The Potential for Modelling and Learning in 'The Sims'™

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Introduction

This paper recounts the experience of the author's interaction with The Sims, an educational[1] PC CD-ROM based game. Sims are 3D graphical characters, that have partially autonomous 'personalities', 'relationships' with other Sims and interactions with other (inanimate) 3D objects. The interaction takes place within a number of 'households', within a single 'neighbourhood'. The author will argue that his experience with The Sims constituted an educationally interesting modelling activity. Further, The Sims represents a richly featured agent-based, parallel microworld, and as such, holds potential as a tool for modelling rich, object interactions and emergent phenomena in educational activities. This paper will seek to investigate the role of a community of users, the degree of pre-structuring of the experience and the implications for the process of cognitive development.

[1] Of course, it is one of the aims of this paper to determine the extent to which this claim is valid.

Description of the Context

The Human Context

The Sims was presented to me as a potential candidate for modelling to the author by colleagues on the Learning with Virtual Worlds module, rather than being selected autonomously by the author. The game was constituted as potentially enabling the investigation of complex inter-personal interactions. Since the author had previously exhibited an interest in ethical discourse, the goal for interaction with the software was thus pre-established as one of investigating the possibility of modelling socially and ethically 'extreme' behaviour. As highlighted by Ogborn and Mellar (Mellar et al., 1994, p. 25) modelling human behaviour "raises all sorts of difficulties that do not arise in modelling the behaviour of inanimate objects". The existence of the model may over-simplify human behaviour to such an extent that it renders the predictive and explanatory powers of the model barely useful. Also, it may end up changing the very human behaviour it seeks to model. These reasons, coupled with the intrinsic complexity of modelling human interactions encouraged the author to approach the simulation with caution and an extra-critical eye.

The author was joined by a colleague in selecting The Sims as a modelling environment. A third colleague, whilst not directly involved in studying The Sims, was involved in researching similar game-based simulations (see Appendix C for a problematisation of the difference between the terms 'microworlds' and 'simulations'). The three fellow users formed a common-interest peer group, sharing ideas, articulating theories, pursuing lines of interest, swapping gaming tips and discussing developments, prior-to and during the game. The group thus played an important part in moulding the approach to the software of each of the group's members.

The overall purpose of the author's interaction with the software was in relation to an end-of module assignment for the Learning with Virtual Worlds

course, the result of which is this paper. So, not only did the author have an explicit and pressing reason and framework for interacting with The Sims, (that is, evaluation, analysis, critical reflection, modelling the game itself), but the author also had the *goal of reflecting* on the learning (if any) taking place during this interaction.

The author's interaction was not only structured by his membership of a social (perhaps semi-professional) community of interested colleagues. There were other means of pre-structuring the experience, an important example of which was the accompanying literature. This consisted of a thick booklet (92 pages) as well as the images and intertextual references on the cover of the CD-ROM. These artefacts were important means of mediating the experience between the author and the game, as well as the author and the game developers. Whilst the author had no intention of reading the entire booklet, even a cursory glance was enough to garner an elementary structure of the game and it's aims. The CD-ROM cover also made reference to another game by Maxis, (the game developer), SimCity 3000, another simulation, this time with the aim of 'constructing' cities. This was a game that the author was familiar with, and so this prior experience was brought to bear on structuring the current activity.

Along with the SimCity game, the author had previous experience with other modelling environments that shared important similarities. Among these was StarLogo, an agent-based environment that allows for the exploration and construction of massively parallel microworlds. This experience had furnished the author with the appropriate concepts and metaphors with which to conceptualise The Sims as an agent-based microworld, which will be discussed later. Please see Appendix B for a brief Activity Theoretic outline of the human context.

The Computing Context

It is important to note that this game was CD-ROM based, rather that being online, or otherwise attempting to facilitate communication between users. This clearly need not be the case. Recently, a number of games that emphasise an explicit construction of the player as an individual against the machine (Half-Life, Quake, Doom, Ultima, DopeWars) have made great strides in reworking this metaphor to include networked interaction with other players, across LANs[2] or the Internet. However, although an individualised experience was encouraged in The Sims, the software did provide the ability to 'export' information about the progression the user has made through the game, as local web pages. Also, an online community has grown up on the web, that provides, among other information, various cheats[3], which the author made use of.

