

Chapter 7

CREATIVE USER-CENTERED DESIGN PRACTICES: LESSONS FROM GAME CULTURES

Olli Sotamaa

1. Introduction

The field of Human Computer Interaction (HCI) studies has lately undergone some significant transitions. The focus of research has shifted from tasks to actions, from offices to the streets and the home, from laboratories to settings where people actually spend their time and from simple “ease of use” to evaluating the suitable level at which an activity should be challenging. Traditional design ideals have been confronted by visions of “affective computing” and HCI research has identified the central position of emotions in designing user experiences. Alongside the standard usability concerns there is an increasing interest in questions concerning enjoyment, fun, and pleasure (cf. Blythe *et al.*, 2003; Jordan, 2002). Meanwhile, and elsewhere, academic game research has challenged the traditional usability methodologies by analyzing the components of pleasure in gaming. The concept of “social usability” has been introduced to acquire “a broader understanding of the ways and needs to use and consume media products, and the habits and practices associated with them” (Järvinen *et al.*, 2002, pp. 10–11). In search for criteria for evaluating “playability,” Järvinen *et al.* suggest that alongside functional and structural factors one should study the audiovisual and social dimensions of games and gaming. In other words, current research in both fields is expanding our ideas about different types of emotion and pleasure to be experienced in relation to information and communication technologies (ICTs).

Widely adopted principles of user-centered and participatory design raise the perspectives of user and context of use to the center of the design process. Not only academic design studies but also business oriented analyses of innovation highlight the importance of observing real people in real life

situations and encourage approaches that make user participation an inseparable part of production (Kelley, 2002). Similarly, the games industry has rapidly learned to appreciate active and constant dialog between developers and gaming community. Gamers are allowed to alter the source code of games and create imaginative modifications of original games. A popular “mod” can significantly extend the life span of a game title. Furthermore, the global gaming community can also serve as an inexpensive research and development team.

Thereby, it seems obvious, that game design and research on gaming culture can inform the design of emotionally satisfying and challenging ICT products in numerous ways. Still, as Clanton (2000) has pointed out, HCI designers and game developers have complementary skills but so far have few contacts and little awareness of one another. The objective of this chapter is to introduce games research to a wider design audience. I hope the examples encourage designers from various fields to think about different types of active roles that users can play.

In this phase, we must pose the question: why is it important to take a look at computer games. I suggest, we can find more than one answer to this. First of all, from their origins and over the course of many years computer games have always been in the front line in developing new means of interaction. Games from the 1970s text-based MUDs (Multi-User Dungeons) to the 21st century MMORPGs (Massively Multiplayer Online Role-Playing Games) have introduced forms of human-machine interaction and computer-mediated communication that are also widely used today outside gamer communities. Computer games are also pushing the development of new technologies through demanding superior graphic cards, graphic processing units, advanced gaming peripherals, and so on. Furthermore, in pointing out the profound blurring of such categories as production and consumption, professionalism and passion, and work and leisure I suggest that game cultural activities already indicate the future relationship between people and new digital technologies.

Although games studies as an academic discipline is still in the making, the different approaches applied can provide interesting insights for people designing and researching satisfying user experiences more generally. Game studies examine why particular games inspire and excite and are fun to play. Other approaches focus on the meaning and significance of the games to the player looking at how games contribute to an understanding of oneself and other people and what the potential effects of games on social behavior are. The manifold dimensions of contemporary games require methodological diversity. First of all, games exist as products consisting of code and different features. Second, games can be approached by examining the experiences of particular gamers. Third, we can look at the larger cultural and social framework and the different interpretations and discourses that give significance to games (Mäyrä, 2002, pp. 5–6).

The emphasis of my approach is on studying players and game cultures. Players actively construct meanings and new ways of using games. They also create content for other gamers to consume. Simultaneously, particular industrial mechanisms attempt both to encourage and to control and regulate player innovation. Therefore, by analyzing what the players can and cannot do we have potential indicators of how the nature of new media user experience is changing and what are the wider scale transitions in the relationship between people and new digital technologies.

