

# GAME DESIGN RESEARCH

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An introduction to theory & practice

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## CHAPTER 5

# GAMES DESIGN RESEARCH THROUGH GAME DESIGN PRACTICE

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PAUL COULTON AND ALAN HOOK

Whilst many game design academics are also game designers, their research is often presented through the lens of other disciplines (philosophy, media theory, human computer interaction [HCI] etc.) and practice-based design research is arguably underrepresented in the games research community. Although game design research espouses to open an inclusive community, at present, research approaches and the presentation of results is dominated by those inherited from either the social sciences or HCI (Deterding, 2016). This dominance of loaded and prescriptive academic frameworks is arguably why many of those creating games outside academia feel such research is unrepresentative of their own practices. In many respects this tension in game design, between research and practice, mirrors what happened in the broader discipline of design whereby academic research was often perceived as separate from design practice (cf. Frayling, 1993). More recently practice-based research has been the subject of increased interest, particularly within HCI (Gaver, 2012) and media studies, coinciding with an increasingly prominent role given to design by the UK Research Council; both as a distinct area of practice-based research and the benefits of its inclusion within interdisciplinary research projects. This also correlates with

feedback from Research Assessment Framework panels (periodic review or research performance at UK) universities which praised the value of practice-based or non-textual research outputs for its impact on communities and cultures outside of the education sector (Sutherland and Acord 2007).

This then leads us to question why is game design research not more readily engaging with the broader design research community? This is particularly important as game design research could also offer insights for design research more generally. Although it has been proposed that adopting a design science approach could address game design through practice (Waern and Back, 2015), drawing on a similar proposition by Herbert Simon (1981) for design, it is important to note that this HCI desire for technological rationality has largely been rejected by design researchers in favor of “design studied on its own terms, and within its own rigorous culture” (Cross, 2001). The aim of this chapter is therefore to draw from approaches used for practice-based research in design that successfully produce what is accepted as valid forms of academic design research so that areas of game design research can move closer to reflect game design practice, mirroring its acceptance in the wider design disciplines. By situating research through game design amid the wider discourses of practice-based research we can consider new approaches to game design research in the context of the broader discipline of design rather than through other academic disciplinary lenses.

To start such a consideration, it is important to gain a methodological understanding of how research through game design could be undertaken by drawing upon methodological approaches that are considered commensurate with design practice. The chapter will then focus on game design practice that is primarily concerned with the construction of the communicative rather than purely as objects of entertainment, that is, games whose design is primarily to question societal

values and norms. The choice of such games is primarily due to the parallels with practices in design research outside of games and provides a useful illustration of the benefits of situating games within more general design theory and discourse. In games research such approaches would primarily be considered as part of *critical play* (Flanagan, 2009), while in design more generally such approaches are considered within *radical design*, *critical design*, *speculative design*, and *design fiction* (Coulton, Burnett and Gradinar, 2016). We therefore situate game design practice within this wider critical research discourse to help illuminate ways game design could grow as a form of research, building on a long history of *research through design* (RtD) practice. We would note that parts of this discussion is a reflection on our own practice as game designers and as academics within art and design and should not therefore be considered a prescriptive model for how such research is undertaken.

For researchers situated in academic disciplines outside art and design this chapter may be both challenging and controversial in that it likely diverges from the practice of research within those disciplines. However, we believe it is important for game design research to emulate the success of RtD practice more generally by not becoming entrenched in a narrow set of research approaches or frameworks and to open up a debate as to whether a wider range of representations of research is needed to fully encompass game design research.

#### TOWARDS A THEORY OF PRACTICE

To start our methodological exploration, we must position practice-based research with respect to what is considered valid knowledge and then what research methods best suit the acquisition or production of such knowledge. Typically design research starts with open-ended research aims or open research questions, rather than a specific hypothesis to be tested. This is a deliberate choice as designers often describe their practice as “problem framing rather than problem solving” (Schön, 1983)

and is a practice that requires reflection, leading to an emergence of understanding throughout the design process. This contrasts greatly with the more traditional positivist methodologies used by many researchers considering games; which place most value on quantifiable outcomes (Nacke, et al., 2009). This is not to say that a positivist approach is wrong, it is just that it is primarily aimed towards fixity, reduction, singularity, and defined outcomes; which is not the only way academic research can be undertaken. It is this reflective practitioner (Schön, 1983) approach that is often seen as the most significant factor in design's ability to address the complex societal and environmental challenges we now collectively face, the so-called *wicked problems* which was originally proposed by Horst Rittel (1972) in relation to urban planning but popularized in relation to design thinking (Dorst, 2011) by Richard Buchanan (1992). This approach is sometimes ambiguously referred to as a *designerly* way of thinking and acting (Cross, 2001; Buxton, 2007; Moggridge, 2007). Further, this is often seen as a way that designers are able to deal with the complexity or messiness of the real world situations they are primarily engaged with. To quote the sociologist John Law:

If this [something] is an awful mess [...] then would something less messy make a mess of describing it? [...] Simplicity [...] won't help us to understand mess (Law, 2007)

