‘game board.’ The identified looseness of early iterations of the game led to a tightening of available space for construction and an ongoing analysis of potential density figures that upwardly challenged targets established in the delivered project brief. The game board was conceived as a collectively tenured plot of 250m² to accommodate one cell of six to eight families. Although offering flexibility at the micro-scale, in the shift from gaming to the development of an urban design solution, thinking became constrained by the physical frame of the game itself. A structured patchwork of boards came to dominate the site, only relieved in a late design revelation where cell boundaries were instead constructed loosely around a series of markers comprising the bench (public), toilets (private), and a cell identification element and/or community building (Figure 9).

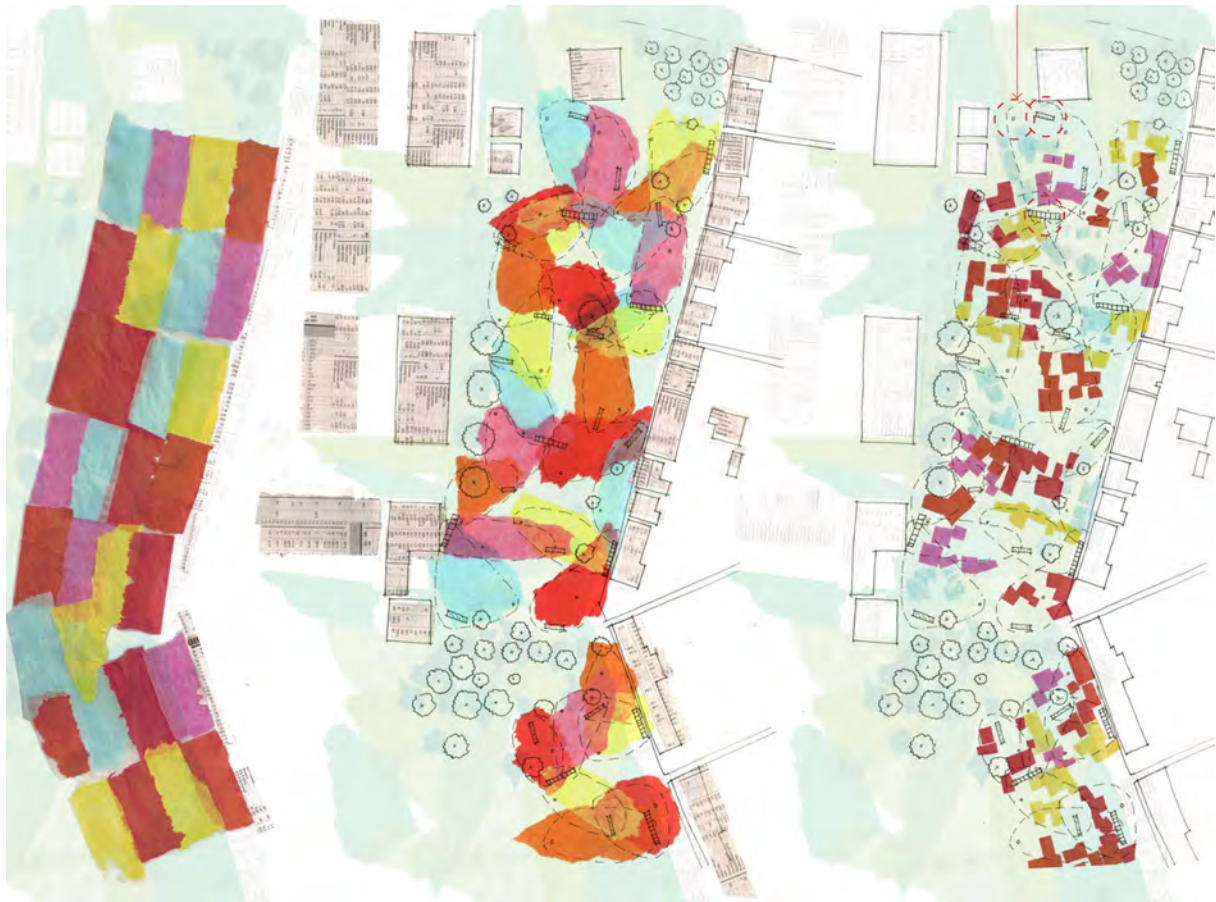


Figure 9, *Kit of parts game, translation of 'game board' to negotiated boundaries by Bek Verrier.* (Drawings copyright the University of Tasmania.)

