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Social Interactions of Computer Games: an Activity Framework

Chee Siang Ang

Submitted for Examination of Doctor of Philosophy

Centre for Human-Computer Interaction Design
City University London

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Dedication

For my family, my friends and Boony.

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Declaration

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Abstract

With the advent of computer games, the Human Computer Interaction (HCI) community has begun studying games, often with the intention of uncovering useful information to inform the design of work-based software. However, most HCI research on computer games focuses on the use of game technologies, often overlooking the fairly large amount of classic game literature.

Despite the potential importance of computer game studies in HCI, there is a lack of frameworks that could guide such studies especially with regard to sociability. I believe that sociability is one of the most important criteria game developers may want to apply to game design as computer games are becoming more social-oriented due to the inception of the Internet. Therefore, the main aim of the thesis is to develop a play activity framework with an emphasis on social interactions.

To achieve this, first, a comprehensive body of game literature was reviewed as a step to provide a solid foundation for the construction of the framework. Through the extensive review of literature, I chose Activity Theory as the foundation for the framework development. In order to demonstrate the applicability of Activity Theory in analysing computer-mediated social interactions, an exploratory study of online activities in a game community was conducted.

Then, two studies were undertaken to formulate the framework by modelling play activities in the social game context. The first study was centred on the individual and collective play activities that take place *within* the game virtual world. The second study focused on games as a whole participatory culture, in which playing games is not just confined to within the game space but also includes other playful activities governed by norms and specific identities *around* the game. Through these studies, a play activity *framework* consisting of three play *models* was developed: intrinsic, reflective and expansive play models, which are inter-related. The framework provides a vocabulary to describe the component, the motivation and the process of game play.

The framework was then operationalised into methodological guidelines with a set of heuristic questions grouped into different categories. The guidelines were

applied to analyse two issues, namely community building and social learning, in a Massively Multi-player Online Game (MMOG).

As a conclusion, the framework has expanded conventional game studies by emphasising the socio-cultural context. It provides a different perspective on analysing computer games particularly the social aspects of gaming. Game researchers could use the framework to investigate play activities within and beyond the game and how they are related. The framework offers a theoretical explanation of various social activities observed in computer games. Finally, the methodological guidelines derived from the framework are useful as they give directions to analyse play activities particularly social interactions and game communities.

1 Introduction

This chapter presents the background and the overview of the research statements and the outline of the thesis

The aim of this thesis is to develop a play activity framework of computer games with an emphasis on social interactions. Since, as most game scholars would readily agree, the social mechanisms in the context of play, especially in Massively Multi-player Online Games (see section 2.4.1) can be extremely complex, a framework is needed to give focus and structure to such analysis. In the rest of this chapter, I describe in detail the background, the problem and the scope of research in social gaming, as well as the development process of the proposed framework.

1.1 Background of the Thesis

The mid 20th century witnessed some serious attempts to study play and games with an emphasis on their importance within culture. Most prominently, Huizinga (1944) maintained in his book Homo Ludens that the earliest stage of culture is in the form of play and that culture proceeds in the shape and the mood of play. He also claimed that some elements of play crystallised as knowledge such as folklore, poetry and philosophy as culture advanced. A more contemporary play scholar, Crawford (1982), in his seminal book The Art of Computer Game Design scrutinised play within computer games and, in line with Huizinga, maintained that play is a source of knowledge and that the most fundamental motivation of play is, in fact, to learn.

As cultures move forward, the notion of play seems to receive more positive recognition among society. In a society where youthfulness is regarded as a desirable state of human life, in which cosmetic surgery is popular especially for women, and both genders modify their hair colour to hide the natural greying, play might be a way by which people can present themselves as youthful (Kücklich, 2004).

In addition, as human civilisation advances towards the post-industrialism era, people have more leisure time and disposable income to engage in play activities. As more emphasis is put on creative forms of labour, the boundaries between work and leisure time become blurred. Offe (as cited in (Bills, 2003)), for example, identified a trend away from work and towards leisure as the means by which people establish their identities in contemporary society.

Not surprisingly, a lot has been done in game research, particularly in computer games (see section 2.2 and 2.3 for relevant past research). One key area of game studies is certainly the social dimension and the players' social experience (refer to section 2.4). Unfortunately, at the time of this writing, there is no framework that can be applied to social gaming research.

1.2 Problem Statements: Existing Frameworks for Game Studies

Previous research of computer games has approached the issue from different angles, borrowing theoretical frameworks from various fields such as literary theory (Aarseth, 1997), media and communicatian studies (Järvinen, Heliö, &. 2002), simulation studies (Frasca, 2001; Juul, 2001), narratology (Jenkins, 2002; Murray, 1997) and so on. Despite these, the field of computer game studies is generally scattered and fragmented. Although some of the approaches claim to contradict each other – such as ludology and narratology – others maintain that they are in fact complementary (Ang, 2006). The narratological framework focuses on the story presented and enacted within the games, but overlooks the structural and functional aspects underlying the narrative layer. Scholars approaching game studies with the ludological framework or simulation theory on the other hand believe that games can be, and should be, examined solely as formal systems that operate on a set of rules. For them, computer games are simulations of a real or fictional world.

Through linguistic and semiotic frameworks, literary theorists analyse games as textual artefacts (Järvinen et al., 2002). Literary theorists examine games based on the textual and linguistic elements in the game without giving substantial attention to the active participation, or the agency of the "reader"; the role of the reader who constantly manipulates the text. Although Aarseth (1997) as a literary theorist recognised what he called the "ergodic" element (i.e. the reader's active participation) of "game texts", his work did not take on board the social interaction among "the readers", or the "collaborative ergodic" element of the game.

Undoubtedly, each of these approaches has its strength in analysing certain aspects of computer games. However, most of these studies overlook the human and social aspects of games. Computer games are not only software artefacts but also activities that emerge from the software. Furthermore, they do not exist in isolation.

Instead, computer games exist around the socio-cultural practice in a community of players. In addition, there is no existing framework that describes games as activities which looks at the development process, i.e. how play activities transform and develop. Before I explain the research undertaken to address these issues, let us take a look at what I mean by "social interactions of games".

1.3 The Scope of Social Interactions of Games

With the advance of computer networks, particularly Internet technology, game play is not just an individual experience even when the game is meant to be played by a single player. Social interactions emerge from the online communities that form around the game. Some computer games are designed specifically to encourage social interactions between players, be it a small group of players connected by a local network or a massive number of players interacting over the Internet. I believe that computer games should be studied as a social phenomenon that spills beyond the confines of the games themselves.

In other words, play activities of computer games stretch beyond the play activities within the game per se. It is therefore valuable to investigate this issue and it is the intention of this thesis to examine the socio-cultural context of play. Indeed, if we observe people playing games, we will likely see them downloading guidelines from the Internet and participating in online forums to talk about the games and share strategies. In fact, almost all game play could be described as a social experience.

This observation is even more evident in Massively Multi-player Online Games (MMOGs) such as World of Warcraft (Blizzard Entertainment, 2004). A player's participation in a MMOG is constituted through social interactions within in-game communities (e.g. in-game chatting and joint tasks) and out-of-game communities (e.g. the creation of written game-related narratives and fan-sites). Play is not only embedded in the game, but also in the community practice of those who inhabit it. Therefore, I would like to define the scope of social interactions in the thesis to include the entire game community which can be categorised into three classes (Ang, Zaphiris, & Wilson, 2005) (refer to Figure 1.1)

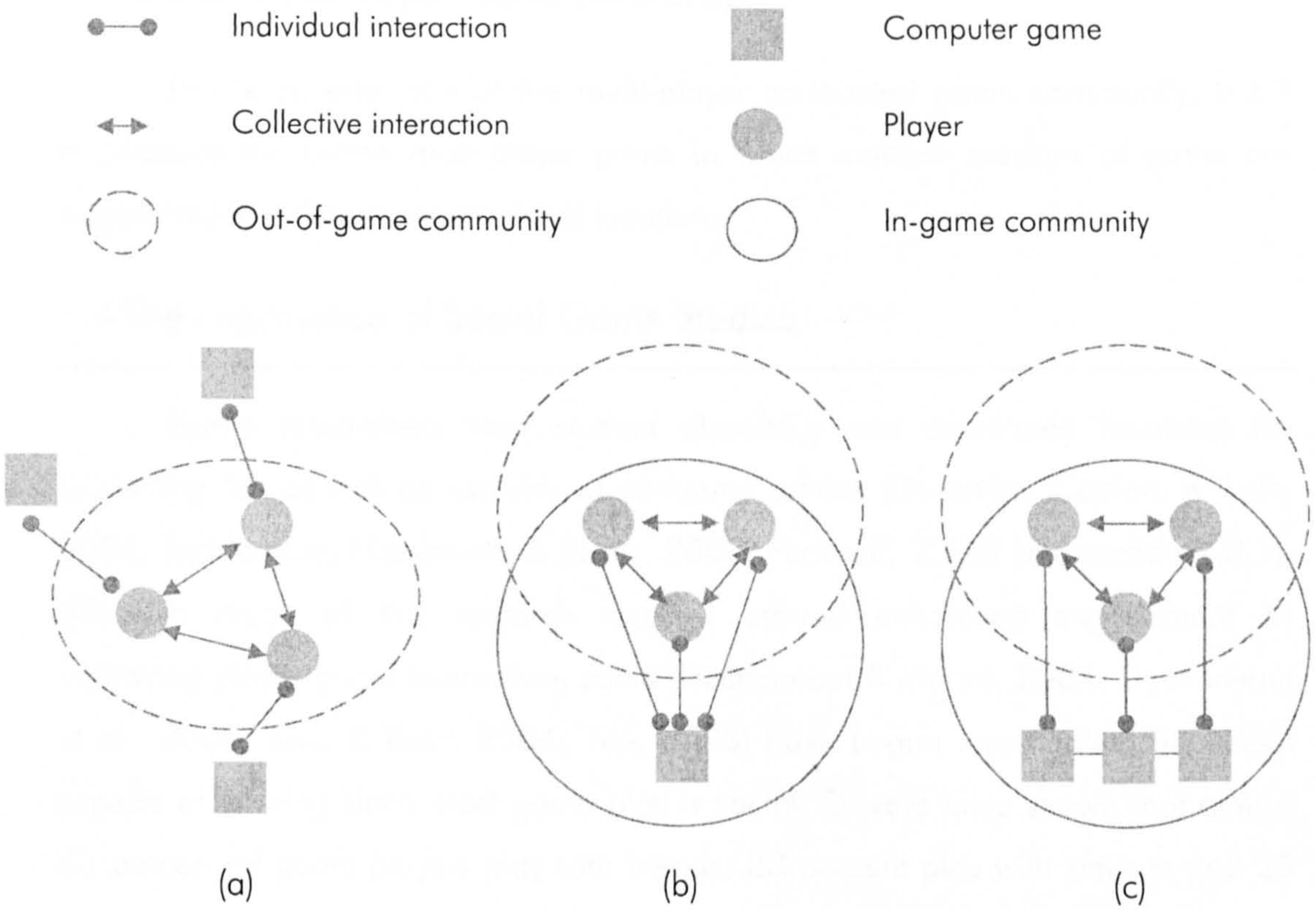


Figure 1.1 (a) single-player game community, (b) multi-player, co-located game community, (c) multi-player, distributed game-play community

- *Single-player Game Community*

This refers to the game community formed around a single-player game. Although players of a single-player game like The Sims (Maxis, 2000) play the game individually, they may be engaged in collective play through association with an out-of-game community which discusses the game either virtually or physically (face to face).

- *Multi-player, Co-located Game Community*

This refers to the game community formed around a multi-player game which is played together in the same physical location. It creates game communities at two levels: in-game and out-of-game. Occasionally, these two levels might overlap. The out-of-game interaction might be affected by issues beyond the specific game system; for example, if the community starts exchanging information about another game.

- *Multi-player, Distributed Game Community*

This is an extension of the multi-player co-located game community, but it emphasises the online multi-player game in which multiple sessions of game are established in different geographical locations.

1.4 The Importance of Social Game Studies

Game researchers have studied playability and developed heuristics for evaluating fun as well as usability of computer games (Desurvire, Caplan, & Toth, 2004; Fabricatore, Nussbaum, & Rosas, 2002; Federoff, 2002) (see section 2.3.1). Although much of this research revolves around enhancing engagement by improving player-game interaction, some (Ducheneaut & Moore, 2004; Ducheneaut et al., 2006; Kolo & Baur, 2004; Yee, 2005) have begun investigating the social aspects of gaming since most game play is social. Surveys have shown that almost 60 percent of game players play with friends; 33 percent play with siblings and 25 percent play with spouses or parents (Jenkins, 2006).

The significance of studying the social aspects of gaming is obvious. Most importantly, social interactions between players appear to contribute to a major part of gaming experience and previous studies (Ducheneaut, Moore, & Nickell, 2004) reported that some game developers have attempted to design sociability in order to encourage interaction between players. This leads us to believe that, although challenging, sociability design of computer games is not impossible. I argue that sociability design can benefit greatly from the in-depth analysis of the social interaction observed in existing games. Examining and modelling social interactions could yield insightful information pertaining to the types of play, the motivations of play and the patterns of interaction, which could be translated into invaluable design suggestions and recommendations for future game development.

I would like to reiterate that sociability design is not restricted to play experiences within the game alone. As pointed out in Figure 1.1, social interactions manifest in three gaming situations, and they take place within the game and around the game. Designing online communities for computer games is an area often overlooked by both game developers and researchers. Note that the design of such

communities is not independent from the development of the actual game software as the structure of the software has a substantial impact on the nature of the online communities that form around it. To implement out-of-game social interactions in game design, it could be fruitful to analyse existing online game (or even non-game) communities. Therefore, I maintain that sociability design should encompass the whole spectrum of game play: within and around the game.

Finally, it is worth noting that a lot of work on game studies also attempts to generalise their findings across work-based software; how understanding computer games help design pleasurable and enjoyable CSCW (computer-supported collaborative work) systems and how game studies could benefit HCI in general (Davis & Carini, 2004). For instance, CSCW researchers are keen on analysing the social interaction among game players especially in MMOGs. Therefore, studying the social aspects of gaming might benefit not only the design of games themselves but also non-play systems.

1.5 The Aim: the Development of Framework

The framework I propose to develop can aid the analysis of social interactions that arise within and around computer games. It is based on a substantial amount of data collected via extensive literature and a number of empirical studies so that a robust framework can be developed. As aforementioned, since the social aspects of games especially MMOGs can be very complicated, we need a framework that directs the analysis of social interactions in a more structured way. The framework should allow us to understand and explain the intricate nature of the social phenomenon of computer games. To achieve these, the *framework* I propose consists of *models* of different types of play and a *vocabulary* which can be used to explain social interactions in the game context. Moreover, it gives focus and structure to game analysis by providing a set of practical *methodological guidelines.*

1.5.1 Theoretical foundation: Activity Theory

In the thesis, the development of the framework is founded on a long established theory known as Activity Theory (Engeström, 2001; Leontiev, 1978; Vygotsky, 1930). Activity Theory is a philosophical framework that provides

theoretical explanations of human activities particularly their social dimensions. According to Activity Theory, actions carried out by an individual need to be examined in light of the socio-cultural context (consisting of tools, subject, object, community, rules, division of labours and outcomes) to which the individual belongs. Furthermore, Activity Theory views human activities as dynamic processes of transformation. In other words, activity systems change over time, as a result of individual and collective actions. Similarly, these actions are also constantly being changed by the activity systems (a detailed description of Activity Theory is presented in chapter 3).

Activity Theory allowed me to examine various aspects of games and therefore develop a play activity framework with an emphasis on social interactions through individual and collective development. In this thesis, the main focus of analysis is the social interaction. However, the individual dimension of game play is not neglected; instead it is viewed as a point of departure and the basis for the emergence of social interactions. Therefore, I argue that Activity Theory is an appropriate theoretical foundation for the thesis. Chapter 4 presents a study undertaken to investigate the applicability of Activity Theory to the thesis.

1.6 Research Questions

As mentioned earlier, the aim of the thesis is to develop a play activity framework for computer games with an emphasis on social interactions. To achieve this, I formulate the following research questions:

1. How can Activity Theory be used for modelling computer-mediated social interactions?
2. How does individual play and collective play arise within computer games and how can this in-game play be modelled?
3. How do various types of play emerge around game play and how can this out-of game play be modelled?
4. What kind of insights can the play activity framework developed in the thesis give in terms of analysing social play activities in MMOGs?

The first research question is intended to examine the applicability of Activity Theory to the thesis. The second and third questions are the modelling of various types of play. The fourth question is aimed to synthesise these models into a unified framework and apply the framework to two issue-based studies of a MMOG.

In addition, the thesis emphasises three key aspects of computer games (see section 5.1.2 for in-depth explanations of these terms):

- games as designed tools: this focuses on computer games as software applications
- games as emergent activities: this emphasises the individual and collective activities that emerge from the artefacts
- games as participatory cultures: this involves the study of the cultural context in which the game is played

The inter-relationship of these three aspects is also taken on board to develop a unified play activity framework. To fully understand the relationship of these three aspects, it is not sufficient to analyse only play activities within the game. Therefore, this thesis includes the analysis of both games which are designed intentionally to be played by multi-players and single-player games in which social interactions arise around the game.

As explained earlier, to understand the social interaction in games from the perspective of designed software applications, emergent activities and participatory cultures, we need to take account of both in-game and out-of-game communities. Thus, the research reported in the thesis is structured into four studies (details regarding the methodologies of each study can be found in chapters 4-7). The structure of the studies is visualised in Figure 1.2.

- *Study 1. Applicability of Activity Theory for analysing computer-mediated social activities* (chapter 4)

The aim of this study is to examine the use of Activity Theory for analysing individual and collective activities in computer-mediated online communities. The study involves investigating social interactions in an online setting to develop an initial activity model (not specific to game play). The main goals are:

- to develop a model for analysing computer-mediated social interactions based on Activity Theory
- to apply the model to analyse a computer-mediated online community in order to give insights into how it evolves and develops

This is to address research question 1.

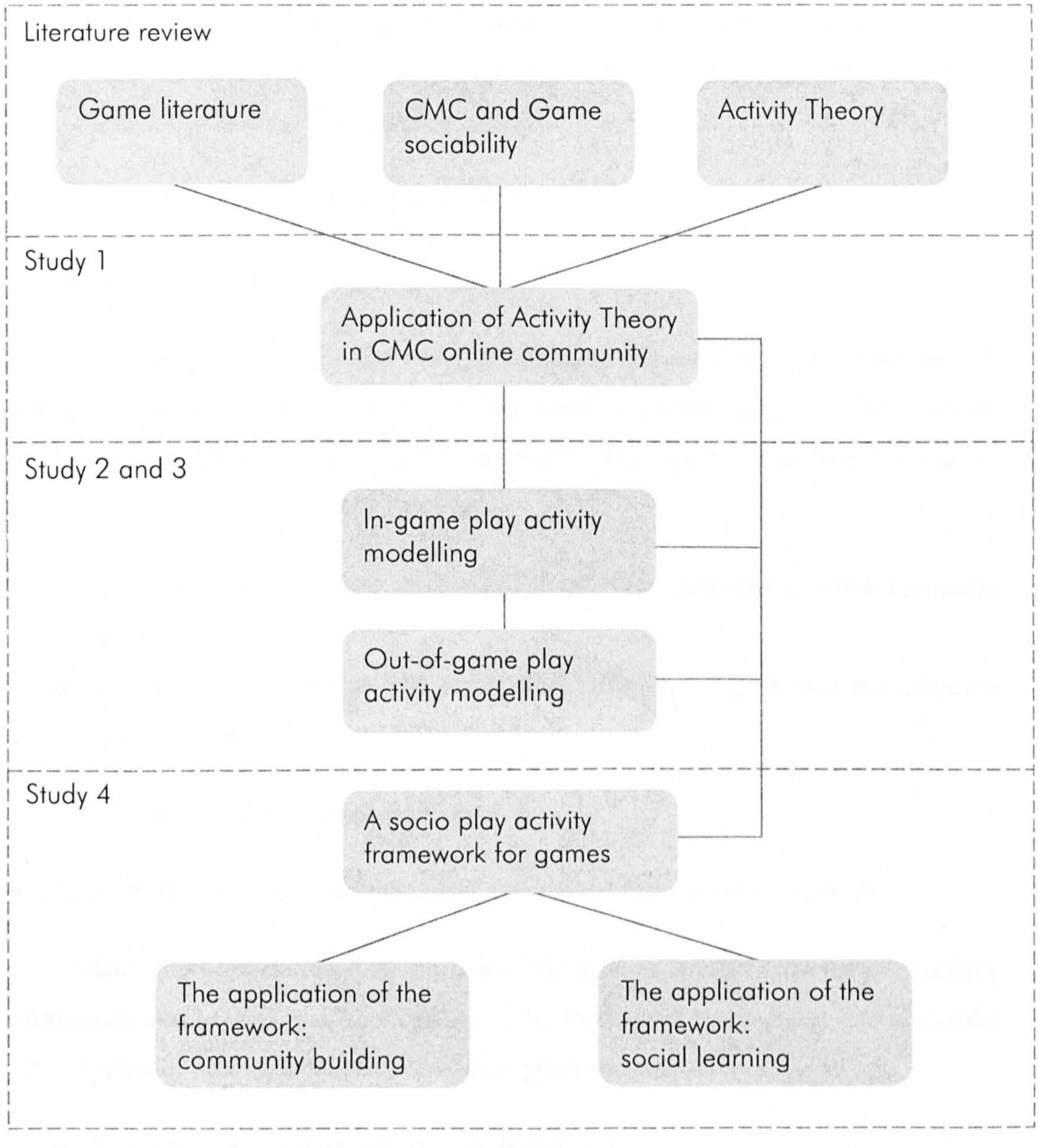


Figure 1.2 The structure of the research

- *Study 2. In-game model* (chapter 5)

The aim of this study is to model in-games play activities at the individual and collective levels based on study 1. The study involves analysing game literature and conducting a non-participant observation on ten different games including single and multi-player games. The main goals are:

  - to examine and identify the components of games as software tools
  - to study play activities that emerge from the game and identify aspects of individual and collective play activities

  This is to address research question 2.

- *Study 3. Out-of-game model* (chapter 6)

Expanding study 2, the aim of this study is to investigate and model out-of-game play activities that emerge from participatory gaming cultures. This involves analysing data gathered from the Internet and online communities. The main goals are:

  - to model various types of out-of-game play observed around computer games
  - to identify the relations and connection between in-game and out-of-game play activities

  This is to address research question 3.

- *Study 4. The synthesis and the application of the framework* (chapter 7)

  Drawing from studies 1-3, the aim of this study is to synthesise the play activity framework and to verify the applicability of the framework by applying it to a specific kind of games, namely MMOGs. The main goals include:

  - to synthesise a unified play activity framework
  - to infer how the process of community building occurs in this 3D virtual space
  - to infer how the process of social learning could occur

  This is to address research question 4.

1.7 The Structure of the Thesis

The rest of the thesis is structured into seven other chapters:

- Chapter 2: This chapter provides an in-depth review of the literature on computer games. The HCI studies of computer games are examined. The main focus of the thesis, sociability and computer games is discussed by presenting some related previous studies in this area
- Chapter 3: Activity Theory is introduced as a theoretical framework for modelling social activities. Previous studies on the application of Activity Theory to games are also presented.
- Chapter 4: This chapter presents the study of an online community in order to demonstrate the potential use of Activity Theory in researching online social interactions. An initial model of Activity Theory synthesising Engeström and Leontiev's conception of Activity Theory is sketched
- Chapter 5: The study on in-game play activities is presented in which the initial model is expanded to model individual and collective in-game play
- Chapter 6: Participatory cultures around computer games are analysed to model out-of-game play so that a unified framework of social aspects of game play can be developed
- Chapter 7: The framework is developed and operationalised to generate methodological guidelines for researching two issues – community building and social learning – in a MMOG. The findings on the issue-based studies are reported to demonstrate how the framework can provide insights and new perspectives to the social activities in the MMOG
- Chapter 8: The framework and the findings are discussed. The chapter also explains how the thesis has expanded the horizon of conventional game research and other related areas by emphasising the social aspects of gaming

2 The Social Aspect of Computer Games

This chapter reviews the literature on computer games from a number of different perspectives particularly the social interaction of this emerging digital medium.

Playing games in general or computer games (also known as video games) in particular is a subset of the whole spectrum of human activities. It is also fundamentally a type of social activity. In this chapter, I review a wide range of literature on computer games. I commence with the definition of computer games, the conventional computer game studies, and their importance as an emerging area of scholarly research. Then, I examine the inception of Human Computer Interaction (HCI) research in computer games, especially work on evaluations and design issues. I also scrutinise some current studies on the social aspect of games by reviewing the research on sociability design in Massively Multiplayer Online Games (MMOGs).

2.1 Computer Game

Computer games are special types of games which are facilitated through the use of computers. However, these contemporary games are more than just traditional game activities played in a high technological context, as revealed by recent studies of computer games (Frasca, 1999; Juul, 2006; Steinkuehler, 2006)

Generally, studies on computer games (or video games) which begun to emerge in 1999 fall into two broad categories: ludology and narratology. Ludologists regard computer games as simulations that model the behaviour of a fictional or a real system while narratologists are keen on seeing the development of computer game as a new born narrative medium. In the next section, I review the opinions from the two schools of studies by looking into computer games from two perspectives: simulations and narratives. Before this, let us take a brief look at what computer games are.

2.1.1 Definitions of computer games

There are many definitions that attempt to describe the different aspects of games. Whilst some game scholars focus on the game itself, others stress the activity of playing the game (Juul, 2003). Perhaps one of the first attempts to define computer games was undertaken by Crawford (1982). Crawford perceived four common factors of computer game: representation, interaction, conflict and safety. He further examined the first factor, representation, and maintained that a game is a closed formal system that subjectively represents a subset of reality. A closed system

means a game is internally complete and self sufficient as a structure, while a formal system suggests that a game has explicit rules. A game also represents something subjectively, not objectively. In other words, the game world is objectively unreal, as it does not physically recreate the situations it represents; yet it is subjectively real to the player who plays it. Finally, a game is a subset of reality in that it mimics the reality.

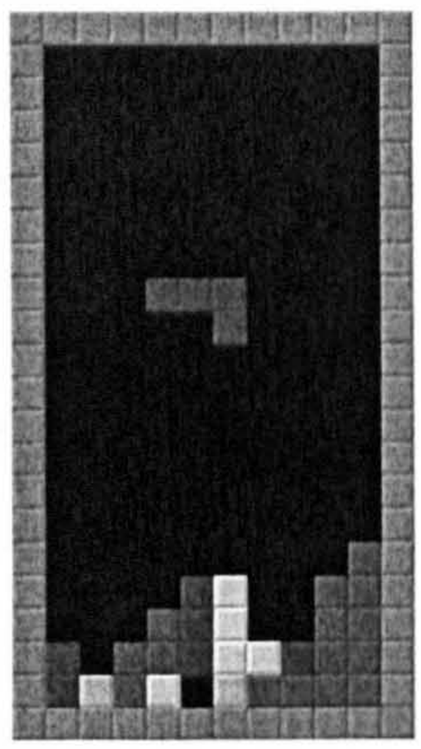


Figure 2.1 Tetris, one of the oldest classic computer games

For Juul (2003), Crawford's definition is problematic especially his interpretation of representation, since a game like Tetris (Pajitnov, 1985) (Figure 2.1) does not seem to have a mimetic relationship to the real world. He proposed a new definition after analysing the similarities and discrepancies of seven previous definitions of game. His new definition of game in general is stated as follow:

"A game is a rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable." (Juul, 2003)

The game definition he proposed contains six parameters:

- Rules: games are rule-based
- Variable and quantifiable outcome: games have variable, and quantifiable outcomes

- Values assigned to possible outcomes: that different potential outcomes of the game are assigned different values, some being positive and some being negative
- Player effort: that the player invests effort in order to influence the outcome (i.e. games are challenging)
- Player attached to outcome: that the player is attached to the outcomes of the game in the sense that the player will be the winner and happy if a positive outcome happens, and loser and unhappy if a negative outcome happens
- Negotiable consequences: that the same game (same set of rules) can be played with or without real-life consequences

Computer games are types of games which are facilitated through the use of electronic devices such as computers, game consoles, handheld devices etc. Although all computer games share this same set of characteristics, some computer games are more than just an electronic version of traditional games. More often than not, computer games nowadays are games which are played around a simulated space that generates immense narrative experiences. In recent years, we have witnessed the rise of academic studies in this area, most notably narratology that treats games as narratives, and ludology that treats games as simulations. I will explicate these two areas of game studies in the next section.

2.1.2 Narratives and computer games

Although it is generally agreed that computer games are not narratives, some scholars believe that computer games are a medium with a high potential for storytelling. Murray (1997) for example explored the concept of storytelling that computers offer and argued that computers could be an interactive narrative (a form of narratives in which readers have an active participation in affecting the outcome). She accounted for three perspectives on the aesthetic of interactive narrative: immersion, agency and transformation. According to Murray (1997), the computer provides us with a new stage for the creation of participatory theatre. We are gradually learning to do what actors do, to enact emotionally authentic experiences that we know are not real.

In a computer game environment, the readers of interactive narratives are able to take meaningful actions and see the result of their decisions instead of being a passive reader. This power of interaction is described as agency. Interactive narratives offer the opportunity for the readers to not only witness stories but to enact them. It means an experience wherein readers are invited to enact or construct their own stories out of a set of formulaic elements. The enactment is transformative as the readers assimilate their actions in the virtual world as personal experiences.

Jenkins (2002) observed computer games in terms of spatial narratives (narratives which are embedded in spaces) and maintained that spatial narratives create the preconditions for an immersive narrative experience in one of four ways. First, it evokes pre-existing narrative associations where spatial design can either enhance our sense of immersion within a familiar world or communicate a fresh perspective on the story through the alteration of established details. Second, it provides a staging ground where narrative events are enacted, in which the story itself may be structured around the character's movement through space.

Third, it embeds narrative information within its settings; the game space becomes a memory repository whose contents must be interpreted as the player tries to reconstruct the plot. Fourth, it provides resources for emergent narratives, in which game spaces are designed to be rich with narrative potential, enabling the story-constructing activity by the players.

2.1.3 Simulations and computer games

Instead of studying computer games as narratives – the dominance of game studies for decades – others opt for the study of computer games as simulations. Both narratives and simulations are media that represent reality although with different approaches. Unlike traditional media such as texts, pictures or videos, simulations do not simply represent but they also model a system (Frasca, 2001). For instance, a picture of a car conveys the meaning and the idea of a real car to the viewer by depicting the characteristics of the car: colour, shape, size, etc at a particular frame of time. A video about a car reveals more about the car than a picture does, as it shows the changes of the car with time.

A toy car on the other hand shows the players more than these characteristics; it models the behaviour of a real car: how the wheels spin and how the car moves. By watching the video, one can infer the rules of a car, while in simulations or games the rules are dynamically applied to the toy car for the players to experiment and test. Basically, the representation of narratives is bottom-up, as they describe the events from which we can generalise and infer rules. Simulations are usually top-down: they focus on general rules, which then we can apply to particular cases.

Computer games are different from narratives because they are not only based on a traditional representation of reality but also rely on simulations to a certain extent. For many scholars, computer games are nevertheless not simulations because simulations model a real system, while computer game designers generally are allowed to simulate systems with no real referents (Järvinen, 2003). Other academics contend that being a computer-mediated entertainment, a computer game is a special kind of simulation that models a system that does not exist or even contradicts the rules of physics of the universe.

Frasca (2001) took this argument further and claimed that computer games are simulations and that simulations do not need a real referent. He studied semiotics of games and proposed that like narratives, simulations can be understood as a sign that represents reality. Therefore, to claim that there is a need for a real referent in simulations is similar to say that the word "unicorn" is not a sign since its referent is not real (Frasca, 2001). The definition of simulation is thus refined as the representation of processes that mimic a system by the behaviour of another even if its source system is not real. By this definition, a simulation does not necessarily model real world logic; it is just consistent within its own world.

2.1.4 Economic game theory and computer games

It is worth mentioning that the work on computer game studies reported in this thesis should not be confused with the economic game theory. Game theory is a branch of applied mathematics that has a long standing tradition in economics. The theory studies strategic decisions between players, meaning that the main focus of analysis is the optimal choice to maximise payoff as game theory assumes that all players involved in "the game" desire the best possible personal outcome (Vincent

2005). Game theory has played an important role in many areas beyond economy. For instance, biologists treat evolution by natural selection as some forms of games which can be modelled with game theory. Apart from these, sociologists have also been interested in using game theory to understand and model human behaviour. Game theorists have also developed "games" such as the prisoner's dilemma to explain certain phenomena in political science. Although generally game theory deals with competitive situations, a derivative of the theory has been developed, known as cooperative game theory to analyse games in which groups of players cooperate to compete with another groups.

However, the use of this economic game theory in the study of computer games is rare (Smith 2006). One reason might be that many computer games can be treated as recreational games rather than purely strategic games and it has been made clear by game theorists that the "game" used in game theoretical analysis do not refer to any recreational activity, but strictly to strategic interaction between agents. In such cases, the analysis is centred on "ideal" players who will always make the best choice given the available resource. As such, game theory might be useful for examining hardcore players' behaviour (in which strategic consideration is the main factor of enjoyment). It will however not be able to explain the interaction of mainstream players who, for instance, deliberately choose a worse strategy in favour for the aesthetic aspect of the game. Apart from these, a main emphasis on this thesis lies in the out-of-game activity, which is very different from what is defined traditionally as game play.

2.2 The Importance of Computers Games

With the advancement and pervasiveness of new technologies, play becomes one of the important beneficiaries. New technologies such as the computer have revolutionised the way in which games are played. Computer games have become one of the fastest growing and most economically successful kinds of software. The US market of computer games and interactive entertainment hardware and software was estimated to have generated USD7 billion in 2005 (Entertainment Software Association, 2007). The retail sales of video game hardware, software and accessories grew 10% per year in the last few years in the US (RocResearch, 2004).

However, the escalating economic importance of computer games, indicated by the rapidly burgeoning revenue within the game industry over the past few decades, cannot be the sole yardstick in measuring its cultural value. In fact, as a new form of play, computer games continue to receive negative recognition from society. They are not regarded highly by policy makers. Most schools and organisations for example ban such forms of activities in the classroom or at the workplace.

This is exacerbated by a plethora of research writings that over-emphasise the detrimental effect computer games might have from various perspectives. For instance, it is claimed that the prolonged use of computer games contributes to obsessive, addictive behaviour, dehumanisation of the player, desensitising of feelings, health problems, and other disorders (Setzer & Duckett, 2000). Others argue that computer games encourage the development of anti-social behaviour among their players (Williams, McAndrew, & Learn, 2001).

Perhaps the most debated issue concerning games is their connection to violence especially among teenagers. A growing body of research is correlating violent computer game play to aggressive cognitions, attitudes, and behaviours. A number of studies show a positive relationship between the amount of game play and aggressiveness among children, adolescents and even adults (Bushman & Anderson, 2002; Gentile et al., 2004).

Nevertheless, there are signs that the negative image of computer games is changing as the game industry is progressing towards maturity. New games are no longer primarily aimed at teenage male audiences. The average age of game players is steadily growing; the target groups are expanding to include those in their twenties and thirties. Furthermore, an increasing number of females are now becoming casual game players (Entertainment Software Association, 2007) and this marks the gradual change of games as a mainstream medium.

In addition, there are games which incorporate violence in a different context. For example, bestseller games like SimCity 3000 (Maxis, 1999) (Figure 2.2) portray violence as a form of failure. Violence is thus regarded as destructive and will

eventually lead to failure given that the goal of the game is to be self-sustaining and constructive (SFGate, 2002).

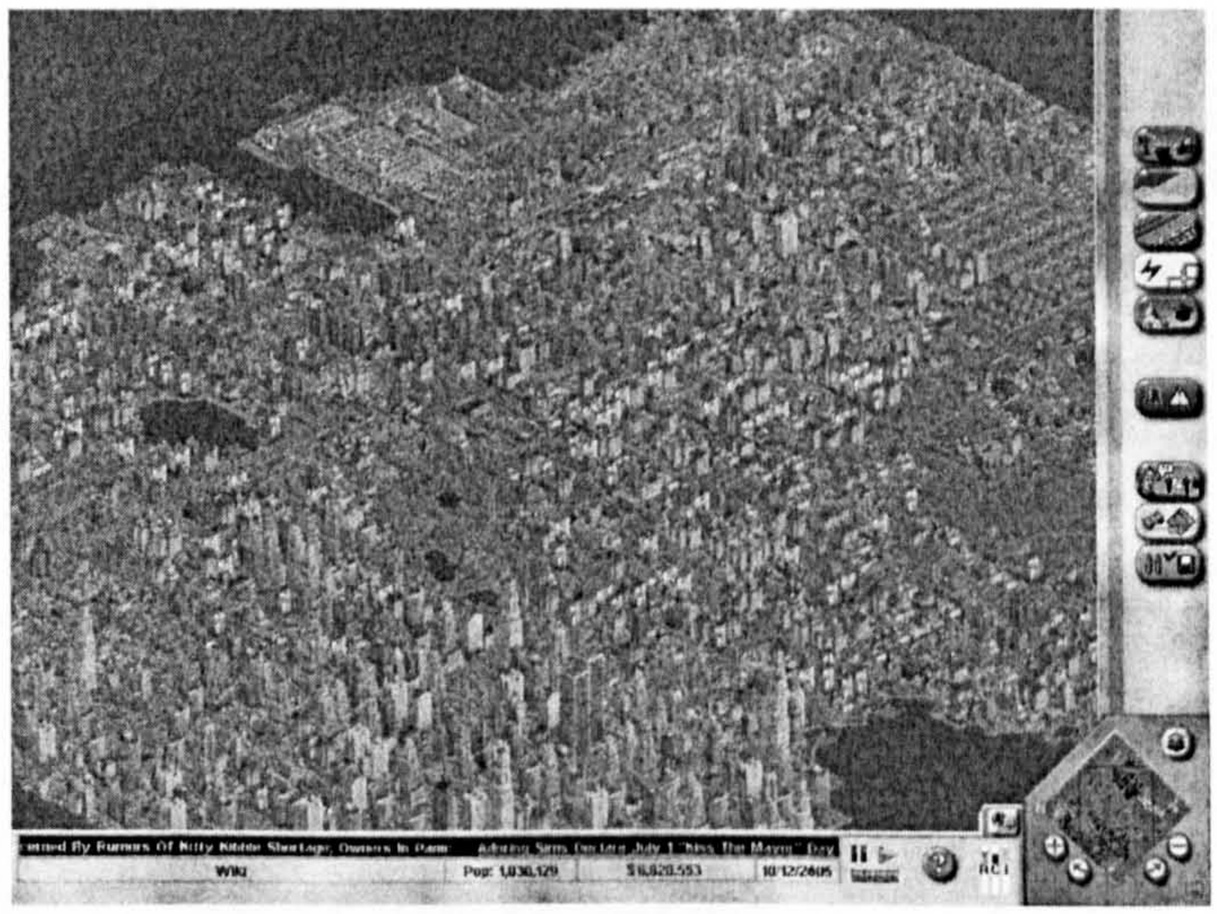


Figure 2.2 SimCity 3000, a city simulator

Furthermore, studies regarding violence in computer games have been refuted with new research. Some new studies on the subject of computer games and behaviour conclude that there are no links between video game use and aggressive behaviour in children (IDSA, 2001). For example, Williams and Skoric (2005) contended that some violent games do not necessarily lead to increased real-world aggression. Contrary to general opinions and most previous research, their study found that players' exposure to a violent online game does not cause any substantial real-world aggression. In other words, aggressive behaviours observed while playing in the game world have not been transferred to the real world.

As their potentiality as a new medium for expression continues to grow, computer games are being used for more than simply entertainment. Some even argue that it is time for games to deal with more serious matters. The term "serious game" was coined in 2002 with the start of the serious game initiative lead by Rejeski and Sawyer (Stokes, 2005). It focuses on the use of games in education, training, health, public policy, etc. The early advent of serious games is marked by the inclusion of serious elements in commercial games which are designed predominantly for entertainment. These commercial games, such as Civilisation

(Figure 2.3) and SimCity (Figure 2.2) series, though aim to be entertaining, include serious elements, namely human history and civilisation as well as city management.



Figure 2.3 Civilisation III, a game that allows the player to build a civilisation

More recently, there are some games developed specifically for non-entertainment purposes. The first political campaign game was launched at Christmas 2003. The game, called "the Iowa Game", was developed to help Howard Dean supporters understand grassroots outreach and to encourage them to participate in pre-caucus campaigning in Iowa (Dean for America, 2004). Following this in 2005, the World Food Programme (2004) developed "Food Force", which seeks to take advantage of the popularity of computer games to educate children about hunger and the work of the aid agency. Another example is the game designed with the help of the New York Fire Department, aimed at training fire fighters to deal with conventional, environmental, biological and terror-based incidents while functioning as a team where the players play the game through networked computers communicating through headsets to complete cooperative tasks (SimOpsStudio, 2005).

Although these accounts might be anecdotal, they seem to indicate that computer games or games in general are no longer seen as mere child's play, but rather as important forms of expression that play a central role in our culture. As Huizinga (1944) claimed, *"that culture arises in the form of play, that it is played from the very beginning"*.