The game made full use of graphics, being controlled almost throughout by the mouse. This rich media environment is in stark contrast to many other more Spartan modelling environments, like LOGO[4] and even commercial applications like Excel. However, in this respect, it does bear a resemblance to tools like StageCast[5] and STELLA[6].

The Sims (like SimCity before) featured the ability to start and stop 'time', which referred to the ability to pause the (both autonomous and user-directed) interaction between the Sims. During this time, the user could make changes to the model and when finished, the simulation would continue to run. This iterative approach is very similar to StarLogo simulations and it could be regarded as broadly experimental. The user is also presented with the ability to speed up and 'super' speed up time.

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[2] Local Area Networks

[3] Cheats are special unofficially publicised codes that provide extra-facilities to the user, that other, non-privileged user don't have access to. Popular examples are extra 'lives', or extra 'money'.

[4] Logo is the paradigm example of the constructivist microworld presenting users with access to an explicit model of a knowledge domain. Turtle Geometry's onscreen drawing 'turtle' artefact is a popular example.

[5] StageCast is a fully visual tool for modelling simple agent-based interactions

[6] STELLA is a tool for modelling systems dynamics that presents the user with both a graphical point-and-click interface and an underlying, mathematical model, generated from the visual model.

The game constructed a number of perspectives throughout the interaction, which the user was required to adopt. The initial position was ‘God-like’; the user was required to make a number of choices regarding the introduction of the characters into the house of the user’s choice. During the interactions, however, the user was encouraged to focus on taking on the perspectives of individual characters and remaining aware of the mood, wellbeing and the state of the relationships between the character and the surrounding Sims. The author rapidly alternated between different Sim perspectives.

There was no single, explicit scoring system in the game, and no point at which one could claim victory. In fact the accompanying booklet (p. 65) celebrated this fact, saying:

> Don’t be absurd. This is a Maxis game! What’s to win? You and your Sims can play unto perpetuity, getting them into all kinds of entanglements and trying to get them out. Before you know it, it’ll be 3A.M. *your* time, and you don’t even have your teeth brushed…
> The Sims booklet, p. 65

Clearly, the goal is located in the process of playing the game, rather than any end point, or *telos*, as one might say. In fact, it was hard even deciding exactly what constituted progression! Thus, the goals were very much user-decided and in this sense, the The Sims could be considered a microworld (more of which will be discussed later). The progression was very difficult to explicitly compare between users/players, though what could be compared were experiences and difficulties, rather than scores. These shared experiences in turn helped to decide goals in a process of mutual construction (between goals and experiences).

The metaphors used throughout took on explicitly masculine and feminine tones. In the masculine sense, the user doesn’t ‘give birth’ to new characters,

unlike Creatures[7] for example, a game of the same genre, rather we almost 'decree' characters and personalities and we 'build' houses. We don't 'shop', but simply 'spend' on items selected from a furniture menu. In fact, we even start of as a man as the default character. In the feminine sense, there is an emphasis on caring for and cultivating family relationships. There was also little detail on work.

Learning Claims

While The Sims is not explicitly pedagogical, it does make reference to what can be seen as instructional or otherwise more-expert devices. The booklet draws attention to the multiple perspectives the player is required to adopt:

> This isn't just a computer game, you know. Most computer games present the player with a fixed point of view…you get to see your Sims face-to-face. And your decisions will put them in each other's faces
> The Sims booklet, p. 1

Not only can we view the Sims world from the point of view of individual Sims (conceptually, rather than visually), but we can 'peel' back different layers to "get beneath the surface of the game's characters" (ibid.). It also highlights the subtlety of the characters:

> We're not talking cardboard-cut out characters, who are either good or bad, on or off – these Sims are creatures of moods, of urges, of soaring desires…
> The Sims booklet, p. 1

More importantly, reference is made to the need for optimisation skills:

> Like our everyday world, the world of the Sims requires judgement and decision-making, in affairs from the trivial to the life threatening…
> The Sims booklet, p. 3