2. Gaming and Culture

The particularity of games in general is based on the fact that they cannot simply be read or watched: they must be played. The creative involvement of the player is a fundamental feature of any game. In other words, the result of the game is highly dependant on the skills and creativity of the player (cf. Aarseth, 2001). Thus, the gaming experience is always constructed in a dialog between the player and the rules of the game. Yet, the general history of gaming includes a variety of interesting examples where existing rule systems and appearances of boards or cards have been modified in order to produce new games. Many traditional board games like backgammon or chess have appeared in several significantly different versions throughout the centuries. Also such an everyday example as a game of soccer played in the backyard shows that play as an activity seems to be open to various kinds of alterations: the soccer game can be played with a varied number of players, the duration of the game can be very flexible, almost any object at hand – be it a tree or a bag – can serve as a goal post, and so on. At the level of rules, games are made of more or less fixed structures. Still, playing them often consists of bending and reworking these rules. As Salen and Zimmerman (2003) point out:

Because a game by its very nature has room for the movement of free play, it is always possible for players to drive a wedge into the system, bending and transforming it into a new shape (Salen and Zimmerman, 2003, p. 565).

In this connection, it is useful to recall that in recent decades several theoretical movements have been eager to highlight the fact that all media audiences are active and therefore they should be understood in terms of production, not of reception. Following this argument, it can be claimed that gamer-made designs can empower gamers and communities and help them to become active participants rather than passive consumers. On the other hand, the industrial context and practical developer choices can limit and regulate gamer activities. What we need here – as a growing literature has lately identified – is a closer integration of studies of media production and consumption. The meanings

that new media technologies acquire are not fixed but are continuously negotiated through their life cycle. To arrive at a profound picture of the meanings attached to artifacts and media texts neither processes of production nor forms of consumption should be privileged (Deacon, 2003; du Gay *et. al.*, 1997).

Furthermore, I suggest that to understand contemporary games requires examining them in relation to the qualities of new media more broadly. As Manovich (2001) points out, digital media objects are open for algorithmic manipulation and therefore media have become programmable. In the context of computer games this leads us in two different directions. First of all, programmability brings us back to the issue already emphasized by Aarseth, namely the nature of computer games as simulations. In brief, “the story” or “the result” of a game is not determined beforehand but has to be understood as a process. The idea of programmability is also tied to the processes of decentralization and personalization that make the daily media environment more fragmented. According to Lister *et al.* (2003) until the 1990s there was a rigid separation between what was acceptable for public distribution and what was acceptable for personal, domestic exhibition (e.g., to friends). Lately, the so-called “prosumer technologies,” aimed not only at professionals but also hobbyists, have made the production accessible to a wider range of people. Powerful and inexpensive machines are today available to the hobbyists so that they can easily experiment with editing and mixing media contents.

As Kamppuri and Tukiainen (2004) point out in their study, “culture” is a relatively recent concept in the field of HCI research. HCI was originally heavily built on cognitive science and therefore cultural, social, and historical contexts were mostly excluded from its research agenda. The cultural perspective has risen in significance during the past decade but still the uses of the concept have been varied. Often culture is still taken for granted, or else it is limited to national cultures and seen as coherent wholes (Kamppuri and Tukiainen, 2004, pp. 43–44, 53). In order to produce an alternative perspective I suggest we take a look at how game researchers have approached culture.

On a general level “culture” can be defined as social and symbolic meaning-making. From this perspective game cultures are not restricted to interactions with technological systems but encompasses all the player activities and dealings connected to gaming. Often new game cultures and cultural qualities arise in relation to particular games and game genres. Therefore, rather than speaking of a single coherent computer game culture, different game cultures can be interpreted as “subcultures.” The cultural studies tradition defines subcultures as groups of people who share interests, values, and practices. Important markers include a particular language, shared rituals and interests in collecting and producing artifacts that promote one’s belonging to a group. This understanding of subculture comes very close to fandom and fan activities – but we will come back to this connection in a moment (cf. Mäyrä, 2004, pp. 4–7). Furthermore, Salen and Zimmerman (2003) introduce two ways of understanding games as

culture: in terms of reflection and transformation. As any system of representation, computer and video games reflect existing values and ideologies: games oversimplify and construct biased views but they can also be used to educate and introduce ethical dilemmas (see for example, newsgaming.com). On the other hand, by introducing new forms of expression games have a potential to transform their surrounding contexts. From the player perspective this implies that player activities are not restricted to creative in-game play. In the words of Salen and Zimmerman, *games offer players forms of participation that extend the boundaries of play beyond the edges of a magic circle* (Salen and Zimmerman, 2003, p. 507).