The cultural importance of games is further marked by the Europe's largest gallery exhibition organised by Barbican Art Gallery, London in summer 2003 to explore the history and the culture of computer games, showcasing international leading talent and innovation within the game industry. The show presented a definitive overview of the past, present and future of games, from the earliest computer game through to the latest advances of technologies and interaction. It successfully attracted 50,000 visitors and could be regarded as an acknowledgement of the cultural importance of games in the late 20th and early 21st centuries.

Undoubtedly, computer technologies are not only a tool for work. Starbuck and Webster (1991) predicted that current and future forms of computer technologies will be used for both work and fun, causing a reduced distinction between work and play. The modern conceptualisation of play presents two different concepts: unproductive play (something that is unproductive and enjoyable) and playful work (something that is productive and enjoyable). Even systems that are not built for entertainment are expected to be a pleasurable experience. Hence, researching computer games might be beneficial in many ways: e.g. designing pleasurable and playful (collaborative) work, computer-mediated communication and collaborative learning.

It can be seen that computer games and play are something worth studying academically due to their commercial importance, their increasing recognition from society regarding their cultural importance, and their application to non-play or serious domains. Most notably, game studies have received a fair amount of attention from anthropologists and sociologists (Caillois, 1961; Huizinga, 1944) while psychologists are interested in human behaviour of playing such games (Setzer & Duckett, 2000; Williams & Skoric, 2005). Naturally, being a subset of software, computer games are also becoming a popular topic among computer scientists including those who deal with the human factors of computer use.

2.2.1 The academic study of games

Although games are as old as human culture, game design does not have firm theoretical work to support game analysis and research. Furthermore, the basics

of game design and evaluation are still unexplored. Indeed, the migration of play to the computerised platform calls for new forms of academic studies as well as different ways of handling the design and evaluation of games.

Now not only have we a body of research devoted to game development that deals with the technical, hardware, software and programming issues, we are also expanding the scope of game studies to deal with the theoretical, aesthetic and social aspects of computer games. Some areas of game studies (not exhaustive) are listed below (Zaphiris & Ang, 2007):

- *Theoretical issues*

It is the study of games as a system including narratives or interactive stories, rules and simulations, semiotic systems and formal models. Some scholars examine the theoretical question of how to understand ludic systems using semiotics, while others explore how games can be considered as formal models, and how we can use this to analyse specific games.

- *Methodological issues*

Another important topic in this area (and perhaps more interesting for the game industry) is that of methodologies in design and evaluation. Various design evaluation methods such as player-centred design, player (user) testing, usability and playability are explored. There is a call for early involvement of players in scenario studies for game design.

- *Technical aspects*

This is the traditional computer science research involving algorithm and artificial intelligence, mathematical solutions for graphics and visualisation, technicality on audio/video/network issues, etc.

- *Socio-cultural aspects*

Socio-cultural studies on computer games are gaining much popularity recently due to the emergence of Massively Multi-player Online Games (MMOGs) in which player-player interaction plays a very important role. Research in this area

includes virtual identity, sociability design, cultural impact of games, participatory culture as well as media and communication studies.

- *Application to other areas:*

Finally there is also an increasing amount of interest in applying computer games, or game design methods to other areas, most notably military or corporate training, education (especially children education) as well as Computer Supported Collaborative Work (CSCW).

2.3 HCI Studies of Computer Games

The study of ludology and narratology as explained in section 2.1 is derived largely from literary theories and media studies. These schools of thought stress the fundamental characteristics and the structural nature of computer games, namely studying games as semiotic systems. Although they have been helpful in analysing computer games, they do not provide direct implication or application for practical use in terms of game design and evaluation.

The advent of computer games marks a new milestone for game studies. Like its classic counterparts, the computer game is now gaining more attention from the academic field. This research field also has its own set of associations (Digital Games Research Association – DiGRA), conferences (such as the DiGRA conferences), and websites (such as gamedev.net, gamasutra.com, game-research.com, socialimpactgames.com, game-culture.com, ludology.org). Several peer-reviewed game journals have also been established, for example: Journal of Game Development, Game and Culture, The International Journal of Computer Game Research, Simulation and Gaming, International Journal of Intelligent Games & Simulation.

Recently, computer games are also becoming a popular topic among computer scientists especially experts that deal with the human factor of games. Pleasure or motivational factors have been of immense interest among the HCI community (Norman, 2003). Hence it is not surprising that computer games are now getting attention from the HCI community, in which games are approached

systematically in order to develop methodologies for designing and evaluating entertainment software products.

With the permeation of computer technologies through our everyday life, we use computers not only for work, but also for leisure. The study of HCI has been focusing primarily on work-based computing, overlooking another important side of the spectrum of human activities: play. The recent emergence of play-oriented computer applications has attracted the attention of the HCI community; scholars are intrigued by the huge commercial success of computer games which concern with mainly fun and pleasure (Dyck et al., 2003).

Although there has not been much published on this topic, some relevant work has been undertaken to study computer games from various aspects through the perspective of HCI. Some examples include the research of game technologies such as 3D graphics and 3D sound (Zhou et al., 2004) to enhance engagement and immersion in game play. Audio and visual elements of computer games such as background colours and sound volumes have also been studied in order to find out the effect of such elements on player performance(Wolfson & Case, 2000).

Others investigate novel forms of interaction such as tangible interfaces (Price et al., 2003) to encourage collaboration and techniques of gathering user requirements for designing educational games (Bekker et al., 2003). Some studies focus on the human behaviour and physiological responses such as frustration (Scheirer et al., 2002) in order to better understand the interface design towards building an affective computer through the study of computer game play.

2.3.1 Games and playability

In this section, I present an area which is more directly related to this thesis: playability. Since the study of playability is mainly concerned with games design issues from the perspective of software applications (game structures and narratives) and individual/collective play activities (usually known as game play although a more traditional notion of game play refers mainly to player-game interaction), which constitute important parts of this thesis, it is worth examining the literature in this particular area.

There is an increasing interest in playability studies which are thought to be equivalent to usability studies in the HCI research of work-based software. Although there is no standard definition for playability, it is generally agreed that playability means the degree to which a game is fun to play. Whilst some studies in this area emphasise the interaction style and the quality of game play, other focus on the plot-quality and the representation of the game.

Järvinen et al. (2002) identified four components that make up playability in creating immersive and engaging gaming experiences: functional, structural, audio-visual and social. Functional playability refers to the controls of the game. A game which is functionally playable usually has simple controls that are easy to master, predictable and that are not subject to sudden change. Structural playability refers to the game play pattern that arises from the game rules. Although the functional aspect should be simple, it is usually desirable to have a more complicated structure in order to provide enough challenges to make the game enjoyable.

The term audiovisual means the audio and graphical representation of the game. In other words it refers to the narrative design of the game space. Basically the game space consists of the audio and visual aspects that contribute to playability. For instance, the virtual camera angle has an impact on the performance of certain tasks in the game. Social playability is implemented explicitly in multi-player games that allow the interaction among players. Although social playability might seem to be present only in multi-player games, it emerges among players of single-player games who often interact outside the game space. Therefore, it can be said that social playability of a single-player game is implicit.

Recently, researchers have begun to approach the study of playability by drawing from more well-established HCI methodologies such as heuristic evaluation and usability testing which are used widely in work-oriented software and websites. Federoff (2002) for example attempted to generate heuristics and usability guidelines for the creation and evaluation of fun in computer games. In her study, five participants from a game development team, each contributing in a different way to the game development process, were observed and interviewed. The data collected and literature reviewed suggested that instituting more formal usability evaluation processes could be helpful to the game development process.

Her heuristics are a starting point for the construction of a standard list of game heuristics for use by the game development community. According to her initial findings, the focal aspects of computer game playability are interface (controls and display), mechanics (game world interaction) and game play (problems and challenges).

In another study, Desurvire et al. (2004) developed a method, known as Heuristic Evaluation for Playability (HEP) as a comprehensive set of heuristics for playability specifically for evaluating games. The HEP heuristics were developed based on the current literature and reviewed by several playability experts and game designers. The playability evaluators applied the HEP while focusing on how each heuristic was supported or violated and then they defined the playability issue. Alternative solutions for resolving the playability issues were generated by both the evaluator and the game designer. To summarise, HEP consists of four categories:

- Game play (the balance between players' ability and the game challenges)
- Game story (the game worlds, characters and storylines)
- Game mechanic (the control and the interface)
- Usability (traditional software usability issues)

These heuristics were tested on a game development process to assess their validity and evaluation effectiveness in comparison to the traditional user testing methodology. The results suggested that HEP is suited to evaluating general playability issues in the early game development phases with a prototype. HEP aims to offer a new method for the game community that can result in not only a usable but also a playable game.

A successfully completed PhD study has also tried to address similar issues although this work delimited its scope to only action computer games. Fabricatore, Nussbaum, & Rosas (2002) asked a straightforward question "What do players want in computer games?" and attempted to identify the fun elements by modelling playability using qualitative methods. The purpose of their work was to propose game design guidelines that reflect players' preference, based on empirical data gathered during play sessions. This work presented a model that describes the main elements which determine the playability of action games. The model proposes

design guidelines that are the conceptualisation of players' preferences. It can be used to help game designers to understand the elements crucial in making pleasurable games. The model consists of three major elements: entity, scenario and goal.

In action games the player interacts with the virtual world which is populated by entities. These range from the protagonist who is controlled by the player, some non-player-controlled objects as well as antagonists which interfere with the players' game goal. The second aspect that determines players' perceived quality of an action game is the scenario, which is where the action takes place. Third, every action game has a main goal. Usually, there are several interrelated goals, and their relations results in a hierarchy.

Table 2.1 Ten most important aspects of mobile games

Pre game	Provide a clear menu structure Simplicity is the key Help where help is needed Consistency on all levels Conserve the user's time
Game experience	Use natural controls Provide save and pause Game world to match real world Easy on the sounds
Post game	High score, a souvenir of success

Although most studies come out of academic interest, there are also studies from the industry. Nokia (2004) for instance has published a technical paper on playability for mobile games (Table 2.1). Research with three developers of mobile phone games was conducted in order to create general usability recommendations. This study strove to provide guidelines for developing easy-to-use, fun, and challenging mobile games for the Nokia Series 40 devices. To help developers

implement usability issues in their development projects, a model and recommendations for usability testing and evaluation were produced.

2.3.2 Summary of HCI oriented game research

There are some shortcomings of the previous work on HCI in games. Most notably, these HCI approaches tend to omit the work from conventional computer game studies, namely ludology and narratology. Furthermore, these HCI studies are mostly centred on mechanics and functional aspects of the games. More specifically, some issues are identified as follows:

- They tend to focus on game mechanics. Some of the studies overlook the narrative and representation aspects of games. Computers nowadays are able to process photo realistic graphics. From this technology arises the interest to create virtual worlds that represent real or fantasy social settings. Therefore, game designers are now more intrigued to craft a narrative-rich world instead of simply an abstract game world.

- The limitation of usability for games is not properly addressed. There is an obvious tension between the terms usability (ease of use) and playability. Whilst usability argues for the design of software that is intuitive and convenient to use, a playable software program might not be necessarily easy. Design that goes against human cognitive model is sometimes desirable.

- Socio-cultural aspects are largely overlooked. The HCI study of computer games overlooks the classic literature that treats games as socio-cultural experience. Most studies revolve around player-game interaction rather than player-player interaction. The emergence of MMOGs has called for the design of sociability within the game space. There are also other multi-player games such as mobile and handheld games. Apart from these, even a single-player game usually involves the interaction of many other players who discuss, exchange game objects, etc. Thus, it will be fruitful to expand game studies to include the socio-cultural context of play.

- Current HCI game research emphasises the implementation and technical aspects such as camera, textual dialogues, enemies, loading time, which might not be applicable to other games. Moreover, this limits the creativity to implement new techniques (such as the touch screen and microphone feature in Nintendo DS (Nintendo, 2007)). A more generic and inclusive view is needed.
- Similarly, the existing guidelines are constrained to current game genres defined by the industry, running the risk of hindering the possibility of innovation and creativity (e.g. the design of new game genre). We need a higher level view that is open to more possibilities.

2.4 The Social Aspect of Gaming

As mentioned before, playing games is essentially a social experience and it is even argued that it is impossible to play a game in isolation in a meaningful sense. With the inception of the Internet in games, the scope of social interaction has expanded to involve a large number of players playing simultaneously. Apart from in-game social play, social interactions also result in the emergence of online communities in the out-of-game context through the use of diverse Computer Mediated Communication (CMC) applications. The term online community is multidisciplinary in nature and difficult to define (Preece, 2000). For the purpose of a general understanding, Rheingold's definition of online communities is presented:

> *"[online] communities are social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace"* (Rheingold, 1993)

The Internet is a new frontier in social relationships; people are using the Internet to make friends, as well as enemies. In general, the factors which bring people together in an online community are common interests such as hobbies, ethnicity, education, beliefs and in the game context the enthusiasm for computer games. Analysing such online communities around games is useful as it reveals social interactions that happen outside the game which might provide some insights

into game design that supports the formation of communities, thus enhancing the sociability of games.

2.4.1 Massively Multi-player Online Games (MMOGs)

Perhaps the most prominent example of social game play is Massively Multi-player Online Games (MMOGs). Unlike conventional games, MMOGs feature a fictional setting where a large group of players interact with each other by forming communities of players. A MMOG enables thousands of players, represented through avatars, to simultaneously play in an evolving online virtual world (Yee, 2005). The game world is usually modelled with highly detailed 3D graphics, and allows individuals to interact not only with the gaming environment, but also with other players.

Often, a MMOG, like a Role Playing Game (RPG) involves killing monsters, developing characters, etc. It however contains an extra aspect which is the internal sociability within the game. Unlike single-player games which rely on other external modes of communication (such as mailing lists, discussion forums outside the game) to form the gaming culture, the culture is formed within the MMOG environment itself.

These MMOG virtual worlds represent the persistent social and material world, which is structured around narrative themes (usually fantasy), where players are engaged in various activities: slay monsters, attack castles, scavenge goods, trade merchandise, etc. On one hand, the game's virtual world represents the escapist fantasy, on another, it supports social realism (Kolbert, 2001).

The MMOG genre now boasts hundreds of thousands of users and accounts for millions of pounds in revenue each year. The number of people who play the games (and the time they invest in terms of activities within and around the game) is astounding. The MMORPG, Lineage (NCsoft, 2005), for example, had more than three million subscribers in at one point (Lineage, 2007, May) and within a year Ultima Online (Electronic Art, 2005) attracted more than 160 million person-hours (Kolbert, 2001).

These games are becoming one of the most interesting interactive media of computer-mediated communication and networked activity environments (Taylor, 2002). Understanding the pattern of participation in these game communities is crucial, as these virtual communities function as a major mechanism of socialisation of the players. As Squire & Steinkuehler (2003) has noted:

"Playing one's character(s) and living in [these virtual worlds] becomes an important part of daily life. Since much of the excitement of the game depends on having personal relationships and being part of [the] community's developing politics and projects, it is hard to participate just a little." (Squire & Steinkuehler, 2003)

MMOGs aim to encourage long term relationships between the players through features that support the formation of in-game communities. One of the most evident examples is the concept of "guilds". Guilds are a fundamental component of MMOG culture for players to run a virtual association which has formalised membership and rank assignments to encourage participation. Sometimes, a player might join a guild and get involved in a guild war in order to fight for the castle. Each guild usually has a leader and several guilds could team up in a war. This involves a complicated leader-subordinate and leader-leader relationship.

In addition, to encourage social interactions, MMOGs are especially designed in such a way that some goals of the game are almost impossible to achieve without forming communities. For example, one player alone could spend a long period of time collecting all of the items needed to assemble a device, whereas complex devices beyond the reach of any individual player could be quickly constructed by the guild. The guild can also accept donations from members and then distribute those contributions to others according to their needs, benefiting everyone as a result of this collaboration (Kelly, 2004).

Apart from relatively long term relationships such as guild communities, MMOGs also offer many opportunities for short-term relationship experiences. For instance, a player could team up with another player to kill monsters in order to develop the abilities of their avatars (level up) or some more expert players could help newer players to get through the game by forming small and temporary groups.

2.4.2 Sociability design and MMOGs

Having illustrated the social phenomenon around such playful virtual communities, I maintain that it is fruitful to research game communities as we might be able to derive useful implications on how successful work-based systems such as Computer Supported Collaborative Work (CSCW) or learning environments such as Computer Supported Collaborative Learning (CSCL) can be designed. For this reason, in this section I describe some studies which have been conducted that examined various aspects of MMOGs, including the social interactions, learning aspects, and design issues.

Recently, MMOG game developers have tried to structure in-game activities to maximise interaction between players. One of the examples of sociability design in MMOGs is Star Wars Galaxies (Sony, 2005) (Figure 2.4) which is organised so that players are steered towards certain locations in the game world where social play is expected to take place. Ducheneaut et al.(2004) have conducted a study to identify how game locations can be designed to encourage different styles of social interactions.



Figure 2.4 Star Wars Galaxies, a MMOG with an explicit design of social locations

In my opinion, this is an interesting study not only because of the results and recommendations derived from the analysis, but also because of the methodologies employed to collect the data as these studies are relatively new and we are still striving to refine and reshape better methodologies. In the study, "virtual

ethnography" (Hine, 2000) was conducted to observe the in-game activities. The researchers created two game avatars with different professions (combat-based and service-based) in order to obtain a wider view of the game by interacting with other online players, and eventually becoming part of the player community. During the observation, the computer screen was video captured for retrospective analysis. This method involves the active participation of the researcher in the game. In other words, the researcher immerses themselves in the virtual life, learns about the culture, norms and practice of the community by interacting with other users and the virtual world.

The researchers, through participant observation, identified two important locations where players congregate on a regular basis. In the second phase of the study, they created two additional avatars which were constantly connected to the game. The "/log" command was used to capture all the public chats which were saved in a text file. A parser program was then written to format the texts and extract useful data. Using this method, the researcher stepped back and observed the community from a "distance" as an outsider.

Through this combination of participant/non-participant and quantitative/qualitative data collection and analysis, it was found that the game Star War Galaxies does attempt to maximise social interactions through the careful design of the game structure and mechanics. One major finding that came out from the analysis is the implementation of social spaces. Some locations are designed in such a way that players have to wait there and socialise. Furthermore, some locations are tied to the provision of a particular service such as the healing of battle fatigue in a specific location. Another aspect that is crucial in designing sociability is the interdependency between game avatars. The game ensures that everyone has to rely on others to complete certain game missions. This encourages players to work together and join certain groups or communities as playing the game alone is less rewarding (i.e. slower progress).

The analysis also revealed some other issues in the game design, one of which was awareness in social spaces. Awareness means *"the knowledge of the presence of other people, including their interactions and other activities"* (Nova, 2002). It is found that in some heavily populated spaces, players are not aware of

the activities and presence of other players and this could result in breakdown in social interactions.

Another sociability design issue is the lack of social play. The data showed that the player-player interaction in the game is instrumental rather than social. This means most players have short and infrequent interactions in order to satisfy their needs to progress in the game. As soon as their needs are met, they leave the place to pursue other game goals. Although there are some players who interact genuinely with other players for the sake of socialising, such interactions are usually not rewarded directly by the game.

Some studies of MMOGs emphasise the learning aspect within the game community. In structurally and socially complex games such as MMOGs, various skills are needed to play and succeed in the game, and the development of these skills highly depends on the social interaction with other players in the virtual space. In a study conducted by Papargyris & Poulymenakou (2005) player interactions in two MMOGs, Earth & Beyond (Earth and Beyond, 5 June 2007) (Figure 2.5) and EVE: The second Genesis (CCP Games, 2003) (Figure 2.6), were observed. It was found that in such multicultural and anonymous environments, many learning processes are evolving that affect players' understanding of the game's state, their social and communication skills.

The main data collection of this study was centred on guilds in which a relatively permanent community was formed. The study revealed that skills in MMOGs can be grouped into two categories: in-game skills (skills you need within the game to make progress and enjoy the game, such as the game stories, collaboration skills, game control, etc) and emergent skills (implicit skills that emerge from the game play, such as decision making and strategy planning and assessment skills).



Figure 2.5 Earth and Beyond, a science fiction MMOG

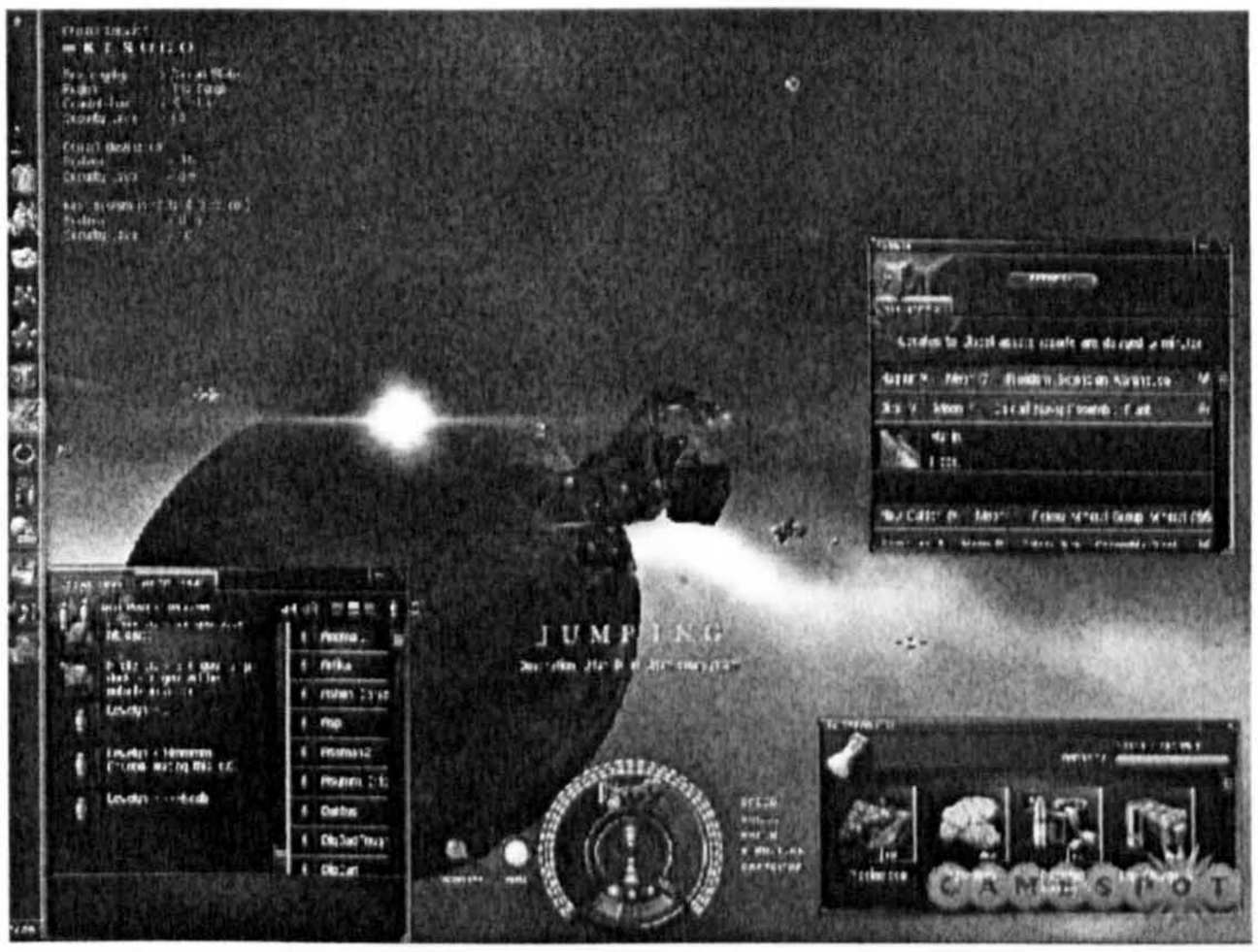


Figure 2.6 EVE: The second Genesis, another science fiction MMOG

Another study on the MMOG Ultima Online (Electronic Art, 2005) showed that what Ducheneaut (2004) described as instrumental play and social play do exist in the game virtual space. As a matter of fact, it is claimed that not only do they exist within the game, they often spill beyond the demarcated boundary of the rule-based system, and propagate into the players' physical life through various means, such as e-mail, online forum and chatting tools. This finding was supported by Kolo & Baur (2004) who conducted a virtual ethnography and observed that most players seek more than merely strategic considerations (instrumental play) when interacting with

other players. They search for communication and persistent social relations (social play).

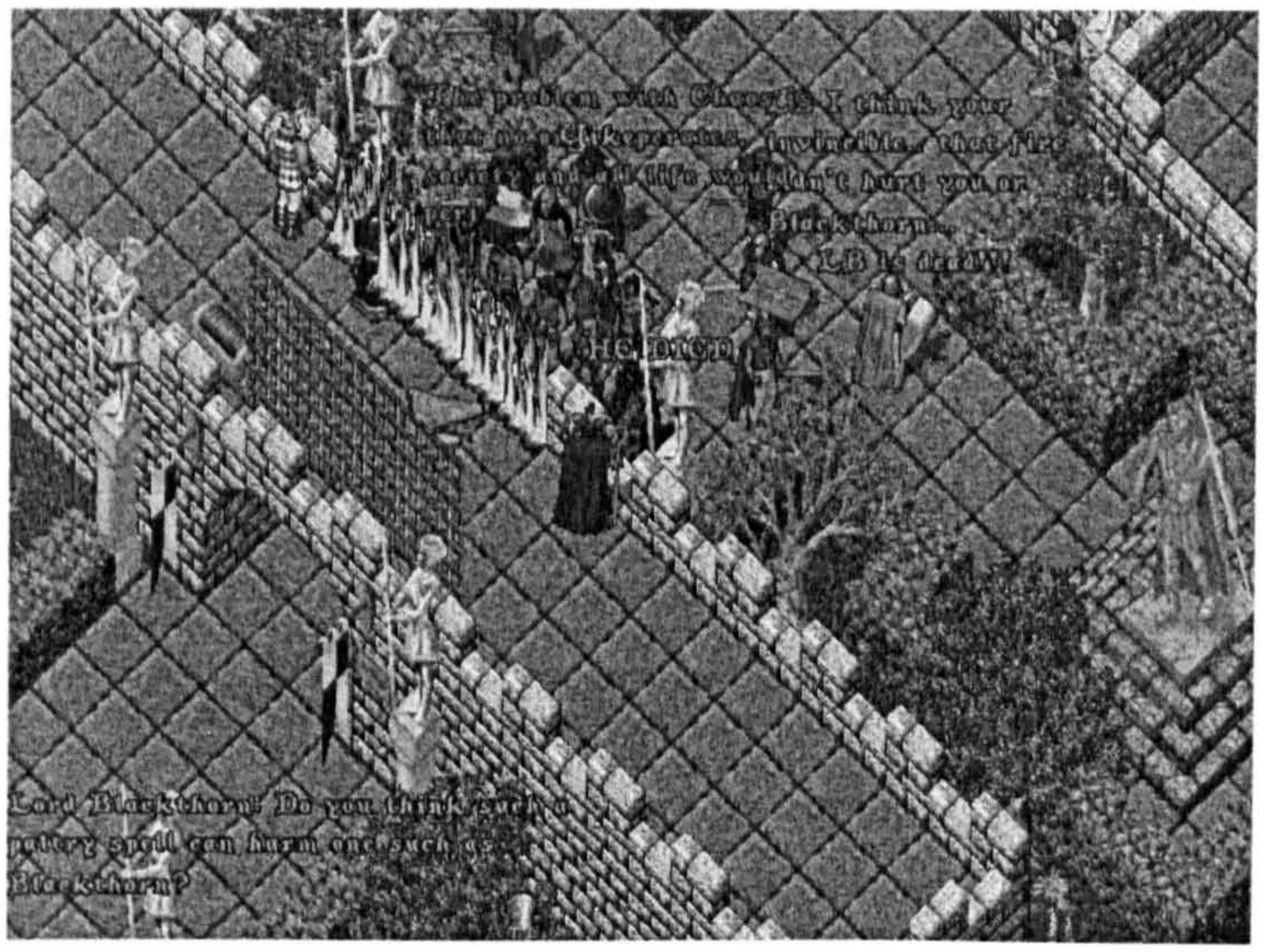


Figure 2.7 Ultima Online, one of the earliest MMOG

2.4.3 Summary of sociability in games

Upon studying this literature, it can be concluded that:

- Playing games is social: literature suggests that playing games, especially MMOGs, is a social activity in which some players are socialising for the sake of it. In some cases, players tend to form a virtual community for mutual benefit in the game.

- Sociability could be designed to increase engagement: It is important to design not only the game environment (i.e. player-game interaction), but also the sociability (i.e. player-player interaction), as some studies have shown that it is possible to design games that facilitate social interactions despite the complexity.

- In and out-of-game social interactions exist: As aforementioned, social interactions exist in in-game and out-of game environments. It might be useful to consider both types of interaction when examining sociability in computer games.

2.5 Conclusion

This chapter looked at two important aspects of computer games which are relevant to this thesis. I discussed the HCI studies on computer games and how these can contribute to the development of design and evaluation methods which can be used practically in the game industry. Then, I further explored and analysed literature on game social interactions: MMOGs (sociability and online communities). This work indicates that it is worth analysing computer games especially multi-player games as we might derive some implications for designing computer-mediated communication or sociability. Based on the literature, I draw two important conclusions. First, in most games, playing is full of social interactions and thus it is fundamentally a social activity. Second, the social interaction of the game can be conceptualised and designed to enhance the enjoyment of game play. In the next chapter, I will review the theoretical foundation on which this thesis is built, Activity Theory, and how it can be used to study the social aspects of gaming.

3 Activity Theory and Social Activities

This chapter describes Activity Theory and how it has been used to analyse human activities in a socio-cultural context.

In chapter 1, I pointed out that the framework I propose to develop bases its theoretical foundation largely on Activity Theory. In this chapter, I explore the concept of activities and how human activities, including computer game play can be analysed through Activity Theory. I introduce the fundamental background of Activity Theory and then I move on to explain in depth the associated theoretical constructs. I also identify and elucidate the potential use of Activity Theory in this thesis. Finally, I present the application of Activity Theory in various research areas of human activities. Although still uncommon, some Activity-Theory-driven game research is described.

3.1 Activity Theory

I propose using Activity Theory as a possible theoretical framework in studying social interactions of computer games. Through a detailed interpretation of the literature on games, I believe that Activity Theory provides powerful theoretical tools for exploring various aspects of games – games as tools, individual and collective actions as well as participatory cultures – which are the main focus of this thesis. However, before probing further into how Activity Theory could be applied to game studies, let us take a look at Activity Theory in general.

Activity Theory is a theoretical framework for studying different forms of human practices or actions, both at individual and collective level. It is founded on the socio-cultural theories originated in Russia which stress socio-cultural aspects in psychological development, claiming that human activities are mediated by cultural tools in which socio-cultural knowledge amasses. People do not interact with the environment directly; instead the interaction is socially mediated with tools, be it signs (language) or external tools.

The most basic representation of activities is illustrated in Figure 3.1, in which activities are understood to be a purposeful interaction of the subject with the world (the object). Note that the interaction is dual-way, implying a process of mutual transformation between the subject and the object. In other words, through the enactment of activities, the subject transforms the object while the object transforms the subject as well.



Figure 3.1 A basic representation of activity

However, this process of subject-object interaction is not direct, but mediated by tools. The key theorist, Vygotsky (1930), proposed the classic triangle model to demonstrate the idea of mediation.

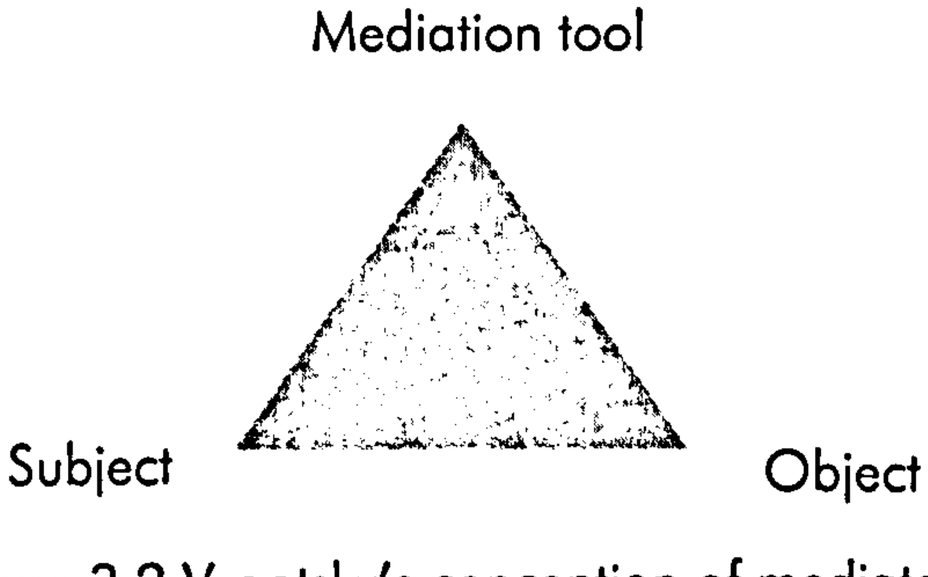


Figure 3.2 Vygotsky's conception of mediated activity

In Figure 3.2, the subject is the individual engaged in the mediated action, the mediating tool could include physical tools and/or prior knowledge of the subject (the internal tool). The object is the objective (or motive) of the subject which will satisfy the subject's need, or the object being acted upon by the subject in the activity. The figure points out explicitly that the relationship between the subject and the object is not straightforward. Rather it is mediated by tools which could be external or internal. For example, when building a website, the subject (the web designer) is working on an object (e.g. raw materials such as texts and images) driven by an objective (i.e. to build a website), using not only the computer (external tools) but also her internal understanding of how websites and computers work (internal tools).

Leontiev (1978) extended this notion of activity to distinguish various levels of activities and objects by proposing a hierarchy of activity (Table 3.1). An activity is connected to the object of the whole community, of which each individual subject is often not consciously aware. An action is connected to a conscious goal. Below the

activity and action there is the level of operation that is dependent on the condition in which the action is performed.

Table 3.1 The hierarchy of activity

Unit of Analysis	Stimulus	Subject	Website building example
Activity	Object	Community	Developing a website
Action	Goal	Individual conscious	Formatting the layout, design the structure of the website
Operation	Condition	Individual non-conscious	Typing, adding images

In his view, an activity system can be analysed at three levels: the activity level which is oriented towards the object/objective and carried out by the community; the action level which is directed at the individual goal, as well as the operation level which is elicited by conditions and is performed non-consciously.

This hierarchy of activity is crucial in explaining the individual development process in an activity. Hence, I would like to illustrate an example of this hierarchy in learning to build a website (refer again Table 3.1). The overall objective is to develop a website. In the beginning, the learner has to work on the basic functions such as adding texts and images at the conscious level. When the learner has reached a higher proficiency level, these actions are transformed into operations. The learner no longer needs to click on the menu to add texts or images deliberately (e.g. following each step as stated in the manual) as these have been learned thoroughly and are now operating non-consciously. The consciousness of the learner is now focused on designing the layout and the structure of the pages depending on the objective of the website development (e.g. is it a serious business website or a play-oriented website?). The text/image insert menu becomes invisible to the learner and she is only selecting appropriate goals to be achieved.

Therefore, it can be inferred that Activity Theory treats individual development as a shift from the higher level to the lower level in the hierarchy (e.g. from actions to operations). Nevertheless, upon encountering new conditions, a learned operation might be shifted back to the action level to be reflected on at the conscious level.

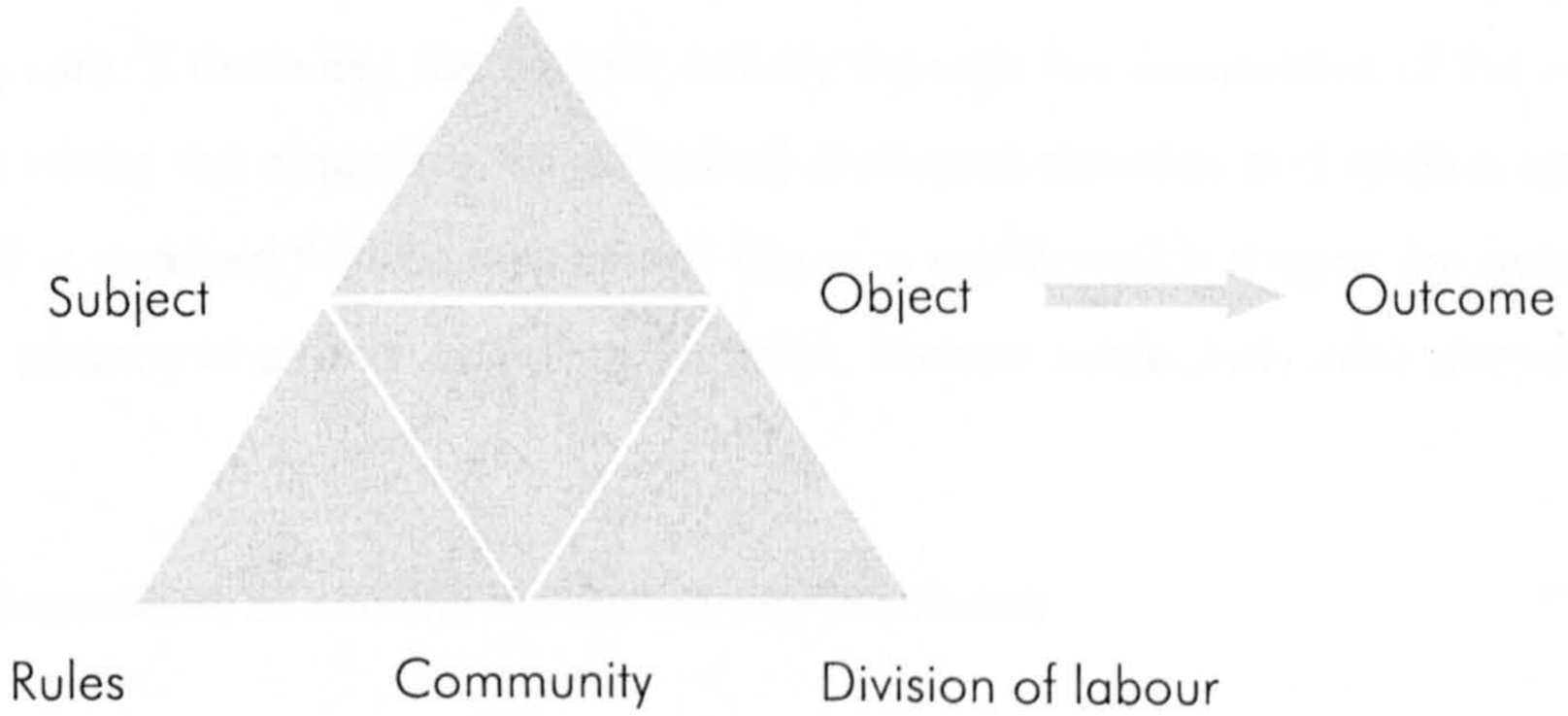


Figure 3.3 The triangle activity system diagram

Drawing on work by Vygotsky and Leontiev, Engeström (2001) viewed all human activities as contextual within an interdependent activity system. Engeström added collective mediation to Vygotsky's tool mediation and presented a more detailed triangle model of activity system (Figure 3.3).

In the model, the subject is the individual who is selected as the point of view of the analysis. The object refers to the raw material or the problem space at which the activity is directed and which is transformed into outcomes with the help of external and internal tools. Tools are the concepts, physical tools, or resources that mediate the subject's interaction with an object. The community refers to those with whom the subject shares the same general object. The division of labour (DOL) is the classification of tasks among the members on the community while the rules are the regulations, norms and conventions within the activity system.

3.1.1 The key concepts of Activity Theory

There are five key concepts associated to Engeström's model of activity system worth mentioning as they highlight some interesting perspectives of analysing human activities which, I trust, are invaluable in the context of computer game studies. These

concepts comprise object-orientedness, tool mediation, hierarchical structure of activity, internalisation/externalisation and continuous development (Bannon, 1997).

- *Fundamental of activity: object-orientedness*

The most fundamental concept of Activity Theory implies that there is a subject who acts on an object. In other words, there is something the subject is interacting with. It describes the specific activity through the perspective of the nature of objects, where the object (or the objective) motivates activities and gives a specific direction. It is deemed that human beings live in a reality which shapes the nature of subjective phenomena and at the same time, human subjectivity also shapes the reality.

- *Key components of activity: mediation and mediators*

As mentioned before, the relationship between the subject and the object in the environment is not direct; instead it is mediated not only individually by tools but also collectively by rules, communities and division of labour. It emphasises social factors and interaction between the subjects and their environments and explains the importance of tool mediation.

- *The structure of activity: Hierarchy*

As explained earlier, Leontiev's interpretation of Activity Theory is associated with the hierarchical structure of activity. An activity system can be divided into activity, action and operation which are dynamic and transformed from time to time. For instance, an automatic operation can become an action if there's a contradiction that raises it to the conscious level; actions might become operations as they are repeated many times.

- *The process of activity: Internalisation and externalisation*

Activity Theory differentiates between internal and external activities. It also explains when and why external activities become internal and vice versa. Internalisation is the transformation of external activities into internal activities. It allows people to imagine and simulate potential interactions with the environment through mental process without manipulating real objects. Externalisation is the

transformation of internal activities into external activities. It happens when an internal activity needs to be updated or shared by the others, resulting in the dependence on an external artefact

- *The transformation of activity: Contradiction and Development*

Activities are not static but are constantly changing; these changes include mediations, the structure, the process and the object which might result in the change of the entire activity system. For instance, the structure of activities is in a fluid state where actions and operations are shifting. The activity system develops by resolving contradictions that arise in the system.