His discussion is centered on a comparison of contemporary positivist approaches which utilize sciences' techniques that favor clarity, specificity and repeatability at the cost of repressing the mess. Mess, according to Law is almost the opposite of intellectual hygiene—by this he means that everything that is typically removed in order to perform unbiased lab-based research can be considered as mess. He argues that this mess makes up a very large portion of the world we inhabit, and as a result mess is highly relevant to the research both in terms of understanding the limitations of the data, and that it encourages the iterative (re)defining of the question that the research is trying to answer in response to the mess. As games are

predominantly designed to be played in the real world, in complex social situations, it seems appropriate therefore that some approaches to game design research are able to embrace the mess of non-laboratory based research, and practice-based design research is arguably well equipped to meet this aim. This notion of embracing the mess was also promoted by Ian Bogost in his 2009 DiGRA keynote speech:

Videogames are a mess. A mess we don't need to keep trying to clean up, if it were even possible to do so. (2009)

Bogost (2009) was also proposing the adoption of Law's perspective and sought to encourage game studies academics of all persuasions to resist the desire to make the study of videogames tidy, which he said leads to unnecessary polarization as exemplified in the ludology–narratology debates.

#### GAME RESEARCH THROUGH GAME DESIGN

To consider the question of what practice-based game design research could be; we address it from within the context of Fraying's description of research within art and design (Frayling, 1993) which begins by making the distinction between research (big 'R') and research (small 'r'). The former Frayling equates to the production of new knowledge, whereas the latter is the utilization of pre-existing knowledge within a design activity (1993). This offers researchers a framework to discuss their activities and a distinction between both the intent and outcomes of the activities. To emphasize the problems of understanding the research within design practice, Frayling (1993) highlights how stereotypical views of artists, designers, and scientists often suggests a clear distinction between these activities, when in fact they are deeply intertwined; "Research is a practice, writing is a practice, doing science is a practice, doing design is a practice, making art is a practice". Frayling's overall conclusion is that amongst these practices there is a lot of common ground but "there is also a lot of private territory". In concluding the discussion Fraying introduces three characterizations of design



research as: Research about *design*, *research through design*, and *research for design*, which can be considered as follows (Frankel and Racine, 2010):

- *Research about design*: Research focused on the experience of designers and those who use their products i.e. design activity, design behavior and design cognition.
- *Research through design*: The emphasis here is on creating design knowledge and not the project solution; through an action-reflection approach. It seeks to provide an explanation or theory within a broader context: for example, research in emerging fields of design.
- *Research for design*: Research to enable design where the end product is an artifact, where the thinking is embodied in the artifact.

Although RtD and research for design are characterized separately, they are invariably linked within the same artifact (Kroes, 2002) and of the three they are “the closest to the actual design practice” (Godin and Zahedi, 2014). However, of these two only RtD is considered by Frayling as producing big R research and therefore, with this applicability to practice, leads us to the conclusion that RtD is highly suitable form of academic research for games. Particularly as game researchers are a community that seeks to actively engage with its commercial design counterpart. The artifacts or systems, which are a product of an RtD approach, can be considered as a form of situated knowledge (Suchman, 1987) in that that they are bound within a particular instance of design. However, the majority of game design research up to now would be categorized as research about design and would include a significant proportion of HCI related research. Whilst RtD is being adopted within the HCI community it is proving highly contentious between those who simply conflate it with making and wish to create generalizable models and frameworks (Zimmerman, Forlizzi and Evenson,

2007) and others who wish to maintain its original focus of reflection on process and reject that generalization is applicable or even desirable for design practice (Gaver, 2012). This contention is perhaps analogous with previous discussion in relation to Law's consideration of mess and that there are very different methodologies used within science and design. Whereas sciences' methodologies typically concentrate on the outcomes of the scientific research processes, such as empirical claims, laws, and theories, Nigel Cross characterizes design methodology as "the study of principles, practices and procedures of design" (Cross, 1993) which aims to improve design practice and is strongly process oriented (Kroes 2002). Therefore, we further argue that whilst HCI research practices have an important role within games research there should also be a place for game design research that provides reflection on the processes of design.

#### TOWARDS AN EPISTEMOLOGY OF GAME DESIGN AS PRACTICE

One of the primary difficulties with, and criticisms of, RtD is that the experience and subjectiveness of the designer/researcher often plays a significant role within the research. This can lead to both the process and artifacts of designing being affected by the culture of, and the tacit knowledge held by, the designer throughout the creative process. A gamut of choices goes into the design of any given artifact that may include: the functionality of the design, its aesthetics, the practicalities of production, the motivation for making, the identities and capabilities of the people for whom the artifact is intended (Gaver and Bowers, 2012). How then do researchers make a case that knowledge generated through such a design process is valid knowledge? To answer this, they must consider their epistemological position as researchers. Whilst this will vary dependent on the individual researcher, here we present a position that is commensurate with our discussions relating to researching through a game design practice.