Gamer-made contents and designs can play a significant role in the gamer's life-world, but at least according to the game press they also have a potential to change the whole composition of the game industry (cf. Edge, 2003). In fact, as Haddon points out in Chapter 4, in the case of computer games there is a rather thin line between user and designer. In the following, I introduce a couple of telling examples from the history of computer games. These examples attempt to demonstrate the significance of hobbyist activities in particular cases. After that I take a closer look at the different manifestations of player innovation.

3. Player Innovation

The urge to modify existing computer systems can be tracked at least back to the first generation of hackers. According to journalist Steven Levy, who has studied the early hackers of the 1960s and 1970s, a hack is *a project undertaken or a product built not solely to fulfil some constructive goal, but with some wild pleasure taken in mere involvement* (Levy, 1984/1994, p. 23). Thus, the hacker approach to computers was right from the beginning very different from the official one: instead of seeing computers as tools, the hackers treated the early machines as if they were toys. Hacking is often understood as an action involving a high level of enthusiasm and enjoyment but the resulting "hacks" can also be entertaining. In the context of this article, it is noteworthy that Levy sees the first modern computer game *Spacewar!* (1962) as being one of the most significant early hacks. *Spacewar!*, built on the minicomputer PDP-1 by MIT students, was partly based on the innovative use of earlier program code. Even the controls for the game were hacked from push-buttons used for 1940s telephones. Typical of the exploratory projects of the time, *Spacewar!* was freely distributed to other PDP-1 owners to play and to rewrite (Haddon, 1988, pp. 55–57; Levy, 1984/1994, pp. 50–69). As *Spacewar!* shows, early computer games were important vehicles for learning about computers and programming. Exploring games helped to understand the potential of the machines. Tinkering with computers and improving the existing algorithms went hand in hand with playing games. Games posed challenges and puzzles that

were somewhat like programming itself (Haddon, 1988, pp. 58–59). In other words, in the early days of computer gaming – as they moved from mainframes and from minicomputers to microcomputers – modifying games was an organic part of the gamer life-world. The arrival of the first microcomputers (mid-1970s to early 1980s) introduced programming manuals that widely used games as a vehicle to explain the structure of computer languages. At the same time, computer magazines presented games as a suitable activity for relaxing in the midst of programming. Early magazines not only reviewed games but they also offered tips on how to break into the programming structure and make the games operate differently. At first, games were mainly both produced and consumed by early microcomputer hobbyists. The introduction of cassette technology made it possible to save and distribute the gamer-made alterations. This had not been possible in the case of earlier home video game machines. At least in the UK the cheap cassette technology also encouraged the hobbyists to found the first mail order ventures selling entertainment software (Ibid., pp. 59, 69–70).

For a slightly more recent example, we can look at Id Software's *Doom* (1993). Already Id's earlier first-person shooter *Wolfenstein 3-D* (1992) had inspired modified gamer-made versions, which according to David Kushner's *Masters of Doom*, were in turn a source of inspiration for the developers at Id software. To give one example, there was a version where the game music had been replaced by a theme song from the children's show *Barney* and instead of the SS boss character, players encountered a smiling purple dinosaur (Kushner, 2003, pp. 115–116). In *Wolfenstein* this kind of replacement always required erasing parts of the original code. Once a picture was changed, there was no easy way to bring the original back. In the case of *Doom*, the media files were intentionally separated from the main program and located in an accessible directory. This reorganizing of game data made it possible to replace sounds and graphics in a non-destructive manner. Id programmer John Carmack also facilitated the amateur designers by making available the source code for the level-editing and utilities program. In only a matter of weeks gamers began swapping *Doom* modifications or "mods" and "homebrew" or amateur editing tools on Bulletin Boards and across the Internet. (Ibid., pp. 165–169.)

These examples show that enthusiastic users can have a significant role in the development of new technologies. Users appropriate technologies in various ways other than the designers originally intended. In Chapter 4 of this book, Leslie Haddon explores innovative use of ICTs and produces a tentative grouping of the different ways in which users can be creative or innovative. I suggest Haddon's four-level categorization can be used as a starting point in introducing and evaluating different types of innovation taking place among gamers.