3.2 Potentiality of Activity Theory in Game Studies

Having reviewed and discussed Activity Theory and its key concepts, I would like to discuss some implications regarding the appropriateness of Activity Theory in computer game studies, particularly in social gaming. It is perhaps helpful to commence by considering why we need a theory. Halverson (2002) identified four attributes of a theory:

- Descriptive power: a theory that is able to provide a conceptual framework and helps us understand the reality and describe the world, such as a work setting and the implementation of computer technologies within the setting

- Rhetorical power: a theory with a set of standardised vocabulary that enables researchers to communicate with others. More importantly, it should help talk about the issue of study by naming important aspects of the conceptual structure and how they map to the real world.

- Inferential power: a theory that makes inferences about phenomena which are not yet understood sufficiently. It should provide some insights to inform the design for a novel situation. For instance, we may want to predict the consequences of introducing change into a particular setting.

- Applicative power: a theory that is able to apply into the real problem space. It must be able to translate to our needs to inform and guide system design.

The theory should also enable us to determine the level of analysis to bridge the gap from description to design.

Considering these four attributes, it is found that perhaps the most powerful aspect of Activity Theory is its descriptive ability. Rather than a predictive or inferential tool, Activity Theory is a descriptive tool effective for analysing and understanding a social phenomenon in general, independently of any specific domain of application. In fact, Activity Theory has been used as a source of inspiration in the context of social computing by some scholars. For instance, in the area of collaborative work, researchers have developed models of cooperation that may be helpful as a theoretical background for the design of social computing systems (Kuutti, 1995; Nardi, 1995). Apart from these, Activity Theory has the rhetorical power as it names its theoretical constructs well. In Activity Theory, dealing with the dynamic process of human activities is built into the theoretical constructs of Activity Theory.

As I have reiterated throughout this thesis, I explore games as social activities. However, the individual dimension of game play is not excluded; instead it is viewed as a useful starting point and foundation for the socio-cultural aspect of play. Therefore I believe using Activity Theory is fruitful in analysing social gaming.

Overall, Activity Theory is appropriate for this study because:

- Computer games are both tools and activities: games can be studied as a tool (e.g. in an out-of-game community, games are a tool to mediate fan constructions such as fan fictions or videos), or activities/actions (e.g. play activities oriented towards an objective or actions driven towards a goal).

- Computer games focus on the individual level: many computer games are intended for an individual. Thus, the individual use of games is a central point of this thesis. Therefore, theories that focus exclusively on the social aspect might not be appropriate. It is also important to investigate which part of an activity is of a genuine collective nature and which part employs computers for individual play. In other word, it is important to differentiate collective and individual play.

- Computer games are getting more social: instead of approaching play merely as an individual inner state motivation, I also see it as a social activity in which each individual is engaged in.. Activity Theory casts light on both aspects. In Activity Theory, although the perspective of the individual is at the centre of everything, it also focuses on the cognitive process of an individual situated in a socio-cultural context.

- Activity Theory provides a clear visualisation of the concepts in a diagrammatic way; Activity Theory has named its theoretical constructs well. Naming is very useful both for communicative as well as descriptive reasons. This is important because names are often what we manipulate in a theory. It concretises the hard-to-grasp abstract aspect of the theory. Being able to manipulate data along with the names in Activity Theory provides an additional advantage. Moreover it breaks down activities into sub-elements for further detailed analysis.

- Activity Theory has a clear emphasis on process and dynamics: dealing with process/dynamics is built into the structure of how Activity Theory is presented. Activity systems keep process at the forefront of the analysis. In addition, the concept of contradictions and transformation is also crucial. So it might be interesting to see the transformation that denotes the progression and dynamics of game play which is something uncommon in most game studies.

A study has been carried out to investigate the applicability of Activity Theory in analysing computer-mediated social activities (see chapter 4) and an analysis on game literature with Activity Theory is reported in section 5.1. Before this, let us take a look at previous studies on the application of Activity Theory in various areas.

3.3 The Application of Activity Theory

Activity Theory is a theoretical framework which describes how humans carry out motivated actions in a social context. Hence, it is applicable to analyse any domain of social activities. As such, it has been used in many areas of research, from education to workplace activities. In this section I elucidate two domains in which Activity Theory has had an impact: social computing and computer games.

3.3.1 Activity Theory and social computing

The HCI studies of social computing have adopted a number of approaches, including theories, conceptual frameworks and descriptive methods (Shapiro, 1994). Through theories, approaches, and methods, researchers aim at evaluating the reality or the truth of the social interaction within the community, often through logical manipulations of theoretical constructs, experiences and experiments. The necessity of a theory in social computing however lies not simply in the need to represent reality within the community. It also calls for a theory that can shape the study by underlining relevant issues (Barthelmess & Anderson, 2002).

Activity Theory has been useful in HCI research and practice especially areas that deal with interaction design through networked computers, or in other words, the social aspect of computing. Its popularity is marked by the range of studies published in some computer-supported collaborated work (CSCW) journals. In this regard, several researchers have highlighted the suitability of Activity Theory in conceptualising user interactions in context (Bannon & Bodker, 1991; Kuutti, 1995; Nardi, 1995). Therefore, it is fruitful to explore the application of Activity Theory as a theoretical and methodological framework in social computing research.

The idea of social engagement among software users and developers has brought about the investigation to integrate Activity Theory into various studies in social computing. Mwanza (2002) for example, has created an eight step process methodology for analysing activity in workplaces based on the component parts of Engeström's (2001) triangle model: subject, object, objective, tools, community of practice, division of labours and rules.

Activity Theory has also been used as guidelines in the development of social systems. Fjeld et al. (2002) for example employed Activity Theory in shaping their design process of augmented reality groupware based on the two basic concepts: mediation tool and object-orientedness. Their system allows a group of people to interact, by means of physical bricks, with models in a virtual three-dimensional (3D) setting. They distinguished three aspects of interaction with the mediation tool: they defined the physical aspects as how to operate the hardware, the handling aspects

as how to use the groupware, and the subject/object-directed aspects as how to use groupware to solve a task.

As for object-orientedness, it was found that the tasks for the groupware are not exclusively goal-directed (or object-oriented); they also have exploratory elements which are performed to unveil hidden information and generate goals. Based on this goal, a new planning stage and a new action phase can be initiated. Hence, they included a new element into their analysis. Instead of setting the goal first, they examined exploratory actions.

Their experience in applying Activity Theory has been reported as positive. The theory has brought structure to the design practice and the vocabulary of Activity Theory has proven to be useful rhetoric tools for their discussions. Building on Activity Theory, and through expansion and modification of the theory, they were able to derive the design practice in a set of design guidelines. In this way Activity Theory provides a platform for practical application.

3.3.2 Activity Theory and computer games

Although still uncommon, some researchers have attempted to study computer games with Activity Theory.

A study has been carried out by Squire (2004) to examine game-based learning, one of the most studied areas in computer game research, in which he explained how Activity Theory could be an analytical lens to examine learning through computer games. Based on this theory which argues that knowledge cannot be treated as isolated entities extracted from the contexts from which they form, he analysed computer games as a tool in the learning activity system.

He used Activity Theory to examine the implications of applying Civilisation III (Firaxis Games, 2001) (Figure 2.3), a history simulation game, in history learning by treating the game as a mediating tool in the learning activity system. Activity Theory also gives an insight into the contradiction of using games as a tool in learning to help participants (students, teachers, instructional technologists) react to the change of the learning environment from the traditional classroom to game-based learning.

Another study, known as The Fifth Dimension has been conducted to design an educational activity system for school aged children (Kaptelinin & Cole, 1995). They implemented after-school systems based on Activity Theory in order to study individual and collective activities in educational games. In addition to tasks written within the game itself, the project team designed out-of-game tasks to help participants adapt themselves to the game culture of practice, to form goals, and to trace progress towards becoming an expert.

Research in games and learning has been emphasising the educational potential of computer games being used either formally in the classroom or informally in an after-school context. Little has been done in examining the learning activity that takes place within the game (Ang & Rao, 2003). Recently, studies have been carried out to identify the learning process within the game when players are playing a game designed specifically for entertainment purposes instead of an educational game. Not surprisingly, Activity Theory has been used as a theoretical foundation in some of these studies. Oliver & Pelletier (2005) for example developed a methodology based on Activity Theory to analyse the detailed learning activity from some instances of game play. Table 3.2 shows the methodological framework which has clearly drawn most of the theoretical constructs from Activity Theory, most prominently the hierarchy of activity and the concept of learning through contradictions and development.

Using this methodological framework, they analysed observation data (video transcripts of the game screen and the players) from the game Deus Ex (Ion Storm Inc., 2000) (Figure 3.4) by identifying contradictions that arose. They found that most contradictions in the game involve the contradictions between the player and the game tool (e.g. the game controller and the in-game virtual artefacts) and the contradictions between the player and the rules (how the tool should be used). Through the use of Activity Theory, they managed to derive play strategies and more importantly the evolution of the strategies through time as players developed.

Table 3.2 A framework of analysis of learning in game play

Time	Activity	Action	Operation	Contradiction between...		Rationale	Evidence of learning (resolution)



Figure 3.4 Deus Ex, a typical first person shooter game

It was also noticed that the attempt to use Activity Theory in analysing computer games was strongly driven by the interest to research the learning activity instead of the play activity itself. Perhaps the most relevant work is the PhD research currently being carried out by Barr, Biddle, & Noble (2006) on the value of computer games using Activity Theory. The original triangle figure is appropriated to reflect the game play activity. The first change made is to substitute "Player/Avatar" for "Subject", in order to convey the nature of the subject in the game contexts. The second change substitutes "Roles" for "Division of Labour" in order to simplify the vocabulary.

The work focuses on the game play that occurs in two major contexts: the in-game context and the out-of-game context. The in-game play activity generally involves the actions of the player's avatar or character in the game world, while the out-of-game play activity includes the player talking with friends, browsing the internet for hints, and so on. Using Grand Theft Auto: San Andreas (Rockstar North,

2004) (Figure 3.5), a preliminary study has been conducted to conceptualise the components and relations of the activity system as they apply to computer games. Although the scope of the study (in-game and out-of-game play) is similar to this thesis, the main aim of the study (Barr et al., 2006) is however to conceptualise value in game play activities, while the focus of my thesis is to analyse social interactions of game play through the development process.

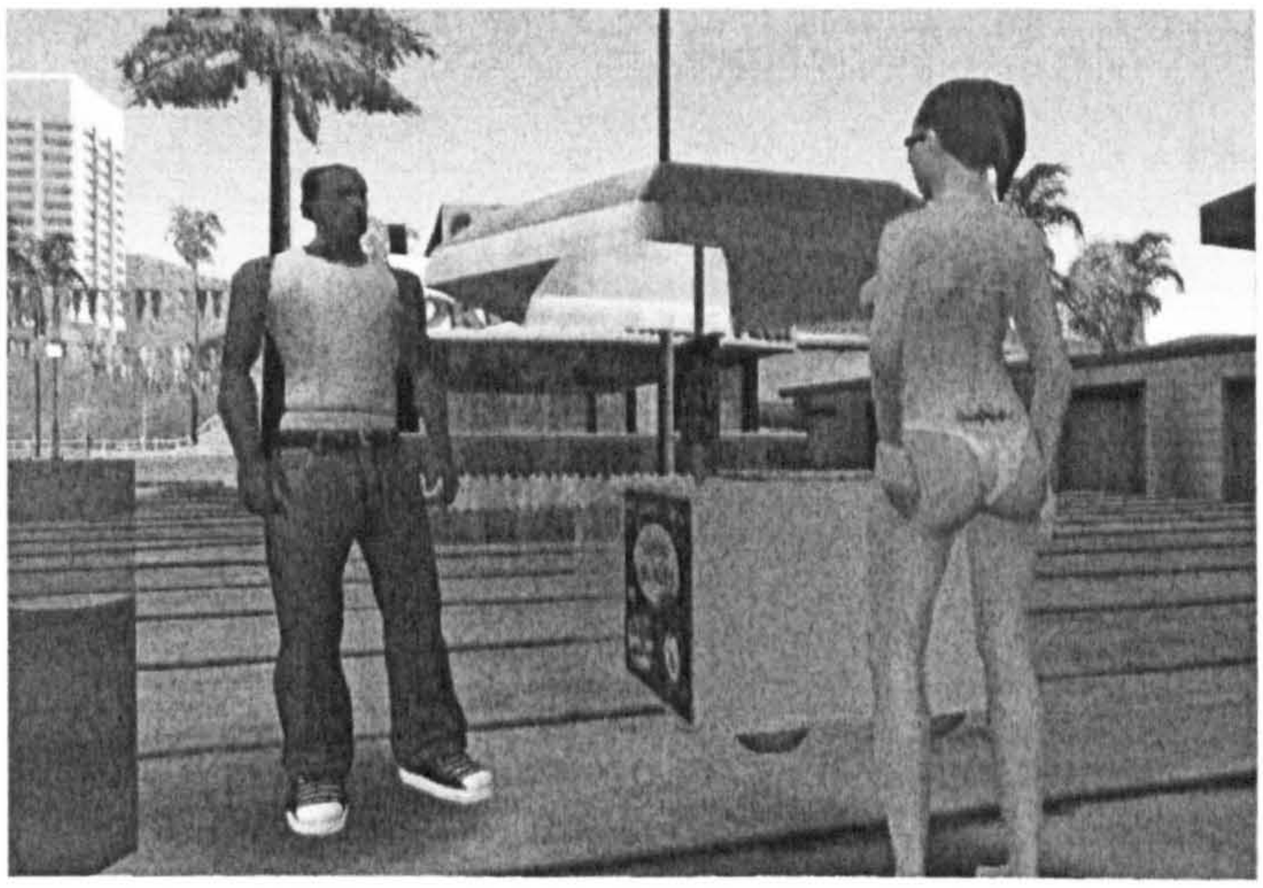


Figure 3.5 Grand Theft Auto: San Andreas, a game that features explicit violence and sex contents

3.4 Discussion on Activity Theory

Activity Theory is a broad theoretical framework of human activity which can be customised to meet the need of researchers for different types of studies. I believe that Activity Theory is very useful in studying computer-mediated social activities and online communities.

Preece, Rogers, and Sharp (2002) stated that an online community consists of people, a shared purpose, policies, and computer systems. They identified various roles among the members: moderators, lurkers, general members, etc. The structure of online community as they suggested can be re-examined through the lens of Activity Theory (Figure 3.6).

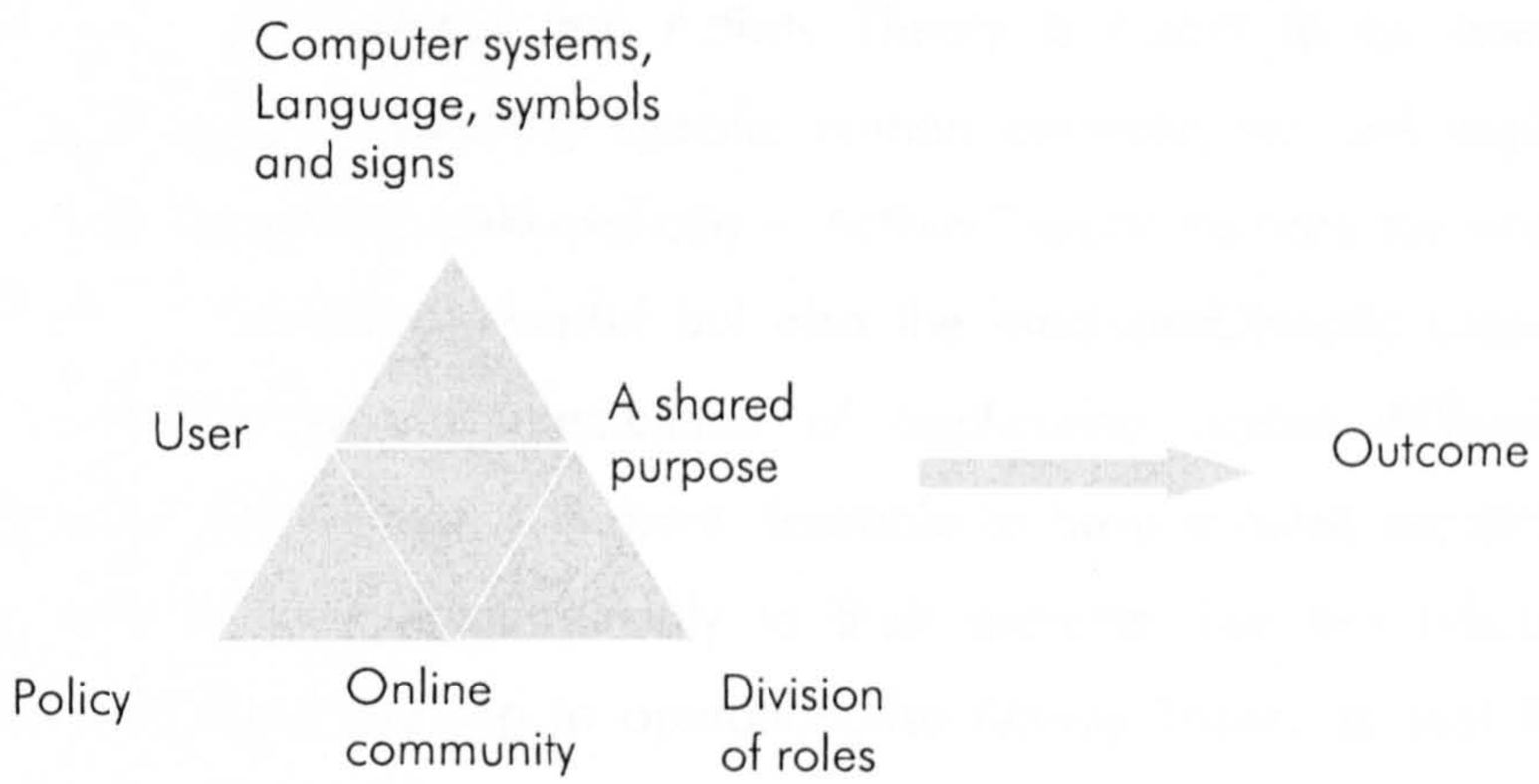


Figure 3.6 An activity system of CMC in general

Matching these concepts into the activity system triangle, we have an activity system of CMC communication that highlights some prominent concepts. Through Activity Theory, we can also identify other issues such as language and symbols as an important tool in online communication. It might be also useful to analyse the outcome which is overlooked in CMC research. The outcome might include friendship development, mutual support, a repertoire of knowledge and resources, etc. It appears that Activity Theory provides a powerful theoretical framework for such analysis. However, there are some shortcomings of Activity Theory which I would like to describe here.

First and most apparently, the hierarchy of activity, which refers to the development process, is not incorporated into the triangle model. The current activity triangle diagram represents only the activity level of analysis, without taking on board the action and operation level.

Second, we also need to present the dynamics of each element in the activity system. As the actions shift to operations, the element in the activity system is changed. The static representation of Activity Theory shows only a snapshot of a particular time, making it hard to analyse the activity across time. Although the concept of transformation is a significant part of Activity Theory, the original triangle does not provide a standard way to operationalise the transformation: especially the transformation of each component and the relationship. Third, the heart of the development concept, internalisation and externalisation, are not visualised.

It should be reiterated that Activity Theory is meant to be open-ended. Through studying and modelling specific human activities, we can explore new concepts which are not depicted explicitly in Activity Theory. Perhaps the openness of Activity Theory is the most powerful but also the most problematic aspect of the theory. It allows numerous possibilities of application across different areas. Nonetheless, for practitioners it is more desirable to have a more straight forward guideline that can be utilised directly to their projects. For this reason, some researchers have been working to operationalise Activity Theory so that it is more practical in day-to-day methodology (Barab, Hay, & Yamagata-Lynch, 2001; Korpela, Soriyan, & Olufokunbi, 2000; Mwanza, 2002). This thesis goes in line with this work in which I attempt to use Activity Theory in a specific domain of human activities, namely computer game play.

3.5 Conclusion

This chapter explored Activity Theory in detail and its possible use in game studies. The discussion began with the general conception of Activity Theory based mainly on Engeström (2001) and Leontiev (1978). The triangle model of Activity Theory was presented and the five key concepts were described. Based on this literature, I identified the potential use of Activity Theory for computer game studies. Then some previous work on the application of Activity Theory in social computing and computer games was reviewed. Through literature, I found that Activity Theory has some advantages in analysing the social aspect of human activities. In the following chapter, I will present a study on computer-mediated social interactions of an online game community to investigate the applicability of Activity Theory.

4 Computer-mediated Social Interactions

This chapter presents a study to investigate the applicability of Activity Theory in analysing computer-mediated social interactions in an online community within the context of computer games

In chapter 2 and 3, I reviewed the key literature on computer games and Activity Theory, which gives us a solid background for the framework development. It is the main aim of the thesis to develop a framework that incorporates models of social gaming with unified conceptualisations and relevant theoretical constructs drawn from Activity Theory. In addition, the framework should also be able to guide the analysis of computer games, specifically the social aspects of play.

As explained in section 3.3, Activity Theory has been used extensively in a broad scope of areas involving the research of human activities. Unsurprisingly, some scholars have begun using Activity Theory to research activities mediated by computer artefacts. However, literature in the area of non-work domains, in which Activity Theory is used as a main theoretical framework, is lacking. Therefore, there is a need to investigate the applicability of the theory to this thesis. It is also my intention to address the shortcomings of Activity Theory presented in section 3.4 so that the process of activities can be visualised in the triangle model.

Therefore, the overall aim of this chapter is to investigate the appropriateness of Activity Theory for analysing computer-mediated social interactions. More specific goals are:

- to develop a model for analysing computer-mediated social interactions by revising and adapting Engeström's (2001) Activity Theory triangle and Leontiev's (1978) hierarchy of activity
- to apply the model to analyse a computer-mediated online community in order to give insights into how the community evolves and develops

The chapter is structured as follows: first I describe the data collection and the analytical methodology of this study. Then, I explain in detail the revised activity model, which I call Computer-Mediated Activity Model (CMAM). This is followed by the findings of the game community analysis. Finally, the discussion of the results and the implications are presented.

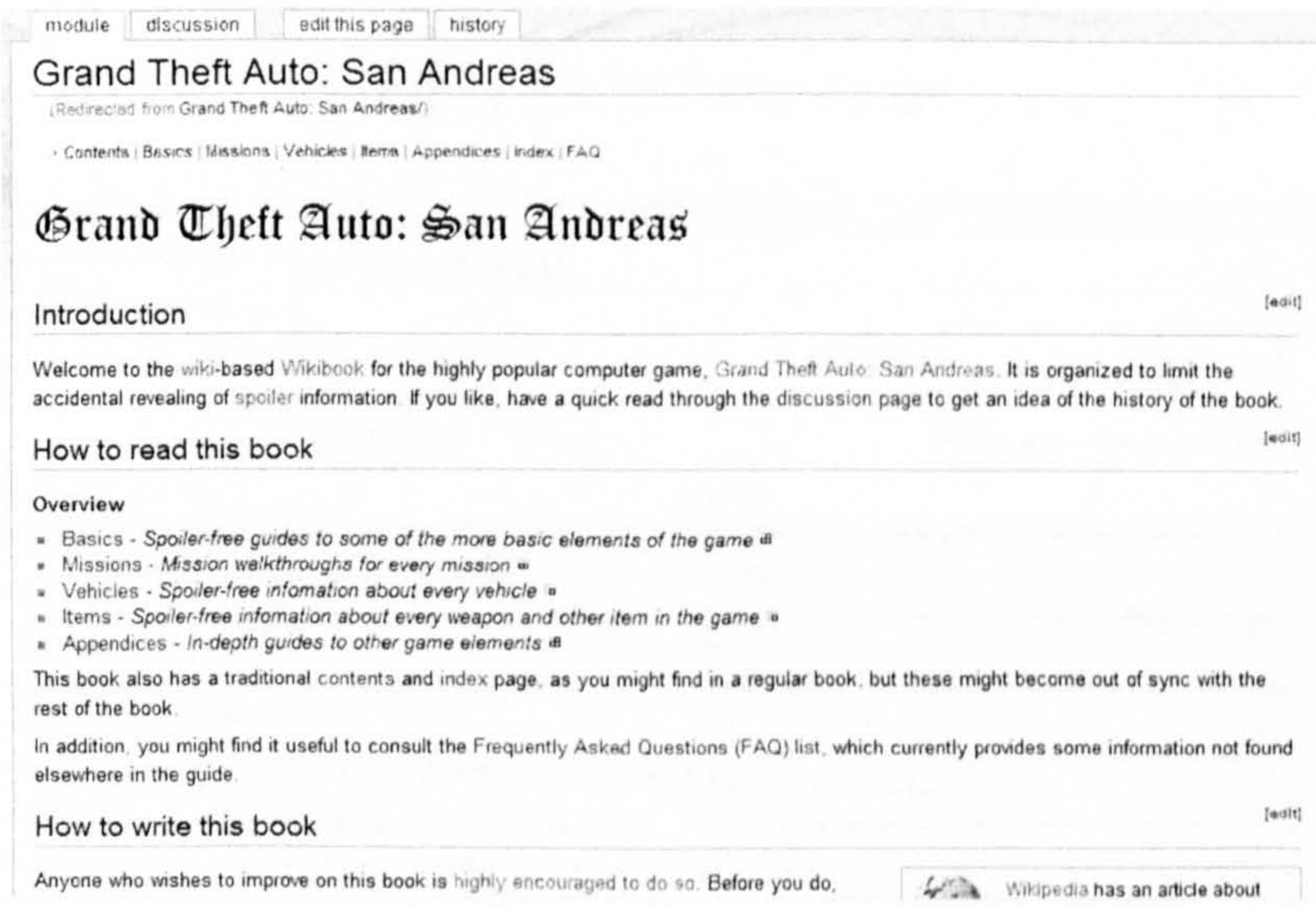
This chapter aims to address research question 1 (How can Activity Theory be used for modelling computer-mediated social interactions?).

4.1 Methodology

The study consisted of two parts: the revision of the activity triangle model and the analysis of the game community with the revised model. First all of, let us look at the particular game community I chose.

4.1.1 The game community

I analysed the game community of "Grand Theft Auto San Andreas" (Figure 3.5) which collaboratively constructs a Wikibook that provides game-related information to the players. "Grand Theft Auto San Andreas" Wikibook (Figure 4.1) was selected for this study because of my familiarity with this game and a preliminary scrutiny of the community website revealed that the participation of this community was active (at the time of the analysis), thus it had sufficient data for analysis.


module discussion edit this page history

Grand Theft Auto: San Andreas

(Redirected from Grand Theft Auto: San Andreas/)

Contents | Basics | Missions | Vehicles | Items | Appendices | Index | FAQ

Grand Theft Auto: San Andreas

Introduction [edit]

Welcome to the wiki-based Wikibook for the highly popular computer game, Grand Theft Auto: San Andreas. It is organized to limit the accidental revealing of spoiler information. If you like, have a quick read through the discussion page to get an idea of the history of the book.

How to read this book [edit]

Overview

- Basics - *Spoiler-free guides to some of the more basic elements of the game*
- Missions - *Mission walkthroughs for every mission*
- Vehicles - *Spoiler-free infomation about every vehicle*
- Items - *Spoiler-free infomation about every weapon and other item in the game*
- Appendices - *In-depth guides to other game elements*

This book also has a traditional contents and index page, as you might find in a regular book, but these might become out of sync with the rest of the book.

In addition, you might find it useful to consult the Frequently Asked Questions (FAQ) list, which currently provides some information not found elsewhere in the guide.

How to write this book [edit]

Anyone who wishes to improve on this book is highly encouraged to do so. Before you do, Wikipedia has an article about

Figure 4.1 The main page of the "Grand Theft Auto: San Andreas" Wikibook

Each page of the Wikibook has its own history page that documents its evolution by recording all the changes/edits made by every participant. It contains the following information: who made the change, what changes were made, when they were made and an option to let the participant explain why a change was made. Figure 4.2 shows the history page for the main page of this Wikibook. It displays a list of all the versions of the page from its creation to its current version. To

identify the differences between two versions of the page, we can select and compare them from the history list (Figure 4.3).

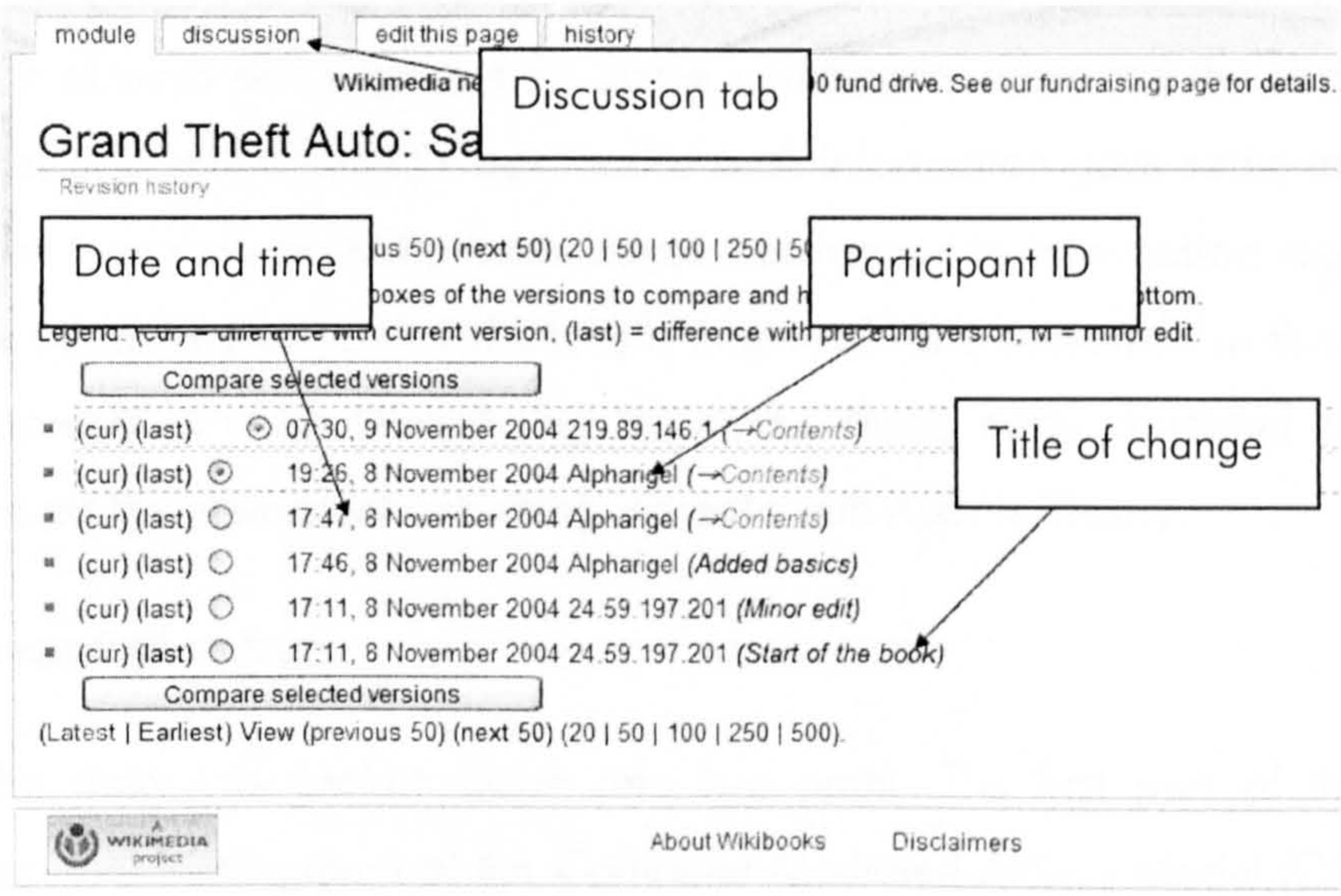


Figure 4.2 The history page

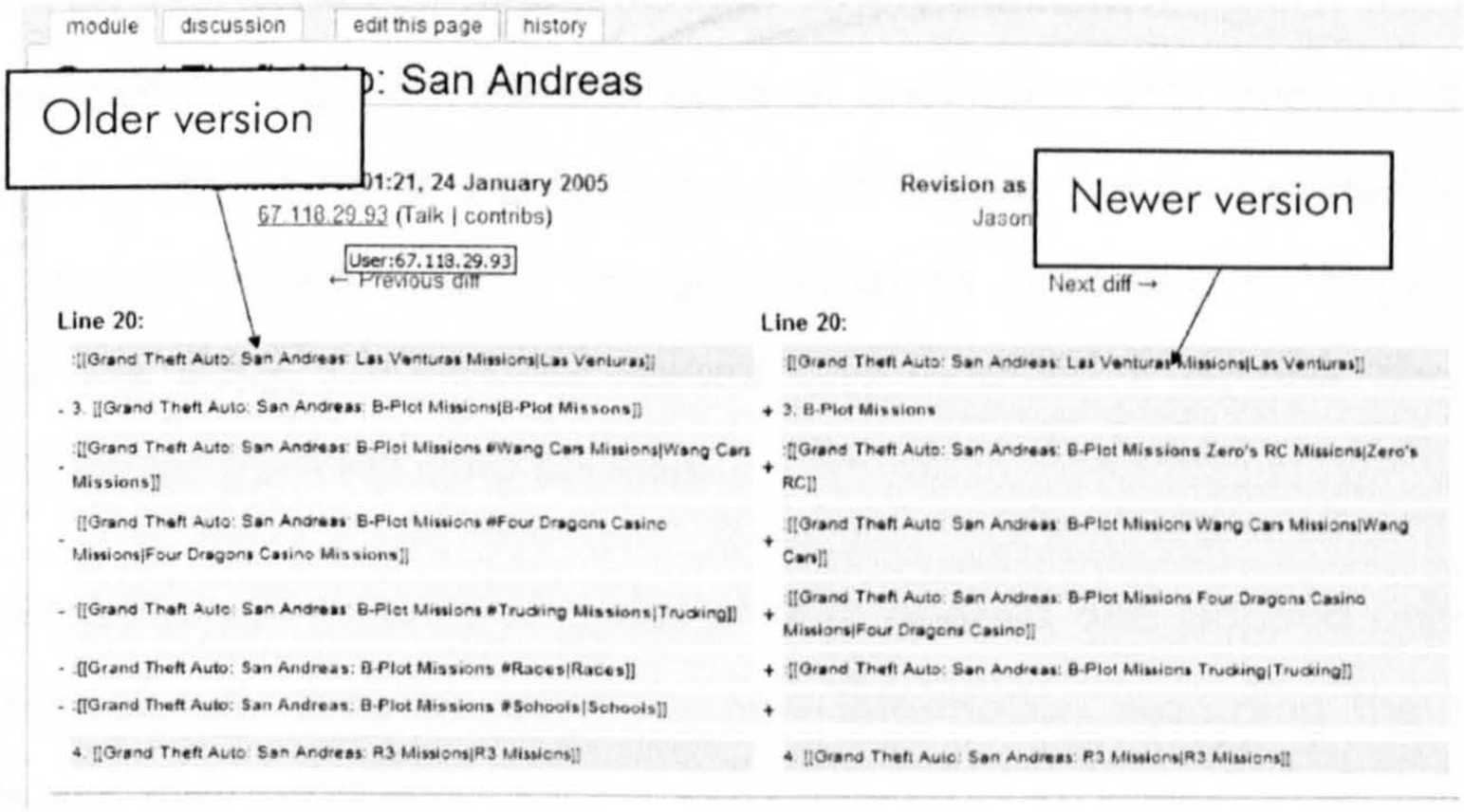


Figure 4.3 The version-compare function

4.1.2 Data collection method

I collected data from 11 pages of the Wikibook. These pages were the work of 65 participants who contributed a total of 421 edits. The collected data were dated from 8 Nov 2004 to 22 June 2005 (a total of 226 days).

I also collected the discussion among the participants in the discussion page (if any). Participants can start a discussion for each page they are working on by clicking the discussion tab (Figure 4.2). Apart from these, I examined the title and description of each edit (Figure 4.2). Some participants described the changes/edits they made, and why a change was made; such information gave some insights into the goal of their actions. Meta-book pages which provide information regarding the Wikibook project were examined as well. Empirical data presented in this study was also comprised of notes kept during the study. These notes consisted of personal reflections on the method of analysing the data with Activity Theory.

4.1.3 Analytical method

The data was broken down into two parts. The first part of the analysis focused on the development of the Computer Mediated Activity Model (CMAM). The model was founded on Activity Theory and grounded on empirical data. Hence, the analysis was both deductive and inductive. It was inductive because the development of the CMAM was based on the grounded theory method, in which the theoretical model emerged through the iterative cycle of qualitative data analysis. It was also deductive because the result was founded on an existing theory. I started the analysis with the original Activity Theory triangle model as proposed by Engeström, and throughout the study, I constantly revised and modified it as new concepts and relations emerged from the data analysis.

I went through a series of cycles of data analysis and stopped only when the examination of new data revealed no new information regarding the theoretical constructs and their relations.

Then, using the CMAM, I examined the second part of the data on how the game community evolved and what characteristics led to the growth of such a community. In other words, in order to demonstrate the usefulness of the CMAM, I applied it to describe the data collected from the Wikibook game community.

For each page of the Wikibook, I recorded and examined all the changes/edits as recorded from its history page and then categorised the changes. For example: was it a change of game contents or was it a deletion or a correction of grammar? The categorisation for each change of the page was recorded and the

same process was repeated for other pages until no new category could be found. In order to validate the category, I ran a focus group with three colleagues who have experiences in similar qualitative research. I started by explaining the category scheme to them. Then each participant was required to apply the scheme to check if it was able to explain the actions in a new Wiki page. Feedback was gathered and any discrepancy was discussed and resolved in order to obtain a robust category set. The category will be explained in detail in section 4.3.

Guided by the CMAM, I analysed the categories with the fundamental aspect of the activity by examining the relationship between the subjects and the object. Then, I analysed Vygotsky's mediation model of activity system consisting of individual actions and tools. The analysis was extended to the whole community of the system to include emerging rules and the division of labour (DOL) that mediate the community. The focus was mainly on the concept of externalising the internal meanings onto a sharable artefact through mediation. More specifically, I looked into:

- Subject and object: What are the actions that act on the object and transform objects into outcomes?

- Action and operation: How do actions shift to operations and vice versa? How do tools mediate individual actions and operations? What is the nature of the mediating tools? How do they support the development of the Wikibook?

- Negotiation and agreement: What is the negotiation that transforms objects to outcomes? How do negotiations shift to agreements and vice versa?

- Rules and division of labour (DOL): What is the nature of implicit and explicit rules that mediate collective actions (negotiation)? How is the DOL manifested in the community? How do rules and DOL support the Wikibook development?

It should be noticed that the analysis could be expanded beyond the above aspects. There are various ways of looking at the data using the CMAM model, but

for the purpose of clarity, I chose to focus on the above four aspects which are the main strength of the model.

4.2 Findings: Computer-Mediated Activity Model (CMAM)

The CMAM was developed based on Activity Theory. It must be emphasised here that the study was not aimed to develop and expand the theoretical tradition of Activity Theory. Rather, Activity Theory served as a theoretical foundation to this field of study. Through the data analysis of the game community, it was found that social interactions mediated by computers can be analysed through externalised actions since the users are often constructing something external (e.g. Wiki pages, sentences, etc). Thus, the object and outcome of this kind of activity are often external and tangible. In this respect, I would like to highlight that in the context of computer-mediated social interactions, Activity Theory purports the creation of external symbols to move symbols constructed internally and locate them in the environment.

This aspect of social interactions provides a very useful theoretical position in game studies within the socio-cultural setting. It emphasises the tangibility of objects and the construction of external artefacts. Recent development of games has witnessed the advent of games with a focus on constructionist play. In other words, instead of simply manipulating "entities" in the game space, constructionist games allow for the construction of these "entities". The most prominent example is probably The Sims (Maxis, 2000) series in which building houses, families, game avatars is a main feature of the game. In addition, when observing the socio-cultural context of game play, in many cases, these kinds of "constructionist play" activities arise around the game even if they are not explicitly supported by the game. Players engage in creating artefacts external to the game such as walkthroughs or artefacts which can be integrated into the game, like 3D models, game levels, etc. Therefore, Activity Theory could cast a different perspective on how the play activity manifests in the social context of games. The study on these play activities is reported in chapter 6.

In this section, I present an adaptation of Engeström's (2001) triangle activity triangle that can enable us to analyse computer-mediated social interactions, especially externalised "constructionist social interactions". I also try to articulate,

within the modified triangle model, the process through the hierarchy of activity (Leontiev, 1978) in order to allow us to analyse the dynamic process of social interactions.

Figure 4.4 shows the graphical representation of the revised activity model, which I call the Computer-Mediated Activity Model (CMAM).

The most important adaptation is that I explicated the externalisation process through mediation. This is marked by the shaded area and the named relationship of subject-tool-object and subject-community-object. I also added an extra arrow that links the outcome to the triangle in an attempt to show the internalisation process. Then, I highlighted the meaning of object and outcome as something tangible in order to emphasis the externalised nature of social interactions.