What emerges from these settlement planning games is a productive creative shift emphasizing process rather than product; however, this can also result in a failure to question the rules of the game and to defer responsibility for design outcomes:

This slightly left-field approach to design allowed us the freedom and flexibility to 'design' a series of processes to achieve an otherwise potentially insensitive outcome to a highly complex situation.

The 'left-field' approach of design games is seen to challenge the norms of design practice, but simultaneously to offer 'freedom' from the sense of paralysis experienced when faced with a blank site and an unfamiliar cultural context. One group described this fear of imposing 'outside' ideologies as "a constant pull between what we would 'like' to design, and what we felt was culturally appropriate." The faith in the ability of games to deliver culturally sensitive design solutions may well be misplaced, but the multiple authorship inherent in the gaming process does relieve the student of responsibility for formal outcomes. While the rules of the game are also designed, as conscious codifications they are readily framed as neutral, non-negotiable boundaries, and—as evidenced by literal transcription of the game board in the kit of parts game—resist transformation.

Discussion

While not without limitations, design games can offer new insight into how architecture students learn about processes of informal urbanism. First, they provide a means of simulating the dynamism and unpredictability of the informal sector, the complexity of the space/time

assemblages and the contested nature of ‘public’ space. While this necessarily remains a partial and arguably idealized window into the unfamiliar world of informal settlements, it is a legitimate alternative to the traditional travelling studio. We suggest, however, that this legitimacy needs to be founded on a detailed understanding of real informal settlements, even if research that focuses on the details of informal morphological change is rare.

Second, design games provide a vehicle for engaging a creative interplay between top-down and bottom-up thinking through an iterative process in which rules variously emerge or are undermined and redefined through play. Although there remains the risk of unquestioned authority as the rules of the game become stabilized, games nevertheless provide a framework for testing the robustness of applied design decisions by identifying the conditions within which informality can flourish as a series of micro-spatial practices. While there is not space to develop them here, there are many connections to social theory that could be productively explored with students and connected to such practices.

We do not claim that these games or the various design outcomes of the studio advance knowledge in practices or principles for development of informal settlements in general or the Indonesian *kampung* in particular. Our concern is for the broader pedagogical implications of this initiative in the context of architectural curricula. We offer several speculations in this regard under the two related themes of the rules of the game and the space of play.

In the ‘game of architecture,’ the rules we are talking about are not the clearly defined physical, economical and societal requirements to which Oosterhuis refers, but rather the invisible set of values attitudes and norms that define the field of play. How can we challenge the rules of the game if we can’t see them? Arguably the most effective means to reveal, and therefore question, the competitiveness, autonomy and abstract idealism that underpins architectural practice generally and the design studio specifically is to expand both the field of players and the field of play by grounding studios within ‘real world’ contexts. Design games do not open up the curriculum to scrutiny from outside or embed practice in the problems, contradictions and messiness of everyday life. While the danger of abstract idealism remains, the participatory gaming process unsettles the field by loosening control, blurring authorship and undermining top-down thinking. Further, while play can be employed to reinforce rather than challenge ideologies, the freedom to play is also the freedom to explore, discover, question, test, and transgress the norms of design practice. Design games offer the opportunity for a space of critical resistance.

The participatory gaming process also opens up the space of play by enabling a shared context for work. Along with countering the ideal of individual authorship, the games encourage peer collaboration and student-centered learning, as control of the games is increasingly transferred from teachers to students. Humor and play prove valuable in motivating students to learn and reinforcing interactions between classmates and teachers. More importantly, they also unsettle the hierarchy between students and teachers—widely argued as essential in transforming architectural education.⁵⁰

One obvious benefit of the design games illustrated here is the shift in emphasis from product to process, highlighting the differences between formal and informal design and the need to accommodate both—or as one student put it, “thinking from the ground up and top down at the same time.” Here, play is enacted not so much as a search for possible solutions, but for the space of possible problems. Nevertheless, in the final settlement planning games, while students recognized the opportunities of creativity in the problem space and engaged in a

reflexive and iterative process of testing ideas, the quest for appropriate spatial and formal solutions became dominant as parameters for assessment reinforced more conventional design thinking. There is no easy answer here since the value of an architect in upgrading informal settlements must incorporate design imagination and innovative spatial thinking at its core and cannot be limited to process. In this studio, clearly the best student work employed such imagination in the design of new games, in an effort to bring architectural form and process together.

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⁴⁸ The quotes here and in the remainder of the article are verbatim transcripts of students’ reflections of the game processes and outcomes.

⁴⁹ *Waria* is a colloquial term for male-to-female transsexuals in Indonesia, derived from *wanita* (woman) and *pria* (man).

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