### **An influence from the postmodern**

Postmodernism is not only used to describe a period but also a set of ideas that can only really be understood in relation to the equally difficult to define modernism. Modernism was a diverse art and cultural movement in the late 19th and early 20th centuries that sought a break from previous ways of doing things. Postmodernism can be considered as questioning the ideas and values associated with a form of modernism that believes in progress and innovation. Whilst a full discussion of this topic and its influence on design and research is beyond the scope of this chapter here we are simply acknowledging that this influence is present within academic thinking and in particular two aspects that are relevant to our subsequent discussions. Firstly, whereas modernist approaches often rely on a single consideration of knowledge production, such as empirical evidence, post-modernism advocates epistemological pluralism, which inherently supports multiple ways of considering the production of knowledge (Rodríguez Ramírez, 2009). In particular, this means stories become the important element of postmodern research and these stories are not only about the people being researched, but also from the own experience and cultural background of the researcher. Many design practices place an emphasis on the role of stories (Erickson, 1996) and thus if game design research is to more closely align with game design practice this would suggest it should take a turn towards facilitating research outputs that actively encourage the inclusion of designers' reflections on a particular design process. Secondly, postmodernism is often associated with adopting and then pastiching existing cultural forms (Jameson, 1985) or adopting critical perspectives particularly in relation to cultural identity (Mukherjee, 2016). The appropriation of particular forms and tropes is an attribute of the critical and speculative design practices we will consider later in this chapter and thus exhibits postmodern tendencies.

### **Constructivism**

Design research is tied to a domain that derives its creative energy from the ambiguities of an intuitive understanding of phenomena (Swann, 2002).

Phenomenology suggests that all mental phenomena are about something, from which it can be argued that the subjective thought of the designer cannot be separated from the object of thought, i.e. the designed artifact, even though they are two different entities. A view of the world in which subjective thought and the object of that thought are coupled is constructivism. Constructivism focuses on the “meaning-making activity of the individual mind” within which the worldview of one individual is as valid as any other individual, including the designer or researcher (Rodríguez Ramírez, 2009). This means that while valid knowledge can be produced, acknowledging the cultural background and motivations of the researcher at all stages of the research is an important means of critically assessing such research. Thus the presentation of such research requires formats that facilitate this form of assessment and it has been proposed that annotated portfolios are one such format (Gaver and Bowers, 2012). An annotated portfolio brings together a collection of individual artifacts within a single body of work and serves to highlight the similarities and differences in this family of artifacts. Annotations can be text, images, and doodles reflecting different purposes, interests, with different audiences and contexts, and the annotations and artifacts exist in a symbiotic relationship mutually informing each other: “Artifacts are illuminated by annotations. Annotations are illustrated by artifacts” (Gaver and Bowers, 2012). Whilst annotated portfolios are common within art and design departments, and have been proposed for HCI (Bowers, 2012), they do not readily adapt to the rigid formatting prescribed by many conferences proceedings or journals. Such structures could thus be considered as examples of what John Law (2014) describes as “method assemblages” which can restrict or curtail the production of knowledge to a limited number of approaches.

Therefore, games research, and other areas approaching design research, need to consider whether they need to be more open and accepting of different forms for the presentation of research.

### **Grounded approaches**

Grounded approaches derive their inspiration from *grounded theory* methodology through which theory is derived as a result of the research and is not the precursor to it. "Theory evolves during actual research, and it does this through continuous interplay between analysis and data collection." (Strauss and Corbin, 1990). A typical approach to applying grounded theory in practice would involve a researcher gathering qualitative data, often in the form of interviews or personal observations. This data is then analyzed through techniques such as coding in which the researchers seek to identify concepts and theoretical explanations for phenomenon (Strauss and Corbin, 1990).

Strauss and Corbin say that this approach is most suitable when "all of the concepts pertaining to a given phenomenon have not been identified, or are not fully developed, or are poorly understood and further exploration on a topic is necessary to increase understanding" (1990). Whilst this suggests that grounded theory responds to the mess previously highlighted, Mol and Law (2002) have argued that it is still inherently positivist as it seeks to create a reductionist explanation of reality and asked "how might complexities be handled in knowledge practices non-reductively, but without at the same time generating even more complexities until we submerge into chaos?". It was Adele Clarke (2005) who sought to answer this question by taking a postmodern turn with grounded theory by moving it away from a social process metaphor to an "ecological root metaphor of social worlds, arenas or negotiations".

Clarke (2005) proposed the construction of knowledge through cartographic situational analysis and in particular making three different types of maps that help visualize different relationships between participants in the situational context. Clarke (2005)

suggested this also takes grounded theory away from the notion that a researcher can approach such research free from any preconceptions, highlighted by Charmaz and Mitchell (1996), as in the act of creating these maps researchers reveal themselves. This emphasis on visual representation aligns well with design practices and in particular the map-making activities seen in areas such as service design (Stickdorn, et al., 2011). Further, as the designer is the one producing the research artifacts, a postmodernist approach to grounded theory allows for this as long as they clearly state their motivations, background, and offer an in-depth description of the experience and decisions that they went through. This is again commensurate with RtD and indeed our own practice.