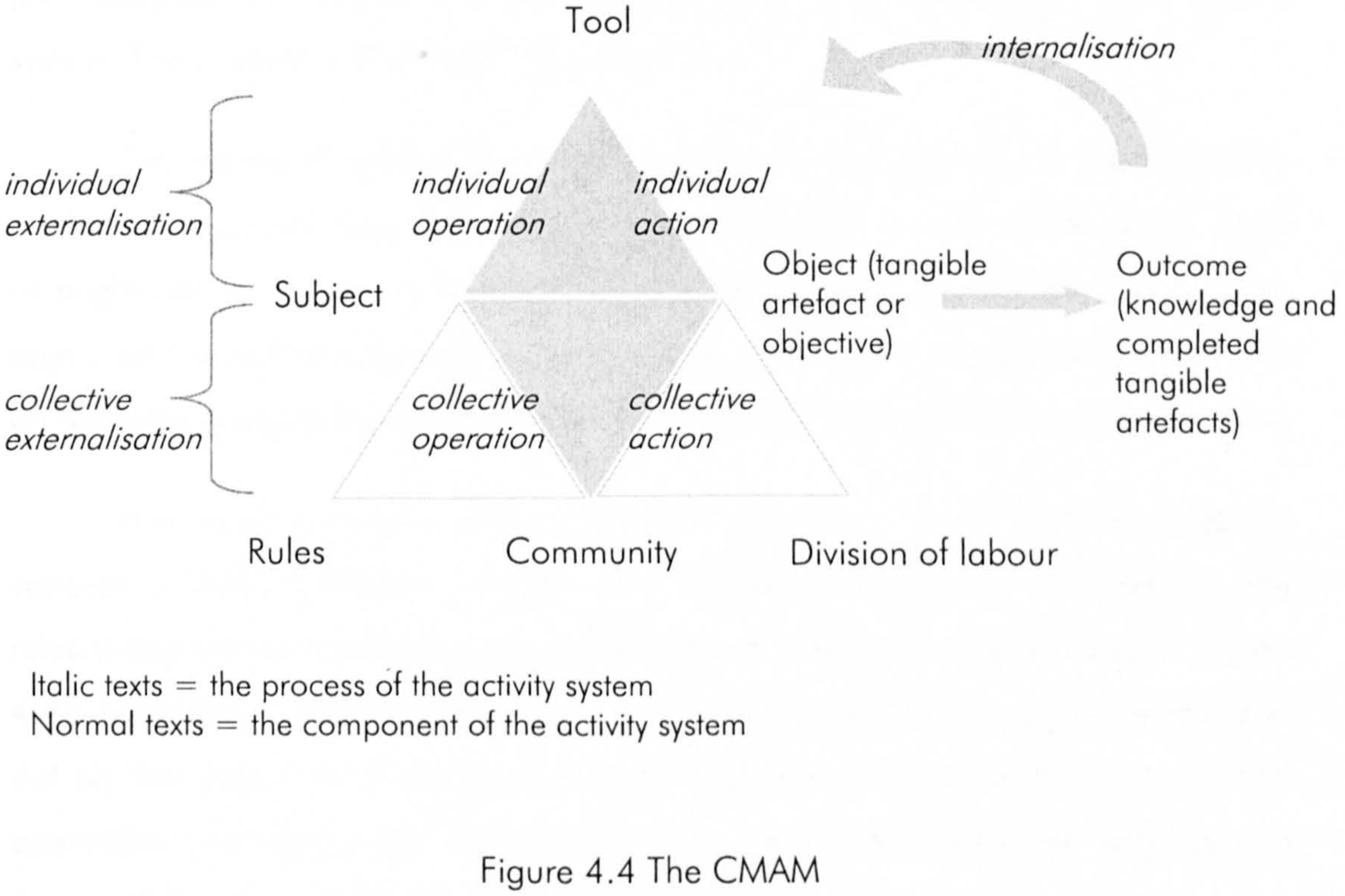


Figure 4.4 The CMAM

Like the original triangle model, the CMAM constitutes seven components. The subject in this case represents the user, while the tool is usually a computational tool which includes hardware and software. The tool also refers to the initial knowledge of the users. The community consists of users of different backgrounds working together to construct the object. The object is the tangible artefact which is being worked on by the users. It will then be transformed into the outcome which in

this context is the pool of game information and the complete sharable artefact (the Wikibook). Last but not least, the interaction between the community and the user is mediated by rules and the DOL.

Although an object in a general activity system could be conceptual or abstract, constructionist activities emphasise tangible objects which are created by the users to express their internal ideas. Mediated by tools, usually computational ones, users are able to project their initial understanding of a concept and transform it into knowledge which is situated in both external objects and the users' mind. The concept of object should not be confused with the tool. Objects are something incomplete that are currently being constructed by the user. Tools are something used by the user to construct the object and they can be physical (such as pencils) or conceptual (such as grammar rules). It should also be noted that a completed object (the outcome) can eventually become a tool in the next generation of an activity system. This process is known as internalisation.

The notion of artefact and tool should also be clarified. In this thesis, an artefact is a general term that refers to a piece of human-made article which might or might not be used as a tool in the mediation process. An artefact could be an object (unfinished raw material, or work-in-progress) which is later transformed into an outcome (a complete artefact) while a tool is an artefact that mediates the activity.

Having explained the components of the CMAM, I would like to visualise the concept of externalisation through the hierarchy of activity by defining the relationship between subject, tool, community and object (the shaded area in Figure 4.4). According to Leontiev (1978), the subject *operates* the tool non-consciously to *act* on the object at a conscious level. In addition, I propose that actions and operations also take place at a collective level. The subject *collectively operates* with the community to *collectively act* on the object.

One example of collective actions and collective operations in the context of Wikibook is agreements and negotiations: an agreement on the developing artefact takes place through the process of negotiation. Thus, the subject *agrees* with the community to *negotiate* the object. I also maintain that like individual operations, agreements happen non-consciously. The difference between the two concepts is

that individual operations take place individually whereas agreements take place collectively. In other words, an individual operation is conditioned towards individual non-conscious (meaning that it happens without the subject realising it consciously), while an agreement is conditioned towards collective non-conscious (meaning that it happens without the community realising it consciously). Table 4.1 presents my proposed hierarchy of collective actions and collective operations.

Table 4.1 A hierarchy of collective actions and operations

Unit of Analysis	Stimulus	Subject
Individual Action	Goal	Individual conscious
Collective Action	Shared goal	Collective conscious
Individual Operation	Environmental condition	Individual non-conscious
Collective Operation	Social condition	Collective non-conscious

Mediated by the tool and the community, the user externalises her initial stage of knowledge through object construction. The individual externalisation (mediated by the tool) can be broken down into actions and operations. Actions are directed towards a personal goal and are carried out with careful deliberation.

For example, in order to write a book with a word processing program, the author (the subject) needs to construct sentences carefully in order to express herself correctly. On the other hand, operations are automatic responses to a condition that arises from the environment of use and are carried out non-consciously without deliberation. For example, for a regular computer user, moving the mouse cursor around and clicking the cross button to close a software program are operations. Sometimes, an action might become an operation if it is practiced many times. This is called a shift of operations and actions and I demonstrate this through the example of a book writing activity (Figure 4.5).

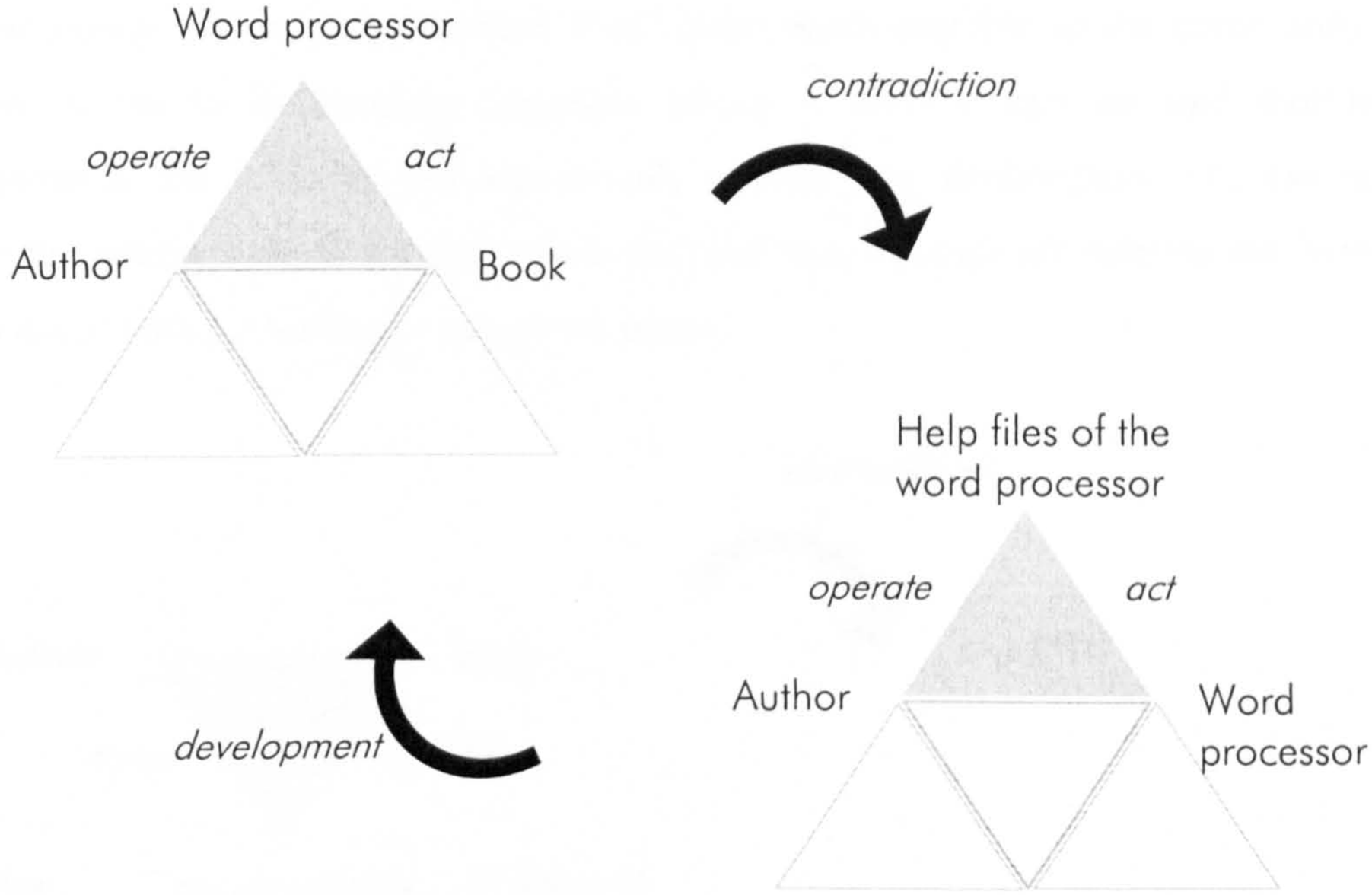


Figure 4.5 The transformation of individual action-operation

In a book writing activity, the author (presumably a regular word processor user) will operate (e.g. typing) the word processor at the non-conscious level and consciously act on the book (to select appropriate words, construct meaningful sentences and paragraphs) she is writing. At a certain point, the author encounters a new condition with the word processor she is not familiar with: say to insert a table into the book. Under this new condition, a contradiction is said to have happened. The conscious effort of the author is no longer placed on the book itself but instead is now placed on the word processor (e.g. to achieve the action: insert tables, the author performs the operation: read help files). Once the author has thoroughly learned about the table insert, she can again act on the book consciously and development is said to have happened.

In a similar way, the collective externalisation (mediated by the community, rules and division of labour) can be broken down into negotiations and agreements. Negotiations are brought about by the contradiction in a community and are carried out consciously with careful deliberation. For example, in order to write a book collaboratively, every author needs to negotiate and achieve an agreement about the writing style of the chapters (such as the use of gender neutral words). For that reason, it is said that agreements are driven towards a set of established rules among

a community. Once an agreement is achieved, each member in the community no longer needs to deliberately negotiate about it. Thus it can be said that final agreements are followed non-consciously without any deliberation. For example, once the writing style of the chapters is decided, each author will refer to the "writing style rules" without having to negotiate again.

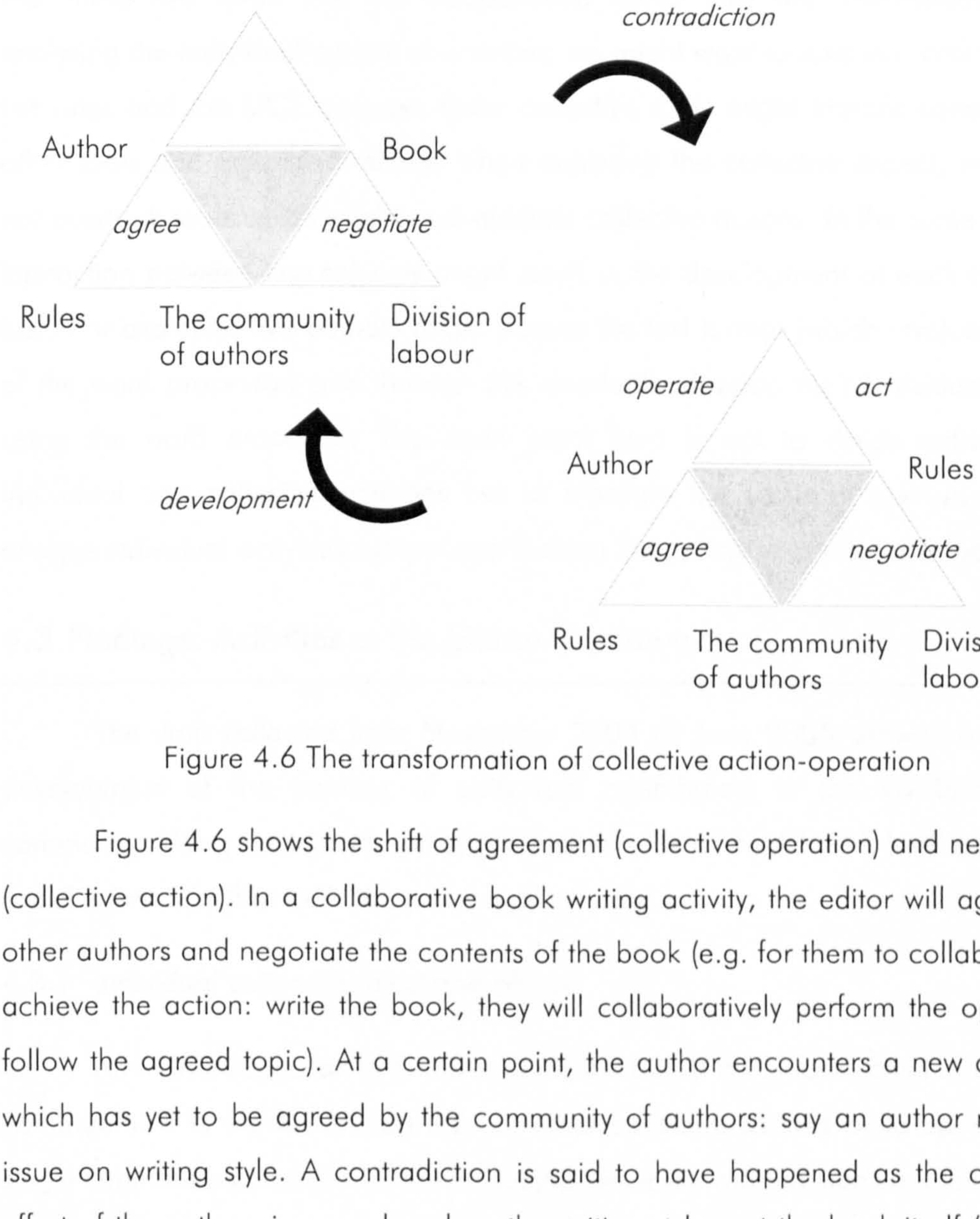


Figure 4.6 The transformation of collective action-operation

Figure 4.6 shows the shift of agreement (collective operation) and negotiation (collective action). In a collaborative book writing activity, the editor will agree with other authors and negotiate the contents of the book (e.g. for them to collaboratively achieve the action: write the book, they will collaboratively perform the operation: follow the agreed topic). At a certain point, the author encounters a new condition which has yet to be agreed by the community of authors: say an author raises an issue on writing style. A contradiction is said to have happened as the conscious effort of the authors is now placed on the writing style, not the book itself (e.g. now for them to collaboratively achieve the action: decide the text format, they will have to collaboratively perform the operation: discuss with the community). Once the authors have agreed the writing style, the rules are updated and they can again act on the book consciously and the development is said to have happened (operation:

agree with the topic and the writing style, action: negotiate the contents and collectively write the book).

It is also important to note that I explicitly marked a clear distinction between the individual and the collective level of actions in the CMAM as it is important to differentiate tools used for individual or collective actions. However I must emphasise that these two levels are not independent; rather they are inter-related. When analysing the individual aspect of activities, we might want to take into consideration the rules and the DOL because these collective tools might impose constraints to other tools and actions. Similarly, when analysing the collective aspect, we should not overlook tools which might also mediate collective actions. In the same way, the interaction between two subjects might result in the development of each individual tool. For example, two authors might discuss the text format (which involves the use of the word processor) and through this eventually develop their individual skill on using the word processor. The main point here is not to divide activities into individual and collective activities but to highlight the focus of analysis; we can analyse individual activities without overlooking the collective context and vice versa.

4.3 Findings: Activities in the Game Community

The data collected from November 2004 till June 2005 showed a constant development of the number of edits and contributors in the Wikibook game community. Using the individual-collective dimension of the CMAM, I will explain the social interaction that took place in the community.

4.3.1 Individual actions: subject and object

An individual action oriented towards the object is the focal point of an online community. It is the foundation that all other collective actions build upon since a single contribution from an individual subject will invite more actions and interactions among members in the activity system.

Table 4.2 Individual action categorisation

Action categories	Goals	Examples of actions
Book content	Directly related to the collective object, which is to build the game knowledge repository	Adding, editing or deleting the following: Textual game information Pictorial game information Meta-book contents
Writing style	To present the information more clearly	Rewording Rephrasing Formality of writing
English language	To present the information correctly	Correcting the following: Spelling Grammar Punctuation
Structure	To put the contents in a proper hierarchy and thus more easily accessible	Sectioning texts Creating new pages Indexing and table of contents Adding, editing or deleting: Links among pages External links Navigational links
Format	To make the contents tidier and more readable	Adding, editing or deleting: Table Font Heading List
Wiki mark-up	To structure and format the contents correctly	Correcting Syntax

Therefore, I first examined individual actions from the history entries of each page. The initial analysis was centred on the nature of actions by excluding the interaction among the participants. At this stage, I studied an individual engaging in goal-oriented actions to expand the Wiki page. By reflecting on the goal of each action, I classified them into six categories as shown in Table 4.2.

Please note that these actions might become automatic operations through practice. This will be discussed in more detail in section 4.3.2.

The first and the most important category is the book content which is the information repository of the community. This category involves adding, editing and deleting contents. Apart from game information in the form of texts and pictures, this also consists of meta-book content, the information about writing the book such as FAQ (Frequently Asked Question) and project meta pages. It can be said that the goal of this category of actions contributes directly to the outcome of this activity system.

Like its antecedent Wikipedia (Emigh & Herring, 2005), the game Wikibook aims for a certain level of formality and standardisation of language use, such as barring informal abbreviations and slang. Thus, the second category (writing style) of actions is directed towards providing a homogenous style of writing and avoiding ambiguous meanings. An example of such actions is presented below:

> User_64 (09:51, 8 May 2005, page_4)
> *Changed from*
> Also starting in the small towns like Angel Pine will make it alot easier and faster to beat, since the people spawn about 10 secs away from the hospital.
>
> *To*
> Starting in the small towns like Angel Pine will make this mission a lot easier, since the patients spawn about 10 seconds away from the hospital.

The third category (English language) involves language related actions such as correcting spellings, grammatical errors and punctuations. The goal of this category of actions is to produce error free and correct sentences.

The fourth category is structure and can be generally divided into two sub-categories: internal structure and external structure. Internal structure refers to the modification of organisation and layout of the content (including texts, images, etc) in a page. It includes moving texts to different locations, grouping texts in a new section, etc. External structure refers to the creation and editing of links among pages. It was observed that the Wikibook started with no clear external structure; as information grew substantially, more pages were created and linked to each other in order to provide an accessible structure to the reader. From my observations, a huge amount of effort was put into modifying the external structure such as creating anchors, changing page names for linking, indexing, creating navigational links, etc.

The fifth category (format) is concerned with the typography and the format of the book including the font type, the font size, lists, tables, etc. The goal is to make the presentation of information more attractive and clear. The sixth category (Wiki mark-up) is related to the use of the Wiki mark-up syntax. Since the Wiki investigated in this study provides limited What-You-See-Is-What-You-Get (WYSIWYG) features, the participant has to rely on the mark-up syntax. Whilst English language and writing style are important for constructing contents, the mark-up syntax is important for structuring and formatting the information.

4.3.2 Individual externalisation: action and operation

I attempted to observe if some of the actions described in the previous section could become operations which, as explained earlier, take place non-consciously.

It is important to point out that on encountering changed conditions, we may have to reflect on the operation consciously again, shifting non-conscious operations back into conscious actions. Referring to the action categorisation (Table 4.2), I can speculate that due to their nature (i.e. their proficiency is dependent on practice) English language, writing style and Wiki mark-up might become operations as they mediate other actions such as book contents, structure and format. A possible instance of the hierarchy of activity for an individual could be the following:

- Activity: to build a game guide
- Actions: game information, structure, format
- Operation: mark up syntax, English language

The following shows an attempt of a participant, User_NSRP, to learn the Wiki mark-up language syntax for creating links:

> User_NSRP (13:04, 23 Dec 2004, page_7): attempt to add a link, but the link contains syntax errors (["'Big Smoke:'"])
> User_NSRP (13:04, 23 Dec 2004, page_7): try to fix the link ([["'Big Smoke:'"]])
> User_NSRP (13:04, 23 Dec 2004, page_7): try to fix the link ([["'#Big Smoke|Big Smoke:'"]])
> User_NSRP (13:08, 23 Dec 2004, page_7): link fixed ([[#Big Smoke|Big Smoke]])

It was observed that this participant was trying to learn the mark up syntax to add a link through a series of individual actions. It can be inferred that the author tried to project her current internal understanding of Wiki mark-up syntax. The externalised object (the particular Wiki page) became a tool that let the participant see and update her understanding of the mark up syntax. However, those who are fluent in the syntax will perform these edits through non-conscious operations.

Since in many cases tools are internalised knowledge (operate at the non-conscious level), I found two possible tools in this activity: language and Wikis. In addition, the subject of the activity system is the participant of the study and the object is the Wiki page under construction.

A Wiki site as a web technology can be regarded as a physical tool that helps the participants to externalise their construction. It is found that some participants tend to make a couple of changes consecutively. One possible inference is that they externalise their internal understanding so as to have a closer look at it. The change that is incorporated in the Wiki becomes the symbolic tool to mediate their next actions. As such, a Wiki site can also be considered an internal tool, as it consists of various signs such as English language and images. It can be said that Wikis help the participants externalise their internal tools (e.g. internal understanding of grammar) and situate them in the Wiki page as external tools (e.g. words, sentences on the page).

For new users who are not familiar with the Wiki, the Wiki itself might be the object of the action mediated by simple keyboard typing operations. After being used for some time, the Wiki becomes the tool to mediate the "real" objective of this

activity which is to create a Wikibook of game knowledge. Furthermore, the tool will be updated when the user encounters a different situation, say to add a table. If the users have not yet learned the mark-up syntax for constructing tables, they have to reflect on the tool consciously again. Thus, tools are dynamic and under constant change.

4.3.3 Collective externalisation: negotiation and agreement

A community is not just made up of a sum of separate and unconnected individual actions. An individual participant is related to and interacting with others in a community to transform the object into the outcome which in this study is a Wikibook of game knowledge. Therefore, I extended the analysis to examine the social dimension to investigate the emerging rules and the DOL that mediate the community. Collective actions take place when more than one user is trying to modify the same piece of information, be it a sentence, a paragraph or the structure of a page.

I have previously described the collective actions as negotiations and collective operations as agreements (section 4.2). I also pointed out that agreements are usually non-consciously carried out, while negotiations require conscious effort.

It is worth mentioning that the term "negotiation" is not used in a conventional sense in this context. Due to the very nature of Wiki-technologies, which allow only asynchronous interaction, negotiations are thus referred to as the process of at least two participants engaging in a series of at least two related actions on the same object. For example:

Participant_A (time_1, page_n): modify abcd to abab
Participant_B (time_2, page_n): modify abab to abef (negotiation occurs)

At this point, I identified the interaction of participants engaged in object-oriented negotiations to expand the game knowledge repository. By reflecting on the goal of each negotiation, I classified them into four categories as shown in Table 4.3.

Table 4.3 Negotiation in the community

Negotiation	Goal	Examples
Game content	To resolve the different understanding/mastery of the game	Correct or clarify game information
English language	To resolve the different understanding/mastery on the language	Correct grammatical errors and typos in another participant's writing
Structure	To resolve the different view on what a clear structure is like	Change the structure within a page or among pages
Format	To resolve the different preferences on the format	Modify the format of the text

The first category is the negotiation on the game contents which is most directly related to the outcome. Each participant who plays the computer game comes to the Wiki site with their own understanding of the game (about how to win the game). Therefore, the negotiation in this category is the most important and is centred on constructing information which is socially agreed by the whole community.

The second category is the negotiation of the English language such as grammar. Despite my belief that language is a tool, and hence should be mediated at the non-conscious (agreement) level, the language mediation occurs collectively at the conscious (negotiation) level, as shown in the following except:

> Dizzle (07:52, 29 May 2005, page_6): typos/grammar, "duel-wield" is changed to "deul-weld"
>
> ... (other actions)
>
> 69.196.128.202 (18:05, 20 Jun 2005, page_6): typos/grammar, "duel-weld" is changed to "duel-wielded"

The third category involves the internal and external structure as discussed previously. One of the most common examples in this category is the negotiation

about the name of a link. It is found that external structuring was always negotiated by two specific participants in this Wikibook. Finally, the fourth category is the typology and formatting of the texts such as the font types:

> User_MTG (04:17, 9 Jun 2005, page_1): add title of the page with different fonts (Beckett, Diploma)
> User_MTG (11:20, 9 Jun 2005, page_1): change font face for the title Old English Text MT
> User_12 (12:34, 16 Jun 2005, page_1): change font size from 12 to 10
> User_A (17:28, 17 Jun 2005, page_1): add font template

Like the relationship between operations and actions, negotiations can be transformed into agreements. For instance, two different participants might have different opinions on the format of the Wiki page and keep editing each other's format until both of them are satisfied at certain stage. Once this stage has been achieved, new rules will arise and a negotiation is said to have been transformed into an agreement. However, when new conflicts arise, the community has to negotiate it again consciously. Once the conflict is transformed into rules, agreements will be achieved. A possible instance of the hierarchy of activity for a community could be the following:

- Activity: to build a game guide
- Negotiation: English language, game contents, structure, format
- Agreement: mark up syntax, writing style

Not all actions need to be negotiated as some actions come to a conclusive agreement. For example, mark up syntax does not involve negotiations as it is more objective; if one makes a mistake, the mistake can be corrected without conflict. In this case study, there is no disagreement on general writing style either; therefore for the specific Wikibook I studied it is safe to assume that most participants have agreed to use a formal writing style.

4.3.4 Rules and division of labours (DOL)

Like individual actions, collective actions are also mediated actions. Collective actions such as negotiations result in the transformation of collective tools

such as rules and the DOL. When a new negotiation becomes an agreement, rules or the DOL will be updated. In addition, negotiations might also result in revising the tool. For example, negotiations on grammar will eventually lead to an agreement that updates the conceptual tool about English in each individual. Indeed, rules and the DOL are also some kinds of conceptual tools. But instead of just meditating individual actions, these tools also regulate collective actions.

Like any other community, the community inherits rules from the socio-cultural background of each participant. Some participants were already part of other Wiki communities before they joined this game Wikibook. However, since every community is to a certain extent unique, existing rules will be amended and new rules will be introduced through negotiations.

In some cases, the rules are made explicit. These rules are written in a specific Wiki page called meta-page and are followed and controlled more strictly. These rules are about formatting which includes the template for the format of pages and the linking name convention. Whilst some rules are explicitly written in a page and are followed and controlled, some rules are implicit, like the use of non-abusive language and the writing style. These rules are agreed without being stated explicitly. Even though this game, Grand Theft Auto San Adreas, itself contains explicit violence and inappropriate language, it is observed that the Wikibook community generally has agreed to avoid the use of abusive language in writing the game's Wikibook:

> User_20 (18:25, 22 Jan 2005, page_7): add abusive language
> ... [other actions]
> User_69 (14:57, 10 Apr 2005, page_7): the abusive info is removed

Rules make sure that an agreement can be achieved without having to consciously negotiate the actions. The project standard meta-page, once being understood and agreed by the community, becomes a rule to mediate the actions and negotiations on the page in progress (the object).

The DOL guides the collective actions by setting the roles and responsibilities of the community members. In fact, the DOL is a subset of rules that organise the division of tasks among the members. In this particular study, the DOL was not clearly marked in the Wikibook as most participants played many different roles.

However, by examining the nature of actions, five categories of DOL were derived (Table 4.4):

Table 4.4 Division of Labour in the Wikibook

Typology of DOL	Description	Related actions
Authors	Contribute new information	Book info
Reviewers	Check and correct information	Book info
Proof readers	Check and correct grammar and typos, writing style, etc	English, writing style
Editors	Format the type face, etc Structure the pages and links	Formatting, structure, mark-up
Vandalism monitor	Control vandalism	Revert the vandalised texts

Authors are the game players who contribute new information about the game. Reviewers are usually also authors and they check the validity of the information. As they read, they find errors and correct them. Proof readers are those who check the correct use of grammar, and writing styles. They might be someone who visits the site to get information about the game and makes corrections on any errors they encounter.

Editors keep the page tidy and make it look nicer by formatting the font types, styles, etc. They also help maintain the clarity of the page structure: e.g. the hierarchy of links. In this study, only two participants were actively maintaining the structure. They were also the two most active authors. It was also observed that vandalism results in a new role, vandalism monitoring. For example, there were some participants like, User_G, whose only contribution was to fix vandalism:

> Player_69 (20:19, 14 Jun 2005, page_7): add nonsense texts
> User_G (2:01, 14 Jun 2005, page_7): revert to a previous version

Although a technology like this invites "vandalism" (this includes the massive deletion of the text, adding irrelevant contents, using abusive language, and any other actions that are directed against the objective), which was identified in a number of occasions in the study, it was basically controllable. The Wiki itself has the revert function that can reverse a page to its earlier version. In addition, there is a self-regulating mechanism within the community that prevents the website from being vandalised.

4.4 Discussions and Implications

Let us revisit the goals of this chapter. First, I have revised the activity triangle model, called the Computer-Mediated Activity Model (CMAM) for analysing computer-mediated social interactions. I have presented the findings of activity analysis of a Wiki community. Based on the CMAM which draws largely from Leontiev's hierarchy of activity and Engeström's triangle model of activity system, I successfully cast some light on the social interaction in a game community. The findings showed that both individual actions and collective actions (negotiation) constitute the activity oriented towards the objective of building a game knowledge repository. I also demonstrated how the development could occur individually through the action-operation transformation, and collectively through the negotiation-agreement transformation.

Apart from these, the CMAM also helps analyse the tools, capture the rules and the DOL which mediate these actions. This must be further explained to differentiate individual mediation and collective mediation. Individual mediation places its emphasis on "how a user uses the tool to write the game guide". In other words, it is about the *affordance* (Norman, 1999) of the tool that supports what an individual can do. Collective mediation is about the community, which consists of two major components: rules and the DOL. Rules define the social conducts; what should be done and should not be done in a community. This should not be confused with the affordance of the tool. The tool might afford certain actions such as writing in abusive language, but the rules might ban this action. The DOL is self explanatory: how the work load is divided among many users in a community.

Based on my observation, individual actions help sharpen the mediation tool, while negotiations bring about new rules or refine existing rules that mediate the collective action. In short, the CMAM is useful to analyse the community in the following ways:

- It helps understand the individual mediation process: subject-tool-object
- It clearly presents the collective mediation process: subject-community-object
- It reveals the emerging collective tools (i.e. rules and the DOL) in the community

The CMAM appears to be a promising model as it gives an analytical lens to analyse and interpret the data. It provides different perspectives of analysis, as it casts different light on the data so that researchers can examine it from multiple perspectives, for instance, by focusing on different sub-triangles of the activity system diagram. It also helps examine the development process: how development occurs individually and collectively through the externalisation and transformation of the hierarchy of activity from action to operation. Furthermore, both individual and collective aspects are given equal importance. The CMAM informs the development of the whole community and the individual development. It explains how individual development contributes to the community growth and vice versa.

My second aim was to use the CMAM to obtain insights on how this community evolved and developed. In a Wiki space, knowledge is socially constructed; it is created individually with tools, negotiated and agreed within a community based on emerging rules and the DOL. It starts as a single unit of information (a page in the case of the Wikibook) and grows organically and evolves into a complex and well structured set of knowledge. From the findings, I conclude what contributes to the development of the community is the fact that:

- the users share some historical backgrounds: they already share some of the tools/rules before joining the community, they also share an interest on the same topic (a specific game in this case)
- users share the same object (goal) (in this case being to build a game guide book)

- the user's individual action: this goal-oriented individual action triggers negotiations that leads to the growth of the space
- the community's agreement on the object: not only the community shares the same object, the community must also be able to negotiate and agree on the object
- they share tools that support these actions and negotiations
- they share emerging rules that coordinate the activity
- they follow a DOL that divides the responsibilities

Apparently, the evolution and growth of a community needs more than a group of devoted users who share the same object. It also involves negotiations and agreements among the users on the object. Although every user tends to act towards her own goal, it takes the compromise of the entire community to agree on the object.

I would like to summarise the contribution of the CMAM to the traditional activity triangle model:

- The traditional triangle model represents activity systems with only the elements of activity, while the CMAM adds processes into the seemingly static presentation
- The CMAM also clarifies and highlights (collective) actions and (collective) operations within the triangle
- Most importantly, it distinguishes the individual-collective dimension without failing to acknowledge the interdependency between these two dimensions

4.4.1 Practical uses of the CMAM model

The CMAM incorporates Leontiev's (1978) conception of the hierarchy of activity within Engeström's (2001) triangle model. Furthermore, I also proposed a collective dimension of the hierarchy, namely negotiation and agreement that explicate the externalisation process at the collective level. It also highlights the process of activities particularly externalised social interactions. These add a new perspective to qualitative data analysis, which is applicable to computer-mediated

social interaction research. For instance, one of the focuses of this research is to examine user activities both as a group and as an individual. With the CMAM, we are able to visualise individual and collective externalisation in a community and how these might eventually lead to development. This is particularly interesting in the case of collective externalisation as my analysis revealed that collective externalisation could lead to individual development as well as collective development. One example identified in the study was that the negotiation among participants can not only result in the development of a mutual understanding of formatting rules, but also can cause each individual participant to update her personal knowledge about the game.

While investigating a computer-mediated community, it is crucial to also look at the tools, which in the case of the CMAM, are divided into individual tools and collective tools (i.e. rules and the DOL). This distinction is important when analysing activities from both individual and collective perspectives, as it helps us identify the development. For instance, when two users are interacting and acting on a specific task, we would like to know if this interaction will eventually develop individual tools (e.g. learning to use the interface of the system) or collective tools (e.g. agreeing upon the appropriate protocol of behaving or agreeing upon the role of each learner in the community). As such, I believe that the intricate relationship between individuals and groups (or communities) is captured through the use of the CMAM.

This points to the internalisation arrow added to the original triangle model. In order to fully understand the social interactions of an online community, it is noted that the outcome is channelled back to the activity system, modifying the elements of the triangle and updating the activity as a whole.

To further demonstrate the practical usefulness of the CMAM model, I present two possible cases in which this model can be helpful in the study of social computing:

- Design: the CMAM can provide a holistic view for sociability design. For example, when designing a social technological system, it should be noticed that technologies (e.g. the computers and web systems) are only one part of the design process. Focus should also be placed on the formation of

communities through supporting social interactions. Possible contradictions (both individual and collective) should be included into parts of the design. While designing the systems, mediation tools should not only be just treated as individual but also collective as well.

- Evaluation: as mentioned before, in order to evaluate social interactions, both individual and collective perspectives can be taken into consideration through the individual-collective distinction made by the CMAM on the hierarchy of activity, which is visualised explicitly in the triangle.

4.5 Conclusion

This chapter addressed research question 1 of the thesis (How can Activity Theory be used for modelling computer-mediated social interactions?). I investigated how Activity Theory can help research social interactions in computer-mediated communities. The activity triangle was revised and the CMAM was proposed. The model embedded the process of activities into the triangle and highlighted the internalisation of the outcome. It also emphasised on the distinction of the individual-collection dimensions without overlooking the connection between them.

Using the CMAM to examine the game Wikibook community, I showed that the proposed model is useful because instead of focusing only on the interaction between the user and the technology or the interaction among users, it includes both dimensions of a community: the individual and the collective aspects. The traditional model of activity system has some limitations in analysing the dynamics process of the activity, as well as the understanding of individual-collective relation. The revised model has addressed these shortcomings.

Building on the CMAM developed for analysing generic computer-mediated social interactions, I set out to apply the model into a specific domain, game play activities, especially social interactions between players. In the next two chapters I will describe two studies in which I modelled in-game play, out-of-game play and formulated the relation between these two types of play. The studies were conducted in order to develop a unified framework that could be used to study and understand social interactions of game play and game communities.

5 Intrinsic Play Model within Computer Games

Drawing on the CMAM for computer-mediated social interactions described in the previous chapter, this chapter presents a study to model in-game play with an emphasis on the social interaction.

In the previous chapter, I explored Activity Theory and its potential as a theoretical framework for computer-mediated social interactions by analysing a game community. I revised the original activity triangle and introduced a new model (called CMAM – Computer Mediated Activity Model) that accentuates the individual-collective distinction and the process of activities. With this theoretical foundation, I set out to develop a play activity framework for computer games. As specified in chapter 1, the framework should encapsulate the social activity within and around the computer game in a socio-cultural context.

In this chapter, as part of the whole framework development, I develop a model of in-game play activities (hereafter known as intrinsic play) with the CMAM in order to study play activities within games, particularly the social interaction. I start the modelling with intrinsic play as it is the most commonly studied aspect of game play and it is the most "direct way" of playing games (i.e. to interact with the game directly instead of playing "around" the game as in out-of-game play).

Therefore, the main aim of this chapter is to develop a model that can help analyse intrinsic play particularly social interactions in computer games without excluding the individual aspect of it. The model adopts the theoretical perspective of the CMAM and is informed by an observational study of game play. The specific goals are:

- to examine and identify the components of games as software tools
- to study play activities that emerge from the game and identify aspects of individual and collective play activities

The chapter contains two major parts. The first part is the interpretation of a wide range of game literature to establish an initial relationship between computer game studies and Activity Theory. I describe the study of identifying important themes from the game literature and the mapping of these themes into the theoretical constructs of Activity Theory.

In the second part, I illustrate a non-participant observation study involving 24 participants aged between 20 and 35. I also explain the modelling of intrinsic

play, by placing particular emphasis on the social interaction and how this affects individual game play and vice versa.

This chapter aims to address research question 2 (How does individual play and collective play arise within computer games and how can this in-game play be modelled?).

5.1 Stage 1: Computer Game Studies and Activity Theory

Being a theoretical framework for studying human activities in general, Activity Theory contains powerful theoretical constructs that offer theoretical explanations to certain phenomena particularly in human social activities. Therefore, it is reasonable to assume that Activity Theory can be used to research play activities which are a sub-set of the whole spectrum of human activities. However, play activities have different characteristics from ordinary human activities as highlighted by some game scholars (Huizinga, 1944). Therefore, at this stage, my intention is to establish the initial link between game studies and Activity Theory in order to identify the relevant characteristics of game play activity from the perspective of Activity Theory.

5.1.1 Methodology

To achieve this, I examined various definitions of games by gathering representative work in game studies, including journals and books (more than 20 pieces of work were analysed; refer to the references in Table 5.1). Reading through the literature, I identified important game themes and grouped related themes into categories. For instance, the theme "rules" recurred throughout major literature and was therefore identified as a major category. I repeated the same process of categorisation for both classic and contemporary computer game theories. New categories were formed and old categories were further supported by new evidences.

If contradictory or controversial themes were found, the categories would be re-shuffled to generate a consistent set of categories. Each category was described and supported by references. Finally I matched the themes to the key theoretical constructs of Activity Theory and provided explanations to support the matching.

5.1.2 Findings: the initial mapping of game studies and Activity Theory

Table 5.1shows the summary of the results of the analysis. This analysis of game literature and Activity Theory revealed the initial connection between Activity Theory and game studies. It cast light on some issues of game play and expanded the scope of conventional game studies. Most obviously my analysis has identified some important aspects (e.g. the process and the outcome) of game play which can be modelled with Activity Theory. Hence, Activity Theory is useful for researching play and computer-mediated social play. Three important perspectives of game studies are highlighted below: games as designed tools, games as individual and collective play activities, and games as participatory culture.