[7] A game making use of A.I techniques to model explicitly 'cute' alien life forms called Norns, which

And explicitly positions the Sims as a modelling tool:

> In short, your Sims can be a lot like you. Or your parents. Or the president's parents. You get to design them that way.
> The Sims booklet, p. 3

There are more complex claims, presented fleetingly when loading the software. These include "Balancing Domestic Coefficients", "Calculating Money Supply", "Inverting Career Ladder", "Normalising Social Network", "Extending Marsh Terrain" and "Calibrating Personality Matrix". While the educational currency of some of these terms may be questionable, they are clearly constructing the game as something almost serious, perhaps academic, yet fun and relevant at the same time.

The booklet also presents a bibliography of recommended reading (p. 89), including references such as 'Notes on the Synthesis of Form'[8], 'Architecture: Form, Space & Order'[9] and 'The User Illusion: Cutting Consciousness Down to Size'[10]. These works were seemingly used in the game designer's development of the modelling environment, and are offered as a means of enabling access to the underlying theory and inspiration.

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the player is encouraged to 'cultivate' by feeding, tickling and spanking. See www.creatures.co.uk
[8] Alexander, C. W., June 1970, Harvard University Press.
[9] Ching, F. D. K. and Ching, F. D., February 1996, John Wiley & Sons.
[10] Norretranders, T. and Sydenham, J., April 1998, Viking Press.

Critical Analysis of Learning

Stages of Interaction

The following description doesn't claim to be fully representative of all users' initial experiences, but many elements will be common across players.

Upon loading the software, which, unlike console[11] software requires following an installation procedure, I was met with certain complex learning claims (mentioned above) and an initial picture of the possible characters available in the game. These on-screen cues are the first of many to attempts by the game developers to pre-structure the user experience, and as such, scaffold[12] interaction to a greater or lesser degree.

The game immediately enters a first-time user tutorial. The user starts with one character (a middle-aged man) and the 'inbuilt tutor' asks the user, via onscreen messages, to perform certain tasks. The user is not presented with choices and possible pathways, and the tutor in no way displays any intelligence in adapting to the user's mistakes or hesitations. The tutor is simple, yet robust. The tasks consist of simple interactions with inanimate objects (refrigerators, showers, TVs) and directs the user to the various devices for displaying state information (mood, wealth, knowledge). Another character is introduced, (a female) with which the user is encouraged to have simple interactions with (greet, talk, joke).

Once the tutorial was completed (about 10 minutes), I chose to carry on cultivating the interaction between the Sims, alternately taking on the perspectives of each character. Very soon a baby Sim was born! After a few more minutes, I ran the game in 'Ultra' speed, which entailed neglecting the new baby. A social worker duly appeared and took the baby away – the first surprise.

[11] A console is a dedicated gaming platform, characterised by easily interchangeable game software, for example Playstation 2 and Nintendo 64.
[12] I am using the term in the technical sense used by Woods, Bruner and Ross, 1976.

I experimented with the home building and shopping features, but fairly soon the interaction became quite staid (after about one hour).

Up until this time, I had only been exploring pre-existing models, rather than pursuing any expressive interaction[13]. I 'created' a new 'family' and moved them into a household, at which point the interaction, especially with other 'families' became more interesting. This may be due to the sense of ownership that I felt over the new characters. It may also have been due to a fuller, more abstract adaptation[14] to the model of the Sim characters. At this I also introduced a 'cheat' into the system, allowing the new family to rapidly accumulate wealth. This allowed for much more adventurous home-building activities[15].

After a time interacting with the software, I was able to locate the areas of relative simplicity and difficulty that refer, perhaps, to tasks with a corresponding pedagogic function. Simple activities included shopping, building, going to and from work and interactions with inanimate objects. Difficult activities lay in the interactions among the by now numerous characters and the attempt to manage and optimise multiple 'lives' in parallel.

Although I was experiencing both exploratory and expressive interaction with the model, attempts were only made to understand *how the game worked* rather than to actively model anything drawn from *outside* the game. Really, this was an effort to understand how to play the game, how to interact with the visual cues and how to navigate the various interconnected choices to be made.

