# The LEGO System as a tool for thinking, creativity, and changing the world

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This chapter looks at LEGO as a tool for supporting creative thinking, developing creative cultures, and contributing to processes which might make a difference in how the world works. My thoughts about these ambitious themes are not plucked from nowhere, and nor are they those of a passive observer, but they might be treated cautiously for a different reason, because they draw upon my experience of several years of close collaboration with the LEGO Group in Billund, Denmark. I am an academic, a Professor in the Faculty of Media, Arts and Design at the University of Westminster in London, UK, but this means I have also – very happily, for me – been able to work with LEGO on a number of projects, as part of their ongoing collaboration with selected academic researchers. From 2005, I worked with the LEGO Group on the development of the consultancy process, LEGO Serious Play, and since 2008, I have worked with the LEGO Learning Institute and the LEGO Foundation exploring play, creativity and learning[1].

In this chapter I will begin by considering the LEGO System, and its reach as a cultural system. Then I will look at LEGO as a tool to support thinking and collaboration. I will introduce a model of creative cultures, which will be applied to LEGO communities, and then maker culture more generally, and consider how individual imagination and collaborative creativity can work together. Finally I will consider some ways in which LEGO products and communities might be said – as in the title of this chapter – to be 'changing the world'.

## The LEGO System

The LEGO System, as commonly understood, refers to the idea that any LEGO element, or any LEGO set, is not an isolated or complete object, but comes with the potential, and the promise, that it is part of a much larger whole. The system of interconnecting studs and tubes, patented by the LEGO Group in 1958, means that any LEGO object can be connected with others and almost endlessly

extended. The System is good for users, because the value of their LEGO collection is increased as it grows – because they are able to do more diverse and more interesting things – and obviously this works well for the company too, providing customers with a rational motivation to make more purchases from the same range of products.

It was Godtfred Kirk Christiansen, the third son of LEGO founder Ole Kirk Christiansen, who developed the idea of a system of play, rather than one-off toy products. The idea had been suggested to him by a buyer from Copenhagen's department store, Magasin du Nord, on a North Sea ferry, as they made their way to London's Toy Fair in January 1954 (Robertson & Breen, 2013). Captivated by the idea of a system, Godfred spent 'several weeks' working out the attributes of the system, arriving at six core features (ibid):

1. Limited in size without setting limitations for imagination
2. Affordable
3. Simple, durable, and offer rich variations
4. For girls, for boys, fun for every age
5. A classic among toys, without the need of renewal
6. Easy to distribute.

These features refer to the product, but also suggest a human dimension which is not contained in the bricks themselves, with notions such as 'imagination', 'classic' and 'fun'. Inevitably, of course, the system is not just about objects but about what humans *do* with the objects. But I would argue that we can take this much further. Today, it seems fair to say that LEGO bricks are just one part of a complex and dynamic set of relationships, where LEGO products and the LEGO Group are clearly central, but are only as important as the numerous communities of LEGO users and fans, of all ages, and the broader elements of the ecosystem including parents, educators, retailers, and the many cultural contexts in which LEGO is to be found. Flowing around the relationships in this system are the shared meanings and collective ethos fostered by use of LEGO products. Research by Yun Mi Antorini and colleagues (Antorini, Muñiz & Askildsen, 2012; Antorini & Muñiz, 2013; Taillard & Antorini, 2013) has explicated the ways in which an ecosystem has developed around LEGO products – and in a sense LEGO ideals – in which the significant actors include all users, young and old, but especially LEGO fans and their communities; parents, educators, retailers, licensing partners, journalists; and of course the LEGO Group itself. The LEGO System is a system which includes all of these materials, and people, and online networks.

Furthermore, the LEGO System is built around ideas and principles, in a way that other creative or construction materials, such as modelling clay, are not. If the heart of the LEGO System is the notion that 'everything connects to everything else', which begins with the studs and tubes system, we can see that this then extends out across the broadly-understood system to embody a democratic philosophy of things fitting together, and empowering people to build. This is found in the values that people associate with LEGO products – an ethic of thoughtfulness, caring and playing together (Baichtal & Meno, 2011). This philosophy also accounts for the strong relationships between LEGO fans and the broader 'maker culture', discussed below. These values and networks are unusual – most other tools or toys or creative materials cannot claim them (perhaps the community of Linux developers comes closest, but is rather different) – so this notion of a LEGO System is actually both meaningful and distinctive.