Table 5.1 The mapping of the concepts of Activity Theory and computer games

Theoretical constructs of Activity Theory	Themes of game play	Supporting literature
Object	Games are directed towards objects/goals to be attained	(Kelley, 1988) (Huizinga, 1944) (Lindley, 2002) (Steinkuehler, 2004)
Rules	Games have rules and convention	(Huizinga, 1944) (Caillois, 1961) (Suits, 1978) (Avedon & Sutton-Smith, 1971) (Kelley, 1988) (Salen & Zimmerman, 2003) (Klabbers, 2003) (Crawford, 1982) (Juul, 2001) (Frasca, 2001) (Tosca, 2003) (Johnsenl, 2003) (Ang, 2006) (Lindley, 2002) (Gingold, 2003) (Steinkuehler, 2004)
Tools	Games are mediated by tools/skill: the skills the player can perform in the game based on a set of game rules	(Suits, 1978) (Avedon & Sutton-Smith, 1971) (Kelley, 1988) (Klabbers, 2003) (Lindley, 2002) (Caillois, 1961) (Kücklich, 2004) (Steinkuehler, 2004) (Gingold, 2003)

Division of labour/role	Game players are marked by roles/identities: the role of the avatar played by the players and how players construct/submit to virtual identity in the game	(Klabbers, 2003) (Caillois, 1961) (Turkle, 1995) (Steinkuehler, 2004) (Gee, 2003) (Squire & Steinkuehler, 2003) (Gingold, 2003) (Yee, 2005)
Outcome	Games results in specific outcomes	(Bernard Suits 1978) (Avedon & Sutton-Smith, 1971) (Salen & Zimmerman, 2003) (Juul, 2003)
Contradiction and Development	Games involve conflicts and transformation: games are designed to bring about conflict to be resolved (transformed)	(Crawford, 1982) (Salen & Zimmerman, 2003) (Huizinga, 1944) (Klabbers, 2003) (Yee, 2005)

5.1.2.1 Games as designed tools

First of all, most conventional game studies treat computer games as designed tools. A game is a designed tool which the player needs to learn in order to achieve the game goal. With the emergence of realistic 3D technologies computer games have evolved from an abstract rule-based system to a complicated artefact with virtual worlds, rich audio visual descriptions, characters and stories. This is probably the most researched area of game studies and it is described in detail in section 2.1.

5.1.2.2 Games as individual and collective play activities

Games are also individual experiences. Different types of play patterns arise from the fictional and rule-based game tool. More often than not, playing a game is an individual learning experience (Crawford, 1982). It is a dynamic activity involving learning various rules, strategies to deal with different situations posed by the game tool, trying to achieve game goals and identifying roles in the game.

Some literature underlines the social dimension of games, pointing out the importance of studying games as social experiences (Klabbers, 2003). The literature

analysis showed that playing is often a collaborative process, marked by a division of roles. The development process of an individual not only arises through player-game interaction but also through interaction with other players. I would like to explain in more depth three themes related to games as individual/collective play activities, namely social play, transformation and outcome.

- *Social play*

In his work on the classification of games and simulations, Klabbers (2003) claimed that computer games are social systems. This follows Huizinga's view that culture arises in the form of play, and that play is inherently social. According to Klabbers (2003), computer games are models of real or imagined social systems which are shaped by the players. While playing a game, people apply knowledge and skills to overcome difficulties set by fellow players or by socio-economic circumstances.

His example, though not a computer game, provides more insightful information that reinforces the similarities between play and activity as described in Activity Theory. Below is an excerpt from his article:

"In a soccer game for example, the players, the coaches and the referees are the main actors (subject). They interact according to the rules (rule). Their resources (tools) are the ball, the soccer field, the stadium, etc. While confirming each other's roles (division of labour), and making use of the rules and resources, they produce and reproduce the social system concerned. By changing the interactions, the rules and/or the resources, they either transform (development) the system or produce a completely new one." (Klabbers, 2003) [parentheses added by the author to show their connection to Activity Theory]

The association between games as social play and Activity Theory can be identified as follows:

- Resources are an important part of play. This relates to *tools* in Activity Theory
- *Actors* imply the presence of subjects with agency
- Each actor holds different roles in play activities. This is similar to the *division of labour* in Activity Theory

- The *community* consists of the fellow players
- Play is also marked by *transformation* which change or produce new rules or resources

- *Transformation*

The last point of Klabbers' (2003) definition highlights a very important aspect of game, transformation which is very often neglected by contemporary game scholars whose main focus is computer games. As play activities move into the computer platform, they have become more "static" in the sense that almost all game rules are pre-written into the software, leaving very little scope for transformation as depicted by Klabbers. Furthermore, many computer games are meant to be played by a single player, reducing the possibility of rule negotiation and agreement. However, with the emergence of newer computer games with a focus on constructionist play and the advancing network capability of games, the concept of transformation of play begins to resurface. Activity Theory can be used to explain this important concept.

- *Outcome*

Avedon & Sutton-Smith (1971) defined games as *"an exercise of voluntary control systems in which there is an opposition between forces, confined by a procedure and rules in order to produce a disequilibrial outcome,"* while play is defined as "*an exercise of voluntary control systems.*"

This definition highlights another important concept which is overlooked by some game theorists: the outcome. This is one of the main characteristics that sets play apart from other activities in which play is often marked by the lack of concrete outcomes. More often than not, play is treated as something that is unproductive and hence yields no outcome at all.

Traditionally, work and play are thought of as separate and opposite activities. Parents frown upon their kids spending too much time playing rather than doing homework. At schools, toys, comic books and other materials, which are considered potentially disruptive to learning, are confiscated from pupils. The negative reception towards games is even more evident in the workplace. Play has

been often viewed as contrast to the efficient management and control of organisations and it is not uncommon that the use of game applications on the company desktop computer is forbidden by employers. Perhaps this is related to the view of play producing no outcome.

Some scholarly studies challenge this canonical view of play and attempt to paint a different picture on this issue. Anthropologists and sociologists asserted that it is almost impossible to grasp human culture unless we look at it through the prism of play and playfulness (Huizinga 1944; Caillois 1961). Huizinga (1944), one of the pioneers of academic game studies, offered a detailed exposition of the outcome of play. For him, play is a significant form of social and cultural functions. Following this, Caillois (1961) sought to extrapolate on the societal identities on the basis of games the society is engaged in. In his work of synthesis on play and games, Caillois cited Chinese culture as an example:

"Along with music, calligraphy and painting, the Chinese place the game of draughts and the game of chess among the four disciplines that a learned man must practice. They believe that these games train the intellect to take pleasure in the multiple answers, combinations and surprises which spring forth continuously from constantly new situations." (Caillois 1961)

The definition of game that claims that games produce no outcome is under criticism as rightly pointed out by Caillois. In play, not only is property exchanged, but goods or services are also produced. Both scholars regard play as something important in the development of societies, culture and even human civilisation. Therefore, the outcome of play is not to be trivialised. Drawing from this literature, it could be argued that the outcome of play could be individual development and socio-cultural development as a whole.

5.1.2.3 Games as participatory culture

It should be recognised that play happens not only within the game and play does not stop when the player switches off the game. The game play activity usually spills beyond the game world and penetrates the physical world in which the player is living. With the proliferation of a new game genre, known as Massively Multiplayer

Online Games (MMOG), computer games have created a social world within the game itself.

For Huizinga (1944), play is always kept separate from activities in everyday life as play is described to have its own space and time. Therefore, according to him, when engaged in a play activity, the player steps out of the real life into a temporary sphere of activities with a disposition of its own. This separateness of play is expressed in the metaphor of the "magic circle" which is defined by its strict set of rules. Within the "magic circle" of play, the intricate laws of ordinary life are replaced, by precise and undisputable rules that must be accepted as such and that govern the correct play of the game in this fixed space and for this given time.

In comparison to Huizinga, Caillois' (1961) definition of play is much broader, for he did not see rules as immutable and absolutely binding. His concept of a continuum between ludus and paidea suggests that rules emerge out of paidea (free play that is not restricted by rules) which then move closer to ludus (more structural play that is defined by rules). This paidea-ludus continuum is bidirectional: a rule-bound game (ludus) might also dissolve into paidea, if the players decide to no longer follow the rules and pursue other goals. Thus, the spatio-temporal separateness between play and ordinary life is less distinct.

In line with Caillois, Salen & Zimmerman (2003) did not regard the boundary between play and the real world as impermeable and their focus of study lies on the possibilities of transgression of the boundary. They asserted that *"certain games are designed to play with this line of demarcation, calling attention to the borders of the magic circle."* Therefore computer game studies should not be limited to merely play activities within the "magic circle" but the participatory culture around the game.

5.2 Stage 2: An Activity Model for In-game Play

Based on the initial analysis of Activity Theory and game literature, I begin to model intrinsic play by observing players engage in playing games. The goal is to develop a model for intrinsic play that will describe computer games as designed software tools and emergent play, individually and collectively. The CMAM developed in chapter 4 is used as a foundation of the model.

5.2.1 Methodology

5.2.1.1 Data collection method

Ten computer games were used (see Figure 5.1). The games were carefully selected based on the high level game typology proposed by Lindley (2003): ludic, simulation and narrative games. Two games were chosen from each category. In addition, four console-based multi-player games (refer to Figure 1.1(b)) were included. This gave me a representative cross-section of the wide range of games currently available. Single-player games were included in the study because I wanted to investigate how social interactions are affected by individual play and I believe that the understanding of individual play is crucial in analysing social interactions.

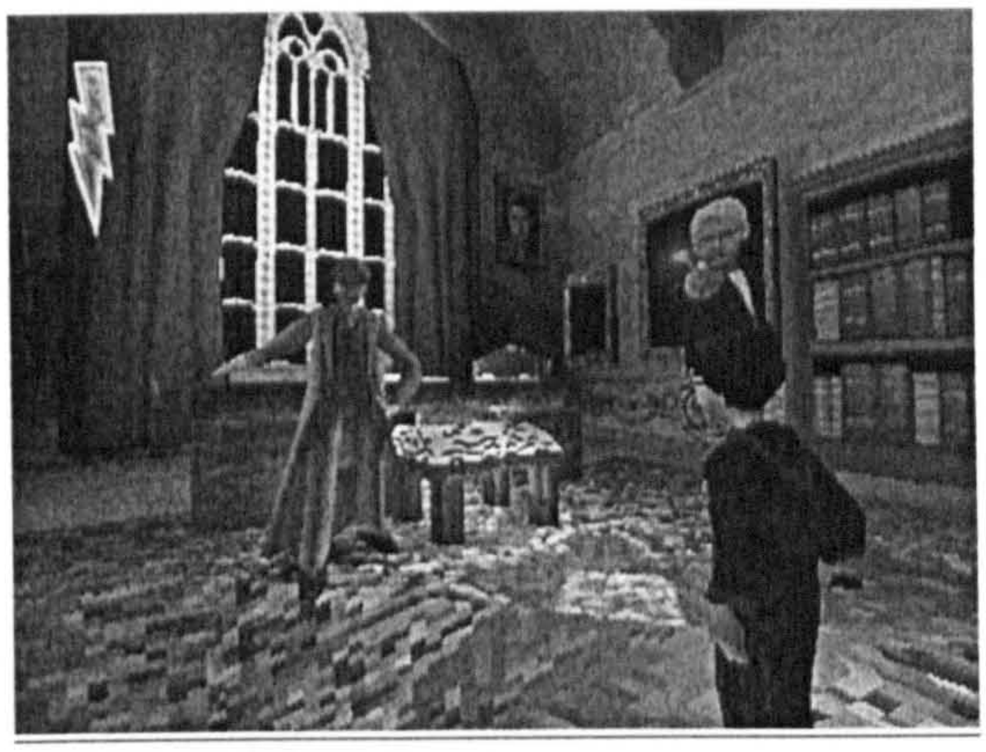
Before the study was run, I spent some time playing the games to familiarise myself with the games. In addition, extra materials such as game magazines, online reviews, walkthroughs, strategy guides were read and reviewed. This also helped identify if the games were suitable and provided useful data in the modelling. Through pilot studies, I also tested the game technicality for example to ensure that it was possible to record the game screen. Some games were actually changed for similar games due to technical problems. The final selection of the ten games is shown in Figure 5.1.

24 participants (12 male, 12 female) aged 20-35 years old with educational levels ranging from school leavers to postgraduates were recruited. Participants were given a pre-questionnaire to obtain their demographics and their self-reported game play behaviours. The majority of them (21 participants) played computer games for 1-6 hours a week. In this study, each participant was required to play two games – one single-player and one multi-player game (in which participants play with or against each other.) – each for about 30 minutes.

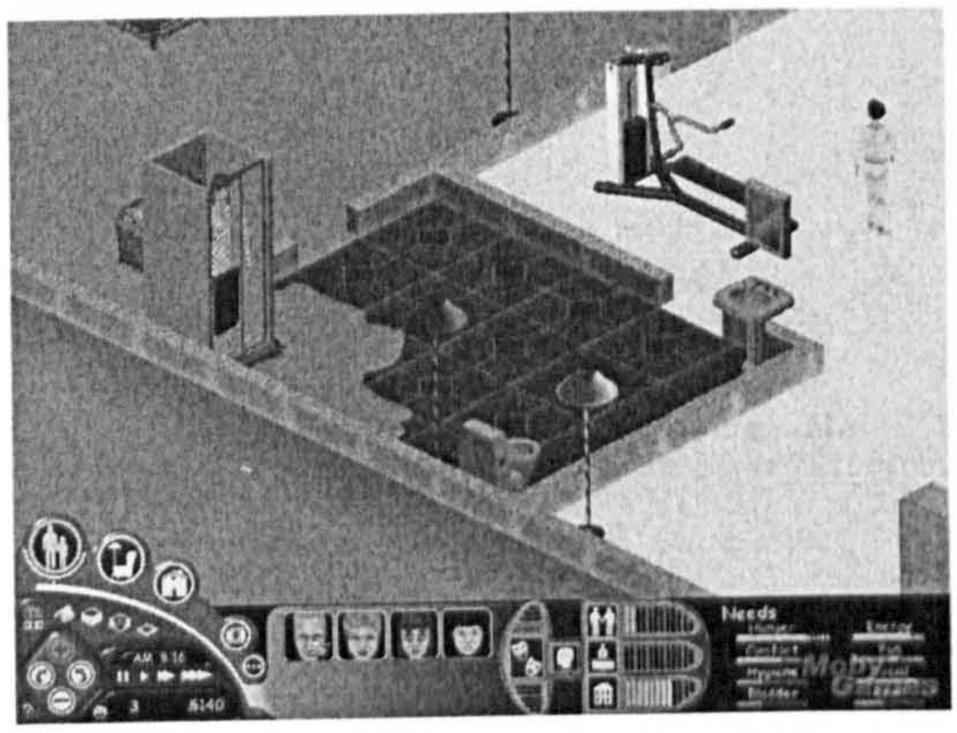
(a) Single-player games



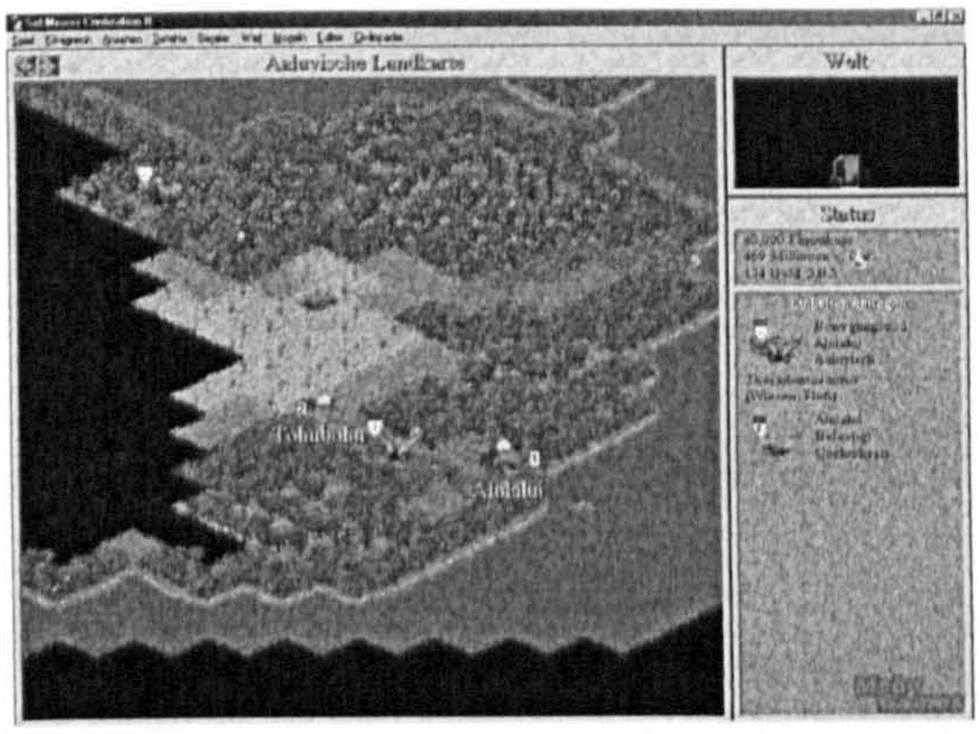
Super Mario Bros. 3



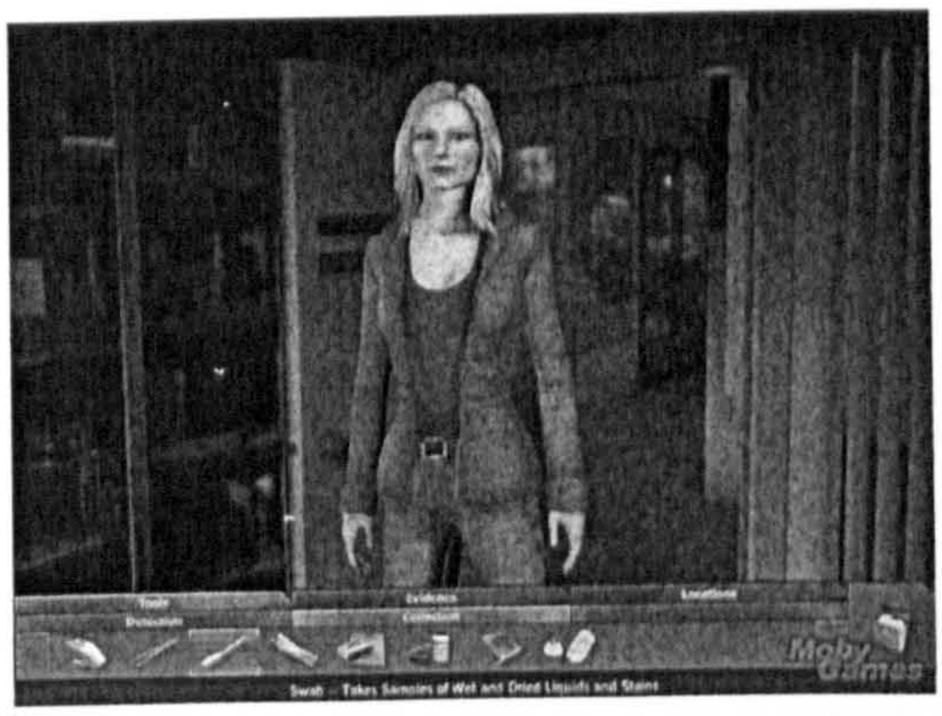
Harry Potter: the Chamber of Secret



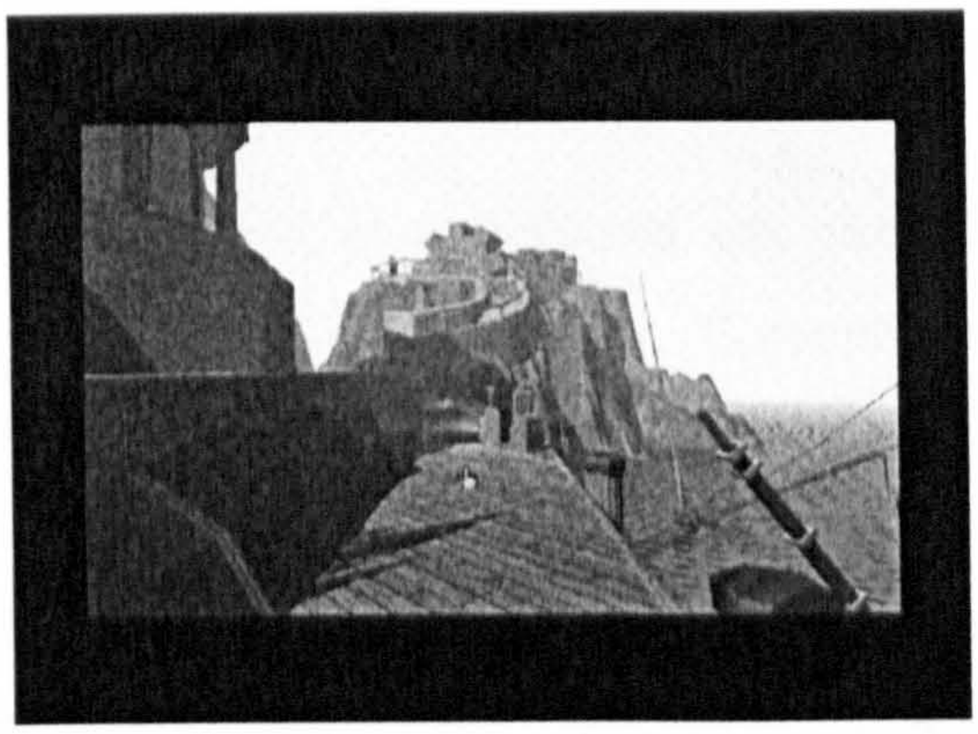
The Sims



Civilisation II

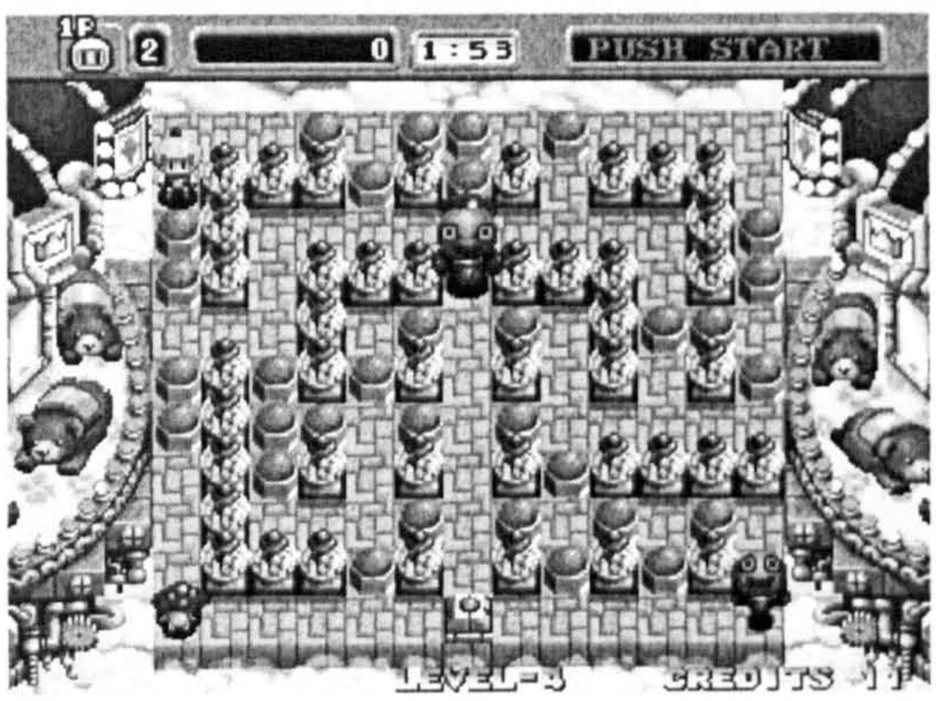


CSI: Dark Motives



Myst

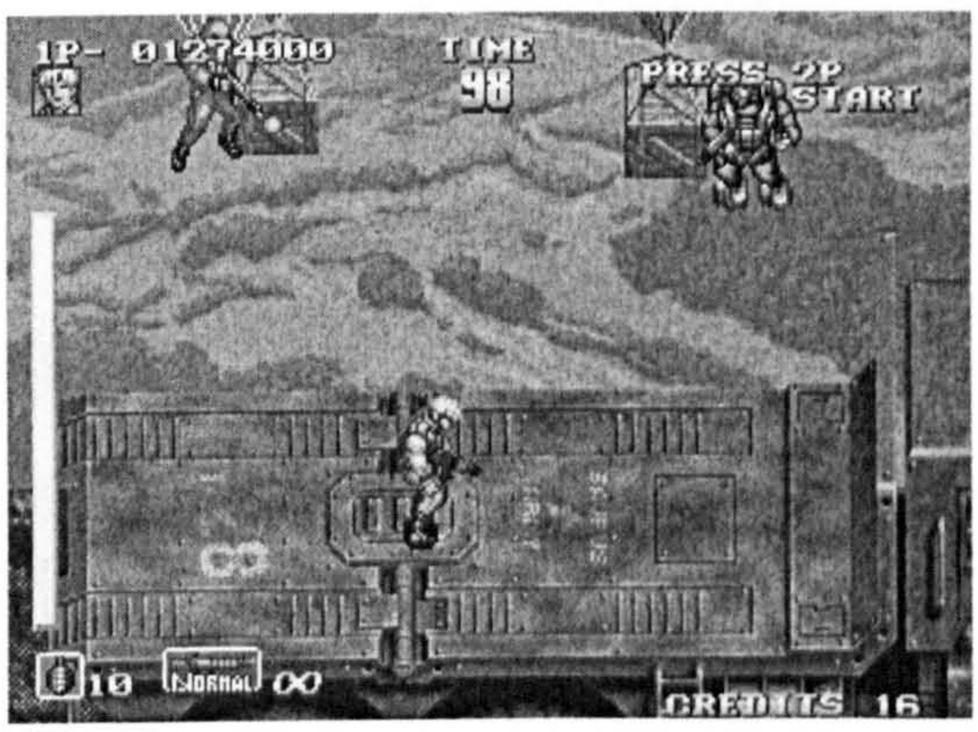
(b) Multi-player games



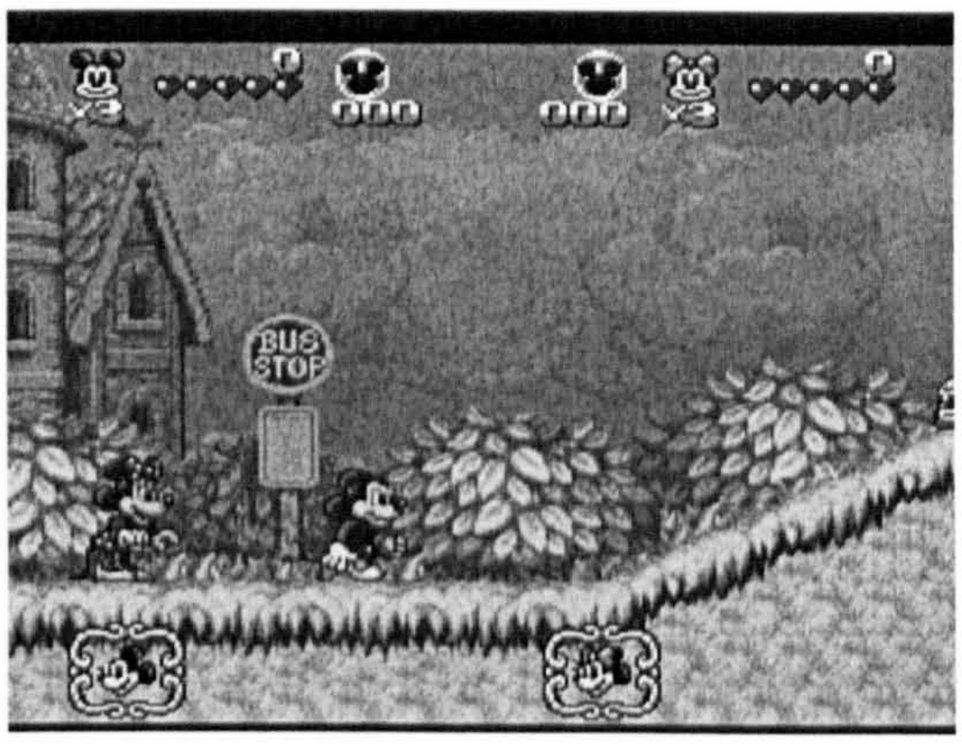
Neo Bomberman



Art of Fighting 2



Shock Trooper 2



The Magical Quest 2

Figure 5.1 The games used in the observational study

In the multi-player game sessions, the matching of participants was carried out carefully so that the gender and expertise were mixed equally. Competitive games (in which players are competing against each other to achieve a goal) were used also because even when playing such games, players also tended to "collaborate" to a certain extent. Through pilot studies, I found that the first 30 minutes was the period of time novel activities emerged. It was because this is the learning curve for most games and thus I was able to capture the most insightful actions. Moreover, I had participants with different levels of expertise (based on their past gaming experience). That provided me with richer data in 30 minutes.

To capture the game play activity of the participants, they were instructed to explore the game at their own pace, try to do their best when playing and verbalise their thoughts. During the game play session, the screen was captured on video and

think alouds (Ericsson & Simon, 1980) were recorded. After the play session, interviews were carried out to clarify issues observed during the game session such as why a certain action was performed. About 25 hours of video and interview audio were collected, transcribed and stored in a qualitative data analysis (QDA) software program.

5.2.1.2 Data analysis method

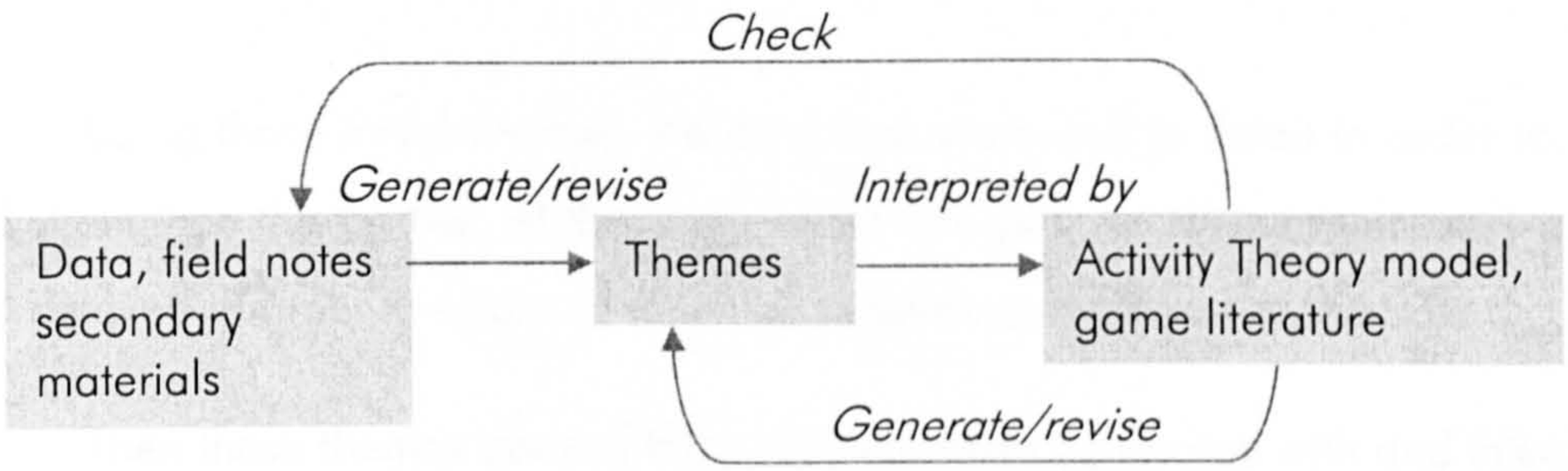


Figure 5.2 The flow of data analysis

Generally the main analysis process can be described in Figure 5.2. Guided by the field notes, secondary materials (such as game reviews, game manuals, etc) and the scanning of the data through transcription, a set of initial themes was identified. A theme could be derived from a block of data consisting of actions oriented towards a goal. A theme might be the action itself, the goal, the tool that mediates the action, the outcome, etc. For instance, in the following block of data, I was able to derive some themes such as role negotiation (action), division of roles (collective tool), dynamic of roles, contradiction with the game tool, contradiction between players.

03:26

Player_S said: what am I supposed to do...ah I see...we have to wait until he [the monster boss] throws the fire away

Player_D said: yea

03:52

Player_S said: you have to go to the other side

Observed actions: Player_D was killed

06:48

Player_S said: there he is...you go left, I go right...no I go left, you go right

07:11

Player_D said: we have to always change side

15:00

Observed actions: fox killed. They moved on.

Using these initial themes, the data was examined in detail in order to revise and strengthen the themes. At this stage of the analysis, the themes were very specific and detailed in order to retain as much as possible the richness of the data.

Then these themes derived from the data were compared with and interpreted based on Activity Theory, specifically the CMAM and other literature on games. Some themes were merged into other themes and irrelevant themes were discarded. The themes were modified; definitions from literature and theoretical constructs of Activity Theory were updated in light of new themes from the data. For instance, "game role" from the literature was refined as individual role (as in player-environment interaction) and division of roles (as in player-player interaction). The notion of narrative has expanded from traditional narrative with plots and events to fictional content.

This process of generating themes from data, interpreting and revising the data through Activity Theory was carried out iteratively until the final models could be used to explain all the data. I explain in detail the methodology in the following:

- *Transcription and coding*

While transcribing the data, I jotted down several prominent themes that emerged and I began creating a basic coding scheme. Then, I pre-coded three transcripts to further revise the coding scheme. Using the revised coding scheme, I started the actual coding process from scratch.

The data was broken down based on player's goals. One block of data consisted of a series of player's actions to achieve a certain goal. For examples, the following shows a series of action to achieve a goal (looking for the library in Myst):

03:31

Player said: where is the library? [after reading the hints about finding Atrus' letter about the library]

[Prompting] maybe you can check the map

Observed actions: she immediately went down to the hint section of the interface and found the button for the map

3:46

Player said: does it [the map] tell you where you are?

[Prompting] no

4:12

Player said: I don't see the library [after browsing the map for quite a while]

4:37

Observed actions: still in the map interface, she used the mouse pointer to trace from where she was to the library [to figure out the path]

Once the goal was achieved or changed, the subsequent data was allocated to another block. The main concepts of play of each block were identified. Sometimes it was also important to identify the relationship between different blocks as they belonged to the same goal. For example, the following transcription excerpt shows a series of blocks of actions spreading across time oriented towards a same goal (to earn more gold in Civilisation II):

04:20

Observed actions: after clicking the buy button, she realised she got only 50 gold

Player said: I need some money

05:01

Player said: I have to learn how to get money

Observed actions: closed city window

06:58

Player said: now...I don't know what to do

[Prompting] explained that the ultimate goal is to build a civilisation

Player said: ok...now I bought the warrior...where do I see the money?... oh [she found it] treasury 50 gold.

26:13

Player said: do I have money to build a city [as tutorial pops out again suggesting to her to build another city]

During the analysis process, I kept moving the codes into sub-categories and let higher levels of categories emerge. Table 5.2 shows major categories that were created and matched to the Activity Theory construct.

Table 5.2 The major categories (and sub-categories) from the in-game play observation

Object o in-game object o shared goal o designed goal o emergent goal	Individual tool o game rule o fiction-element	Collective tool o collective rules o division of roles
Outcome o development o contradiction	Individual play o action o operation	Social play o co-action o co-operation

- *Modelling*

The concepts were categorised and matched into the CMAM and other Activity Theory concepts to develop a model of intrinsic play. Some modifications and appropriations on the CMAM were made and explained (refer to the finding sections). Apart from identifying each element on the triangle activity system, I also modelled the transformation of the activity system. For instance, the excerpt of an observation at page 108-109 shows that participants were developing new strategies in a multi-player game:

This detailed observation was then modelled with activity triangles (Figure 5.3).

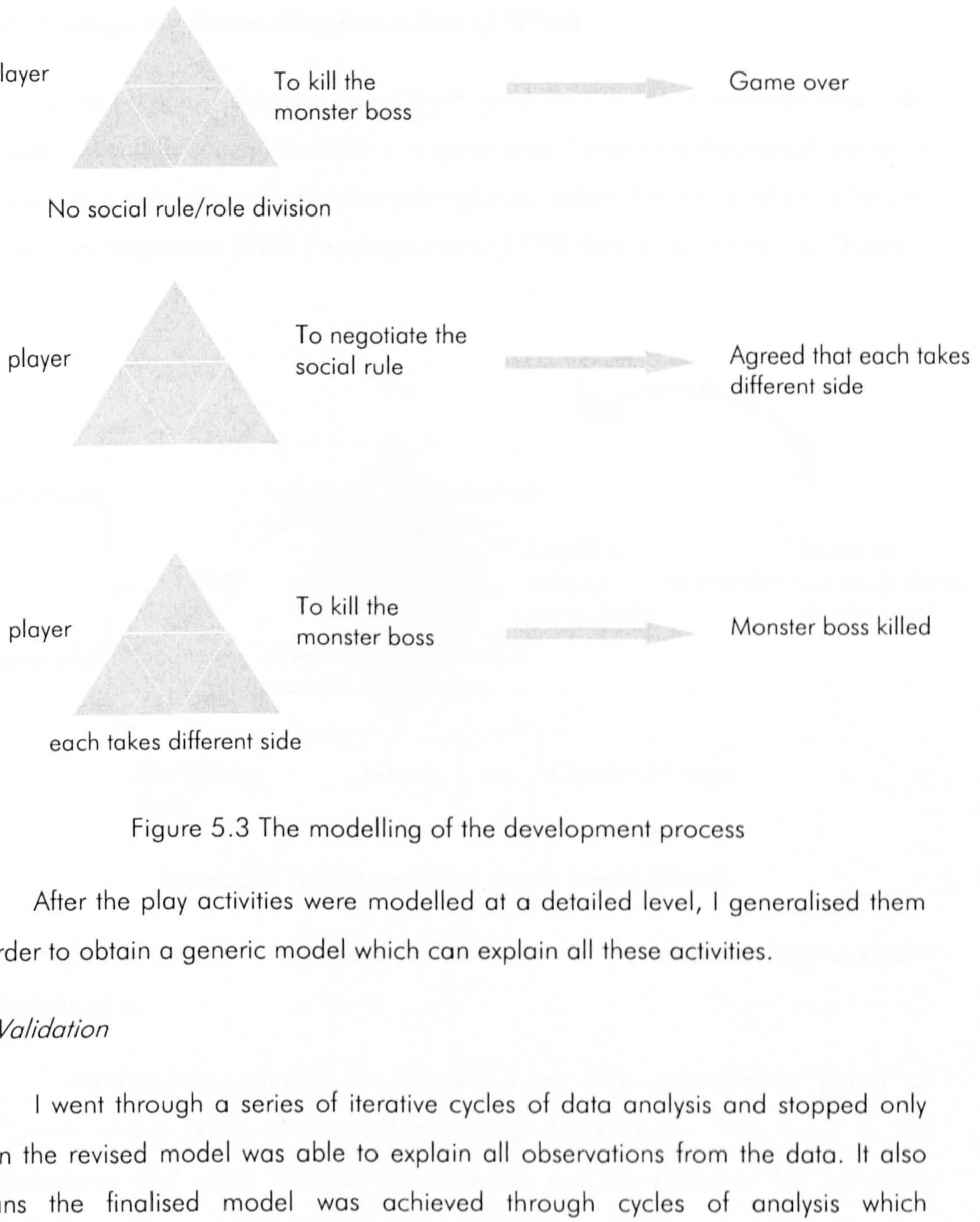


Figure 5.3 The modelling of the development process

After the play activities were modelled at a detailed level, I generalised them in order to obtain a generic model which can explain all these activities.

- *Validation*

I went through a series of iterative cycles of data analysis and stopped only when the revised model was able to explain all observations from the data. It also means the finalised model was achieved through cycles of analysis which demonstrated that the examination of new data revealed no new information regarding the theoretical constructs and their relationships. To further validate the model, I ran a focus group with three researchers experienced in similar qualitative research. I started by explaining the model to them. Then each participant was

required to apply the model to check if it could be used to explain the actions in samples from the data. Feedback was gathered and any discrepancies were discussed and resolved. Therefore, the proposed model is data driven in both its construction and validation.

5.2.2 Findings: the Intrinsic Play Activity Model (IPAM)

In this section, I describe how I have used the CMAM to conceptualise play activities particularly social interactions in game play. I present a theoretical model of individual and collective play for computer games, called the IPAM, which is largely derived from Engeström (2001) and Leontiev's (1978) conception of Activity Theory.