In order to facilitate an understanding of how the game worked, I engaged in what can be described as extreme modelling, or modelling limits. This consisted of conceiving of a real-world situation (usually as a group,

[13] See Mellar & Bliss (1994, p. 3) for more on exploratory and expressive activities in learning.
[14] I am using the term in the technical Piagetian sense.

encouraging in each other a kind of morbid interest!) in which relationships would be heavily tested and normal interactions would be challenged. One example was of packing a lot of people into a small house. Another was of trapping people in a room without facilities like windows, toilets, seats, entertainment or even food. Still another consisted of setting Sim personality parameters deliberately so as to conflict with each other. These are examples of predictive modelling, in that we used the computational environment as a testbed for ideas that would be difficult or impossible to instantiate in the 'real-world', where the outcome was not a trivial function of the initial model setup.

The Sims as a Modelling Environment

Reference has been made already to The Sims as a modelling tool, and interaction with it as a modelling activity, but this clearly needs to be justified.

Learning activities can be usefully seen as being more or less exploratory or expressive. The distinction is between a tool to "allow learners to explore a given model, and tools designed to permit learners to construct their own models" (Mellar and Bliss, 1994, p. 3). Thus, exploratory activities engage learners in exploring ideas presented by someone else and expressive activities "involve learners in expressing their own ideas" (ibid.). The Sims presents the ability to engage in exploratory activities, as evidenced by the initial tutorial, scaffolded interaction and subsequent pre-built households. The Sims also allows expressive activities, as evidenced by the ability to create families, fine-tune personalities, build houses and create complex, indeterminate 'pathways' of interaction and interconnected choices between the characters (as opposed to following narratives) (Bliss and Sakonidis, 1994, p. 157)

Mellar and Bliss (1994, p. 4) also draw a distinction between quantitative, semi-quantitative and qualitative modelling tools and activities – a distinction which throws light on the modelling nature of the game. The Sims is a

[15] It would be interesting to compare this across genders – would females be more likely to engage in shopping activities, for example, or would these cultural stereotypes be challenged?

qualitative tool, since it models qualitative rules of interaction, rather than explicit or even 'rough and ready' quantitative relationships. There are minor aspects of quantitative thinking when modelling work and consumption activities, although these are far less foregrounded. The qualitative rules are set when creating the Sim character and the parameters, which consist of neat, outgoing, active, playful and nice (see Appendix A). The parameters, coupled with the cumulative history of the interaction of any two Sims, largely determines the possible interactions available at any given point in time, that is, the possible interactions change over time, progressing or regressing dependant on prior interactions. The interactions thus display aspects of what Ogborn and Miller call evolutionary (history-based interactions) and constraint (personality parameters) modelling (1994, p. 34). Evolutionary models "model change and others (constraint models) model fixed relations between parts of a system" (ibid. my brackets).

Ogborn (1994, p. 12) highlights a number of features shared by modelling activities and which we can see displayed by The Sims. Firstly, "One thing is used in place of another", secondly, there is "idealization and simplification of modelling resources" and thirdly, there is a "tendency to play with the modelling resources for their own sake". The Sims provides many metaphors and visual artefacts in place of 'real-world' objects. These include furniture and building materials, houses, neighbourhoods, people, moods, personalities and relationships. All are used to represent a corresponding phenomenon (an object or a relation between objects) in the real world. These visual cues are also greatly simplified and idealised. For example, the number of characters is limited to two age ranges and three ethnicities, with personalities consisting of five parameters (see Appendix A). Finally, although The Sims simulates 'real-world' human interactions in various important ways, it would be difficult to conceive of the people playing the game as a means to greater 'real-world' understanding, although this may be a side-effect. Instead, the game becomes an end in itself.

As we can see, The Sims clearly exhibits some important modelling features and as such could be legitimately considered a modelling activity.