In the very first of the LEGO Learning Institute projects that I was involved with, *Defining Systematic Creativity*, written with Cecilia Weckstrom and Edith Ackermann (2009), we set out a 10-point description of the LEGO system, which begins with physical attributes of LEGO bricks and pieces, but broadens out to include the System's ethos, which is just as important, although less tangible.

1. *An interconnecting set of parts:* Connections come easily and sometimes in unexpected ways.

2. *A low entry level for skills:* So that anyone can pick up LEGO bricks and make something satisfactory.

3. *A medium for mastery:* A developed level of expertise is also rewarded as the system can be used to create both very simple and very complex constructions.

4. *The ability to create something where previously there was nothing:* Imagination coupled with the lack of need for preparation and planning: as they say in LEGO Serious Play, 'If you start building, it will come'.

5. *An open system with infinite possibilities:* It can grow in all directions and the parts can be combined in limitless ways.

6. *A belief in the potential of children and adults and their natural imagination:* Anyone can make and express whatever they want to, through the system.

7. *A belief in the value of creative play:* A respect for play as a powerful vehicle for learning and exploration.

8. *A supportive environment:* Different ideas can be tried out and experimented with, with no negative consequences. On the contrary, it is common that one good idea leads to another.

9. *The LEGO System grows with the person:* From the youngest child to the adult user.

10. *The LEGO System also grows beyond the person:* At all levels of engagement with LEGO products, from Duplo® to the world of the AFOL [Adult Fan of LEGO], LEGO bricks are a social tool, fostering connection and collaboration.

This ten-point list proved to be really valuable for later projects. When we produced later studies such as *The Future of Play* (Gauntlett et al, 2011), *The Future of Learning* (Gauntlett et al, 2012), and *Cultures of Creativity* (Gauntlett & Thomsen, 2013), the list offered a clear path to link our findings back to the LEGO system.

A number of these points reflect the notion of 'low floor, high ceiling, and wide walls' (Resnick & Silverman, 2005). The LEGO system has a low floor, which means it is easy for newcomers to get started, whilst the high ceiling means that more experienced users can work on increasingly complex projects. Most important of all are the wide walls, which mean that creativity and imagination can take a project in innumerable directions.

Our ten-point list takes this further by including the social – going 'beyond the person' to foster 'connection and collaboration'. But really it doesn't go far enough. The greatest strength of LEGO today is its place in networks of people with shared passions and values.

LEGO before the internet was rather like computers themselves before the internet. In the 1980s, we had home computers and had great fun tinkering with them and programming. They weren't connected to the internet – most people had not really heard about the internet at that point. Today, of course, the idea of a computer that doesn't link you to the internet is inconceivable. Similarly, LEGO toys have always been great fun, but today, the whole idea of LEGO is fantastically boosted by its visible online interconnection with cultures of enthusiasm, learning, and support.

**A tool for thinking**

Before we proceed to discuss the LEGO System as an expansive and thriving culture, this section pauses at the individual and small-group level to consider LEGO as a tool for thinking. Clearly, LEGO bricks offer huge opportunities for imaginative play, which is what children normally do with them, and can be used to build cool or complex models of things – vehicles, buildings, or whatever – or they can form the basis for machines and robots, which is often the adult domain. Here, though, our focus is on using LEGO bricks to support the representation of ideas, and the organisation of thinking.