Much of this would also appear similar to *action research*. Action research also acknowledges the complexity of social phenomena (Swann, 2002). It also acknowledges that there is non-linearity between cause and effect, and that the best response to such mess or complexity is to reject the notion that this can be addressed by a lone researcher and to engage stakeholders into the research process. Thus action research can be viewed as an approach for carrying out participatory research in which research through game design can easily fit.

#### BEING ITERATIVE

There are a number of models proposed for considering design activities that occur throughout the process but here we draw upon the work of renowned interaction designer Bill Verplank (2009) and his consideration of difference between *craft* and *design* as shown in Figure 1. Unlike craft, design exhibits separate activities or modes. For example, in an ideation phase the aim is to produce many alternatives which can be evaluated through testing. In a game this might be a series of different mechanics to explore the relationship between game objects or assets. Each alternative and testing is followed by reflection in an iterative manner. Without this iteration alternatives are not considered,

comparisons are never drawn, and assumptions are never challenged.

At the core of invention might be a hunch followed by a hack followed by another hunch (craft) but an idea or generalization is needed for generating alternatives, prototypes and tests (design). The goal is principles, which organize the value of a product which creates a market which creates a paradigm and we are back to a fixed orbit. Design is the “transfer orbit” that gets us out of a small orbit into a larger one. (Verplank 2009)

Design processes such as these can be considered as method assemblages (Law, 2014), which can ultimately restrict what new and situated research knowledge is created to only that which is facilitated by the method. In other words, if your research practice is through the creation of games the way you produce those games will heavily influence the knowledge produced. What is also interesting about Verplank’s (2009) diagram is that we can use it to consider different aims of research game design and commercial games design as also shown in Figure 1. In commercial games the ultimate aim is primarily to get the game into the market in order to make a profit. As with research for design, in a commercial game the knowledge produced would be demonstrated in the final product. In research through game design our aim is to produce knowledge which comes through the iterative critical and reflective practice and is likely represented through new methods, principles, and paradigms.

#### REFLECTING ON THEORY IN PRACTICE

In the following sections we will consider game design that goes beyond that of producing games purely for entertainment. In particular, we focus on approaches that could be considered as emerging from the so-called *art games* movement as defined by Jason Roher (cited in Bogost, 2011). This is arguably the area currently closest to practice-based research. However, we would concur with Ian Bogost that art games is an insufficient term to consider many games, and it is currently “a stand-in for a yet

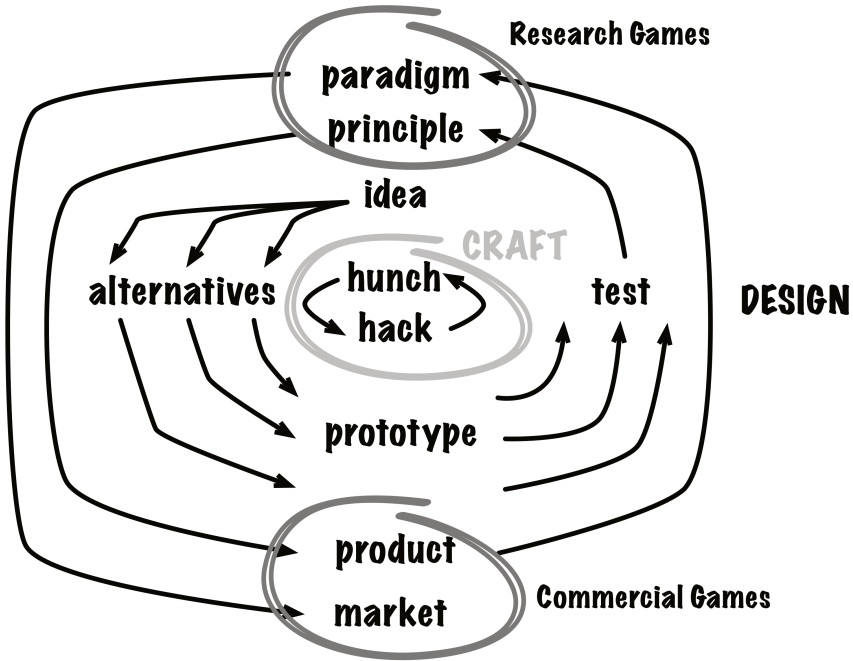


Figure 1. Design/Research Process inspired by Verplank (2009).

unnamed set of movements or styles, akin to realism or futurism” (Bogost, 2011) and by considering relevant approaches from design we may help towards developing a clearer understanding of what this may be.