The first level includes designing and re-designing ICTs and applications. Haddon associates this level with technologically skilled and often enthusiastic users. A telling example from games culture is the phenomenon noted

above called “modding.” “Mods” and “modders” come in many forms. Console gamers install “mod chips” to their systems. These programmed micro-controllers bypass the region code system that the game industry has created to control the international markets. Anyway, hardware modding is not limited to allowing gamers to play imported games but in the hands of a creative hobbyist the games console can become a versatile video player, mp3 jukebox, or a personal game archive. Some gamers also use significant amounts of time and energy on “case modding”: decorating and altering the semblance of their gaming devices. While hardware modding has so far been limited to fairly small groups of enthusiasts, game content modifications have been a great success all over the world. The digital nature of games allows them to be manipulated and reprogrammed – even by individual consumers. Players personalize the appearance of their in-game characters by creating models and skins and create new maps and adventures based on existing game titles. For example, sports game fans create detailed copies of national and local leagues including player statistics, uniforms, and stadiums. Moreover, modders also develop and share new tools and editors that enable production of more sophisticated modifications.

Turning to the next level in Haddon’s categorization, innovation need not be merely technological, but it can also consist of introducing new practices and doing new things with technology. “Machinima” films are a fairly recent example of this from games culture. These computer-generated animations utilize game engines to create virtual 3-D environments. Machinima films come in several genres: some films follow a narrative plot while others are mostly experimenting with the modified engine features. Similarly games like *The Sims* (Maxis, 2000, PC) are no longer used merely for playing but gamers also use them as a medium for producing and distributing contents of their own.

The various ways in which online games are making use of the Internet provide a good example of practices that exceed the objectives that global information networks were originally intended to fulfil. No longer are people playing alone but they connect with other gamers via the Internet to compete and share experiences. Text-based adventure games called MUDs, short for Multi-User Dungeons, originated in the late 1970s and introduced communication patterns that today are widely used in chats and other real-time online environments. Furthermore, networked multi-player games are very social in nature and inspire gamers to unite. While role-playing games and shooter games give birth to clans, tribes and guilds, sports games are played in local and global teams and leagues. Here, we move towards the next level. Gaming as a hobby often finds its expression in online forums and personal websites. Gamer groups and individual gamers regularly update thousands of websites to promote the achievements of a particular clan, to share the significant pieces of information (patch updates, walkthroughs, strategy guides, etc.) and to keep in contact with other gamers.

Finally, some innovations reside not in improving the performance of technology or in creating new forms of gaming, but in groups of gamers creating complex sets of practices and negotiating the meanings around gaming technologies. Sometimes finding a time and a place to play can itself require some creativity in everyday life. It is important to bear in mind that these categories of user innovation obviously overlap. In the following we move on to examine how innovative gamers both follow and challenge the theories of media fandom.

4. Fans and Modders

Fandom and fan cultural formations are traditionally associated with “cultural forms that the dominant value system denigrates” (Fiske, 1992, p. 30). Therefore, it is no surprise that such typical objects of fandom as pop music, television series, movies, and cartoons have recently been accompanied by modern computer games, all being the ideal commodities of digital popular culture. Fans draw their resources from commercial media culture while also reworking them to serve alternative purposes. In his influential study, Henry Jenkins borrows de Certeau’s term “poaching” to characterize the relationship between fans and corporate producers of media texts as “an ongoing struggle for possession of the text and for control over its meanings” (Jenkins, 1992, p. 24). Later on, Jenkins suggests that “[f]andom originates, at least in part, as a response to the relative powerlessness of the consumer in relation to powerful institutions of cultural production and circulation” (ibid., p. 278).

The history of media fandom can at least partly be seen as the history of series of efforts to influence programming decisions (ibid., p. 28). In this connection, in order to examine the collective power of the gaming community, we can look at the case of the *Babylon 5* computer game. On September 1999, Sierra studios cancelled the production of the long-awaited computer game, *Babylon 5: Into The Fire*. *Babylon 5* fans organized a worldwide boycott of Sierra titles and gave all their support to the game development team. With the encouragement of this large community, the developers of the game formed their own company to continue the project. Eventually it proved impossible to get the rights to the original material but several fan-created freeware games and B5-themed game modifications have later seen the light. When pressuring industry proved to be difficult, gamers themselves took on the role of programmers and producers. My point here is that innovative gamers, who rework and develop further the products of the games industry, share characteristics with fans of other media texts and therefore earlier fan ethnographies can assist in understanding the motivations and strategies behind gamer actions. At the same time, other forms of fandom offer a useful point of comparison that can highlight important differences and clarify the particularities of game cultures.