As the psychologist and cognitive neuroscientist Merlin Donald (2001) has shown, a central component of human evolution has been our ability to make tools and to externalise thoughts. Being able to communicate and store ideas, through innovations such as drawing and writing, has been a crucial plank in evolution. The individual human brain may be remarkable, but it becomes much more powerful through the use of tools which enable us to set out and review our thoughts and ideas. It can be difficult to hold all the parts of a complex argument or situation in mind at once, but once thoughts are put into 'external storage' – such as writing, a diagram, or a model – they can be shared, developed and worked on. Donald writes that 'We can arrange ideas in the external memory field' – by which he means, in the physical realm, when we have represented them somehow – 'where they can be examined and subjected to classification, comparison, and experimentation'. He continues:

> In this way, externally displayed thoughts can be assembled into complex arguments much more easily than they can in biological memory. Images displayed in this field are vivid and enduring, unlike the fleeting ghosts of imagination. This enables us to see them clearly, play with them, and craft them into finished products, to a level of refinement that is impossible for an unaided brain. (Donald, 2001: 309).

It was this idea, that abstract meanings, feelings or concepts could be physically represented, and then manipulated and tinkered with, that was embraced within LEGO Serious Play.

LEGO Serious Play was a consultancy process developed by the LEGO Group, from the mid-1990s, and was an activity for groups of adults, guided by a facilitator, in which participants would build metaphorical models using LEGO bricks. The models would typically represent their experiences of activities, structures and communications within their organisations, and then – having externalised these things, by building them in LEGO – they would go on to combine and review their built meanings, and then to build ideas for initiatives or strategies, in response to this construction. Unusually, LEGO Serious Play invited people to build in *metaphors* – everything in metaphors. So, for example, a school would not be constructed as a building with doors and windows, but would be represented with interconnected metaphors such as an owl representing knowledge, flowers reflecting emotional support, a tower for leadership, and a staircase representing personal growth.

The central idea of LEGO Serious Play is not uniquely tied to business consultancy. It can be used to represent all kinds of experiences and feelings, and responses to things. From 2005, I worked with the LEGO Group on researching some aspects of this process, and I developed it as a social-science research tool. (My project which used LEGO Serious Play to explore how people thought about their own identities was published as *Creative Explorations* (Gauntlett, 2007)). In 2007-08, Anna-Sophie Trolle Terkelsen, a concept developer in LEGO Education, took the principles of LEGO Serious Play and created a self-facilitated version, which dispensed with much of the apparatus that had been built up around LEGO Serious Play. Her adaptation had the appearance of a board game – although it was not exactly a *game* as such – which prompted participants to move through a sequence of activities, picking up cards that would tell them what to do next. Different sets of cards could be used to prompt people to explore different concepts, themes or issues. This innovation made LEGO Serious Play much more portable and less labour-intensive. Others, including myself, also modified the process in different ways – often in response to the previously-established 'prescribed' version of LEGO Serious Play, which made heavy demands in terms of materials (specific collections of LEGO bricks in huge boxes), time (one or two day sessions), and people (a fully trained facilitator required for every session). When Trolle Terkelsen and I were asked to produce the 'open source' release of LEGO Serious Play in 2010 – the LEGO Group had basically decided not to continue trying to make money from the process in any direct way, and was happy to release it 'into the wild' instead – we included a lot of the very good and thoughtful original scripting and etiquette of LEGO Serious Play sessions from the original manuals, but sought to balance this with a more flexible and 'lightweight' approach to its implementation.

In any case, these details about the complicated life of LEGO Serious Play are less important than the very different-to-normal use of LEGO bricks which it demonstrated. The process showed that LEGO could be used to represent abstract experiences, feelings or ideas – and then could be used to think through the implications of those things, and to build alternatives or solutions to what was shown, either as an individual process, or in groups (Gauntlett, 2007). Having a physical *thing* – representing, say, an organisation, or a relationship, or a challenging situation – means that its creator and others can examine, review and discuss the concerns that are represented, often raising provocative issues ("Wouldn't you expect [x] to be closer to [y]?" "The whole thing seems to be dominated by [z], and there is very little substance when you look round the back" – or whatever).