CRITICAL PLAY

Mary Flanagan (2009) introduced *critical play* in relation to games as a way to understand how games, as designed systems, can work as a critical or cultural lens to reflect on social, cultural or political issues. The game acts to encourage players to think critically about the problems the game reflects upon. Thus play, as a form of interaction within the designed situation, system or framework, then works as a mode of critical enquiry into the topics that the game addresses. Games that use *critical play* to inform their development often reflect on current, or historical, political and cultural issues. However, critical play does not have



the focus on critiquing possible or plausible futures as is dominant within *critical design* (Dunne, 2008), *speculative design* (Auger, 2013), and *design fiction* (Lindley and Coulton, 2015). Whilst Flanagan does not preclude such a focus for critical play, thus far the vast majority of the critical games created have primarily been either to critique current events or practices within the games industry or critique games themselves (Grace, 2015). An example of the former is Molleindustria's (2011) smart phone game *Phone Story* which critiques smart phone production by highlighting aspects such as the harvesting of precious metals and the production of electronic waste. This example is important as it utilizes the games platform to create a critical linkage between the designed object (the smartphone) on which the game is played and the critical play of which critiques the objects own ecology of production. In effect the game transforms the smartphone into a critical object and asks the players to reflect on the media and technological ecology of the device. Critical games, or games which use critical play often try to create tensions between the player objectives, the obstacles and the rule systems; to create a space for reflection by the player about the games meaning and the social or political critique it is performing. Reflecting on how a designer constructs critical play, Grace (2010, p.28) states that "critical gameplay is created by observing a set of standard assumptions, deconstructing the assumptions in that standard, and reorienting that set of assumptions through the production of an alternate model of play." This iterative approach is commensurate with the design activities previously shown in Figure 1.

Another example of critical play is Flanagan's own game, *Giant joystick* (Flanagan and Nissenbaum, 2014), which provides both a critique about the lack of collaborative play in many games, while its phallic nature also pokes fun at male dominated play and machismo within contemporary game design (Grace, 2014). In this respect, Martins' (2014) critique of privilege within speculative and critical design, cannot be so easily leveled at critical games, as the work of designers, such as Anna Anthropy

(2012), directly address subjects such as race, gender, and sexuality. Through critical play, games can then also function as operational tools to reflect on and understand the self (Flanagan, 2009) and are often “orientated towards introspection over immediate gratification” (Bogost, 2011, p.14). Flanagan’s engagement in both the theory building around games, and contribution to valid knowledge through the creation of RtD is important as it shows the production and consolidation of valid knowledge through both traditional and non-traditional means.

Another researcher, who writes traditional scholarly work as well as making research through game design, Stefano Gualeni (2015) builds on the work of researchers such as Flanagan by proposing games and virtual environments as a form of philosophic tool. Gualeni (2015, p.85) argues that games can open up “new and interactive horizons of thought, and of ways to understand time, space, properties, and causation that are supplementary, and in some cases even alternative, to those through which human beings structure their everyday relationships with the actual world.” Games then can be a speculative practice which can help players (re)consider, critique and reflect on the present, but are also a process of world building where players can explore alternative ways of being. This approach to games is able to both challenge and build theory and could be interpreted as commensurate of viewing games through the disciplinary lens of philosophy. For example, Gualeni’s research, both his written responses and his games, create a body of work, or reflective portfolio, that situates it both within game design, and philosophy contributing new knowledge to both disciplinary fields. Thus games can engender debates about the world and open critical, speculative, and discursive spaces where the player can consider complex cultural issues through play.

#### CRITICAL DESIGN, SPECULATIVE DESIGN, AND DESIGN FICTION

Whilst there is no commonly agreed definition of speculative design, critical design, or design fiction they arguably share

certain similarities in that they: remove the commercial constraints that might normally limit the design process, uncoupling the methodologies from commercial discourses; use prototypes as the main method of enquiry; and use fiction to present alternative realities (Auger, 2013). As such they are indicative of a more general shift from design no longer principally focusing on technological problem solving but instead to the cultural and the construction of the communicative (Arnall and Martinussen, 2010; Balsamo, 2011). Thus, whilst design research can aid technological innovation it can also involve the creation of expressions of cultural understandings, including narratives, myths, values, and representations (Martinussen, Knutsen, and Arnall, 2014). An early example from the commercial design world is *Futurama*, created by Norman Bel Geddes, and sponsored by General Motors (GM) for the World's Fair of 1939. *Futurama* transported visitors over a huge diorama of a fictional section of the United States, and is widely credited as introducing the American public to the concept of networked expressways connecting the nation. *Futurama* painted a picture of the world 20 years into the future. It set an agenda and significantly influenced transportation and planning policy. By providing a glimpse of an unknown-yet-desirable future the exhibit influenced how a nation saw their world in relation to the product that ultimately came to define the USA: the car. GM did not promote a possible design for a car, but rather they prototyped a fictional future world that endorsed the notion that cars would become an integral element in American society and culture. Another example of such fictional prototyping in the commercial world is vaporware—a term commonly used to describe software and hardware that is announced, sometimes marketed, but is never actually produced (Atkinson, 2013). It is worth noting that although it pervades many areas of technology, the games industry is one that seems particularly prone to producing vaporware yet most critical games do not engage with the technological trajectories being promoted as games' futures.