The Sims as an Agent-based Parallel Microworld

If we draw a parallel between Sim characters and the cells in a cellular automata[16], we can see that The Sims is in fact a complex form of this modelling tool, or at least is heavily inspired by the it. There are thick layers of graphics and simulation parameters laid over the array, but if these are striped away, what we find are cells, or agents (Sim characters) whose behaviour is determined by a set of rules applied to the agents in the local vicinity, to give rise to group-level patterns of behaviour. Thus, according to Boohan's three stages of learning (ibid, p. 175), I was able to *explore the world* that had already been created and *change this world*, by altering its parameters. But it would be difficult to argue that I was able to actually *create a world*, as this would involve creating new forms of agent interaction, and this is one feature I didn't have access to.

Object-orientedness is particularly useful for situated approaches to learning, which emphasises concrete examples and contextualised environments (Resnick, 1997, p. 43). In the same way that students could relate to and imagine themselves as a Logo turtle, I was able to relate to and indeed was required to imagine myself as any one of a number of different characters, male, female, young and old.

There were many opportunities for me to engage in decentralised modelling[17] in The Sims. Once I had 'wound-up' their Sims with different personality traits (nasty and tidy for example) and placed them in particular relations to each

[16] Richard Boohan describes the concept of a cellular automaton in relation to the modelling environment WorldMaker, a description useful in conceptualising other agent-based environments, which as we shall see, includes The Sims. A cellular automata consists of an "array of cells where each cell can exist in one of a small number of possible states…It evolves over time, with the same rules applied to all cells…" (Boohan, 1994, p. 171). Further, "These simple rules can show an extraordinary range of phenomena…some eventually die out, some lead to stable patterns, and others oscillate…" (ibid., p. 172).

[17] Decentralised agents organise themselves without recourse to "lead or seed" (Resnick, 1997, p. 123). According to Resnick, when trying to understand the behaviour of self-organising systems, people often assume that there is either a leader orchestrating a pattern (the supposed 'lead' bird in a flock, for example) or that there is something intrinsic to the environment that moulds or directs a pattern (the speck of sand in an oyster shell that becomes a pearl, for example). Both ways of modelling detract from true decentralised thinking, which relies purely on agents acting under local rules to produce global phenomena.

other (ten to a house, no lavatories, no doors or windows for example), I then sat back and watched them interact to see what kind of patterns were produced. This kind of modelling helped me see that certain outcomes were not due to the constant intervention of a central figure (me), but 'merely' to the complex interactions of decentralised agents obeying local rules[18].

Edwards presents two views of "what makes a microworld a microworld" (Edwards, 1995, p. 143). A structural view seeks to provide a list of characteristics that most microworlds are likely to have. According to this view The Sims should be classed a microworld, because it provides "a set of computational objects…which model some aspects of the natural or social world." (ibid.) (the Sim characters), a linkage of "more than one representation of the underlying model" (ibid.) (multiple Sims, all evolving over time), the ability to combine objects to form more complex objects (the building activity, for example) and the ability to pre-programme a set of user activities into the environment (for example, an existing household in the tutorial).

The functional view describes microworlds in terms of how they are used. It is more difficult to conceive of The Sims as a microworld under this view. An important use of microworlds is to manipulate the objects so as to eventually understand the functioning of the system as a whole; is not clear that objects are manipulated in The Sims with either the intention or the outcome of inducing much more than the mechanics of specific circumstances and environments. Another use is to incorporate feedback from the system in order to 'debug' one's understanding of the knowledge domain and here is a stronger case for The Sims as a microworld, since the user is often engaged in altering the model and testing changes (by running the model in 'live' mode). A further use is to use the objects to create further entities to enhance one's understanding. Inanimate objects are often and easily combined, but Sims experience only fleeting interaction. There is nothing really corresponding to, for example, StarLogo programming code that the user has

[18] The Sims environment does exhibit a trade-off, however, between the number of agents interacting and the subtlety of their interaction. The Sims is far from being massively parallel, as StarLogo is, yet

access to and can combine with other programs, so in this sense there is limited extensibility with The Sims environment.