The physical building of such non-physical phenomena means that LEGO bricks can be a genuinely helpful tool for thinking, and is rather distinct from what you could do with other materials. Of course, it might seem that a similar process could be conducted with modelling clay, or pen and paper, but, having tried such alternatives, I can say that they are less pleasing and much less efficient for most participants. With LEGO, most people can assemble a range of meanings, and revise and combine them, rather easily. With other materials, I found, participants were much more anxious about their abilities – embarrassed that they could 'not draw' or could not make their model 'look right' – and everything was much slower, with single representations taking a long time to produce (Gauntlett, 2007, 2008, 2009). So although LEGO is not totally *unique* as a tool for representing ideas and concepts, and collaborating on their development, it certainly has affordances which make it significantly more useful than anything else I've seen.

**A cultural model – applied to LEGO cultures**

LEGO Serious Play is, of course, a little-known fragment of the LEGO universe. The culture of LEGO products and users is broad and diverse. In the LEGO Foundation *Cultures of Creativity* report (Gauntlett & Thomsen, 2013), we adapted a model of culture which was proposed by Anne Scott Sørensen et al (2010) as a way of thinking about creative cultures. (The LEGO Foundation does work around the themes of play, learning and creativity – clearly, very 'LEGO' themes – but it is independent from the company, and is not primarily concerned with LEGO products). The model is useful for thinking about the culture of LEGO, and LEGO within cultures – both of which this book is about – as well as creative cultures more generally[2].

The model by Anne Scott Sørensen and colleagues, which we adapted, had itself drawn upon a number of previous models or perspectives on culture. This model recognises that culture always signifies both a context for experiences, and actual experiences themselves. So on the one hand, culture is a given – the culture, largely made by others, which we inhabit – and on the other hand, culture is being created and recreated, right now, through individual and social meaning-making and experiences, including our own. To put it another way, the model shows culture both as the already-existing site within which people are creative, and simultaneously as the 'live' space which influences, and is influenced by, their creativity.



Fig. 1: A model of culture (Gauntlett & Thomsen, 2013, adapted from Sørensen et al., 2010)

The model suggests that culture is a system through which people build meanings, and develop community, through the four dimensions of *having*, *doing*, *being* and *knowing*. The creative mindset is supported when there are stimulating environments and resources (*having*), when there is a lot of inspirational activity and the engaging support of peers and mentors (*doing*), when there is an ethos which supports the passions of makers (*being*), and where there is a solid body of expertise and knowledge, and support for learning (*knowing*). These dimensions are all parts of culture, continuously in play together, and so they should not be considered as separate things. These four dimensions are driven by *playing*, *sharing*, *making* and *thinking* – the active processes through which people learn and form meanings together – and so these processes appear in between the four dimensions in our diagram, driving this windmill of continuous cultural creation.

If we consider the model in relation to the LEGO System itself, we can see that it maps on quite straightforwardly – underlining the sense in which the LEGO System is a kind of culture in its own right. The *having* dimension is about actual things, and so has the most straightforward connection to LEGO products. A culture is more likely to thrive if it has democratic, easy to use tools with which cultural meanings and understandings can be built and shared. Looking beyond the present – beyond just describing how things are – this dimension encourages us to consider how products and tools might be optimised, so that they could maximise opportunities to play, make and share; and how we might enhance the environments, offline and online, where people might do these things – such as kindergartens, schools, libraries, art galleries, science and history museums, and cultural centres.

The *doing* dimension concerns the relationships and practices which are the lifeblood of a culture. In terms of LEGO culture, children are typically eager to exchange inspiration and stories around their creations, and this is supported by the LEGO.com website, YouTube videos, the LEGO Club magazine, LEGO's collaborations with museums, and so on. Communication and networks are vital to the *doing* dimension – especially for Adult Fans of LEGO (AFOLs), whose networks have exploded with the rise of the internet (and are typically independent of the LEGO Group). These cultures really take off when people are *doing* things together, sharing ideas and inspiration, and learning from one another.