In response to commercial visions of the future the radical design movement of the late 1960s and early 1970s in Italy arose with an aim that designers and architects should not only be seen as service providers for commercial interests but that they could actively and critically engage in social and political matters. With manifestos, transdisciplinary working methods and utopian design ideals, radical design protested against functionalism and the established practices of design. One of the most influential groups of this time was Superstudio who are cited as highly important by many architects including Zaha Hadid (Stauffer, 2002) whose work reflects this rejection of conformity. In the same time period the UK based group Archigram also promoted a more overtly political stance for design and in particular a utopian socially and politically engaged architecture (Sadler, 2005), but with playfulness analogous to what is seen in some critical games. The critical awareness brought about by radical design has more recently expressed through critical design (Dunne, 2008). Critical design uses design methods and processes to create critical objects, which are often outside of commercial practices and serve an inquisitive or provocative role (Malpass, 2010). The objects are usually counter to conventions or question usability, profit or taste (Mazé and Redstöröm, 2007). The practice “rejects how things are now as being the only possibility, it provides a critique of the prevailing situation through designs that embody alternative social, cultural, technical, or economic values” (Dunne and Raby, 2001, p.58) As described by Dunne and Raby, critical design allows designers to open up a discursive space that accommodates the unavoidable plurality of the future “the idea is not to show how things will be but to open up a space for discussion”. One of the key criticisms of critical design is Dunne and Raby’s assertion of the promotion of the designers’ preferable future which as Prado de O. Martins (2014) states, means “critical design risks to incur the same mistakes as critical theory” by “promoting elitist views of a ‘better world’ that society should aspire towards” (Bowen, 2010). A further critique has been to consider critical design alongside contemporary art practices is that while they try and open spaces

for reflection, debate and critique, they are too often displayed in showrooms or galleries (Bardzell, Bardzell and Stolterman, 2014). While we may consider critical games as focusing on introspection rather than entertainment, critical design focuses on introspection over functionality or utility.

While it has been argued that while no formal definition of speculative design exists its focus on designed outputs intended to facilitate discourse with a broad audience, without the emphasis on promoting a preferable aspect seen in critical design, allows for a greater plurality of views to emerge and, when linked with design fiction, could free itself from primarily being displayed in gallery situations (Coulton, Burnett and Gradinar, 2016). Auger (2013) also states that speculative design could present alternative presents as an exploration of ideologies as design proposals. Thus speculative design offers designers a space for reflection, consideration and critique; to imagine other possibilities through the consideration of the rhetoric and ideology distilled into them through the process of design in the same way as critical games. This consideration of rhetoric is important and one we shall explore in more detail in the subsequent section.

Design fiction is of particular interest in relation to technology related futures, as it couples the unequivocal power of science fiction to influence the world (Dourish and Bell, 2014) with design's inherent world-shaping ability. Design fiction achieves this by creating plausible future worlds that are inhabited by designed objects (Lindley and Coulton, 2015). By placing these designs in a plausible and fully textured world (Coulton, et al., 2017), our relationship with these speculative objects goes beyond mere utility or usability and, to use the anthropologist Lucy Suchman's (1987) term, are "situated" (ibid). Design fictions can be both a way of communicating visions (Tanenbaum, 2014) and also a way of building inspiring design concepts (Knutz, Markussen and Christensen, 2014). They create discursive spaces (Lindley and Coulton, 2015), which can address the

complexity of emerging technology in future scenarios. The aggregate of all these properties means that design fictions can provide *cultural triggers* for hardware, software and system developments.

The term design fiction was coined almost accidentally by the science fiction author Bruce Sterling when he was trying to articulate how design thinking impacted his literary output, “Design fiction reads a great deal like science fiction; in fact, it would never occur to a normal reader to separate the two” (Sterling, 2005). More recently Sterling has refined his thinking on design fiction, defining it as “the deliberate use of diegetic prototypes to suspend disbelief about change” (cited in Bosch, 2012). The term ‘diegetic prototype’, where the *diegesis* is the interior of any given story world, has its origins in David Kirby’s (2009) research into how science is represented and informs cinema, and conversely how cinema informs science. Sterling’s definition underscores the importance creating believable fictional worlds whose coherence is intertwined with the designed prototypes. Julian Bleecker’s (2009) characterization of design fiction as a distinct practice instigated a surge in interest from a range of disciplines.

As design fictions explore these nascent technologies along plausible trajectories (Coulton, Lindley and Akmal, 2016) it is a practice that could be a useful approach for games industry as it is an area that readily embraces new technology. As an example we consider *Game of drones* which is a research paper (Lindley and Coulton, 2015b) that describes a trial in which drones are used to provide services to local authorities, aiding in the enforcement of local by-laws. Specifically, it presents a gamified system in which retired members of the police and armed services act as remote drone pilots helping to enforce by-laws relating to parking offenses and dog fouling in a small UK city. The whole interaction takes place through a game-like interface and points are awarded for catching other citizens infringing upon the rules. The paper was submitted for The ACM SIGCHI