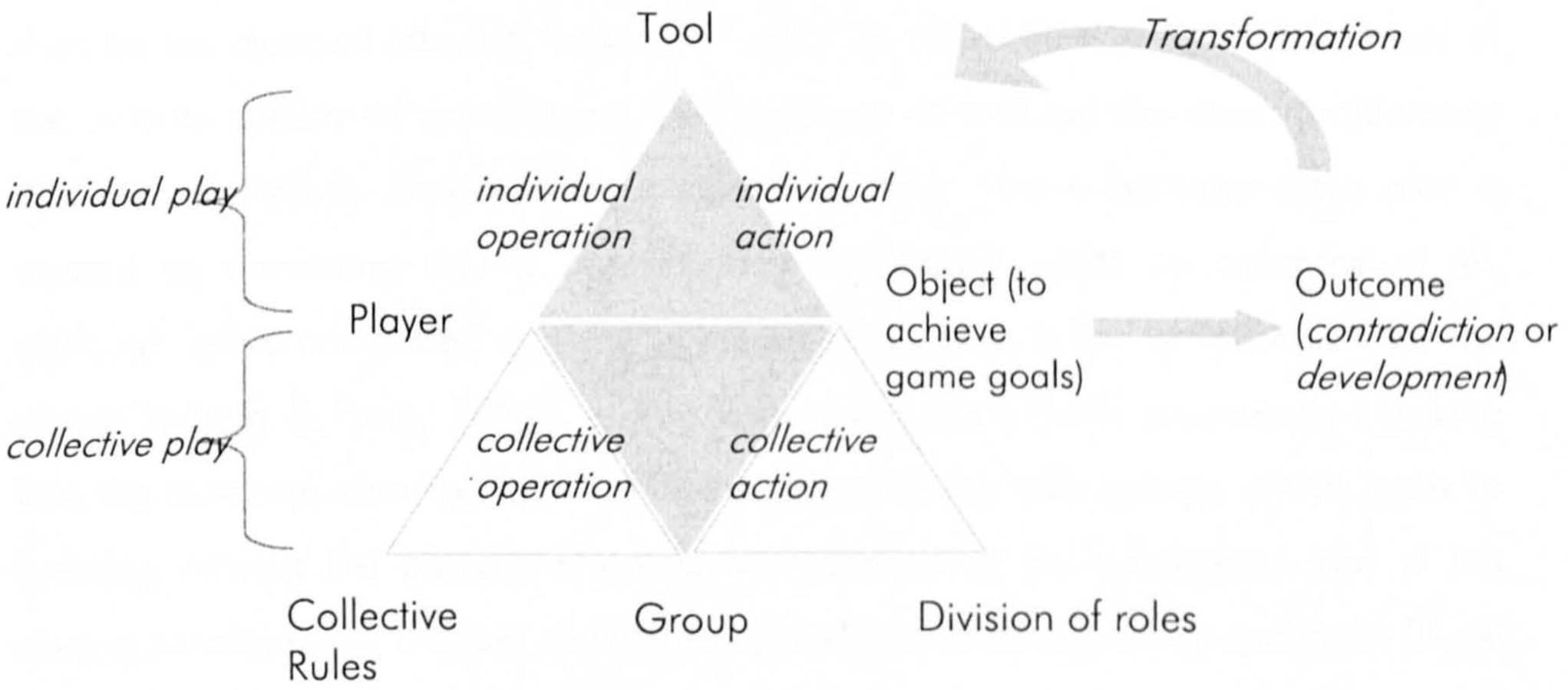


Figure 5.4 The Intrinsic play activity model (IPAM)

Figure 5.4 shows a graphical representation of my proposed activity system for intrinsic play.

Firstly and most obviously, the "subject" in this case represents the "player" of the game whose perspective is taken during the analysis. The "tool" is the computational tool which includes the hardware and the software. The hardware consists of input/output devices while the software is the virtual space of the game.

The "community" in the original Activity Theory triangle is replaced by "group" since a group of players playing a game together does not necessarily constitute a community as their relationship might be temporary (Preece & Maloney-

Krichmar, 2003; Rheingold, 1993). Thus a group refers to other players who are interacting with the "player" and act together on the object.

Instead of using "rules" from the original Activity Theory model, I have "collective rules" which are the norms that define the relationship between players. These "collective rules" mediate interaction between players, rather than player-game interaction. This distinction is very important as there are many different types of rules in computer games as I will explain in the next section. "Division of labour" is adapted to become "division of roles", referring to the responsibilities of each player in the game. This is mainly an adaptation of terminology as the fundamental concept remains the same.

The "object" is the goal of the game. The model shows that the object will then be transformed into the "outcome" which in this context is the development of the activity system of game play. The outcome is one of the most problematic concepts of Activity Theory when it comes to play. This is because often play is treated as something that is unproductive and hence yields no outcome at all, although some contended that the outcome of a game is fun or relaxation for the player (Ryberg & Ponti, 2004). In line with Huizinga's (1944) arguments, I believe that the outcome also includes the development of the play activity, which leads to learning among the players. However an outcome of an instance of play is not always development, it could also be the inability to develop, or contradiction (it will be explained further in the next section).

While the strength of the original triangle (Engeström 2001) lies in its openness and therefore it is able to explain a wide range of activities, the change of terminology in this study is necessary since the aim is to adapt Activity Theory, particularly the CMAM to explain a specific context of human activity, namely intrinsic game play. Moreover, by introducing new terminology, game researchers can easily recognise the concepts of play they are familiar with, thus are able to adopt the model more readily.

In the following sections, I expand the discussion of the IPAM by focusing on two key aspects – games as tools and games as play activities/actions – with an emphasis on social interactions in intrinsic play. Where appropriate, I support the

description and conceptualisation of these aspects through examples from the analysis of the qualitative data collected.

5.2.2.1 Games as tools

Games are tools with various rules which the player needs to learn in order to achieve the goal of the game. In recent years, with the emergence of realistic graphic technologies, computer games have evolved from a simple, abstract rule-based system into a complicated application with a virtual world represented by rich audio visual descriptions, characters and stories. In general, game applications consist of tools and objects. Compared to other software applications, games are special kinds of applications with built-in objects/goals. Whilst most other software consists of a variety of tools which allow the user to achieve their personal goals, most games explicitly or implicitly impose a goal structure on the player, motivating and directing players' actions. I will look at two dimensions of tools; individual and collective, as well as the object of play.

- *Individual and collective tools of play.*

One of the main concepts of Activity Theory is that all human activities are mediated activities. This applies also to game play activities in which the player does not act directly on the object; instead it is mediated not only individually by various tools, but also collectively by collective rules and division of role (which are the collective tools).

According to Vygotsky (1930), a tool is crystallised knowledge in the activity system. Hence, a tool refers to the parts of the game world which have been thoroughly learned by the player and are used by the player to achieve the game's goals. For example, once the "detection tool" in CSI: Dark Motives is thoroughly learned, it becomes a tool that mediates the game's goals, e.g. to detect new evidence from the crime scene.

In computer games, tools can be physical (hardware) or virtual (software). Physical tools are game controllers, keyboards, mice, etc.; they are the devices that connect the real world and the virtual game world. They provide the mechanisms for the player to communicate with the game space. Virtual tools are anything within the

game software, including graphics, audio, and rules. Virtual tools consist of two layers: fictional contents and paidea rules which are the most studied areas of conventional computer game studies. Simply put, fictional contents are audio visual representations of the game world while paidea rules define how the game world behaves (Ang, 2006; Frasca, 1999).

Thus, fictional contents could be images, animations, audio, or videos that represent the game world. For example, my observation shows that fictional contents in Super Mario Bros. 3 are the Mario images, the sound of Mario growing (after touching the mushroom), animations that show Mario returning the key to the King after defeating the boss monster, etc. On the other hand, paidea rules are usually neither visible nor audible in the game, but they are a crucial aspect as they define how the game world behaves. For example, paidea rules define what happens when the player presses the A button on the game controller, what happens when Mario touches the mushroom, what happens when Mario jumps, pulled down by gravity and stomps on a monster.

It is worth mentioning that some fictional contents are operated by paidea rules while some are not. For example, in Super Mario Bros. 3, the fictional mushroom is operated by paidea rules (when it is touched by Mario, it vanishes and Mario grows). On the other hand, the clouds at the background simply do nothing (i.e. there is no paidea rule behind the visual representation). The same is true for video cut-scenes (e.g. in Harry Potter 2) that are simply played back to give the player some information in the form of narrative. However, all paidea rules are represented by fictional contents to a certain extent. For example, the paidea rule that defines the damage that inflicts Mario when he runs into the monster is represented by a change to Mario's image and some sounds. If paidea rules were not represented, the game would not be understandable by the players.

The study also revealed that game play is centred on two types of tools: designed tools (tools pre-designed by the developers) and emergent tools (tools constructed, negotiated and agreed by the players as they play the game). The individual tools are largely pre-designed by the developer although it is possible for the player to hack the game and modify the paidea rules and the fictions to create emergent tools (examined further in chapter 6).

The study also revealed an important individual-collective dimension of rules and role. Most previous studies on games and Activity Theory do not make a distinction between individual and collective rules and roles which I found very important in game studies. I claim that the implemented system rules of the game (or paidea rules) should be analysed as a tool in the play activity. Such a distinction of individual and collective rules is less obvious in the work context, although not indistinguishable. For instance, a pen has its internal rules and mechanism, e.g. you need to fill it up with ink, you need to hold it in a certain way, etc. Similar to paidea rules, these internal rules (of the pen) are built into the pen, not easily modified and they mediate the individual actions.

When playing collectively, the player needs to interact with other players (the group) and this interaction is mediated by collective tools, namely collective rules and division of roles. Whereas paidea rules define player-game interaction, collective rules are rules that define player-player interaction. Thus paidea rules are an example of individual tools and collective rules are an example of collective tools. For instance, I found in the observation of Shock Trooper 2 that the players came to a collective agreement to not shoot each other:

2:15

Player_U said: ouch [mistakenly thought that Player_U shot her]

Player_M said: sorry. It was you [mistakenly thought that she shot Player_U]

2:21

Player_U said: shall we have any strategy

Player_M said: let me take the right side and you take left side

While paidea rules are fixed and thus are non-negotiable, collective rules are rules that arise through constant negotiations and agreements between players. This was evident in the data; for instance, although the paidea rules of Magical Quest 2 do not restrict a player from collecting all the coins in the game, the players did agree that they should not collect coins that were supposed to belong to another player.

I identified two types of collective rules from the observation (Table 5.3). Individualistic rules are rules that define the conduct of each individual which have

been agreed by all players. These rules do not necessarily encourage social interactions as they define what an individual player should do in a collective context. Relational rules are collective rules that define the relationship between players; how the players should interact in the game.

Table 5.3 Types of collective rules

Type of collective rules	Explanation	Example
Individualistic collective rules	Collective rules that re-define each individual's action but do not necessarily lead to coordination of the players	Each player has agreed to do her best in the game to kill monsters
Coordination collective rules	Collective rules that define the relationship between players which results in strategy coordination	Players should not shoot each other. Player 1 should protect player 2 etc.

Division of roles is a subset of collective rules that define the responsibility or the task of each player in the game. For example, it was observed that players of Magical Quest 2 split responsibilities among themselves, with one player being responsible for diverting the attention of the boss while the other player being responsible for attacking. Although both avatars (Mickey and Minnie) in the game were designed to have the same abilities, the emergent roles were created through social interactions in the game play.

21:36

Player_D said: you want to Hoover [an attack mode] or [use other attack mode]?

Player_S said: I am Hoover, you change [to another attack mode]

Observed actions: Player_D changed to normal Mickey since they agreed that one of them should be normal Mickey and another using Hoover

I must also emphasise that in the thesis, the concept of division of role in computer games should not be seen as the division between the player and Non-

Player Characters (NPCs). Although one could claim that there is a division between various roles within a single-player game (Barr et al., 2006), my study focused on the division between human players since computer AI's (or NPCs) have no conscience and thus their actions are not driven by an object/needs.

Therefore, division of roles in the thesis is treated differently from the role the player plays in, say Role Playing Games (RPGs). In many contemporary games, players play a role of some sorts in the game, such as an investigator (in CSI) or a wizard (in Harry Potter). These roles, unlike the division of roles, mediate individual play, in the way that it helps the player establish and connect their identities to the fantasy game world. It mediates their individual play actions by providing meanings to their actions. Moreover, each role is usually designed with some forms of tools (the ability of the character role such as jumping, shooting, etc.) that mediate individual play actions. Hence, the division of role between the player and NPCs is treated as an individual tool in the thesis and is called "role" rather than "division of role". Therefore, "division of roles" in the thesis refers to the division of role between the player and other players and are treated as a collective tool.

It was observed that division of roles is not static as the players continued to re-negotiate and agree on different roles as the game progresses. The following is an example of the dynamics of roles.

> 02:12
> Player_E: you have to jump I think. When the fox is shooting the fire at me, you have to jump [on top of the monster boss]
> 04:05
> Player_E: I think when he is shooting at you, I have to jump over him

Collective tools are mainly emergent tools through the process of play. However it was found that the design of individual tools has an impact on collective rules. For instance, in the following example, Player_A obtained a tank which was designed to be much more powerful than ordinary weapons and this resulted in the emergence of a simple form of role division.

11:13
Player_A said: I am helping you Player_P, don't worry (Player_A is in a tank)

11:28
Player_P said: I am clearing the way

Player_A said: I am supposed to be clearing the way [being in a tank which is more powerful]

- *Objects of play*

Another fundamental concept of play activities in computer games is that the player is acting on an object. This concept describes the specific play through the perspective of the nature of objects, where the object (or the objective) motivates play and gives a specific direction. Objects of an activity can be examined at three levels: motive, goal and condition (Leontiev, 1978). At the highest level, the motive of play is "to have fun" but in this section, I would like to further examine the object of play at the goal level in which achieving the goal will result in fun in the game directly or indirectly. Usually the game goal is defined by the game developers and it shapes the action of the player although often the players also shape the object as they play.

Paidea rules, as introduced earlier, are rules about how the game world works, while ludus rules are rules about how to win or lose the game (Ang, 2006; Frasca, 1999). Ludus rules are the game goal to be achieved by the player. When playing games, players are usually driven by ludus rules. For instance, in CSI: Dark Motives, the ludus rule is to solve the crime while in Harry Potter 2, it is to defeat the monster in the secret chamber. There are some games without pre-defined ludus rules. The Sims for example, does not have a clear goal as to what the player needs to do in order to win the game, for one can never "win". However, this does not mean it has no ludus rules.

I observed that players create their own ludus rules while playing the game. For instance in The Sims, players might set their own ludus rule, to reach the top of the career ladder. Once the ludus rule is established, the player's action will be driven towards it. Goals which are pre-defined by the game developers are known as extrinsic ludus rules, while goals which emerge from the players are known as intrinsic ludus rules (Ang, 2006).

However, there are also cases when a play activity is not driven towards an objective, or in other words the player's action is not driven towards achieving any ludus rule. I would like to call this type of play, expressive play (which is in lines with Juul's (2007) discussion on games without a goal), as opposed to progressive play which is oriented towards winning the game. For example, some of the players I observed were sometimes simply flying around with the "Cat Mario" in Super Mario Bros. 3, or decorating the house in The Sims. In this case the object of play is driven towards the game world rather than the objective of the game. I summarise my observations in Table 5.4 with an example.

Table 5.4 An example of game as tools for Shock Trooper 2

Games as tools		Examples of Designed Tools	Examples of Emergent Tools
Individual tools	Paidea rules	The way the game characters interact with the enemies and items	Not applicable
	Fictional contents	The graphics, animation and audio of the game world	Not applicable
Collective tools	Collective rules	Game characters cannot shoot each other	Players should not collect items that belong to other players
	Division of roles	Not applicable	Players divide the game screen into two areas and each player is responsible for one
Objects (goals)	Ludus rules	To defeat the final boss monster	To collect a more powerful weapon

I want to emphasise that the object in Activity Theory according to Leontiev (1978) refers to the overall objective of an activity which in the case of computer

games, is "to have fun". Engeström's activity triangle does not visualise the hierarchy of activity. Thus I incorporated Leontiev hierarchy of activity into the triangle. This results in an alteration of the connotation of object in the triangle. In the game context, we can use the triangle to visualise play activities at various levels according to Leontiev. The "object" in the triangle can represent activity, action and operation. In the examples in Table 5.4, I modelled game play at "action" level.

5.2.2.2 Games as play activities

Computer games are not merely tools or collections of tools and objects. They are also a dynamic process of play that arises from the tools, which is oriented towards an object and it results in contradiction and development. I explain this in detail in this section.

- *The structure of play.*

Based on the hierarchy of activity proposed by Leontiev (1978), the player operates the tool non-consciously to act on the object at a conscious level. In addition to this, I have proposed in section 4.2 that actions and operations also take place at the collective level. The subject collectively operates (co-operates) with the group to collectively act (co-act) on the object (see Table 5.4).

The structure of play explains the process of the play actions and how collective play is related to individual play. As in other forms of activities, there are three levels of activity in computer games – activity, action and operation – an important concept of Activity Theory proposed by Leontiev (1978). I will explain this hierarchy in the context of game play activity.

The first level is the play activity itself which is oriented towards the high level objective of computer games (why people play games) which is to have fun in the case of entertainment-oriented games or to learn in the case of educational games. The second level, actions (or co-actions in the case of multi-player games) refer to something the player does consciously towards a game goal whether it is extrinsic ludus rules (goals pre-defined by the game developer) or intrinsic ludus rules (goals created by the player) in order to have fun (or to learn). For example, for an intermediate player, she would probably have to concentrate a lot when trying to kill

a monster boss. Finally, we have operations (or co-operations for multi-player cases) which are something the player does non-consciously, e.g. an intermediate player would probably press the key or click the mouse without thinking about it.

Table 5.5 An example of game as individual and collective play

	(Collective) Action	(Collective) Operation	Outcome
Individual play (CSI : Dark Motives)	The user interface	Eye-hand coordination skills	The user interface becomes a tool (development)
	The crime scene	Eye-hand coordination skills, the user interface	The knowledge about the crime scene becomes a tool (development)
	To solve the case	Eye-hand coordination skills, the user interface, knowledge of crime scenes	The solving of the case
Collective play (Magical Quest 2)	To defeat the boss monster	Initial collective rules: implicit agreement to do one's best	Unable to defeat the boss (contradiction)
	The division of role	Individual tools (or learned skills of each player)	New division of labour is agreed, one player distracts the monster and another attacks (development)
	To defeat the boss monster	New division of labour (distract and attack)	The defeat of the boss monster

The play structure is by no means static as its state keeps changing as the game proceeds. The object is transformed from time to time depending on the player's needs and the game world. As the player transforms the object, the transformed object affects the player's actions. Let us look at a typical example extracted from the observation data (see Table 5.5).

When playing CSI: Dark Motives, the participant started by trying out the game's Graphical User Interface (GUI). Operating on the computer mouse and her eye-hand coordination skills (tools), the participant was acting on the objects which were the graphical icons (fictional contents) and the internal behaviours of the icons (paidea rules). The outcome of this individual action was the learning of the GUI i.e. the object (GUI) was transformed into a tool (the knowledge about the graphical interface).

Then, operating on the newly learned tool (the icons of the interface), the participant was able to act on the crime scene (the object) and the outcome was the discovery of evidence about the crime. Operating on the new knowledge about the crime (the new tool), the participant was now able to act on the new game objective (to find the criminal) and the outcome was the solving of the crime.

Similarly, the collective play structure keeps changing as the game proceeds. The object is transformed from time to time depending on the mutual needs of the players as well as the game world. Let us look at an example extracted from the observation data (see Table 5.5 again).

When playing Magical Quest 2, both players were trying to defeat (co-act) the monster boss (the object). The collective rules or division of roles were not clear at the beginning. The initial collective rule (if any) was that "both players must try their best to kill the monster". During the observation, it was found that players were acting on their own at the beginning and it resulted in them being killed in the game.

Then the players started to shift the focus from the monster boss to the division of roles. They negotiated and quickly (as it was a fast paced game) agreed on a new division of roles. The outcome was the creation of a new role for each player. They agreed that one of them should distract the monster while the other attacked it. Then, co-operating through the new division of roles, the players co-

acted on the object (which was now the monster boss), resulting in the killing of the monster.

5.2.2.3 Individual-collective relationship

Although the discussion so far has treated individual play/tool and collective play/tool separately, in most cases, they are inter-related. From observations, I identified the following ways in which these two dimensions are connected.

- *individual tool affects collective play*

Collective play often cannot take place without the development, to a certain degree, of individual tools. For example, if a player has not yet learned the basic controls of the avatar, it would not be possible to negotiate and agree on a mutual strategy.

- *collective tool affects individual play*

Sometimes, agreeing on collective rules/roles will affect the individual play as the individual player needs to follow the collective rules. For example, after splitting the game area that each player is responsible for, the player will be limited to act within a specific boundary.

- *collective play structure results in individual tool development*

Collective play often results in the development of individual tools. For example, two players discussing and helping each other might improve each other's strategy rather than improving collective rules.

- *individual tool limits collective tool*

Collective tools often emerge under the constraint of individual tools. Since collective tools are negotiated and agreed by the players, they rely on the individual tools of each player. For example, if a player has not yet acquired knowledge of how to jump on top of the monster boss (tools), it would not be possible to assign the role of attacker to that particular player (agree on and create a new collective rule/role).

5.3 An Exploratory Case Study: Recommendations for Sociability Design

Drawing from the IPAM and my experience modelling and analysing intrinsic play, I developed a set of methodological guidelines (refer appendix C) to demonstrate how the concepts from the IPAM can be practically used to transform observation data into design recommendations as a step of validating the model. I re-examined the observation data from the multi-player games using the guidelines as guidance to help identify specific game design issues. I list below some examples of recommendations that can help enhance sociability design of console-style multi-player games.

- *Issue 1: Meaningful division of role*

Focusing on the concept of collective operations through division of roles of the IPAM, I found that division of responsibility in these multi-player games works at a superficial level. Although all players in the study did divide responsibilities (in all cases, the players divided the game into two areas for which each player was responsible) they ended up performing the same action which was to simply "shoot" regardless of what another player was doing.

Design recommendation: avatars should be designed in such a way that each of them has unique abilities. This will encourage a meaningful division of role. Certain game tasks should be made more easily attainable through the combination of different abilities from different avatars or through collaboration of the players. Further, the division of roles should also be dynamic so that each player is given the opportunity to play different roles in the game.

- *Issue 2: Shared players' information*

Analysis of the concept of division of roles also revealed that when certain information about player status was not shared or displayed on the screen, this could result in difficulties in planning for strategy. For instance in Shock Trooper 2, the players were not aware of the ammunition left, making it harder to coordinate their actions.

Design recommendation: important information should be available for other players and displayed on the screen at a location easily seen by all players. The game system can also gather information generated by the players and transform it into useful information. Knowing the status of other players will help strategy planning, thus increasing interaction between players.

- *Issue 3: Shared object*

Drawing from the concept of collective actions towards game goals, it was noticed that when it came to the boss stage in Magical Quest 2 and Shock Trooper 2, the players were more likely to coordinate actions and work out strategies to co-act. However when fighting other monsters, they did not work together at all as each of them was picking up his or her own "object" to act on.

Design recommendation: rather than posing game challenges by having a big number of enemies, less but tougher enemies would encourage players to work out ways to collaborate.

- *Issue 4: Socialisable tool*

. Observation on the relationship between individual and collective play activity revealed that some participants attempted to manipulate certain game entities (such as the tank in Shock Trooper 2) together. However there was no tool which could be co-acted on by the two players. This reduced the opportunity of socialising.

Design recommendation: design more tools that need to be manipulated together to achieve the game goal i.e. tools that encourage a "task-team" are needed.

5.4 Discussions and Implications

Let us revisit the goals of this chapter. I have presented a model for intrinsic play, known as the IPAM which looks at two aspects of games: software tools and play activities. Like the CMAM, a distinction between individual-collective dimensions is stressed. The relationship between individual and collective play is also explicated and the outcome is treated as contradictions and development of the play activity.

The game tools could be individual or collective. Generally speaking, individual tools mediate the interaction between players and the game world, while the collective tools mediate the social interaction between players. An important finding in respect to the game tool is the distinction of paidea rules and collective rules. Paidea rules are individual tools that define the behaviour of the game world; the physics, the game event structure, the score system, etc. Collective rules on the other hand are the norms that dictate the acceptable actions within the player group. For instance, players might agree, through collective rules that they should not use "super power" before the boss stage although the game rules do not prevent them from doing so. Similarly, in-game roles should not be confused with division of roles. In-game roles are individual tools mediating the projection of player's identity to the game world. Division of roles is a collective tool that defines the division of tasks between players. Therefore, I would like to accentuate two aspects of the findings which are unconventional to traditional activity theorists. First, the concept of rules in the activity triangle model needs further refinement and elaboration. Based on the findings, I have claimed that the implemented system rules of the games should be treated as a tool since they mediate individual actions. Second, the role that mediates player's projection of fantasy identity to the game environment should be analysed as a tool, instead of divisions of role.

Tools could also be studied from another perspective: designed tools and emergent tools. Designed tools are pre-designed by the developer and are pre-programmed into the game software. Emergent tools are tools that arise as a result of negotiations and agreements between players. Similarly, the game goal could also be pre-designed or emergent during the process of play.

Play activities could be progressive or expressive. Players could engage in progressive play which is directly oriented towards progressing and winning the game. Progressive play is structural and instrumental, including developing strategies and optimising the use of game resources to achieve the game goals. Players could also engage in expressive play which is oriented towards using the game to express their creativity and turning the game into a medium for expression and creation. Expressive play has a loose structure and is not oriented towards the progress of the game. In other words, it can be inferred that progressive play is centred on the

paidea rules in which players learn the game rules and develop skills to achieve the game goals under the restriction of the rules. Expressive play is centred on the fiction elements in which players use, tweak and create the game fictional elements to express their creativity using the game. Sometimes game rules are tweaked to enhance the flexibility of the game for expressive play.

Apart from these, despite the fact that individual-collective distinction is stressed in the model, the model also emphasises the relationship between the individual and collective tools/activities. Finally, I demonstrated how the IPAM could be practically useful in analysing social interactions in computer games. I believe that by extracting practical information from the theoretical model, researchers and practitioners can get direct guidance for studying computer games. We can use the model to derive some design recommendations to improve sociability in game play.

5.5 Conclusion

This chapter addressed research question 2 of the thesis (How does individual play and collective play arise from within computer games and how can this in-game play be modelled?). In this chapter I applied and adapted the CMAM (refer to section 4.2) to make it appropriate in the context of computer games. A model called the IPAM was developed. It is based on game literature and empirical data, and is useful for analysing social interactions in game play especially console based multi-player games. It covered two important aspects of computer games: games as tools and games as play activities. Activity Theory has been very helpful in modelling these aspects of game play by highlighting key concepts and their relationships.

Having developed the model for intrinsic play, I am now set for the analysis of out-of-game play. An often overlooked perspective of games studies is the play activities that arise around computer games, even in the case of single-player games. In fact, some games such as The Sims have placed a substantial emphasis on player community building and the production of fan materials. In order to support such communities, design issues for both the game and the community should be addressed. Therefore, in the next chapter, I will present a study that modelled the out-of-game play activities in order to develop a unified framework for social play activities.

6 Extrinsic Play Model around Computer Games

Expanding the context of game play, this chapter presents a study to model extrinsic play by analysing play activities in online game communities.

In the previous chapter, I presented a study on the model of intrinsic play (called Intrinsic Play Activity Model, or IPAM). In order to develop a unified play activity framework, we need to understand the socio-cultural context in which play activities take place. Therefore, in this chapter, I examine the participatory culture around computer games to model out-of-game play activities.

I analyse out-of-game play (hereafter known as extrinsic play) mediated by games and Computer-Mediated Communication (CMC) tools. Expanding the IPAM (refer to section 5.2.2) and founded on the third generation of Activity Theory that maintains that an activity system does not exist in isolation, but interacts with other activity systems (Engeström 2001), I model extrinsic play around games. Specifically the goals of this chapter are:

- To examine and model various types of extrinsic play observed around computer games
- To identify the relations and connections between intrinsic and extrinsic play activities

This chapter is structured as follows: first, I illustrate in general the cultural phenomena around computer games. Then, I introduce the third generation of Activity Theory as proposed by Engeström (1999) and present some previous work on the application of the theory in various areas. This is entailed by the methodology section and the detailed description of the models of extrinsic play. Finally I discuss a case study to demonstrate how the models can be applied to analyse a popular game, The Sims.

This chapter aims to address research question 3 (How do various types of play emerge around game play and how can this out-of game play be modelled?).

6.1 The Boundary of Game Play

Computer game studies have witnessed a shift from the conventional game software analysis to the game study in a socio-cultural context of play (Ducheneaut et al., 2006; Krzywinska & Lowood, 2006; Mortensen, 2006). This is partly due to the advancement of the game industry towards the social aspects of play. Game

developers have attempted to apply social connectivity and player community in the new generation of game consoles. Sony, for instance, will launch Play Station 3 Home (Sony, 2007), a 3D virtual social space, where players meet to socialise, share gaming experience and play games together.

It is argued that sociability and collective play constitutes a significant part of game play experience (Ducheneaut et al., 2004; Ducheneaut et al., 2006; Kolo & Baur, 2004; Wright, Breidenbach, & Boria, 2002; Yee, 2005). Social interactions are even embedded into what appear to be individual play of a single-player game; game play is not merely limited to what is happening within the game software itself, but it also comprises a game culture that arises from it. Although a number of researchers have acknowledged the importance of collective play (Gee, 2003; Manninen, 2001; Squire, 2002), not much has been done on play activities that extend beyond the computer screen.

Hence, I maintain that computer game studies could incorporate the broader spectrum of play activities that spreads beyond the screen, and that understanding extrinsic play is beneficial for game design, game development and ultimately scholarly game studies. This type of research is starting to emerge, but often lacks empirical rigour and frameworks at the methodological level (Mäyrä, 2006). The oft-mentioned theories of game studies – ludology (Frasca, 1999; Juul, 2006) and narratology (Murray, 1997; Ryan, 2001) – fall short of the insights on a socio-cultural perspective of computer games.

The innovation of computer games either in terms of technologies (e.g. graphics engines, network capability, etc) or game mechanics (interactivity) has brought about the transformation of the nature of play from manipulation to construction. This involves the construction of game avatars, architectural structures, weapons, etc. in the virtual space. More recent games also facilitate the construction of artefacts that can be used independent of the original game world. These artefacts include movies or even completely new games. It is noticed that these constructionist activities often go beyond the game itself in which novel play activities not anticipated by the game developer arise (Steinkuehler, 2006).

These game modification activities, sometimes known as "Mods", are not surprisingly encouraged by the game developers because they contribute to a massive variety and evolution of the game world, which cannot be achieved by the game developers alone. Apart from creating game contents, some players also modify the programming aspects of the game, creating a new pattern of play. For example, after Doom's (Mobygame, 2006) release, some technologically savvy players began to create level editing programs, allowing other players to alter the game space. Furthermore, the players were also swapping their Doom levels in online forums across the Internet.

The contribution to the player community through the participation in the construction activity of games has become an integral part of the game culture as players gather in an online virtual space and form a community. These extrinsic play activities are important not only because they offer support and useful tips for other players but also because they participate in generating a sense of community among players. It is not uncommon that the players gather their resources in order to produce something that can benefit the community. Hence, it has been claimed that the yardstick of a game's success may not be simply the number of units sold, but how broadly the game acts as a medium for expression, extension, or reinforcement of a game culture (Poremba, 2003).

Player-created artefacts challenge the conventional notion of what constitutes game play. Although some criticise that player construction falls outside of the boundaries of the game and hence maintain that this activity cannot be studied as part of the game itself, some argue that game studies should include such extrinsic play (Steinkuehler, 2006). As I am interested in the social aspect of games, I believe that studying games in their socio-cultural context could yield invaluable insights to game play. As Gee (1999) has pointed out, while the game software partially constitutes the designed tool that mediates individuals' play experience, it is the emergent culture around it that gives it meanings.

6.1.1 Game communities and participatory culture

The emergence of Internet technology and the development of games with less violence are changing the picture of gamers from a solitary male teenager in his

own room to the participation of a group of diverse people socialising in the virtual world. Indeed, when trying to win the game, players often need to get information from other resources: guidebooks, discussion forums, etc. Hence, it is safe to assert that gaming is fundamentally social, designed to be played collectively and distributed across multiple media. The enjoyment of game play is not only embedded within the game, but also in the community practice of those who inhabit it.

Being a new media and a popular culture, computer games are intended to be used by "active construction", instead of "passive reception". Game players are active audiences: audiences as creators rather than as recipients of pre-designed media messages. Apart from creating the meaning of the game internally, players are engaged in externalising the meaning by producing tangible artefacts (Ackermann, 2002).

Jenkins (2003) called this participatory culture, or a fan culture that draws its resources from commercial media culture while also reworking them to serve alternative purposes. This no doubt blurs the boundary between players and game developers. It is claimed that participatory gaming culture tears down the barrier between developers and players, making the players both "consumers and producers" (Pearce, 2006). In other words, they not only use the game as mediated experience, but often also as a creative media. Even in cases where official support is not available, players still find ways to use games for their own purposes.

6.1.2 The importance of studying extrinsic play

Therefore, understanding contemporary computer games requires examining them in relation to a broader socio-cultural aspect. From this perspective, games are not restricted to interaction with the game software. Rather, they encompass all the player activities connected to game play. Game participatory cultures arise in relation to a particular game or game genre. There are groups of players who share interests, values, and practices, including a particular language, shared rituals and interests in collecting and producing artefacts that promote the players' belongingness to the groups.

Only through examining game play in a socio-cultural perspective can we fully understand computer games: how a game as a tool evolves and changes in

terms of its motives of use and how different forms of extrinsic play emerge. Unfortunately, this area of game studies is often overlooked by both game scholars and game developers. A few studies reported by Poremba (2003), Salen & Zimmerman (2003) and Sotamaa (2005) discuss such play activities, but are lacking in theoretical insights. I believe there is a need of theoretical models to understand this phenomenon through the analysis of empirical data.

6.2 The Third Generation of Activity Theory (3GAT)

I propose using Activity Theory particularly the third generation of Activity Theory (3GAT) to model extrinsic play. The basic argument of the 3GAT is that activity systems do not take place in a vacuum. In other words, they are not standalone; rather they occur in a complicated social setting. To understand the networks of interacting activity systems, Engeström developed his conception of Activity Theory, in which the basic triangle model (Engeström, 2001) was expanded to include minimally two interacting activity systems (Figure 6.1).

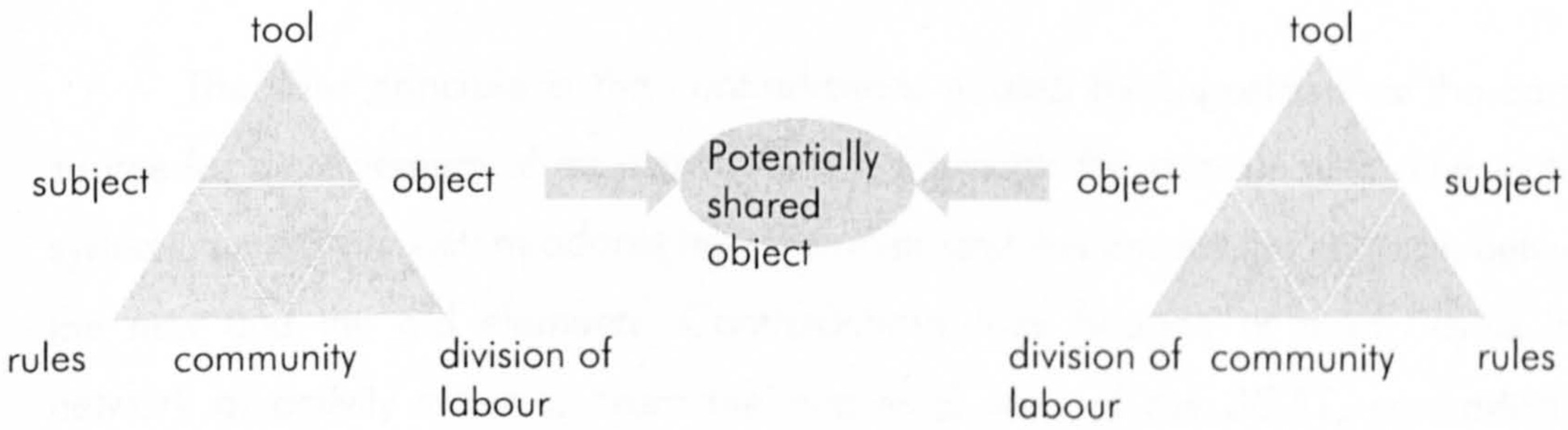


Figure 6.1. Two interacting activity systems

In the 3GAT, Engeström (2001) emphasised specifically the shared object by two or more interacting activity systems. According to him, the object moves from an un-reflected and situational state to a collectively meaningful object constructed by the system. He further contended that in the third generation, the object might transform into a potentially shared object for two or more connected activity systems. For instance, in a book writing activity system, the object moves from an initial state of raw material such as initial ideas and outlines of the book to a more meaningful object such as sentences and paragraphs constructed by the author, and then to a

shared object with another activity system (e.g. publishing) such as a collaboratively constructed manuscript of the book.

I would like to illuminate five important concepts associated with the 3GAT which are relevant to game studies.

The first concept is the individual aspect of Activity Theory as conceptualised by Vygotsky (1930) who maintained that activities are tool-mediated and object-oriented. He also acknowledged the operation-action aspect (Leontiev, 1978) as subordinate unit of analysis. Most importantly he asserted that this individual aspect should be analysed against the background of the entire interacting activity systems.

Second, the activity system is multi-dimensional, involving the rules and division of labour. In other words, it constitutes a community with various roles, different positions, rules and conventions. This is even more prominent in a network of activity systems, where rules and division "move across boundary" (a concept referring to the movement of elements from an activity system to another), interacting and resulting in new sets of rules/division of labours.

The third principle is the contradiction, treated by Engeström as the central source for development of an activity system. Through the relation with other activity systems, an activity system adopts new elements and this causes the collision between the new and the old elements. Contradictions may happen at many levels in a network of activity systems. From the analytical view of the 3GAT, contradictions span across multiple activity systems, as the result of "boundary crossing". Taking book writing as an example, it is always necessary to "import" tools (e.g. formatting, etc) from the publishing activity system. This might trigger contradictions with what the author has already accustomed to in the writing activity.

This leads to the fourth principle, development. As contradictions occur and disrupt the usual process of activity systems, the subject or the community begins looking into the issue that causes contradictions and in some cases, this brings about the development of the activity systems. Development is said to happen when "the object and motive of the activity are re-conceptualised to embrace a radically wider horizon of possibilities than in the previous mode of the activity"(Engeström, 1999). In the analysis of the 3GAT, development involves the change in positional relations

between the elements of different activity systems apart from the positional change of the elements within the activity system.

The fifth principle is the different level of tools. Wartofsky (1979) proposed three types of tools that mediate human actions and this was developed by Engeström (1990) into a three-level hierarchy: (a) primary tools are tools used directly to mediate the relationship between the subject and the object; (b) secondary tools are representational tools used to preserve and transmit skills in the mediation of the primary tools; (c) tertiary tools are imaginative tools that give "identity and overarching perspective to collective activity systems".

In an example of a book writing activity system, primary tools could be the word processor; secondary tools could be the manual and help system of the word processor; tertiary tools could be the imaginative vision as how the book might be serve as a screenplay for a movie which triggers the development of a new activity system.

6.2.1 Application of the 3GAT to various areas of human activity

The 3GAT has been used to study and analyse different contexts of human activities. In this section, I present some relevant work to the application of the 3GAT.

A good example of the applicability of the 3GAT is an article written by Roth (2005) in an attempt to identify the nature of academic research and publishing. He illustrated the central activity system of professors writing an article, in which they receive rules and tools from other activity systems (e.g. American Psychological Association, computers, word processing software), and produce outcomes for other activity systems (e.g. research participants, school policy makers).

He observed that people and tools flow from one activity system into another. The external elements are appropriated by the activity system, modified, and made integral part of it. He also identified the network of activity systems in academic research (Figure 6.2).

In addition to analysing activities through the simultaneous and interdependent activity system network, the 3GAT reveals other processes hidden

from researchers, and articulates various activities that bring about the outcomes of a writing process, for instance, the decision letter from the editor to the author.



Figure 6.2. The network of interacting activity systems in academic writing

The 3GAT has been used in the research of social computing as well. A study has been undertaken to observe the collaborative work to implement Lotus Notes as a tool for information sharing. Guided by the 3GAT, Guy (2003) attempted to create a design template for information sharing tools. It was found that in some cases, such tools contradicted the object of user activities – the ways the work was done using existing practices and tools. Using the 3GAT, she investigated the types of representations needed to function as a shared design artefact that can be used by both users and developers. The 3GAT provides a shared model that can mediate between the activity systems of developers and users to create a collectively constructed representation of the features of the groupware.

6.2.2 Application of the 3GAT to socio-cultural game play

Although still quite uncommon, the 3GAT has been used to analyse computer games. Ryberg & Ponti (2004) used the 3GAT to explain the play environment around a single-player puzzle game among pupils in order to examine learning, engagement and identity. It is observed that the game created a new form of cultural practice among the pupils. A competition arose in which the pupils tried to achieve

the high score. Furthermore, the high-score board became a topic of discussion in online forums and the pupils started writing articles about the game play activity containing interviews with top-scorers. Based on their observation, they described games as three levels of tools.

As a primary tool, the outcome of the game is "fun" or "relaxation" for the individual player. As a secondary tool, the game is a mode of belonging, participating and affirming membership in the community. As a tertiary tool, the game is used for imaginative and fictional construction, which functioned as a creative playground.

In a similar way, Squire (2004) analysed Civilisation III (Firaxis Games, 2001) (Figure 2.3) as a tool for learning history through three different levels. He pointed out that Civilization III is a primary tool when used as a tool for game play and a tertiary tool when used to remediate understandings of world history. He asserted that even if Civilisation III is appropriated as a tertiary tool, there is no guarantee that students will interpret game symbols in the manner that educators hope. Thus, it is important to examine the contradiction between two different levels because as a primary tool, Civilisation III mediates fictional world history while as a tertiary tool used for school learning, a real world history is desired as the outcome.

6.3 Methodology

The main aim of this chapter is to analyse extrinsic play around computer games and to develop models of play from the socio-cultural perspective. In order to identify extrinsic play within online communities, I investigated the activities in game community websites. I collected more than 100 pages from more than 30 game websites (refer to appendix D for the list of websites) of four genres of games.