The *being* dimension concerns the rituals, sentimental practices, and group characteristics and identifiers which bind together a culture. In LEGO culture, this can refer to the collective practices of LEGO users and fans, and the general ethos associated with the company. As well as being helped by positive actions, this binding ethos could be disrupted by miscalculations – such as might occur if the major release *The LEGO Movie* (2014) had represented LEGO in an underwhelming or trivial way (which it didn't), or if a licensing tie-in were to associate LEGO with unexpectedly violent narratives (which the *Teenage Mutant Ninja Turtles* line perhaps does). The positive ethos can be sustained through the more timeless emphasis on the joy of building, which is supported by LEGO-affiliated products (such as books and the *Movie*), and also by the independent online communities of LEGO fans, who support and inspire each other. Research has shown that members of online maker communities like to both give and receive support (Kuznetsov & Paulos, 2010), emphasising an ethos of 'open sharing, learning, and creativity' rather than profit or self-promotion. This mutual sharing also helps to foster the collective identity of LEGO enthusiasts.

The *knowing* dimension highlights the knowledge and shared meanings that support a culture. In the case of LEGO cultures this dimension is well integrated with *doing* and *being*, which as we have seen, both involve networks of knowledge-sharing and mutual support. As LEGO cultures tend to be

friendly and non-competitive, knowledge about products and techniques tends to be freely shared. Indeed, LEGO fans are often keen to share their achievements and passions with others, which drives the knowledge exchange within communities. As well as the active exchange of ideas, LEGO culture rests on a substantial body of more permanent materials, such as the several non-fiction books on LEGO building, techniques, and the company and its products, and huge online archives of LEGO history and innovative building methods, and vast inspiring collections of LEGO 'My Own Creation' models (MOCs) built by enthusiasts around numerous fictional and real-life themes.

In short, then, the dimensions of *having*, *doing*, *being* and *knowing* describe the forces which bind, sustain and grow the LEGO culture. The culture is continuously made and re-made, normally through the small actions which collectively make up the whole. Sometimes there is a bigger, more potentially disruptive intervention, such as the 2014 release of *The LEGO Movie* – mentioned above – which was a notable event in mainstream popular culture. Fans of LEGO were concerned that the movie, if misjudged, might be a corny cash-in, and perhaps generate negative associations with their cherished System. Of course, this concern – which I had myself – overlooked the fact that the LEGO Group typically take very good care of their brand, and could be expected to insist that it be a good reflection of LEGO values. Thankfully the *Movie* paid due regard to the *having*, *doing*, *being* and *knowing* – the special products, relationships, sentiments and knowledge – that are associated with LEGO cultures.


**The cultural model – applied more broadly**

The model of creative cultures described above works just as well for the 'maker movement', and communities of craft-making people and designers. I described aspects of this culture in *Making is Connecting* (2011), with an evident particular affection for the arts and crafts community, and for digital media makers, such as bloggers and YouTube video makers. There is a 2013 book by Mark Hatch called *The Maker Movement Manifesto*, a title which struck me as a bit presumptuous, not least of all because Hatch is the CEO of TechShop – as it boasts on the front cover – and so might be expected to represent the interests of an engineering, technology and 3D printing sort of business than the whole maker community (or communities). To be fair, TechShop seems like a nice idea – a membership organisation giving people access to workshops with tools and equipment to build their own projects. And, actually, Hatch does a pretty good job of representing broad maker-culture interests. The short version of his *Manifesto* (Hatch, 2013: 1-2) appears under nine keyword headings: 'make', 'share', 'give', 'learn', 'tool up', 'play', 'participate', 'support', and 'change'. His assertions under these headings are thankfully open and inclusive, and would generally apply just as well to lambswool cardigan knitters as to metal robot makers. For example, to pick just three of them:

> MAKE: Making is fundamental to what it means to be human. We must make, create, and express ourselves to feel whole. There is something unique about making physical things. These things are like little pieces of us and seem to embody portions of our souls.

> GIVE: There are few things more selfless and satisfying than giving away something you have made. The act of making puts a small piece of you in the object. Giving that to someone else is like giving someone a small piece of yourself. Such things are often the most cherished items we possess.

SUPPORT: This is a movement, and it requires emotional, intellectual, financial, political, and institutional support. The best hope for improving the world is us, and we are responsible for making a better future. (Hatch, 2013: 1-2).