annual symposium on computer-human interaction in play (CHI PLAY) 2015 in the Work in progress section and indicates its fictional nature by including design fiction as a keyword at the start of the paper and revealing itself as a speculative artifact in the paper's conclusion. As one of the authors of this paper is also author of this chapter we note that when the paper was reviewed, the reviewer's responses indicated that they had not fully grasped the fictitious nature of the game presented in the paper and this was echoed by some of the reactions of other researchers when the work was presented at the conference (Lindley and Coulton, 2016). Much of the confusion may be due to the fact the paper is written in the style of typical papers in this field. This perhaps suggests that unless the fiction is highlighted significantly within the artifact, our emotional engagement with the fictional world, especially if it resembles a familiar form, might override the signposts explicitly pointing out its fictional nature and provides a good example of the power of this technique (Coulton, Lindley and Akmal, 2016). The paper and the game prototype create a play between the RtD and its exegesis that acts to create and reinforce the fiction in a process of world building. This important link between RtD and other commensurate academic practices helps them work together in a symbiotic relationship to create and situate the knowledge, which as we have previously highlighted, is important in the development of robust and structured approaches to creating research while being aware of the issues associated with method assemblages.

Along with the previously defined attributes of speculative design, critical design, or design fiction, we would also suggest there is another similarity within these approaches in that the resulting artifacts can often appear subversive, irreverent, and frequently humorous in nature in order to break down the barriers to discussion. This suggest that games and play are highly relevant in the context of critical design, speculative design, and design fiction: the games often create a playful subversive and irreverent space, which is analogous to the often described property of games, the *magic circle* (Salen and

Zimmerman, 2004), and is perhaps closer to Huizinga's (1955) original discussion as a space for enacting ritual. Having discussed communicative approaches both within design and games how do we bring these areas of design together? One way we suggest is through the consideration of rhetoric and in the following section we explore this further.

#### DESIGN AS RHETORIC

Before examining rhetoric within design it is worthwhile considering how the term rhetoric is being applied. In some modern contexts, such as politics, it can be associated with insincerity, whilst here it is used in the historical sense relating to the art of persuasive speaking (Rapp, 2010). In terms of applying rhetoric within a specific design context, it can be considered in relation to the three modes of persuasion: *logos* (argument), *pathos* (emotion), and *ethos* (character) identified by Aristotle (cited in Rapp, 2010). Within these three modes various devices can be used to appeal to the audience, for example:

- *Logos* might utilize facts, statistics, analogies, and logical reasoning
- *Pathos* might appeal to our emotions and draw upon feelings of fairness, love, pity, or even greed, lust, or revenge
- *Ethos* would draw upon credibility, reliability, trustworthiness, and fairness.

Although in Aristotle's time, rhetoric was associated only with speech it has developed beyond this:

- to the visual rhetoric associated with image (Kim and DiSalvo, 2010) which is prevalent within marketing
- to all artifacts of design through Richard Buchanan's (1985) argument that all design can be considered as rhetoric.



Ian Bogost (2007) proposes utilizing rhetoric to reveal to the player the underlying processes or concepts that drive a system or activity through playing the game in his book *Persuasive games*.

In relation to games, Bogost (2007) argues that the basic representational mode of videogames is *procedurality*, enacted through rule-based representations and interactions and, when used to reveal processes or concepts of another system, presents the player with a procedural rhetoric. Thus, procedural rhetoric is the practice of using interactive processes persuasively (Bogost, 2007). Whilst we acknowledge that procedural rhetoric is being challenged by some game scholars (Sicart, 2011) this criticism is always focused on procedurality and this then is overshadowing the consideration of rhetoric which is arguably the more important aspect. Just as Buchanan (1985) understands that all design is a form of rhetoric, where objects are encoded with meaning and values by the designer, proceduralists propose that the system of a game, as a designed artifact, can be encoded with meaning and values which are authored by the designer for the player or audience to decode and reflect on. It is worth noting that Bogost's definition differs from Buchanan's argument, whereby all games would be considered as rhetoric. Although Bogost is essentially only promoting the conscious use of rhetoric, his definition would not necessarily preclude its unconscious use, and therefore, as Coulton (2015) argues procedural rhetoric could be applied to the design of all computer mediated interactive systems if we substitute system logic for rules as shown in Figure 2. Perhaps one of the principal differences between speculative design and persuasive games is in relation to commercial constraints as many of the games cited by Bogost (2007) in his book are produced by large commercial entities. In relation to this research we would argue the consideration of all design is rhetoric as one of the most useful ways of unifying design theory with game design theory. This approach to game design, such as critical and speculative design, can open up spaces for reflection and critique for their audiences.