As mentioned earlier, the theory of “active audiences” has emphasized the productive nature of all media use. Still, fans hold a particular position in relation to media texts since their productivity often takes a textual and material form: they create things. The commitment of fans is manifested in various ways. Fans write stories, “fanfiction,” using characters and settings of some original media presentation (film, television series, computer game, etc.). Similarly fan paintings, songs, and videos comment on the original industry produced texts and add new meanings and points of view on them. Today, the forms of fan creativity often have counterparts in games culture ranging from themed websites to image manipulations, collages and Machinima films. Abercrombie and Longhurst have studied television audiences and produced a five-class classification (Abercrombie and Longhurst, 1998). If we apply this schema to the context of gaming culture *consumers* are the ones who occasionally play games and see them as one leisure time activity among others. In case of the *fan*, gaming becomes an inseparable part of everyday life. *Cultists* see gaming and being part of gaming community as a central element of identity while for an *enthusiast* gaming and talking about games becomes subordinated to producing them. To clarify what this means in context we can turn to my interviews among computer game mod makers. When asked about the influences of modding they often highlighted that the time spent on playing had significantly diminished and launching the game mostly meant that some new component had to be tested. (Sotamaa, 2004). In the case of *petty producers*, cultural production is no longer random but the skills are marketed to an imagined community – the members of particular gaming culture (cf. Järvinen, 2003). Applying this classification helps us to see that players hold very different positions and sets of skills in relation to games. Therefore, instead of seeing gamer communities as coherent and homogenous groups game cultures seem to consist of different subgroups with complementary roles.

Just over 10 years ago, Henry Jenkins noted that *fans lack direct access to the means of commercial cultural production and have only the most limited resources with which to influence the entertainment industry's decisions* (Jenkins, 1992, p. 26). In the same manner John Fiske wrote:

(F)ans do not write or produce their texts for money; indeed, their productivity typically costs them money. Economics, too, limits the equipment to which fans have access for the production of their texts, which may therefore often lack the technical smoothness of professionally-produced ones. There is also a difference in circulation; because fan texts are not produced for profit, they do not need to be mass-marketed, so unlike official culture, fan culture makes no attempt to circulate its texts outside its own community (Fiske, 1992, p. 39).

Investigating the contemporary game scene immediately indicates that the landscape of fan culture has developed during the past decade. The networked

PC has opened a variety of new possibilities and caused visible changes in everyday fan activities. One of the traditional claims of the fan critics is that fan cultural texts are not produced to make profit. Indeed, earlier fan activities were mainly discussed in fan conventions and copies of texts were circulated in the fan community. This system with its own rules for production and distribution is called a “shadow cultural economy” by Fiske. Today the Internet is extensively used both for distribution of materials and as a platform for discussion. Furthermore, industrial media companies have been eager to bring the petty productions of fan culture from the “subcultural shadows” to the “mainstream light.”

A well-known example of the development described above is the Star Wars Fan Movie Awards, a yearly competition organized by Atomfilms in partnership with Lucasfilms – the producer of the official Star Wars movies. Those fan filmmakers who win an award receive a commercial distribution contract that guarantees them legitimate royalty payments. In addition, from the production company’s point of view the awards offer an important opportunity to control and regulate fan production. Equally, Epic Games and Atari Inc. announced a big modding competition in the summer of 2003. “*Make Something Unreal*” was organized together with Nvidia to generate modifications to Epic’s popular first person shooters Unreal Tournament 2003 and UT 2004. While offering considerable prizes and significant publicity opportunities for the winning mod groups the companies also obviously expect to increase the sales of the games and the latest Nvidia graphic processors.