Hatch's nine keywords can be mapped quite easily onto our model of creative cultures (fig. 1, above). Since all of the elements overlap and are part of a whole, it doesn't make much sense to treat them separately. But we can see that our 'having' dimension would include 'tool up' and 'support'; 'doing' would include 'make', 'share', 'play', and 'participate'; 'being' would include 'give' and 'change'; and 'knowing' would include 'learn', and 'support' again. In fact most of them go with most of them.

So we can see that this model and this manifesto mesh well together – but to what end? Talk about creative cultures is full of these pleasant, kind words – 'share', 'participate', 'support', and so on – but what is their significance? The answer is that making things, being creative within a culture, and supporting others to be so, are essential to the health of a society (see Gauntlett, 2011). These activities might have attractive outcomes, and be fun to do, but their value is greater than these pleasures. Everyday creativity and the do-it-yourself spirit are vital and culturally necessary – otherwise we are a 'read only' society, a culture of consumers.

Ivan Illich, the philosopher most famous in the 1970s, makes a powerful case for the do-it-yourself approach to life and culture in his book *Tools for Conviviality* (1973). He outlines a distinction between 'industrial' tools, which are one-size-fits-all things that only convey the identity of the organisation that produced them, and 'convivial' tools, which are flexible to different people's needs, enable individual self-expression, and encourage conversation. Industrial tools often arrive as pleasant conveniences, but foster a terrible sickness within our cultures:

> Society can be destroyed when further growth of mass production renders the milieu hostile, when it extinguishes the free use of the natural abilities of society's members, when it isolates people from each other and locks them into a man-made shell... Corporate endeavors which thus threaten society cannot be tolerated. At this point it becomes irrelevant whether an enterprise is nominally owned by individuals, corporations, or the state, because no form of management can make such fundamental destruction serve a social purpose. (Illich, 1973: xi).

Illich makes a powerful argument that people need to be able to shape their own environments, make their own stuff, and express themselves, rather than simply purchasing readymade alternatives to these convivial relations. Through building the meaningful materials of everyday life, we learn that we can make a difference to the bigger picture as well.

> Industrial innovations [– top-down, one-way, one-size-fits-all offerings –] are planned, trivial, and conservative. The renewal of convivial tools would be as unpredictable, creative, and lively as the people who use them. (Illich, 1973: 75)

The significance of LEGO cultures, and the maker movement, are that they operate at the convivial level, enabling people to create, communicate and connect. These might be supported by certain kinds of *industry* – such as The LEGO Group, or 3D printer companies, or craft retailers – but these are not (or should not be) doing the 'industrial'-scale imposition of meanings and identities that Illich deplores.

**Uniting individual and collaborative creativity**

In *The LEGO Movie*, there is a tension between the celebration of individual creative imagination, and its other message about the importance of collaboration, working and playing together. This is nothing new – it is a tension we often come across in the discussion of creativity. It appears in Illich as well. *The LEGO Movie* nicely reflects the fact – supported by much creativity research literature – that distinctive and novel ideas arise when individuals feel uninhibited, encouraged, and supported (see, for example, Lanier, 2010, 2013; Csikszentmihalyi, 2002; Claxton, 2008). Personally I was quite moved when, in the middle of the film, Vitruvius tells Emmet: 'Don't worry about what the others are doing. You must embrace what is special about you'[3].

On the other hand, individualism can go too far, of course, and the film also indicates that play and collaboration between people can often spark the best ideas, which is also a reality supported by a lot of research (for example, Sawyer, 2012; Kaufman & Sternberg, 2010; Csikszentmihalyi, 1997). The tension is not entirely resolved – which may not matter too much in the film, where we can accept both points. But if we seek a cultural theory of creativity, this contradiction presents a problem for our argument, and must be resolved.

A solution is offered by Gerhard Fischer, another of the experts we collaborated with for the LEGO Foundation *Cultures of Creativity* project. Fischer argues that individual creativity and collaborative making can be combined:

> Our work [in the Center for Lifelong Learning and Design] is grounded in the basic belief that there is an 'and' and not a 'versus' relationship between individual and social creativity... By integrating individual and social creativity, support will be provided not only for reflective practitioners but also for reflective communities. (Fischer, 2013: 25).