The websites consisted of the game official and unofficial sites, discussion boards, online forums and online communities of the games where players posted their fan constructions. I attempted to choose games that could represent a wide range of games in the industry. The selection was based on the fundamental difference of the game mechanics and was based on the selection from the previous study (refer to section 5.2.1): Super Mario Bros. 3 represents the ludic game group,

Myst classic the narrative-based game, The Sims the simulation game, Art of fighting 2 and Shock troopers 2 the multi-player game (Mobygame, 2006).

The data analysis method followed that of chapter 5, in which the analysis was based on the process depicted in Figure 5.2. Data was examined and analysed through the lens of the 3GAT and the IPAM in order to identify emerging themes of extrinsic play. The analysis was carried out in four steps: scanning, categorisation, modelling and validation.

- *Scanning*

I started by browsing and reading/viewing the information from a popular website of the game (usually the official site). This served two purposes: first to get a general overview/impression of what kinds of information (and thus possible play activities around the game) were available; second to identify more websites associated with the game. Through this process of snowballing, a number of websites dedicated to the particular game were gathered. All websites I selected were not just limited to one particular version of the game but all the franchise of the title.

After that, all websites were browsed at a high level, to examine its structure. Through this I was able to quickly identify the major information types (such as the stories of the game, tips and strategies, etc) on the website. After that, the contents were read carefully and critically to extract important information that would reveal extrinsic play activities. The goal at this point was to find out all possible types of play activities around the game which could be observed on the website. Therefore, irrelevant information such as information about other unrelated games, the help function of the website, etc was ignored.

The information ranging from textual contents, images, to other media such as video, sounds, animations was extracted from the websites and stored in a QDA software program. The same process was carried out for other websites. Redundant information types from the same game were ignored so that a solid set of trimmed data was obtained. This data collection process was repeated for all five games.

- *Categorisation*

Reading through the data, I identified types of play activities observed at the websites for each game. For example, the following is the list of activities for The Sims.

- Strategy guide
- Game rule discussion
- Meta-information about the game
- Tutorial for playing game
- Tutorial or making skins
- General discussion with other players
- Movies/films
- Photo/family album
- Comic strips
- Personal story
- Game music
- 3rd party software
- Level editing
- Sims idols
- Sims big brother
- Making a new different game
- Skinning (putting new skins to the 3D model to create a new character)
- Character building
- Game item building
- Desktop themes

Then I categorised these activities in order to obtain a set of more consistent and useful themes. I came up with Table 6.1.

Table 6.1 An initial category for extrinsic play

	Rule-based element	Content-based element
Around the game (discussion and exchange game experience)	Discussion on game rules, game strategy	Discussion on the game stories, sharing the game images, fan journal
Beyond the game (using the game to play in a totally different way) and breaking the game (modifying the game directly)	Sim Idols, killing the Sims etc Changing the game code	Fan fiction, move making, comic strips Changing skins, wallpapers, using level editors to create new stories, etc

- *Modelling*

For each type of activities, I visualised it with the activity triangle by identifying the goal/objective of the activities, the outcomes, tools, etc. For instance, Figure 6.3 shows a model that explains the data obtained from a website regarding the character editor for Super Mario Bros. (Figure 6.4).

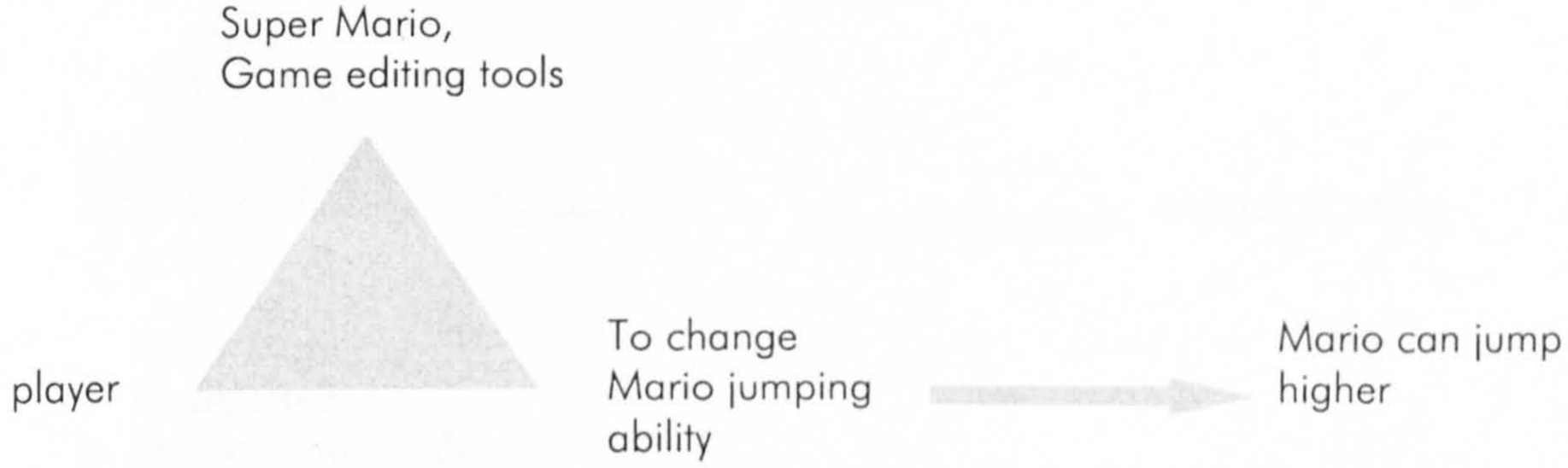


Figure 6.3 An activity of creating a new rule-element

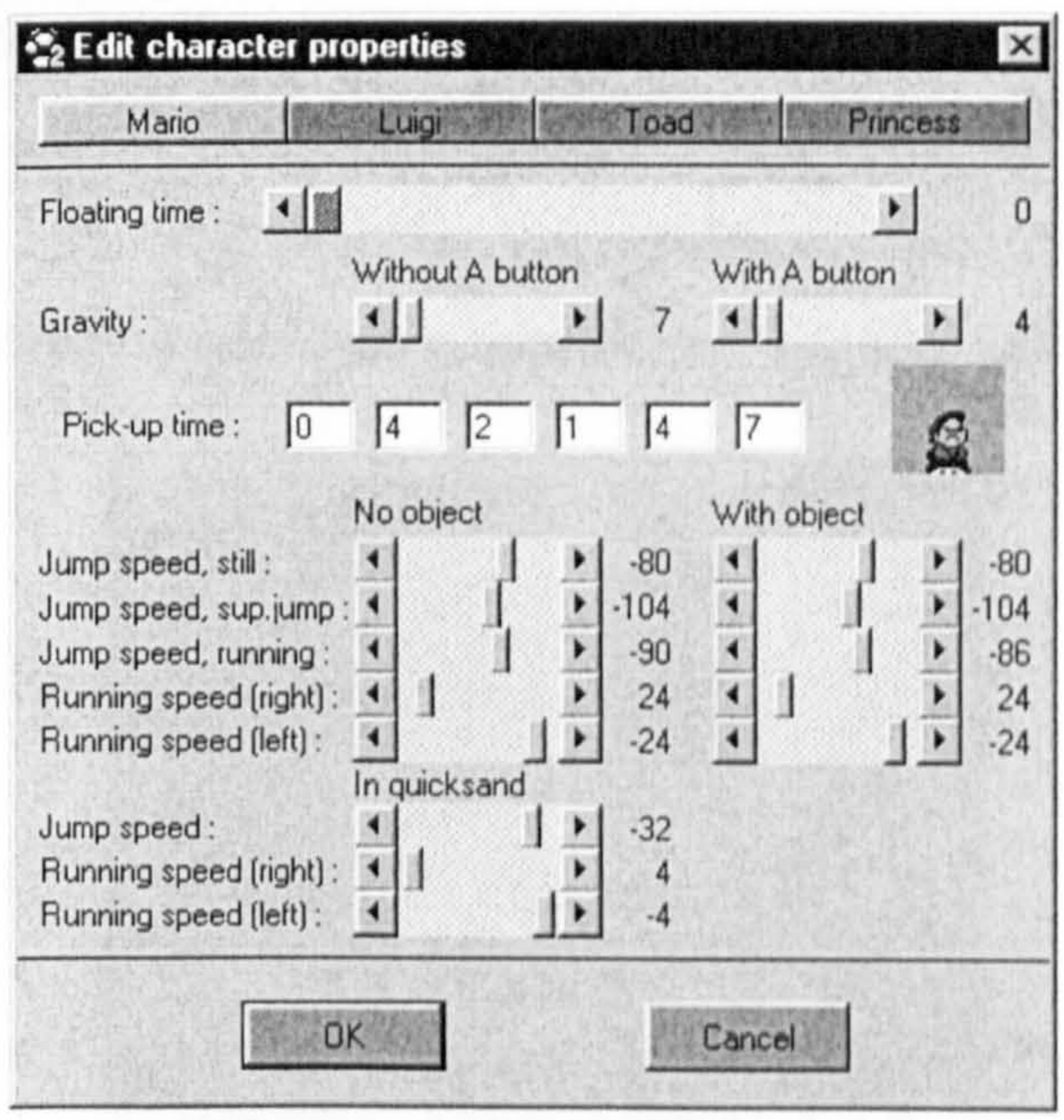


Figure 6.4 A screenshot of the level editing tool for Super Mario 2

The following is an excerpt of the description of the level editing tool:

"Oh yes, this. It allows you to change the character properties (how high they jump, how fast they run, how fast they pick up things, etc.) See the Mario there? You can preview the pickup speed (you'll see the character pick up a vegetable at the speed you set)!"

Once I modelled all the themes of extrinsic play, I attempted to generalise the activity systems so as to obtain a generic activity system that is able to illustrate all the extrinsic play activities that fall under the same theme. I was also able to match each theme into the three levels of tools: primary, secondary and tertiary.

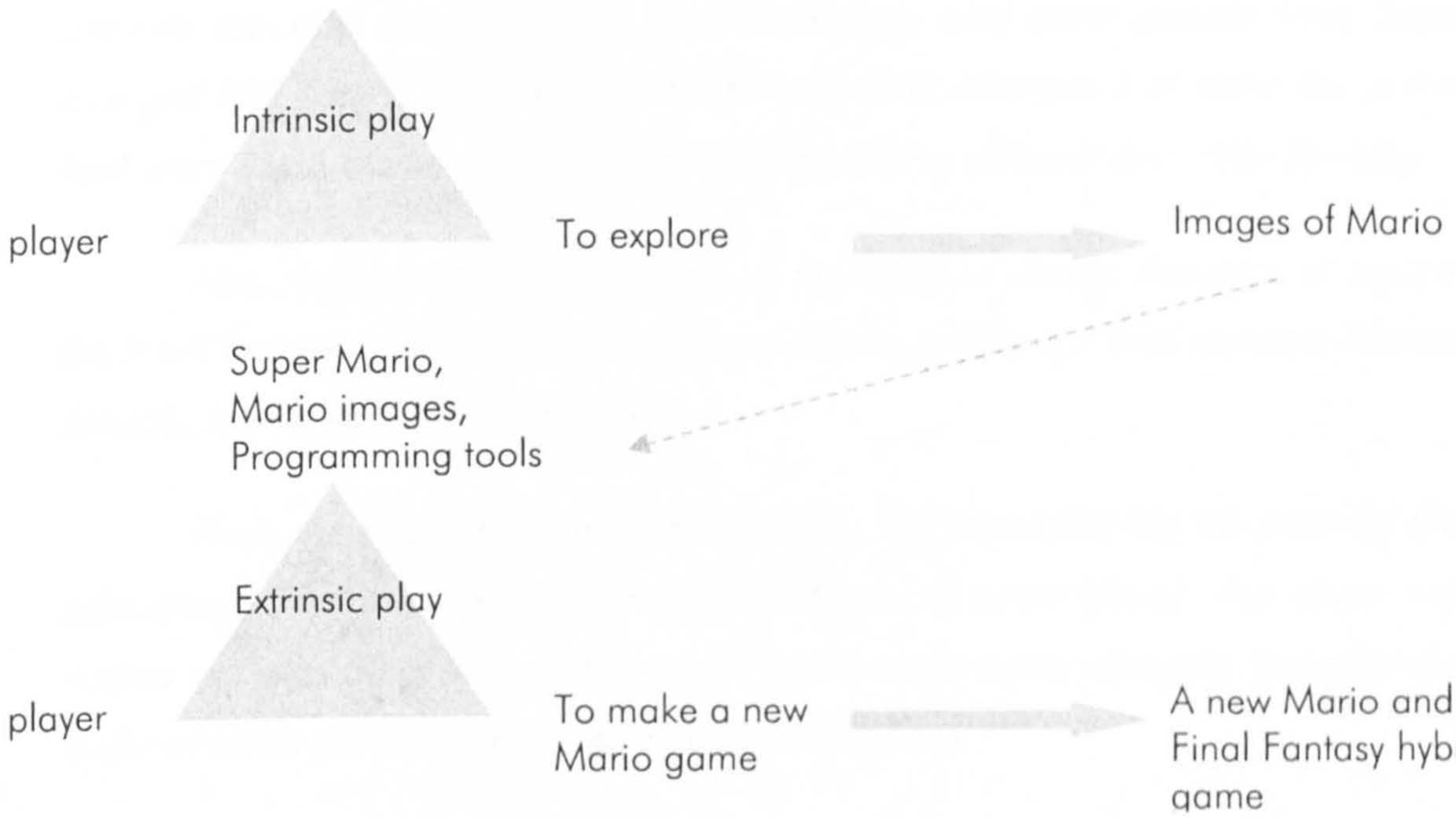


Figure 6.5 The relationship between intrinsic and extrinsic play

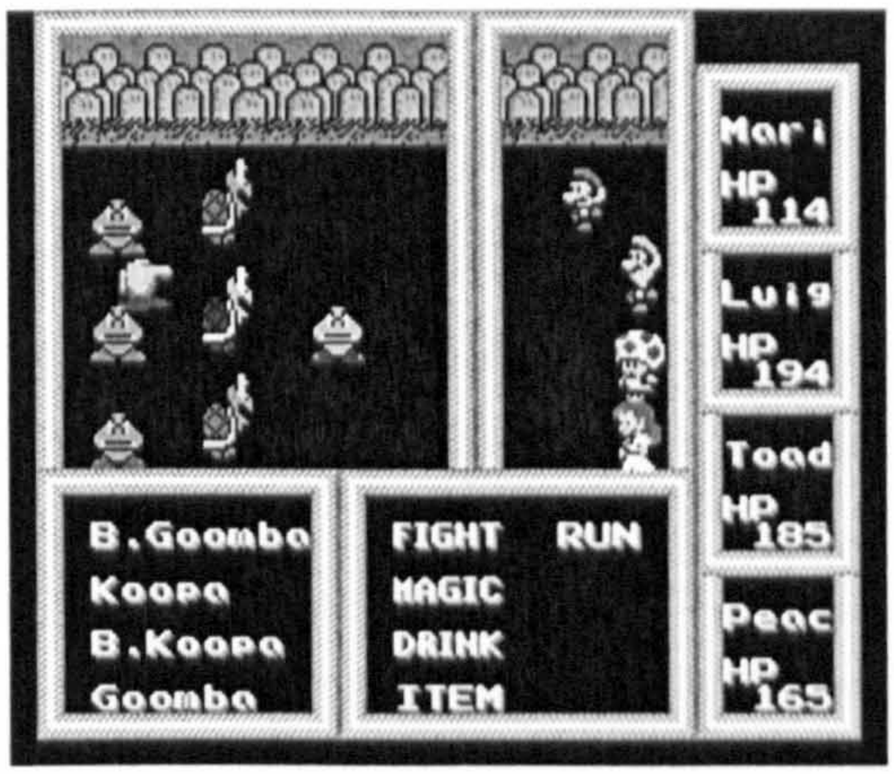


Figure 6.6 The use of Mario images for other games

Then, based on the result I obtained from the study from the previous chapter (refer to section 5.2.2), I inferred why extrinsic play activities arose. For each type of extrinsic play activities, I visualised the relationship. For instance, Figure 6.5 shows

the model that explains the data obtained from the website regarding the character editor for Super Mario Bros. (Figure 6.6).

The following is an excerpt of the description of the new game:

> *"First, it changes all your characters into those from Mario games. For example, the Fighter is Mario, the Thief is Luigi and the Black Belt is Toad. Some enemies are also changed (Imps are Goombas), and some people have been changed into Toads. Well, there [are] many graphic changes that make the game look more like a Mario game ... (or at least something different than Final Fantasy)*
>
> *Also, there's some text change [...]. I'm trying to change the story, at least a bit. It will happen in Mushroom World, and Bowser will be the final monster. Names (people, towns, etc.) will be changed.*
>
> *Then, there [are] the overworld changes. The towns (the first two actually) are restructured, and the overworld is a little different at some places. The caves and castles will also have minor changes. I'll try to make some changes that alter the order at which you do things to go farther in the game.*
>
> *And [...] some of the game data that will be changed. The enemies will have different properties, the levels [will not] require the same EXP points, the weapons will be different, etc."*

Based on these activity systems I modelled, I generalised them into two high level models, which I called reflective play and expansive play. I also abstracted the relationship between intrinsic and extrinsic play, drawing from the theoretical constructs of Activity Theory: contradictions and development.

I identified "cross boundary" elements from the intrinsic play activity system to all the extrinsic play activity systems I just modelled. By examining the nature of the "boundary crossing" process, I generalised and identified the types of such process. Particular emphasis was placed on the interaction of the tools, the objects and the outcomes. The model will be explained in depth in the next section.

- *Validation*

Further data collection and analysis was done until the revised model was able to explain all observations from the data, meaning that analysing more data no

longer yielded new insights. To ensure the reliability of this model, a focus group with three colleagues was run to validate the results. I explained the final models to the participants of the focus group and each participant was given an excerpt of data of a specific type of extrinsic play activity. Then they were required to explain in detail the specific play activity using the models. Any discrepancy was recorded and resolved in order to obtain the final models.

6.4 Findings: the Extrinsic Play Activity Models

It is found that Activity Theory provides powerful theoretical constructs for analysing computer games. Although these theoretical constructs have been used by some Activity Theory scholars in various areas (Roth 2005; Leadbetter 2005; Guy 2003), they have not been explicated in a clear manner in the context of computer games. In the following sections I present my models which highlight these theoretical constructs and how they are useful for analysing computer games.

Studying game play from a broader context, taking on board the play activity and enjoyment players experience not only within the game but also beyond, I found that game play consists of multiple activity systems with different motives which are significant to be examined on their own.

First, let us look at game play in general at the activity level.

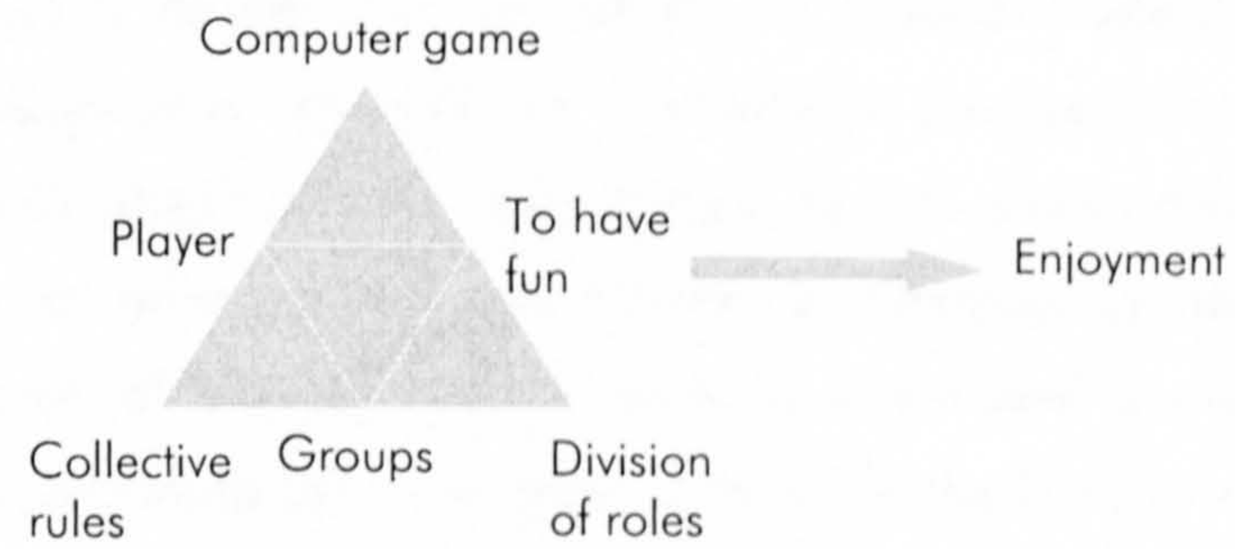


Figure 6.7 The game play activity in general

Figure 6.7 shows that the motive of game play is to have fun and this results in the enjoyment of the player experience (the outcome). The play activity is mediated by the computer game software (the tool). In the multi-player case, the play activity is also mediated by collective rules and division of roles. Note that the motive of play

activities could also be something else, depending on the nature of the computer games as some games are designed specifically for educational purposes, healthcare training, advertising, socialising (e.g. Second Life (Linden Lab, 2003)), etc (Stokes, 2005). In this chapter, I focus on entertainment-oriented games and the social interaction that arises from such games.

This motive can be instantiated into a series of motives which contribute to the overall enjoyment of game play. I have mentioned elsewhere in this thesis that there are two types of play: intrinsic play and extrinsic play. Intrinsic play refers to the play within the pre-defined boundary of the game structure while extrinsic play refers to the play which goes beyond this original game structure. Based on the analysis, extrinsic play can be broken down into reflective play and expansive play. Reflective play involves the process of externalising various aspects of intrinsic play through communication, sharing and discussion. When Reflective play occurs, players step out of the pre-defined game boundary and reflect on their intrinsic play activities.

Expansive play refers to play activities which transgress the original game boundary and transform intrinsic play in an unexpected way. Expansive play generally involves modification of intrinsic play that results in a new pattern of play that goes beyond the original game context. The study indicates that understanding social interactions in computer games requires the analysis of three types of play.

These three types of the play occur at both the individual and collective levels. For example, my observation revealed an interesting collective dimension of reflective play, in which players are not only interacting with each other through intrinsic play, but also co-reflecting their play activities by externalising their actions through the construction of external artefacts such as Wiki-based game strategy guide books. Similarly, expansive play also arises at the collective level, in which new artefacts are constructed; emerging rules and division of roles are negotiated and agreed. Drawing on Activity Theory, I describe in detail each of these types of play and their relationships.

6.4.1 Intrinsic Play Activity Model (IPAM)

Let us recap the IPAM in order to identify the relationship between intrinsic and extrinsic play. As explained previously, I define intrinsic play as play activity

within the structure of game defined by the game developer. The object of intrinsic play lies in the process of the intrinsic play itself. This object triggers the motive, which is to achieve the game goal; whether it is developer-defined or player-defined. The outcome of the intrinsic play activity system is the achievement of the game goal, that will directly and indirectly contributes to the overall enjoyable experience. Figure 6.8 shows the (simplified version of) IPAM (for the detailed version, see chapter 5).

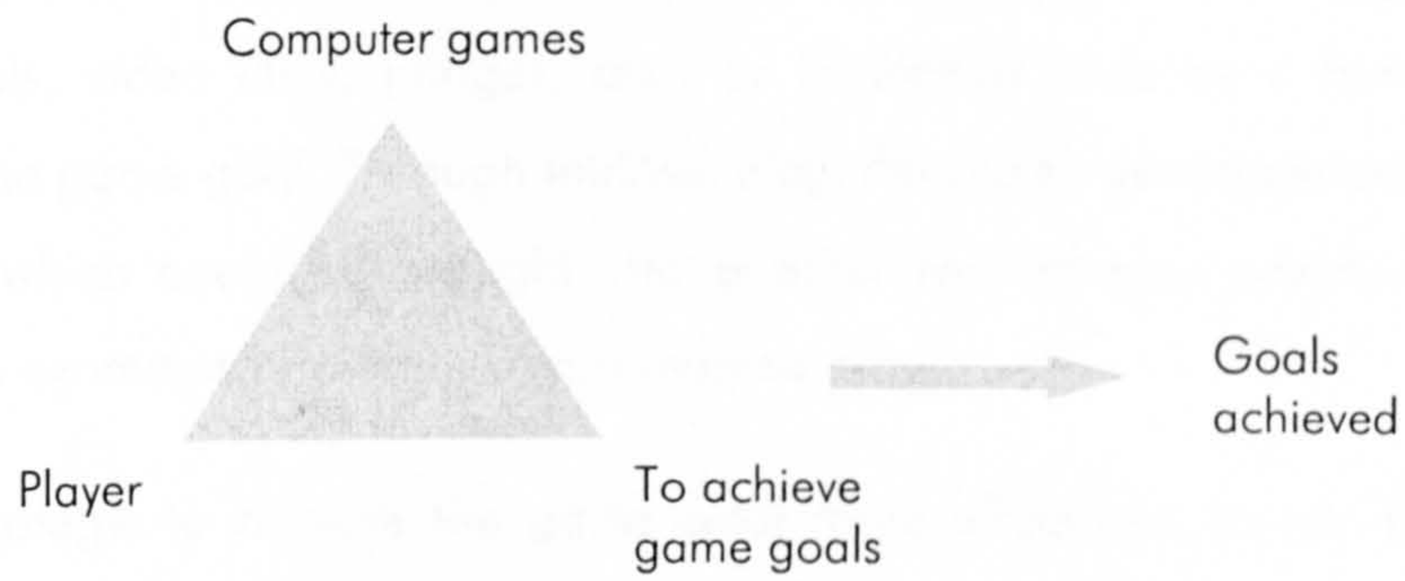


Figure 6.8 Intrinsic play activity model (IPAM)

Whilst the activity level gives us an overview of the play structure in its long term formation, a useful analysis on intrinsic play (and other types of extrinsic play) can be carried out at the action level, in which the dynamic process of play can be examined more closely. The play activity system generates actions through which the motive is enacted (carried out) and re-constructed (changed). In other words, activities are realised by individual and collaborative actions and the chains of networks of these actions which are related by the same overall motive.

At the action level, the goal of intrinsic play can be highly unstructured, such as "to play around with the game avatar" without an intention to achieve any specific game goal that would result in the progression of the game directly. Thus, intrinsic play goals could be structural (or progressive) as well as non-structural (or expressive). Progressive play actions are actions mediated by the game tool in order to progress through the game structure. Expressive play actions are actions mainly mediated by signs and language which are directed towards free-form play such as expression through the game avatar, socialising with other players, etc.

The outcome is not always the achievement of goals, since the outcome of the play action at a particular time could be a contradiction, in which the player is unable to achieve the goals due to the lack of skills or knowledge.

Based on the analysis on play in the socio-cultural context, I identified another possible aspect of the outcome: the construction of artefacts. Artefacts should not be confused with tools used for mediation. Tools may be used to create artefacts while artefacts are the outcome of a play activity. These artefacts could be tangible such as screenshots, video clips, images, etc., or intangible such as a better strategy to achieve the game goal. Through intrinsic play, the player generates and accumulates artefacts which could be brought into another type of play activity system. Listed below are examples of artefacts from intrinsic play:

- Strategy: to achieve the game goal more effectively, to win the game in a shorter time, etc.
- Story: the built-in story lines of the game or stories enacted and constructed when the game is played
- Media resources such as sounds, graphics, videos, from the game
- Game entities such as in-game 3D character model, architectural structures, etc.

In intrinsic play, the game software serves as a primary tool that mediates the activity/action to achieve the game objective/goal. Some examples of primary tools in games are the game interface, the game avatar, other game entities such as weapons, the game avatar abilities such as magic casting, etc.

6.4.2 Reflective Play Activity Model (RPAM)

According to Leontiev's (1978) hierarchy of activity, when a contradiction occurs, the subject stops working towards the goal in order to reflect on the tools to resolve the contradiction. This will eventually result in the development of the activity so that the subject can focus on the goal again. Taking this claim further, reflection can be analysed like other forms of activities particularly when the subject is reflecting on the contradiction in a social context within the community. Like other activities, reflection could happen at the collective level, in which players' internal thoughts are externalised through signs such as texts, videos, images and shared with

other players. Although players often suspend their disbelief when playing games, they are always conscious of the rules of reality and different sets of rules in different types of play. It is particularly pronounced when they reflect on the play; they step back into reality in which they are fully aware that it is just play.

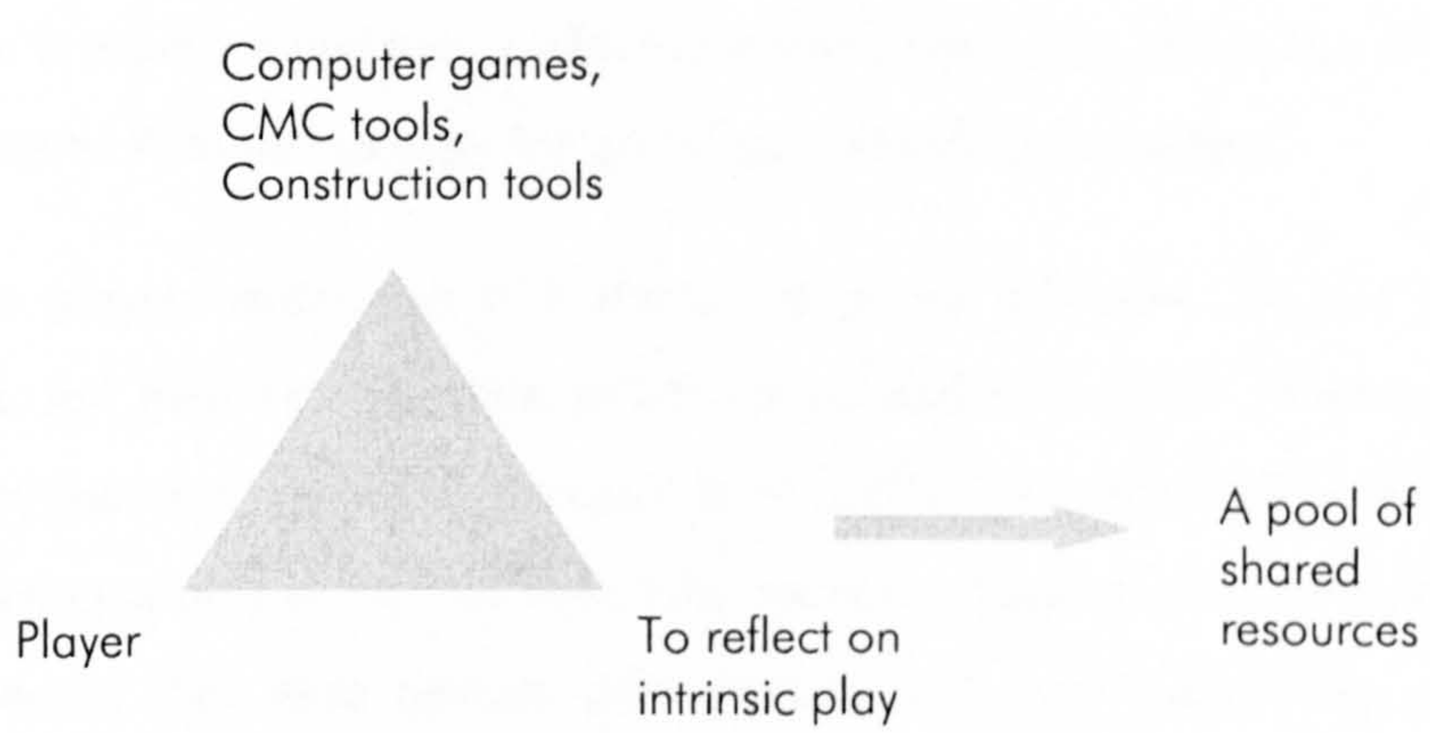


Figure 6.9 Reflective play activity model (RPAM)

Figure 6.9 shows the reflective play activity system. I would like to call it the Reflective Play Activity Model (RPAM). The object of reflective play lies in the process of the intrinsic playing itself. This object triggers the motive which is to reflect on intrinsic play and it results in a pool of shared resources as the outcome. These resources can be combined, used and transformed in novel ways through expansive play (see the next section for expansive play).

Examining reflective play at the action level, I identified three types of actions that take place in this activity system.

- discussion
- construction
- exchange and sharing

The most prominent action of reflective play is perhaps discussion, in which players talk to each other about issues around intrinsic play. Players' actions are no longer driven towards the intrinsic game goals. Rather, players step back from their game avatar/game fictional world and talk about their intrinsic play, including the rules, stories, strategies, etc. via CMC channels such as discussion boards and online forums.

Players also externalise their intrinsic play experience through the construction of various artefacts. Players construct unofficial game strategy guides, novels of the in-game stories, game play videos, etc. For instance, using video capture function of the game or other external software, players record their game play sequences or in-game stories in the form of videos. Although my observation shows that this construction is mainly individual, collective construction also exists, the most common being the use of Wiki technology for game guidebook construction.

Then players exchange and share the game artefacts. Players upload their high scores, tell their stories while others download and read. This kind of play is supported by the analysis of Ducheneaut et al.(2006) on a MMOG and they claimed that showcasing is also a form of social interaction. Apart from sharing their intrinsic play experience, they also discuss their construction: complimenting, commenting and talking about techniques for construction.

Therefore, such collective-reflective-play not only helps each individual understand and play the game better, but also creates a sense of community and brings players closer to each other. Collective rules emerge, for instance the community of players negotiates and agrees on rules of conduct in discussion boards. Players also assume different set of roles which are not related to the roles of the in-game avatar they are playing, for example some players become the moderators of the discussion forum. In some cases, the in-game avatar is used to represent the player in such discussions to relate their reflective play experience to the intrinsic one.

It is also noted that game play dos not always begin with intrinsic play. Sometimes, even before playing the game, players are already receiving some information through the discussion with other players which contributes to the overall enjoyment of game play.

The outcome of reflective play which is important for further examination is development. Development in reflective play includes the resolution of the contradiction that arises from intrinsic play. Sharing the knowledge from resolving the contradiction with other players generate a pool of resources (the outcome of reflective play at the activity level). The outcome could also be artefacts. For

instance, players externalise their reflection by constructing walkthroughs and strategy guidebooks. It also involves the narrative aspect, such as the externalisation of the game stories and fictional elements through the use of symbols (including writing, images, videos, sounds).

In reflective play, the game software becomes a secondary tool which consists of externalised symbols of how to use the actual tool (the primary tool). Procedural instructions such as instruction manuals can work as secondary tools. In computer games, secondary tools are materials or any other tools that help better understand the game.

Some examples include the in-game tutorial mode, help files, in-game dialogues about the game control/game tips, manuals, screen capture tools, video editing tools, CMC tools such as online forums, chatting programs, etc. Some of these tools are built into the game software while others are external applications. Artefacts constructed in reflective play such as strategy guides and videos might become a tool in mediating reflective play to resolve the contradiction of intrinsic play, thus expanding the game as a secondary tool.

6.4.3 Expansive Play Activity Model (EPAM)

Even though most computer games have a strict structure that defines the basic pattern of play, when observing players play the game in a broader context, it is found that play activities tend to go beyond the original context of the game. I would like to call such play expansive play. Expansive play generally means play activities that go beyond the original game structure. Players are testing and stretching the boundary of the game, especially in multi player games, since it is common to negotiate and modify the original game rules.

The concept of expansive play draws from Engeström's expansive learning, which purports that learning involves the transformation of the entire activity system the learners are engaged in. It is further claimed that expansive learning "produces culturally new patterns of activity" (Engeström, 2001). In a work context, expansive learning produces new forms of work activities which are novel and appropriate/useful. Usefulness in the context of play in games not only refers to the production of useful artefacts (Eales & Perera, 2006) but also other useful outcomes

(e.g. the enjoyment, learning, achieving the game goal) it "produces". Expansive play expands not the personal capacity of playing (individual development and learning), but the whole activity system of play, changing the common play practice within the community.

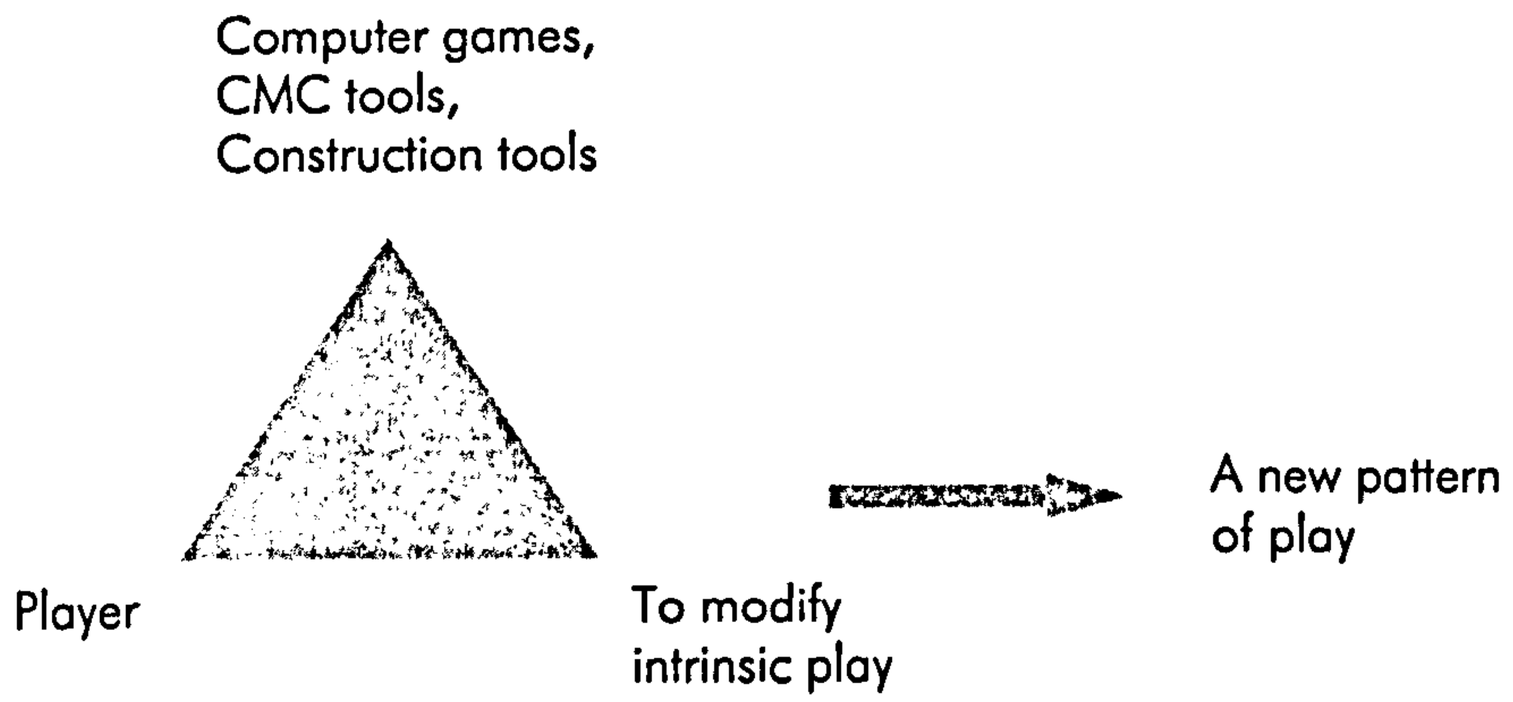


Figure 6.10 Expansive play activity model (EPAM)

Figure 6.10 shows the expansive play activity system. I would like to name it the Expansive Play Activity Model (EPAM). The object of expansive play lies in the process of the intrinsic playing itself. This object triggers the motive which is to modify intrinsic play and thus produce a new pattern of play (the outcome).

Engaging in expansive play means players are not limited to acting or reacting to the game environment (as in intrinsic play) or reflecting on the environment (as in reflective play) as they have the possibility to design the environment through the creation of new artefacts that transform the environment.

Expansive play involves a player connecting previously unrelated resources (artefacts, tools, actions, etc) to produce a novel idea. Expansive play is also a collective process, thus the resources come from a group of players. The outcome from reflective play "moves into" expansive play in which the community of players uses external shared representations to develop and share novel ideas. The development in intrinsic and reflective play is mostly individual or collective development of the players, but in expansive play, the development changes the "horizon" of the whole activity system

Examining expansive play at the action level, I identified three types of actions that take place in this activity system.

- Transgression
- Construction
- Expansion

I observed that playing a game goes beyond its original rules and transgresses its structure. Expansive play can occur at the level of rule-transgressing. It involves using the game for a different type of game play. In some cases, the player not only plays the same set of rules in different way not expected by the game designer, they also modify the rules. This happens through negotiation and agreement on new sets of rules to play or even hacking the game codes. Transgression can happen in order to achieve the designed game goal or a completely new goal constructed by the player. For instance, I found that The Sims is used for a new type of game known as Sim idol (SLproduction, 2006).

Expansive play actions also involve constructing artefacts independent of the game original context (such as videos), or artefacts which can be imported into the game (such as game interfaces). The difference between construction in reflective and expansive play lies in the goal of the construction. Artefacts are constructed in reflective play for the player to reflect on and thus learn more about some aspects of intrinsic play. In expansive play, construction is for new types of enjoyment, such as the enjoyment of watching the video, and of expanding the game play.

In game expansion, the basic game structure is not changed substantially. Rather, contents are added. It often means constructed artefacts such as new weapons or characters are imported into the game to expand it. Sometimes new game levels are constructed and added into the original game, prolonging the game play. In addition, various aspects of games are changed although the basic game play is not altered, e.g. changing the graphic of the games and the appearance (skin) of the game characters.