The game development kits that modders use are often released with commercial PC games. Tools are often available for free downloading via the official game websites. It is also quite common for modders to create tools of their own. This is not something entirely new, since games from the early 1980s like *Lode Runner* (Broderbund, 1983, C-64) already included editors that allowed players to create additional levels. The Commodore 64 scene also witnessed such titles as *Boulder Dash Construction Kit* (First Star Software, 1986), a tool set inspired by the popular *Boulder Dash* game series and a generic shooter editor *Shoot-Em-Up Construction Kit* (Sensible Software, 1987). Mods are typically downloaded from the Internet for free but they do not normally work without the retail version of the original game. Therefore a popular mod can significantly extend the life span and the sales of a game title and participate in developing a devoted fan base. The games industry has so far been mostly unwilling to estimate the commercial significance of an enthusiastic mod community but the various ways in which modding is encouraged and supported suggests that companies see some value in modder activities (Postigo, 2003, p. 596, 603). Particularly successful works of the mod community can make the jump from being a mod to a retail title. Probably the most well known example of this is *Counterstrike* (2000), a team play modification of *Half-Life* (Valve Software,

1999). Furthermore, from the games industry point of view the mod community can serve as an inexpensive research and development team. During the year 2002 members of top mod teams all over the world were flown to Electronic Arts' Westwood Studios for a full day Mod College aimed at informing the mod community about the new game engine.

5. Discussion

The very well-known quotation from usability guru Jakob Nielsen says that "*users are not designers*" (Nielsen, 1993, p. 12). In brief, this means that one should not expect users to be able to design things and therefore the input they give should not be regarded as an unquestionable truth. I suggest that computer game mods reflect a very different design policy. At least some game developers and producers regard game development as an iterative process in which modders' observations, suggestions, and designs are used as an invaluable resource. Instead of analyzing user needs and validating user requirements that is typical of traditional user-centered design approaches the tools are given to the users and fiddling and experimenting with them is encouraged.

Similar approaches have also emerged lately in other high-tech fields. In academic terms, this phenomenon has been discussed under the title "Toolkits for user innovation" (see Thomke and von Hippel, 2002; von Hippel and Katz, 2002). The pioneers of this approach emphasize the point that toolkits for innovation have existed for a long time since developers and designers are normally equipped with suitable tools. Many users also have personal toolsets that can be applied to modify and repair existing products and to create new ones. What is new and unique in the toolkits for user innovation is the integration of user toolsets which can customize products and enable users to produce the designs "as is" by manufacturers (von Hippel and Katz, 2002, p. 825). In connection to mods, this means that the user-driven content generated following the rules embedded in a tool kit will be compatible with original code and immediately available for sharing.

I suggest that from the industry point of view, this invitation to experiment arise not only from an interest in learning what gamers want or learning to recognize and exploit the groups whose work has proven popular among this community. Developers also want to learn that their work is appreciated and that there is a worldwide community developing their project further. I hope this can also produce a wider understanding of the games industry as a field that consists not only of manufacturers, game development studios and distribution companies but also of an enthusiastic crowd of skilled hobbyists (Postigo 2003, pp. 595–596). Enabling users to develop new features to games can have a significant effect on the tasks of game industry professionals. Instead of developing new variations and combinations of existing game types

in order to satisfy the needs of the increasing variety of specified target groups, developers can leave at least a part of that job to mod developers. Mods can experiment with ideas that are too “obscure” or “far out” for mainstream productions and the ones that prove to be popular in the market can be picked for official release. On the other hand, the increase of detail in contemporary games has already caused a huge increase in the workload of mod developers. Instead of single virtuosos we already witness the rise of large global development teams. Coordinating and facilitating such teams places new challenges both on mod community members and on the game development professionals. It seems likely that even more complex symbioses between media companies and individual media (prod)users will arise.

From the player perspective the maturing of the games industry has produced new and interesting possibilities. In some cases gaming can shift from being a hobby to a full-time job. Video game tournaments with considerable prizes and sports-like national teams training several hours per day can transform gaming into a serious business. Some game developers have openly admitted that today mod projects are often used as a portfolio when applying for a job in the games industry. I would like to end this chapter with a quotation from an interview I conducted during the summer of 2004. In my opinion, this excerpt shows clearly that through designing their own projects young gamers can learn not only particular skills but also a more mature attitude towards games and the game industry.

It [modding] has made me more aware of the little details in a game. Also instead of being interested in whether an item could be killed I am now more interested in how it's made. [—] OFP [computer game Operation Flashpoint] has made me realize that it is not so great as it first seemed, there's a lot of hard work involved, and you have good days and you have bad days. I would have to say that OFP has given me the lust to try and get a job within the game industry, but it has also in a strange way showed me that it is a serious commitment and you have to be incredibly dedicated... so in that way it has also scared me away from a job within the gaming industry in that aspect (Modder, aged 15).