People are all different, and have different backgrounds, and different skills. This doesn't mean that we should leave them all to do creative things separately, though, Fischer suggests. On the contrary, these differences are an 'opportunity' to develop new insights and new ideas. He explains:

> The challenge to foster and nurture cultures of creativity is often not to reduce heterogeneity and specialization, but to support it, manage it, and integrate it by finding ways to build bridges between local knowledge and by exploiting conceptual collisions and breakdowns as sources for innovation. (Fischer, 2013: 26).

The most important thing for cultures of creativity is not the ability to access or learn *existing* knowledge, it is having opportunities to make new knowledge *together*, addressing issues of shared concern. The 'designer mindset' is fostered not by seeking and finding knowledge that is 'out there', but through the creation of new knowledge. Access to information – often cited as a key triumph of the internet – is 'a very limiting concept,' Fischer says. What we really need are environments and education systems that cultivate the development of the designer mindset 'by creating habits and tools that help people become empowered and willing to actively contribute to the design of their lives and communities' (Fischer, 2013: 27).

Harnessing the power of people working together on a shared enterprise is ultimately more valuable than well-informed, imaginative individuals doing clever things. But we can have both: people can be supported to be individually creative, and then these insights and achievements can be integrated with

the insights of others in the next, collaborative step. This is what happens in LEGO Serious Play, where participants build individual models first, before combining their meanings into a shared model at a later stage; and it is also, really, what happens on Wikipedia, and on YouTube, where individuals plant flowers that become part of a vast and flourishing garden.

**. . . And changing the world**

This brings us to the transformative cultural power of LEGO. I could hedge around this bold notion by saying 'Of course, LEGO products are children's toys, and you would not really expect them to be world-changing phenomena...', but that would not really be quite right, because actually LEGO products *are* intended to be world-changing phenomena – in my experience that is absolutely what the people at LEGO wish for their products and for their business. By fostering creative play and imagination in children, they hope to contribute to a inventive, thoughtful society. The LEGO Group's stated company mission is to 'Inspire and develop the builders of tomorrow,' and in my experience, they definitely mean it.

That is not to suggest that the LEGO Group sits outside of capitalist business models as a purely altruistic, public-service organisation – but it does indicate that certain companies can be both money-making and socially useful. Indeed, the business book entitled *Brick by Brick: How LEGO Rewrote the Rules of Innovation and Conquered the Global Toy Industry* (Robertson & Breen, 2013) is very much the story of how the LEGO Group almost collapsed (around 2002–03) when it had diversified too far, and was producing toys and ventures which strayed away from the LEGO System and principles; and then how it turned the corner to be the incredibly successful business it is today, by focusing on the core LEGO identity, the joy of building, and the motto 'Only the best is good enough' [*Det bedste er ikke for godt*] – the phrase which Godtfred Kirk Christiansen carved and put up in his father's workshop in 1936, at the age of 16.

As well as feeding children's imaginations, I believe there are (at least) three central ways in which LEGO products and cultures contribute to a more creative and hands-on orientation to the world, potentially making it a better place:

- *Everyone can make something:* Building with LEGO is quick and straightforward for most people. Of course, some people become much more skilful over time (as we saw near the start of this chapter: 'low floor, high ceiling, and wide walls'). But LEGO building helps people step into the world of making, and this is a vital shift in terms of a person's sense of self in the world – being a creator, not just a consumer. These small steps are significant (Gauntlett, 2014) and contribute to a necessary shift in our culture towards a greater sense of creative ownership, and engagement with our environment.

- *Remaking and rebuilding:* LEGO play builds the sense in which things can be constructed, deconstructed, reviewed and changed, not simply by thinking about them, but by actually making them and changing them. The notion of rapid prototyping, foregrounded by IDEO and other design companies, has grown more influential in recent years (Coughlan, Fulton Suri & Canales, 2007; Brown, 2009), but people have been doing it with LEGO bricks for decades. More generally, LEGO creativity fosters familiarity with making and construction, and the sense of objects as things that are made, which leads to the sense that things can be made differently – an optimistic approach to change.