Learning Issues in The Sims

The cognitive notions of internalisation and externalisation are reflected in the users interaction with microworlds, in that the computational environment is being used as a 'tool for thought' (Bliss, 1994, p. 29). We need to be careful when looking at what is actually being internalised during the user's interaction with a modelling environment like The Sims. If the task is explicitly pedagogic, what is internalised is likely to be conscious and relatively easy to reflect on (surface knowledge). If the task is less explicit on the other hand, the internalised experiences will be more tacit and difficult to reflect on (deep knowledge) (ibid.). I was required to reflect on any learning that had occurred in interaction with the modelling tool and this was to be carried out in a specific timeframe, selecting an analytical framework from a well-defined body of knowledge. These conditions would be very difficult to achieve in a more naturalistic setting, so regardless of what I may have learnt, one has to question the generalisability of any findings.

The model was an effective means of externalising thought for a number of reasons. It allowed me to not only express ideas by giving them 'concrete' form, but it also allowed the community of users to explore each others models, or at least experiences of their models, (since the group didn't ever see each others creations), an activity made possible thanks to the common language and frame of reference provided by The Sims. This 'inter-exploration' allowed the group members to encounter mutually induced cognitive conflict in a constructive, manageable way.

Multiple perspectives and object manipulation are heavily foregrounded features in The Sims and these are very important from a Piagetian point of view. Ackermann (1996, p. 28) refers to the importance of "diving-in" and

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the types of interactions between the agents go beyond simple rules – they are dynamic and contextual, which is important for modelling subtle interactions, which StarLogo isn't so good at.

“stepping-out” to the process of cognitive growth. Ackermann claims that “People cannot learn from their experiences as long as they are entirely immersed in it” (ibid.), and she recommends an alternate distancing and immersion. This was facilitated for me by The Sims’s use of multiple perspectives both between characters and between the character level-view and what Ackermann calls the ‘God’s-eye-view’ (ibid., p. 29).

Object permanence is another important Piagetian concept reflected in the Sims modelling environment. Users are required to make numerous changes to structures whilst still recognising the ‘sameness’ of that structure, whether that structure is a house or a developing inter-Sim relationship. Perspective taking and object permanence are important stages of cognitive growth, according to Piaget, and it would seem that The Sims presents an environment especially conducive to them.

One needs to ask also how the user is adapting to the modelling environment, that is, how the user is assimilating and accommodating it. Ackermann (1994, p. 27) describes assimilation as “imposing one’s order upon the world”. To what extent was my interaction with The Sims – whether exploratory or expressive – merely a projection of existing concepts and biases? It was quite clear from interacting with the software that many of my existing ideas were simply transferred to the game, from building and shopping activities, to the priorities regarding the types of relationships that were developed between Sims. The Sims also fitted neatly into my existing mental model of what a modelling environment could and should be like, yet The Sims was still an interesting and somewhat unexpected addition to that mental model. It was similar to SimCity and Creatures, yet it represented another example of this kind of game.

However, there was an element of accommodation, what Ackermann calls “listening to the world” (ibid., p. 28). Not only were existing social relationships (among members of the group) altered to accommodate the new environment, but new kinds of activities were conceived, to be modelled in The Sims. The community of users had never before thought of modelling

starvation, or overcrowding or extreme unsociability before, thus our notion of *what could be* easily modelled had to be altered to accommodate The Sims. The results of such extreme modelling in turn should have encouraged an accommodative adaptation of pre-existing ideas, but there was little evidence of this – our notions of starvation, aggravation or overcrowding were not changed. This may well be due to the age range of the user community, and a younger user group may well have a different experience.

Implications for Personal and Professional Concerns

Eisenberg (1995, p. 176) notes that while 'traditional' educational software along the lines of "computer-assisted instruction, intelligent tutoring systems, and child-friendly programming environments – have collectively been challenged, if not eclipsed, by the advent of what might be called 'educational applications'…such as SimCity, SimLife…", these new educational applications can help inform the design of traditional modelling environments in a number of ways. The environments should aim to integrate "direct manipulation interfaces with interactive languages", they should productively blur the distinction between 'professional' and 'educational' software and they should include a number of scaffolding elements, such as inbuilt tutors, to assist the user in mastering the interface (ibid., p. 179)

But the relationship between commercial game-like modelling environments and traditional pedagogic 'tools-for-thought' is more complicated. Stevenson and Hassell point to the important role played by ideology in teacher change (1994, p. 210)[19], a role formed "within a professional culture that changes in an evolutionary way over a long period" (ibid., p. 211). Teachers therefore cannot immediately be expected to accept such commercial, educational applications as The Sims into classroom activities, thereby limiting possible implications.