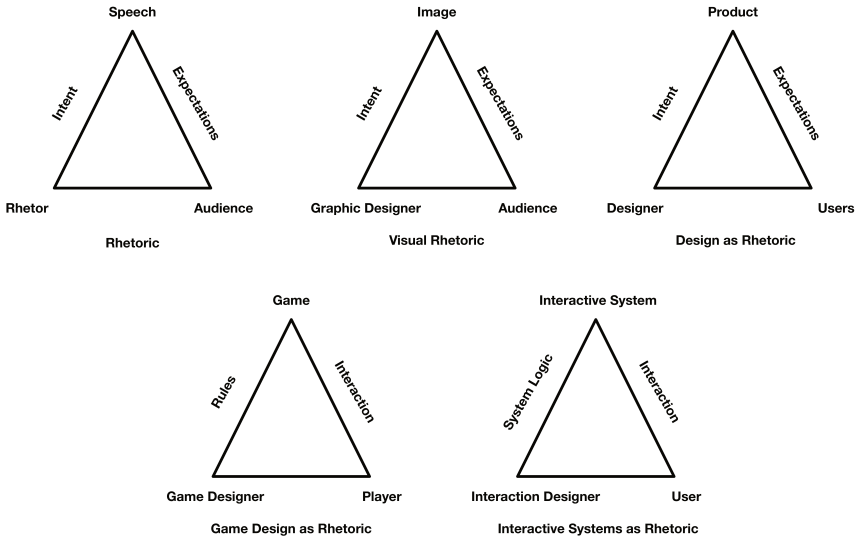


Figure 2. Rhetorical mediums.

CONCLUSIONS

The aim of this chapter has been to draw from successful approaches used for practice-based research in other design disciplines and suggest how these can be utilized within game design research so that it may better reflect game design practice. With this in mind the first half of the chapter explored approaches to knowledge that are readily considered within practice-based design research and in particular RtD.

Any forms of research in which the experience of the researcher is at work, such as design, can stray towards subjective evaluation, which can lead to criticism that it is not a valid form of knowledge creation. However, RtD has established a number of approaches that help ensure it is not performed through a designer’s personal and privileged perspective, or that it does not reflect either design scholarship or design practice. One of the important facets of RtD is that it both includes, and is included, in the contextual world of design knowledge by being developed with influences from design scholarship and from an acknowledgement of everyday design practices. The knowledge

created in design research is thus situated both historically and culturally within design. It is this relationship with the wider context of game design research that will allow practice-based game design researchers to avoid being subjective and to establish a balance between the object and subject of knowledge. Further, RtD can analytically consider design artifacts both in terms of how they reflect the particular research topic under consideration and how they address a particular research question.

To achieve this, practice-based game design researchers need to adopt a critical approach in order to avoid a personal and subjective construction of knowledge. At times during the research, the game design researcher is also a game designer who produces the designed artifacts under consideration. While at other times during the research they need to act as a critical researcher whose aim is to produce knowledge by analyzing and producing insights based on their own experience of the process and from the analysis of the designed artifacts. To allow this dual identity to occur fluidly within the course of the research process requires flexibility within the adopted research methodology to avoid becoming dogmatic about using particular method assemblages.

In this chapter we have argued that a constructivist approach to research through game design can both provide this flexibility and produce valid knowledge as long as the research adopts certain practices that produce the transparency required through which the validity of the research can be externally considered by others scholars. The game design researcher must therefore clearly define both their motivations for doing the research and their own personal background as these will ultimately affect the decisions they make during the design process. The game design researcher also needs to provide an in-depth description of their experience during the design process, how the process was performed, and how decisions within the process were made. This also means that the format in which the research

is presented must facilitate such presentation. As part of the chapter we suggested that the annotated portfolios provide a good vehicle for such a presentation although this format needs to be better accommodated in the venues for reporting game design research. While some HCI conferences are experimenting with alternate formats they are not yet widely used or accepted. The subject and object of the design need to be situated within the wider world in different ways, for example, through player testing and interviews with other game designers or researchers. The final designed artifacts themselves also have to be critically interrogated as, even though all their design and development has been documented, they are always likely to reveal something unexpected that provides more information, more insights, creates more questions, and indeed define new research problems that start the process again. It is worth noting that this all can be performed without the need for quantitative analysis and indeed can be done with a small number of participants as long as the insights gained from the player sessions are described in depth. We further highlighted that adopting a grounded approach will allow the game design researcher to analyze findings from the design process and compare it with other data gathered from the wider context of game design. Whilst this approach to design research implies a qualitative approach to research that to some disciplines is problematic, it has been shown such research can be further validated through triangulation (Swann, 2002). This means that knowledge produced through the act of designing may offer a stronger argument if it is backed up by other different methods to gain the same kind of knowledge.

The second half of this chapter considered design approaches, such as *speculative design*, *critical design*, and *design fiction*, in relation to similar approaches with games design that broadly come under the banner *critical play*. Whilst all these approaches center on design that focuses on the creation of expressions of cultural understandings, critical play has tended to focus its criticism on either the games industry or games themselves.

However, through the frame of rhetoric all these techniques can be united and potentially open up opportunities of extending critical practice in games. Further, Coulton, Burnett and Gradinar (2016) have argued that games offer an exciting medium for critical design, speculative design, and design fiction in that they can free these practices from the criticism that they are often only ever seen in art galleries and thus they can be used engage a wider audience by presenting complex issues in a way “that allow players to consider the societal impacts of alternative presents and plausible futures” in a variety of contexts. Overall we believe this chapter highlights alternate approaches to game design research by drawing significant parallels between game design and practice-based design research more generally, that valid research can indeed be achieved through game design practice, and has the potential to enrich the area of game design research.

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