- *Supporting and sharing:* The LEGO ecosystem, as mentioned above, includes extensive networks of users eager to learn and exchange knowledge and inspiration. The striking phenomenon here is not produced by The LEGO Group itself, but flows from the self-initiated activity of LEGO enthusiasts (lightly supported by the company, which seeks to support but not to interfere). The networks of peer support and knowledge-sharing in LEGO communities serve as a model for other spheres (Antorini, Muñiz & Askildsen, 2012; Antorini & Muñiz, 2013), such as academic networks – where 'open access' principles have been variously embraced and rejected (Suber, 2012; Fitzpatrick, 2011) – and in the design community. The excellent anthology *Open Design Now* (Van Abel, et al, 2011) shows how socially valuable design and innovations are generated through open sharing and collaborative practices, such as those which have been adopted – in a quiet, relatively unplanned, but powerful way – by LEGO users online.

Clearly, in conclusion, LEGO is not 'just a toy'; the LEGO System describes a complex web of products, resources, people and knowledge, which interact in powerful ways. Of course, these are things which have a place within a wider culture, and so, even if LEGO could 'change the world', it couldn't do it on its own. Nevertheless,  whilst there is absolutely no need to apologise for the purely fun dimension of LEGO play, I hope to have demonstrated that it connects with some valuable social movements – such as maker culture and open knowledge sharing – and can help to build a mindset which is creative, optimistic, and willing to try out new things. It is this orientation that will be needed if we are to escape the gravitational pull of relatively passive media consumption and a purely 'consumer' approach to the world, which drag us towards ever more serious environmental challenges. Instead we can build a more energetic, do-it-yourself culture, where nature and human creativity can thrive together.

David Gauntlett is a Professor in the Faculty of Media, Arts and Design, and Co-Director of the Communications and Media Research Institute, at the University of Westminster, UK. His teaching and research is about self-initiated everyday creativity, and cultures of making and sharing, with some emphasis on digital media. He is the author of several books, including *Creative Explorations* (2007) and *Making is Connecting: The social meaning of creativity, from DIY and knitting to YouTube and Web 2.0* (2011). He has made several popular websites and YouTube videos, and has worked with a number of the world's leading creative organisations, including the BBC, the British Library, and Tate. For almost a decade he has worked with LEGO on innovation in creativity, play and learning.

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**NOTES**

[1] To provide more detail: From 2005, I worked with the LEGO Group on developing versions of the consultancy process, LEGO Serious Play, for purposes beyond its initial business-consultancy application. For instance, I used it as a social research methodology for the first time (covered in my 2007 book, *Creative Explorations*), and developed smaller and more portable applications of the LEGO Serious Play principles. I was co-author of the Open Source release of LEGO Serious Play, launched in 2010 (available at http://davidgauntlett.com/portfolio/lego-collaborations/). Since 2008, I have been a leading member of the LEGO Learning Institute, and have worked closely with the Institute directors and colleagues from the Universities of Cambridge, Edinburgh, and MIT, to produce reports and materials including *Defining Systematic Creativity* (2009), *Defining Systematic Creativity in the Digital Realm* (2010), *The Future of Play* (2011), and *The Future of Learning* (2012), all published by the LEGO Learning Institute. In 2013 the LEGO Learning Institute was absorbed into the LEGO Foundation, who supported and published our next study, *Cultures of Creativity* (2013). I have also produced videos, worked with LEGO Education, and co-produced a Systematic Creativity training pack and workshop, which has been used by all new employees at the LEGO Group in Denmark since 2009.

[2] This section of text draws on some of the material that I wrote for the *Cultures of Creativity* report (Gauntlett & Thomsen, 2013). Reused/remixed by kind permission of The LEGO Foundation.

[3] A clip which contains this bit can be seen at: http://youtu.be/9VeUoVKiyhE