More directly related to cognitive growth, it would perhaps be difficult to see The Sims as having implications for anyone other than very young children. They can be expected to explore and express, building and testing social scenarios using iterative, experimental methods, altering perspectives all the while in a way that is clearly important from a Piagetian perspective. Yet there were times when even I came to appreciate the ease with which to model relatively simple, though interesting social situations, which I refer to above as 'extreme modelling'. I came to ask, whether what was really being modelled was myself, rather than anything 'out-there' in the 'real-world'. In a sense this

is not an interesting conclusion – we can only really externalise what is already a mental model, as Tompsett points out in his distinction between the external world and the cognitive representation, and between the real-world and it's corresponding model (1994, p. 149-150). But in another sense, perhaps what we are really learning about when making expressive, constructive use of The Sims is really our own deep-rooted prejudices, biases, interests and expectations, rather than any underlying model of reality that the game is trying to represent.

One could also argue that all The Sims really teaches us is about itself, rather than either it's underlying models or the reality they are modelling. This may be accepted without entailing that what is learnt is intrinsically non-transferrable. The Sims is a simulation (and perhaps a microworld) and as such stands in relation to all other simulations. By learning how to navigate the structure of The Sims, how to read it's visual cues, what it's various metaphors and dialogues mean, the user is learning more about interacting with simulations (and the culture of simulations) generally, and in this sense, what is learnt is very much transferable. All interaction with the underlying models in The Sims took place via mediated cultural tools – sounds, words, animations, icons, menus and other users via paper-based booklets, web-sites and a small community of fellow colleagues. By interacting (exploring and expressing) with The Sims, we can expect to make extensive use of these cultural mediators, assimilating them into existing schemas and accommodating new ones.

[19] Where Ball (1987) is quoted as defining ideology is as "A connected set of systematically related beliefs and ideas about what are felt to be the essential features of teaching".

APPENDIX A - The Game's Models and their Navigation

Personality Parameters

We can see parameters such as 'Neat', 'Outgoing', 'Active', 'Playful' and Nice', along with the age, skin colour and gender options.

Mood Parameters

The Mood parameters are displayed as 'Need' and include 'Hunger, 'Comfort', 'Hygiene', 'Bladder', 'Energy', 'Fun', 'Social' and 'Room'.

Interaction Types

These two Sims have a good relationship, as evidenced by the types of interactions on offer – ‘Dance’, ‘Call Over’, ‘Cheer Up’, ‘Give Back Rub’, ‘Hug’ and ‘Tickle’. These interaction types change as the relationship develops.

Building Types

Building consists of simple drag-and-drop from a list.