References

- Aarseth, E. Computer game studies, year one. *Game Studies*, 1(1) (July 2001). Available at <http://www.gamestudies.org/0101/editorial.html>; 2001.
- Abercrombie, N., Longhurst, B. *Audiences: A Sociological Theory of Performance and Imagination*; 1998 Sage, London, Thousand Oaks and New Delhi.
- Blythe, M.A., et al. (Eds.) *Funology: from usability to enjoyment*, 2003. Kluwer Academic Publishers, Dordrecht and Boston.
- Clanton, C. Lessons from game design. In Bergman, E.(Ed.) *Information Appliances and Beyond: Interaction Design for Consumer Product*; (2000) Morgan Kaufmann Publishers, San Francisco: 299–334.

- Deacon, D. "Holism, communion and conversion: integrating media consumption and production research". *Media, Culture and Society*, 2003; 25: 209–231.
- du Gay, P., et al. *Doing Cultural Studies: The Story of Sony Walkman*; 1997. Sage, London, Thousand Oaks and New Delhi.
- Edge *The future of electronic entertainment*, 126 (8/2003), 2003.
- Fiske, J. The cultural economy of fandom. In Lewis, L.A. (Ed.) *The Adoring Audience: Fan Culture and Popular Media*. Routledge, London and New York: 30–49.
- Haddon, L. Electronic and computer games: the history of an interactive medium. *Screen*, 1988; 29(2): 52–73.
- Järvinen, A., Heliö, S., Mäyrä, F. Community and communication in digital entertainment services. *Hypermedia Laboratory Net Series 2*, University of Tampere. Available at <http://tampub.uta.fi/teos.phtml?7310>; 2002.
- Järvinen, A. Verkkopelien ABC – Doomista MMORPGiin, Quakesta roolipeleihin, mediumi 2.1. Available at http://www.m-cult.net/mediumi/article.html?id=231andlang=fiandissue_nr=2.2andissueId=15; 2003.
- Jenkins, H. *Textual Poachers: Television Fans and Participatory Culture*; 1992. Routledge, New York and London.
- Jordan, P.W. Human factors for pleasure seekers. In Frascara, J. (Ed.) *Design and the Social Sciences: Making Connections*; 2002 Taylor and Francis, London and New York: 9–23.
- Kamppuri, M., Tukiainen, M. Culture in human–computer interaction studies. In Sudweeks, Ess (Eds.) *Proceedings cultural attitudes towards communication and technology*, Murdoch University, Australia: 43–57.
- Kelley, T. *The Art of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm*; 2002. Harper Collins Business, London.
- Kushner, D. *Masters of Doom: How Two Guys Created an Empire and Transformed Pop Culture*; 2003. Random House, New York.
- Levy, S. *Hackers: Heroes of the Computer Revolution*; 1984/1994. Delta, New York.
- Lister, M., et al. *New media: a critical introduction*; 2003. Routledge, London and New York.
- Manovich, L. *Language of New Media*; 2001. MIT Press, Cambridge, Mass. and London.
- Mäyrä, F. Introduction: all your base are belong to us. In Mäyrä, F. (Ed.) *Computer Games and Digital Cultures Conference Proceedings*. Studies in Information Sciences; 2002, Tampere University Press, Tampere: 5–8
- Mäyrä, F. Introduction and prehistory of digital games. Unpublished course material for Master's Course in Digital Games Research and Design. University of Tampere, Hypermedia Laboratory, 2004.
- Nielsen, J. *Usability Engineering*; 1993 Academic Press, Boston.
- Postigo, H. From Pong to Planet Quake: post industrial transitions from leisure to work. *Information, Communication and Society*, 2003; 6(4): 593–607.
- Salen, K., Zimmerman, E. *Rules of Play: Game Design Fundamentals*; 2003. MIT Press, Cambridge, Mass. and London.
- Sotamaa, O. *Playing it My Way? Mapping The Agency of Modders*. Presentation at Internet Research 5.0 Conference, University of Sussex, UK, September, 19–22, 2004.
- Thomke, S., von Hippel, E. Customers as innovators: a new way to create value. *Harvard Business Review*, 2002; 80(2): 5–11.
- von Hippel, E., Katz, R. Shifting innovation to users via toolkits. *Management Science*, 2002; 48(7): 821–833.