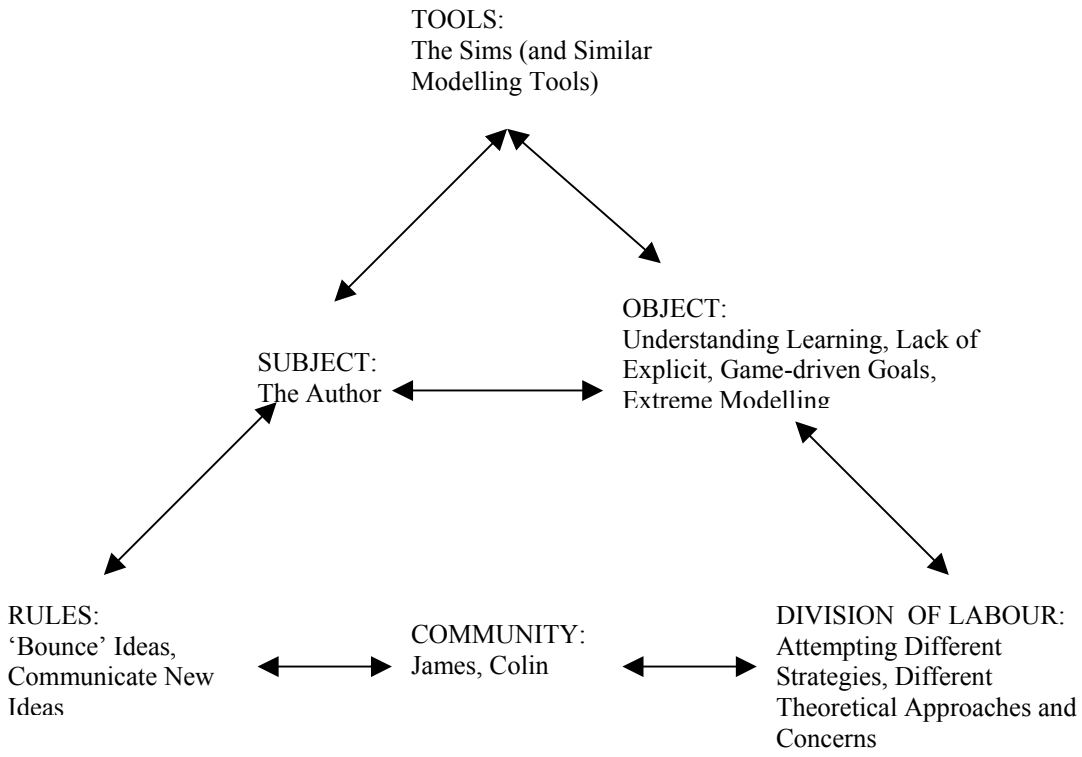
Neighbourhood

There is only one neighbourhood, pre-set with a number of houses, which can be populated or bulldozed.

Relationships

Relationships progress and regress. Love is shown for the first Sim.

Appendix B – An Activity Theoretic Outline of the Author's Context



Appendix C – Problematising the Term ‘Microworld’

We can distinguish two senses of the terms ‘microworlds’ and ‘simulations’. The first is the ‘strong’ sense and the second is the ‘weak’ sense. In the strong sense, examples of microworlds would be Logo, StarLogo, STELLA and StageCast. Examples of simulations would be SimCity, The Sims, Civilisation and Quake. The strong sense refers to paradigm cases – to how the term is employed in common usage. The weak sense of a microworld would point to any environment in which we can operate to create a product and the weak sense of a simulation points to the product produced in the microworld (weak sense) environment.

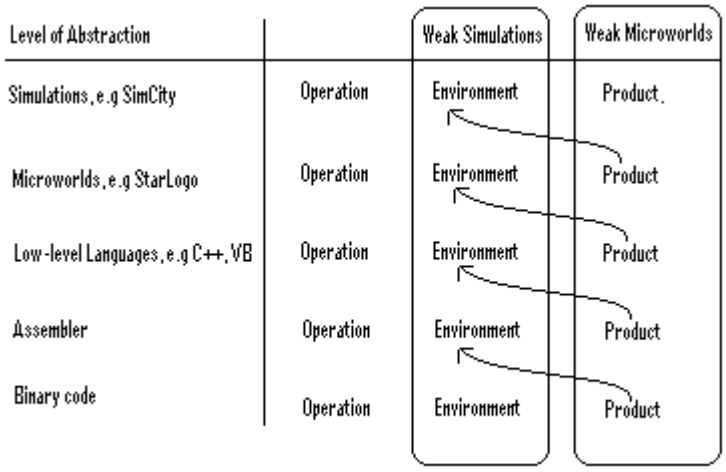


Figure 1 The Weak and Strong Senses of 'Microworlds' and 'Simulations'

The upshot of this discussion is that in the weak sense of the terms, microworlds and simulations are but different sides of the same coin, simply different stages of the same process. A simulation (The Sims, StarLogo, C++, and Assembler) is a product of a microworld (The Sims, StarLogo, C++, Assembler, and Binary Code). A Simulation becomes a microworld if it can be operated within to create a product – a further simulation. So we can see that The Sims is a microworld or a simulation, (in the weak sense), depending on usage – when used in an exploratory way it is a simulation, when used in an expressive way it is a microworld.

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