The outcomes of expansive play are mainly artefacts which might become a tool in another play activity system. For instance, the outcome might be a game entity used as a tool in intrinsic play. It can also be the construction of level editing

software which can be used as a tool in another expansive play action (to create a new game level).

The tools of expansive play are third party software tools which enable players to manipulate the resources (artefacts from intrinsic play, e.g. videos, images, sounds, game entities, etc). These tools, such as the level editor, might be developed and supported by the game developer itself. The computer game software itself could also act as tertiary tools. In other words, the game itself is not only used as a mediated experience, but as a creative medium.

The game becomes an imaginative tool which redefines the player's understanding of the change in the overall play. Examples are Mod tools, in-game editing tools, game entity import/export function, 3D modelling tools, video editing tools, screen capture functions, CMC tools, etc. Note that some of these tools are similar to secondary tools as the same tool can be used for different motives/goals.

6.4.4 Relationships

A prominent concept of the 3GAT is the cross-boundary process of two interacting activity systems. It refers to the movement of the element of an activity system to another, motivating the development of the activity system. This concept is crucial in understanding how extrinsic play emerges from intrinsic play.

For instance, a contradiction might occur in intrinsic play, in which the player is unable to achieve a goal. This contradiction is then transformed into a new motive (to resolve the contradiction, to break the rules, etc) for the emergence of a new form of extrinsic play. In other cases, some activity systems borrow tools from another activity system.

Based on my observation, analysing the outcome from different perspectives casts some light on the cross-boundary process of the play activity. Let us look at some key types of cross-boundary processes I identified in the study:

6.4.4.1 Outcome-object

Outcome-object relationship is one of the main concepts we can use to explain the connection between activity systems. An object refers to "something" a

subject is working on. It could be raw materials, motives or goals which will be transformed into outcomes. In the context of game play, the outcome of intrinsic play triggers the emergence of motives that direct extrinsic play. Thus, the outcome becomes the object of another activity system.

As aforementioned, the outcome of an action at any particular point of time could be contradictions or development. I have also pointed out that development does not simply mean the achievement of the goal as in many cases the achievement of the goal also implies the construction of artefacts.

- *Contradiction-object*

When the player is unable to achieve a goal in intrinsic play, a contradiction arises and it forces the player to change the goal she is acting on in order to resolve it before she can focus on the goal again. The contradiction is transformed into a goal of extrinsic play.

If the contradiction is due to the lack of skills or knowledge of the player, it could result in reflective play, the goal of which is to reflect the contradiction and resolve it. If the contradiction is due to the inability of the game tools to mediate the intrinsic play action, it could result in expansive play, in which the player attempts to modify the game tools. An example is the expansive play action of building a car in the Sims.

In a work context, creative and novel actions are usually defined as a problem solving activity, indicating that these actions are triggered by a problem (Warr & O'neil, 2005), or a contradiction in Activity Theory term. But expansive play can be expressive like art which is not necessarily triggered by a problem. A player might not have a problem to solve in order to be expressive and creative. Rather they become creative because of the presence of resources or artefacts.

- *Artefact-object:*

Artefacts from intrinsic play trigger expansive play actions. They become raw materials and are potentially transformed into a motive of expansive play.. For instance, the artefact (the outcome) from intrinsic play (such as screenshots) is

transformed into a goal of expansive or reflective play such as to create a comic strip, the overall motive of which is to modify the game and create useful information for the game community. In this case, the presence of resources provides an opportunity for the expansion of the game activity system. The outcome of expansive play could also be a contradiction (e.g. need more resources which is not available) and this results in reflective play in which a pool of resources and artefacts is gathered.

Furthermore, artefacts from intrinsic play motivate the players to share and showcase their "play actions" and indirectly help them or other players reflect on their intrinsic play.

6.4.4.2 Outcome-tool

Another common relationship in a network of activity systems is the outcome-tool process. The outcome of an activity system either provides new tools or transforms the existing tools of another activity system. The development of an activity system could result in the change of the tool of another activity system. For instance, goal achievement in reflective play will resolve the contradiction of using the tool in intrinsic play.

- *Artefact-tool*

Artefact-tool process is an important concept that explains the "cross-boundary" process of game play. The most common example is the transformation of artefacts from expansive play into tools for intrinsic play. For instance, the outcome of the intrinsic play such as the game stories or strategies become the tools for discussion in which such knowledge mediates the reflective play activity.

6.4.4.3 Outcome-action

The transformation of tools and goals directly or indirectly transforms the play action itself. In some cases, the development does not change the goal or tool but the play action – the way players act on the same goal with the same tool. For instance, the outcome from reflective play could be the development for using the tool more skilfully (intrinsic play actions) to achieve the goal. In other words, actions

of intrinsic play are transformed through the development (outcome) of reflective play.

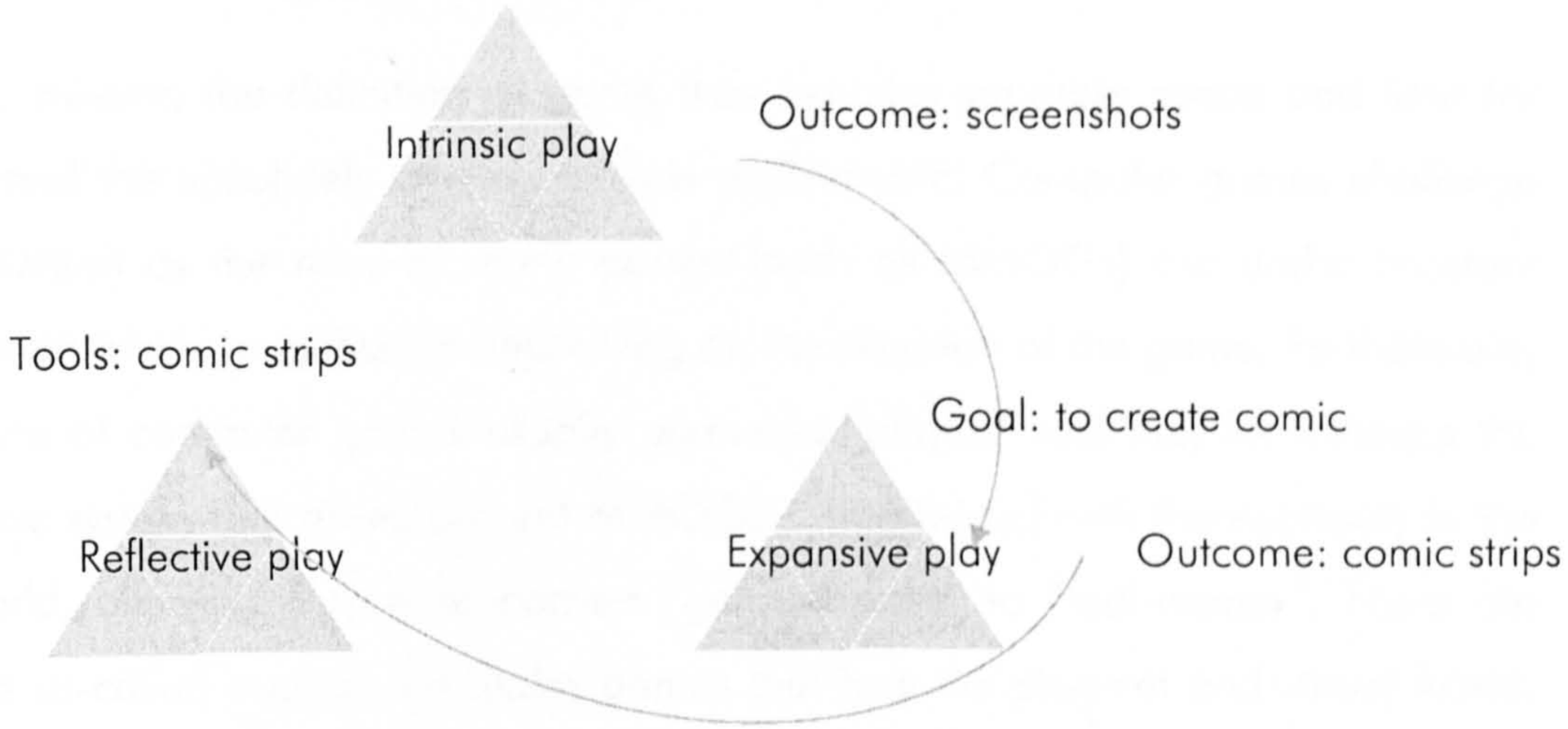


Figure 6.11 An example of the network of play

Figure 6.11 shows an example of a connection of the three types of play. The outcome of intrinsic play is the screenshot of the game play which triggers the goal of expansive play to construct comic strips. This expands the original game structure and turns the game into a creative medium. Then the comic trips become a tool for reflective play to reflect on and share the intrinsic game play experience.

6.5 The Expanded Magic Circle

The findings presented in this chapter have a significant impact on computer game studies. One major concept which has gained much popularity in game studies is the magic circle introduced by Huizinga (1944) and adopted by computer game researchers (Salen & Zimmerman, 2003). It has been explained briefly in section 5.1.2.3 but I would like to expand it further. In general, a magic circle means:

"A delineation in time and space of the game's existence from reality in which game play takes place" (Salen & Zimmerman, 2003).

This concept is extremely important as entering the magic circle signifies the activation of game rules and narratives. For instance a piece of wooden horse figure

might carry no special meaning to game players. But once the players decide to play a chess game, they immediately enter the magic circle. Suddenly, the piece of wooden horse becomes the knight of a kingdom (narrative) and it has certain type of movement on the game board (game rules).

However, the definition of game that assumes separate space and time for games and the absolutely binding rules is problematic. Computer games challenge this definition as the rules of many games (such as MMOGs) are under constant negotiation and re-negotiation depending on the situation of the game. Furthermore, the space of computer games usually permeates players' real life; for instance the economic system that arises around MMOGs is intertwined with the economy in the real world, allowing players to convert "game-money" to "real-money". There are also the so-called augmented reality games that fuse the physical and virtual world. For example, some mobile games utilise Global Positioning System (GPS) that incorporates real world into the game world.

Having examined three types of play (intrinsic, reflective and expansive) I found that the magic circle of play is not only a given space as pre-defined by the game developer but is also being constructed in negotiations between players and the game developers, and among players themselves. I therefore propose three levels of magic circles (Figure 6.12).

- *Primary magic circle*

The players are playing within the narrative and ludic boundary of the game as defined by the game developers. The primary magic circle is rigid and fixed and pre-defined before the game starts. In the primary magic circle, players are immersed in the game world, submitted entirely to the rules by suspending disbeliefs and become oblivious of the "real world".

- *Secondary magic circle*

The players are discussing and exchanging ideas about the primary tool (various rules, fictional contents etc). The secondary magic circle serves as the intermediary that allows the primary and tertiary magic circle to communicate and exchange information. Here, players are themselves in the "real world". They are detached from the primary magic circle and are looking at the primary magic circle from the outside. For some designers, the aim of game design is to create a virtual environment that would immerse the players as much as possible by keeping them within the primary magic circle. However, analysis on extrinsic play revealed that detachment from the primary magic circle is not necessarily a bad thing. Players are still engaged in the game within the "bigger magic circle" through reflection, and this could contribute to the development of player community. However, it is not to claim that players are not immersed in the game when playing in a secondary magic circle. This secondary immersion lies in the social interaction with the community and the meta-interaction with the game.

- *Tertiary magic circle*

The players are breaking the rules, agreeing on new rules and adding new fictional elements. The tertiary magic circle is constructed and is founded on the primary magic circle. It is dynamic and organic; it expands and contracts through the time of play. At this level, players are immersed in the primary magic circle and at the same time are aware of the world around them. They are switching their roles from time to time. As they submit themselves to the rules and fictions, they are also constantly rebelling against and modifying the rules and the fictions. Thus, this tertiary level of immersion urges the players to re-construct the primary magic circle.

It is clear, from these new interpretations, that the boundaries of the magic circle are not fixed in advance before the game starts. The creative pursuit in games brings about in the expansion and contraction of the magic circle, as a result of the immersion and detachment of the original magic circle (the primary magic circle). Players engage themselves in the game by detaching themselves from one level of magic circle and moving across a different level of immersion.

Therefore, this model of magic circle challenges the system-oriented interpretations of the concept which assume a physical and temporal isolation of

game play activities from other activities of daily living. Game play is thus seen as an activity that moves across the boundaries between the game world and the real world. This movement is not limited to physical movement such as artefacts (e.g. chess pieces, virtual swords) but also players' identity or role movement from being a wizard trying to save the world, to a student who spends hours playing computer games and earn real world money from the game world. Understanding this cross-boundary movement is particularly important as games are getting more ubiquitous, causing the blurring boundary between game world and real world.

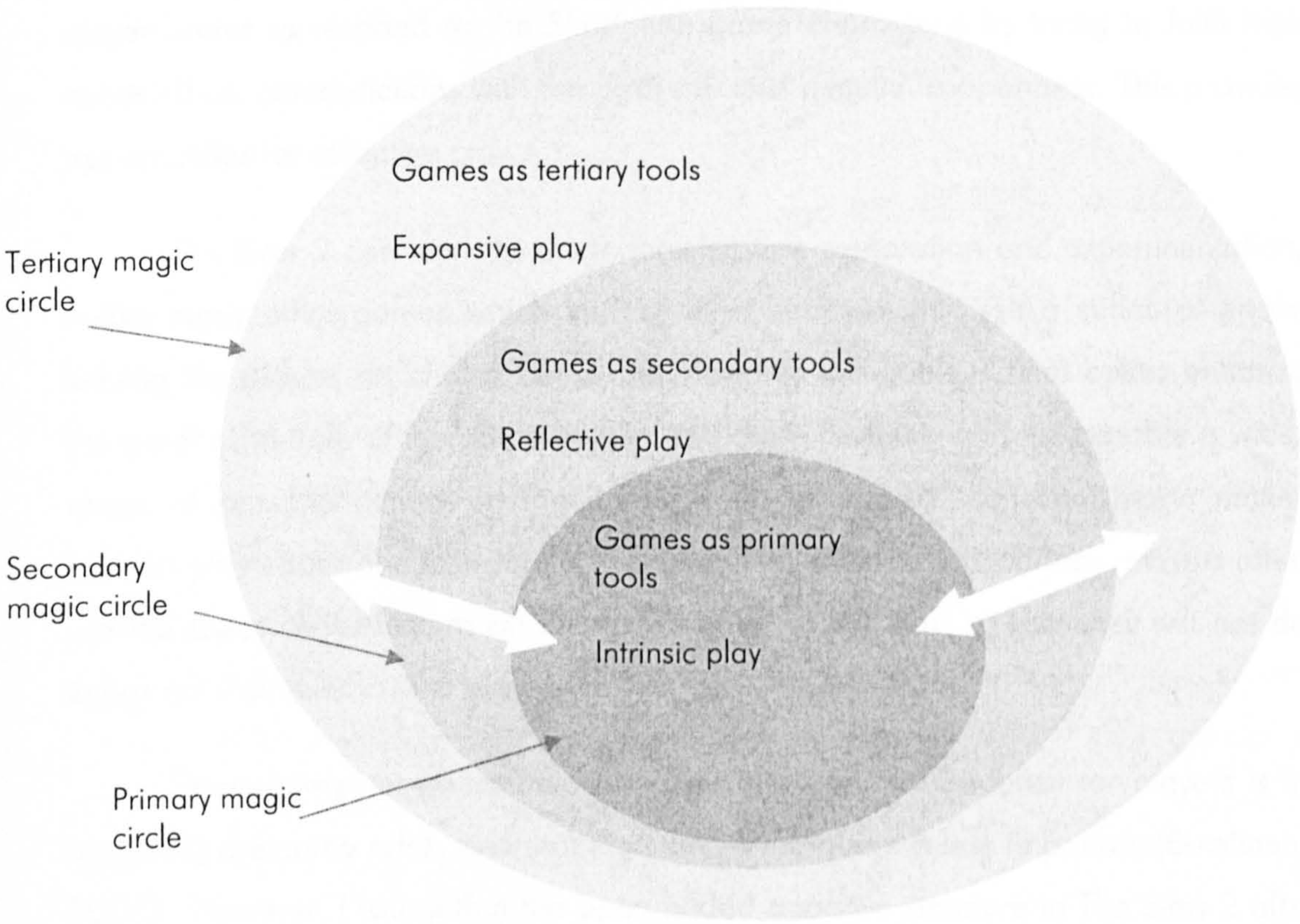


Figure 6.12 The three levels of magic circle

6.6 An Exploratory Case Study of The Sims 2

In this section, I would like to present a case study of the socio-cultural context of a game, by examining The Sims 2 as a step to validate the usefulness of the models. It is generally agreed that The Sims 2 is a highly successful game in terms of its online community support and the emergence of extrinsic play. Using the game play models (the IPAM, the RPAM and the EPAM), I explored the Sims 2 to identify the characteristic of the game software tool which supports extrinsic play.

One unique feature of the Sims 2 is its open-ended ludic structure. It has no built-in game goal. Playing the game is not only about engaging in progressive play actions, achieving goals and progress through the game, but also expressive play. Expressive play is oriented towards player-defined goals such as "to decorate the house to look like mine (in real life)", " to create a nice looking Sims", etc. Therefore the game software of The Sims 2 is a tool which is used by the player to realise their personal goals.

Although the game goal is not explicitly built into the game, in general the player seems to respond to the Sims' (the game characters) by trying to fulfil their needs. Thus, contradictions with the goal still exist despite its openness. This provides opportunities for reflective play.

The Sims 2 can work as a sandbox for free exploration and experimentation, unlike many other games which impose strict structure through a series of goals, leaving the players no choice but to play towards the goals. Cheat codes enhance the sandbox feature of the game by allowing more flexibility and they enable a wider range of possible actions in the game. This "enhanced" sandbox mode makes extrinsic play easier and less painful. For instance, when making videos, players often use the cheat codes to turn off the "autonomy" of the Sims so that they will not do things not instructed by the player.

Some computer game theorists assert that the main interest for players is in mastering the game rules, and that the story of the game is less important (Eskelinen, 2001). However, I found that the open-ended narrative structure in The Sims 2 also contributes significantly to social interactions in the community. As I said before, the ludic structure is not built-into the game as there is not rigid structure as to how the player should progress through the game. Similarly, the story in The Sims 2 is not written into the game software tool, it emerges as the play activity enacts. One way to see this is to consider games as a tool of narrative expression. I found that players seek enjoyment in creating and showing off their game families and houses in the Sims and acting out stories around them.

The Sims 2 supports engagement not only with the game progression (both ludic and narrative) but also with the fictional contents. Fictional contents can be

easily expanded to broaden the scope of intrinsic play where The Sims 2 allows straight forward import and export of the game contents. This also simplifies the process of sharing knowledge and resources, thus facilitating reflective play. The play activities of The Sims 2 are characterised by changes and construction of new contents. If the game developers make room for player's expansive activities, they will generate such expanding elements. The opposite will occur if the developers put too much structure into play; expansive play will not appear.

Finally, The Sims 2 has built-in "utility tools" which are not used to mediate intrinsic play. Rather they serve as secondary and tertiary tools that mediate extrinsic play. For example, the screen capture and video record functions in the Sims are not used to achieve intrinsic play goal (e.g. to develop the logic skill of the Sims); rather such functions give opportunities for players to capture their moments of game play and share them with others.

6.7 Discussion and Implications

Let us revisit the goals of this chapter. Analysing the socio-cultural context of game play, I identified two major types of extrinsic play and their connection to intrinsic play. Through this analysis, I found that reflection (or reflective play in the game context) is not just an action that resolves contradictions, but also an activity that contributes directly to the fun and enjoyment of game play. Similarly, expansive play does not mean an action of learning (at individual or collective development level) but the expansion of the whole activity of play.

This extrinsic play activity models also provide answers to the question of what motivates players to play from a different point of view. The oft-cited taxonomy of play (to achieve, to explore, to socialise and to kill) presented by Bartle (1996) explains only the motivation of intrinsic play. Through my analysis, I expand this by proposing that:

- Players are motivated to play by reflective play in which they want to talk about the game with others and be parts of the player community
- Player are also motivated to explore what they can do with the game in order to test the game boundary and to expand the game through expansive play

As I just mentioned, the enjoyment or the fun aspect of game play can be studied at three levels: intrinsic, reflective and expansive play. Unlike conventional game studies which focus solely on intrinsic play, I pointed out that players are also experiencing fun by reflecting on intrinsic play they are engaged in. Reflection is externalised, thus making it possible for players to reflect on intrinsic play of other players even before they actually "play the game". After the player has started playing the game, especially when the player has explored all the possibility of intrinsic play, the player attempts to transgress the original boundary of play, sometimes resulting in a completely new way of expansive play.

Through this study, I also found that social interactions in game play happen at three levels. In intrinsic play especially in a multi-player game, players are interacting with each other to achieve a shared goal to progress through the game. However, social interactions are not limited to play directed towards intrinsic play goals, as every now and then, players pause and reflect on their intrinsic play.

Personal reflection is an individual action but my study demonstrated that reflective occurs collectively as well. Reflection can be externalised like other activities through signs (language, images, etc). I believe that it contributes to social interactions in gaming as it provides opportunities for players to share their experience through externalising their individual reflection. Thus reflective play is not merely an activity to reflect the contradiction to resolve it. It encourages social interactions and community building. When contradictions happen, players can get helps from the game community.

Expansive play also triggers social interactions in which creative artefacts are constructed. The original game tools are modified, new practices of play emerge. These are shared among the players and they lead to community building. Apart from sharing, expansive play itself could be collective, resulting in interaction among players. For example, an original single-player game can be turned into a game which involves other players playing together. Thus, I believe that social interactions arise not only at intrinsic play level, but possibly more on reflective and expansive play levels.

Apart from identifying possible areas of social interactions that occur beyond the confined structure of game, the models also provide some other insights of computer games as tools and activities.

First, I found that the game software acts not only as a primary tool that mediates intrinsic play but it is also explicitly designed as a secondary and tertiary tool that mediates extrinsic play. In other words, computer games can be designed to support community building. Using the models I developed, we are able to analyse the game tools, play actions, goals, and outcomes to understand the relationship between intrinsic and extrinsic play. This can provide insights as to how games can be designed to facilitate social interactions. I have demonstrated in the previous section how The Sims 2 is designed to support community building.

Second, game play is mediated not only by the game software alone, but also other tools such as 3D modelling tools, video/image editing tools. In particular, CMC tools play an important role given the online context of game play I studied. Players seek to connect to others through different communication channels. Some recent game design has taken on board the development of CMC side by side with the game software itself (such as The Sims) while some have even incorporated CMC into the game software (such as MMOGs, which will be studied in depth in the next chapter). These external tools can be analysed through three levels: primary, secondary and tertiary.

Third, goal analysis is crucial in game studies. Although some games such as The Sims might appear to have no goal, my analysis shows that game goals, like game tools (such as the video editing tool) are not necessarily built into the game software. Goals exist in all game play activities. The game software itself might not impose an explicit goal but once the play begins, a goal is constructed. In addition, even without an explicit goal, the game software does imply some implicit goals. For instance, the character in The Sims will respond asking for food when the hunger level is low, nudging the player to feed them.

Fourth, the outcome of game play has been a difficult concept to explain in Activity Theory as unlike work-oriented activities, it is often believed that play activity does not produce a concrete "outcome". Some scholars using Activity Theory to

study computer games argue that the outcome of game is "fun and enjoyment" (Ryberg & Ponti, 2004). Examining games in a socio-cultural context, I found that the outcome of game play is more than "fun" as it could be the production of something "tangible" such as videos.

In addition, I not only treat outcomes as the "final result" of an activity, but also the "state" of actions at a particular time. Thus analysing outcomes involves analysing contradictions and development which are not only important to study the evolution of an activity system, but also provide a theoretical explanation to the evolution of the network of activity systems. I have demonstrated in the previous section (section 6.4.4) how this concept can be used to explain the emergence of extrinsic play from intrinsic play. In a similar way, we can also examine how extrinsic play influences intrinsic play.

Finally, research is being carried out to study the learning process within computer games due to the increasing popularity of serious games particularly their educational potential. More recently, social learning has been studied in which computer games are not just treated as an educational tool loaded with information to convey knowledge to learners. Instead, computer games become a social tool and cultural practice shared by a community of learners, in which they encourage social interactions among learners. Based on the models I proposed, social learning could take place at the level of reflective play in which players externalise thoughts about the game (and thus knowledge of the game) in a group through language and media. The benefit of such collective-reflective-play is that players not only reflect on the knowledge built into the game software itself but also on individual roles, goals and knowledge shared in the group.

6.8 Conclusion

Computer games are cultural tools which not only mediate fun experience in intrinsic play, but also reflection and expansion through construction, sharing and discussion. Fun and enjoyment in entertainment-oriented games are driven by the achievement of the game goal (intrinsic play), the learning of the game (reflective play), and the transgression of the game (expansive play).

This chapter addressed research question 3 of the thesis (How do various types of social interactions emerge around game play and how can this out-of game play be modelled?). I presented a different perspective of game studies that investigated socio-cultural game play. I also illustrated in depth extrinsic play and the relationship with intrinsic play by highlighting some theoretical constructs which are useful in analysing this cultural phenomenon. With the emergence of computer technologies particularly the Internet, computer games are becoming more open in terms of the structure as well as the authorship. In addition, game play is becoming a "productive" activity. This chapter covered an important aspect of computer games: games as participatory cultures. In addition, it is very encouraging to analyse computer games with Activity Theory as it reveals the connection of intrinsic and extrinsic play.

In the next chapter I will formulate a unified framework of play (see section 7.1) that includes intrinsic and extrinsic play modelled through the studies reported in chapters 5 and 6. I will also present two in-depth issue-based studies in the following chapter to demonstrate how the framework can be used to explain and give insights to the complicated social phenomena in a MMOG. The main characteristics of MMOGs are that they involve much bigger groups of players playing simultaneously and that relatively permanent relationships are established among players, resulting in the emergence of persistent online game communities. It is important to validate the usefulness of the framework by presenting new insights we gain through studying MMOGs with the framework.

7 Issue-based Studies on WoW

This chapter presents two issue-based studies on a Massively Multiplayer Online Game, namely World of Warcraft. Synthesising the results from chapters 5-6, the Social Play Activity Framework is presented. Using the framework, two issues, community building and social learning, are examined.

The previous chapters (5-6) were devoted to modelling play activities within and around games. A number of exploratory case studies were presented (see section 5.3 and 6.6) to demonstrate the usefulness of each model. What is still absent is an application of the framework to a complex social game environment. In this chapter, I summarise the framework and apply the framework to two issue-based studies in a Massively Multiplayer Online Game (MMOG).

I analyse player activities in a MMOG, namely World of Warcraft (WoW) which is based on a popular single-player computer game, Warcraft. The main aim of this study is to validate the applicability of the play activity framework by investigating player communities in WoW. More specifically, the goals are:

- to synthesise a unified play activity framework
- to infer how the process of community building could occur in the 3D virtual space
- to infer how the process of social learning could occur

The two issues – community building and social learning – are chosen because of the focus of social interactions in this thesis. Due to the social nature of these issues, they could reveal an extensive range of social activities in WoW. Furthermore, a deeper understanding of these issues may yield valuable recommendations for the sociability design of 3D virtual worlds.

This chapter is presented in the following structure: first, I summarise the framework, which I call the Social Play Activity Framework (SPAF) and operationalise the framework to generate a set of methodological guidelines for analysing game play in MMOGs. Then, the literature on Computer-Mediated Communication (CMC) and related issues is discussed, with an emphasis on 3D virtual spaces. It is followed by the methodology section in which I describe the data collection and analysis techniques. In the findings and results section, I explain in depth the results on how community building and social learning could occur in WoW. Finally I discuss the implications of this study in 3D CMC compared to its 2D counterpart.

This chapter aims to address research question 4 (What kind of insights can the play activity framework developed in the thesis give in terms of analysing social play activities in MMOGs?).

7.1 Social Play Activity Framework (SPAF)

Through the empirical studies presented in chapters 5-6, I modelled three types of play activities, namely intrinsic play and extrinsic play (consisting of reflective and expansive play). With the intention of demonstrating the usefulness of each model, I applied the models to study the sociability design of some games (section 5.3 and section 6.6).

Let me now synthesise and summarise the findings into a framework, which I call, the Social Play Activity Framework (SPAF).

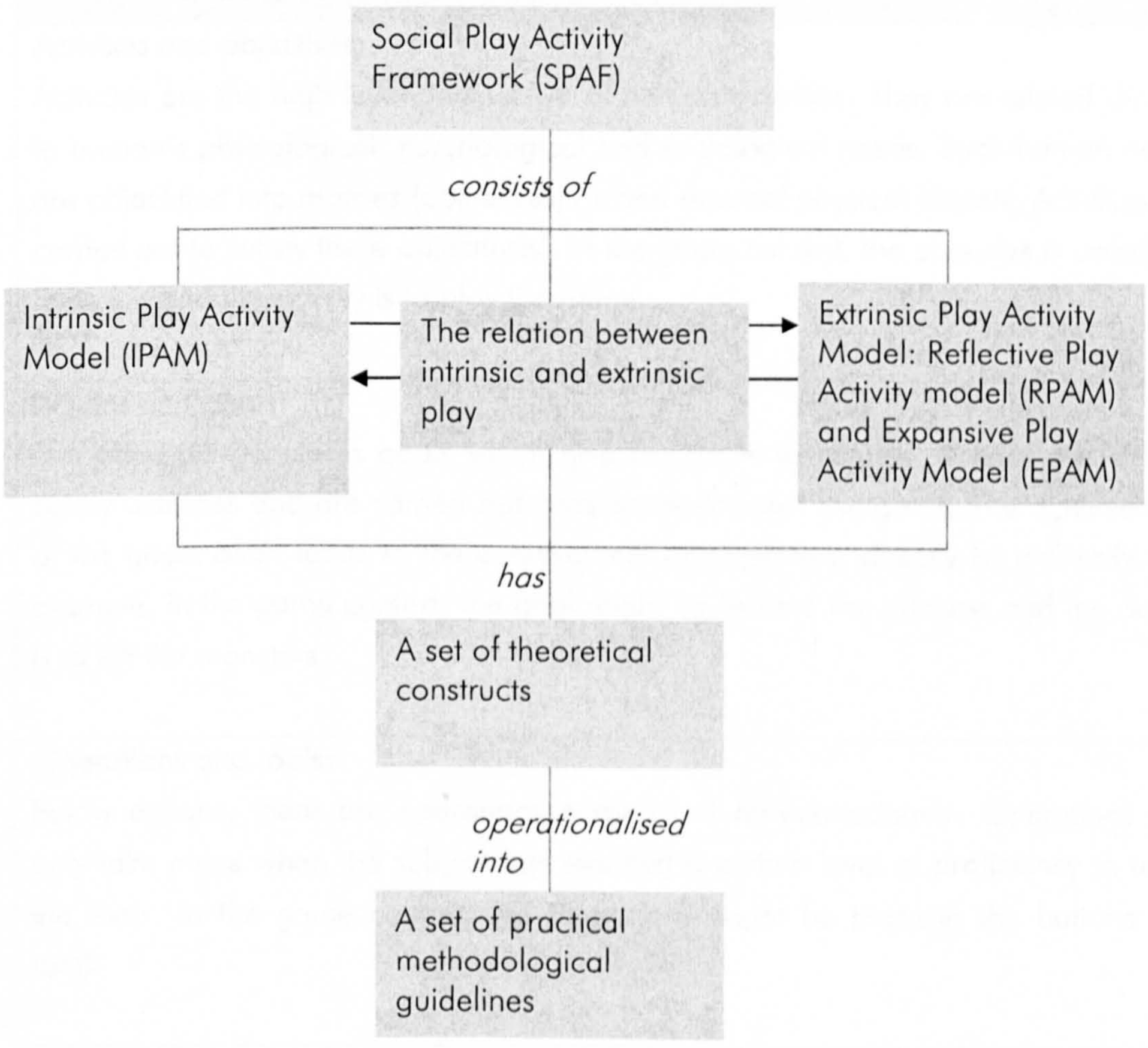


Figure 7.1 Social Play Activity Framework (SPAF)

Figure 7.1 shows the SPAF. It is a modular framework comprising three models of play: the IPAM, the RPAM and the EPAM. The relationship between the models is also encapsulated in the framework. The models (and their relationship) provide a set of theoretical constructs that can be used to explain the social phenomenon of game play. I therefore sum up the theoretical constructs which are important in analysing social interactions in game play.

- *Computer mediated activity model (CMAM)*

Although the development of the CMAM is not directly related to the game context, it is the basic foundation on which the intrinsic and extrinsic play models were developed. For that reason, it is essential to recap its key concepts (Table 7.1).

Table 7.1 Theoretical constructs of CMAM

Hierarchy of activities (refer to section 4.2)
Activities and **objectives**: Activities are the high level perspective of human activities. They are related directly to human's physiological, psychological and sociological needs. Such human needs are objectified into motives (objectives) or/and external physical objects. Activities are carried out to satisfy these object(ives). In the game context, the objective is usually to have fun and the activity is to play the game.
Actions and **goals**: The objective generates goals which give directions to actions. Actions are a level below activities and are carried out consciously towards the goals. The achievement of the goals often leads to the achievement of objectives, directly or indirectly. For example, in the game context, the goal might be to save the princess and the action is to kill the monsters.
Operations and **tools**: Below actions, there are operations carried out non-consciously. Operations can only take place when the subject has reached a certain level of proficiency in using the tools. In the game context, the operations might be pressing the buttons (the tool).

Individual and collective level
Individual operations, individual tools and **individual actions**: (refer to section 4.2) Even in a social setting, the subject needs to operate individual tools to act individually. However, note that the individual level is not independent of the collective level. Individual actions could also be directed towards collective goals. For instance, in a multi-player game, a player operates her own avatar with her own set of controllers (e.g. game pads, keyboards) to act on the monsters individually. Her actions could be oriented towards the success of the group (collective goal) even the action might not achieve her personal individual goal.
Collective operations, collective tools and **collective actions**: (refer to section 4.2) The subject's actions are collective in which the actions are coordinated and are conformed by a set of norms. Collective actions could be directed towards individual goals as well. For instance, a group of players might coordinate according to a set of collective rules to achieve an individual goal of a group member.

- *Intrinsic Play Activity Model (IPAM)*

The key concepts of the IPAM are summarised in Table 7.2.

Table 7.2 Theoretical constructs of the IPAM

Activity and actions
Intrinsic play is play that occurs within the game world, confined by the magic circle (i.e. the original boundary set by the game developer) of games.
Play (intrinsic or extrinsic) could be progressive or expressive (refer to section 5.2.2.2) **Progressive play** is play oriented towards progressing and eventually wining the game **Expressive play** is play oriented towards using games as a creative medium

Tools
Individual tools in computer games could be paidea rules (or game rules) and fictional contents (refer to section 5.2.2.1). **Paidea rules** define how the game world behaves, what can be and cannot be done in the game environment. **Fictional contents** are audio visual elements that give themes and narratives to the game. They also often act as feedback to the players.
Collective tools in computer games could be collective rules and division of roles (refer to section 5.2.2.1). **Collective rules** define the coordination between players, i.e. how players should appropriately behave within the context of maintaining agreements **Division of roles** defines the division of responsibilities between players
Tools (collective or individual) could be designed tools or emergent tools (section 5.2.2.1). **Designed tools** are tools which are pre-designed by the game developers and are pre-programmed into the game. **Emergent tools** are tools which emerge through the process of playing. They could be agreed collectively through negotiations in a group
Object and goals
Game goals (collective or individual) could be designed goals and emergent goals (section 5.2.2.1). **Designed goals** are goals which are pre-defined by the game developer and are built into the game **Emergent goals** are goals which are constructed by the player. They could be agreed collectively through negotiations in a group

Outcomes
Outcomes could be development or contradictions (refer to section 5.2.2.2) **Development** of game play could be individual, e.g. learning to use a tool or a skill to achieve the game goal. Development could also happen at the collective level, e.g. agreeing new collective rules, etc. The outcome of play is not always the development of play, or the achievement of the game goal, but also the contradiction or the inability to achieve the goal. **Contradictions** of game play could be individual, i.e. contradictions between the player and the game situations (i.e. challenges imposed by the game). Contradictions could also be collective, i.e. contradictions between two players.

Individual-collective relationship (section 5.2.2.3)

Although the IPAM advocates the analysis of individual and collective levels separately, the individual-collective relationship is never overlooked. This relationship is treated as an important concept in analysing game play. There are many possible aspects of analysis. For instance, how individual contradictions will lead to collective development, or how collective actions are influenced by individual actions, etc.

- *Reflective Play Activity Model (RPAM), Expansive Play Activity Model (EPAM)*

The key concepts of the RPAM and the EPAM are summarised in Table 7.3.

Table 7.3 Theoretical constructs of IPAM

Activity and actions
Extrinsic play is play that occurs around the game world, i.e. beyond the magic circle of games. There are two types of extrinsic play: reflective and expansive play (refer to section 5.2.2). **Reflective play** is play in which players step back from intrinsic play and reflect on certain components (refer to Table 7.2) of intrinsic play (or expansive play) (refer to section 6.4.2). **Expansive play** is play in which players attempt to test, stretch or break the boundary of intrinsic play, often by modifying certain components (refer to Table 7.2) of intrinsic play (refer to section 6.4.3).

Tools
The hierarchy of tools (refer to section 6.4) **Primary tools** are tools used directly to mediate the relationship between the player and the game goal in intrinsic play **Secondary tools** are representational tools used to transmit skills in the mediation of the primary tool. Secondary tools mediate reflective play. In some cases, they can be construction tools used to produce the representational tools. **Tertiary tools** are tools used to expand the horizon of the activity system. Tertiary tools mediate expansive play.
Outcomes
Outcomes (refer to section 6.4) **Activity system development** Development could happen not only at individual and collective levels but also activity level. It signifies the development involves not only the player (or the community/group of players) but also the whole play activity system, usually involving the change of goals, subsequently changing other components of the activity system. **Activity system contradictions** Similar to development, contradictions could also take place between components of different types of play activity systems.

Cross activity relationship (refer to section 6.4.4)

Each type of play does not exist independently. They are connected and are constantly transforming each other. There are many possible aspects of analysis for the cross-boundary relationship. For instance, how development of intrinsic play moves across and influences the tool of reflective play.

Whilst the SPAF provides a vocabulary of theoretical constructs for describing the social phenomena of game play, from the practical research angle, we need a set of methodological guidelines that gives structure to the analysis and highlights important aspects worth further examination and interpretation.

7.1.1 Methodological guidelines

In order to apply the framework to analysing sociability in games, it is useful to derive some practical methodological guidelines. Therefore, I operationalised the theoretical constructs from the previous section into a set of practical methodological guidelines for researchers to study the social aspects of games. These guidelines are the result of my reflection on the data analysis in chapter 4-6 and experiences gained throughout the research studies in this thesis.

- *Aspect 1: Action analysis*

The main focus of the analysis is the collective actions between two or more players. This includes coordination and cooperation. We should always keep in mind that individual actions and collective actions are often connected and examining this connection might reveal interesting insights. In addition, collective actions include conversations/verbal actions which might provide interesting insights into the internal thoughts of the player.

Then, we move on to a higher level of the action, the activity by inferring the motive (intrinsic, reflective or expansive) of these actions that are directly related to the ultimate motive of game play, to have fun. Whilst analysing the actions and the goals, it is helpful to keep the high level activity-motive in mind. Analysing actions leads to the analysis of the construction of shared goals, which involves the negotiation and agreement of goals.

- *Aspect 2: Goal analysis*

Examining the action in the context in which the action is carried out, we are able to infer the goal of the particular action. Goal analysis of the action is important as players might perform the same action but with a completely different goal. Goals change from time to time thus analysing goal formation and transformation is crucial. Apart from inferring how a goal is constructed through the action, we can also ask: is the goal imposed by the game itself? Is the goal constructed by the player to fulfil a certain motive? We also need to understand why a goal is changed; is it because of contradictions, goal achievement or goal re-negotiation; and how are individual goals transformed into collective ones? We can also examine how

goals contribute to the fulfilment of motives. It is important to distinguish between individual and shared goals and how they affect each other.

- *Aspect 3: Tool analysis*

Even before the (participant or non-participant) observation begins, we can analyse the game tool on its own. This can be done from two perspectives: the structure and the content. We can identify the game (paidea) rules: what actions are and are not allowed in the game; what functions support these actions. To do this, we can look at the game entities the player interacts with.

Game contents such as graphics, texts, videos, and other media can be examined. Unlike game entities, most of these contents are interacting with the player indirectly – the player does not perform actions on these contents; instead game contents enhance player experience through narrative construction, the game contents transform the abstract structure into a thematic one.

During the observation, we can analyse how these tools are actually used in the action. We can try to identify the types of tools used individually and collectively. It is particularly interesting to see how tools can be used to mediate collective actions. Then we can analyse the hierarchy of tools: whether the tools are primary, secondary, tertiary or a combination.

- *Aspect 4: Collective rules*

When analysing collective actions, collective rules and division of roles may arise as a result of negotiations. We can infer why collective rules arise: e.g. to ensure fair play between players, whether it is cooperation or competition; to ensure an effective way of achieving shared goals, etc. We can investigate how collective rules override the original game rules, or how new rules arise as a result of expansive play.

- *Aspect 5: Outcome analysis*

Lastly, we examine the outcome of each action. It could be either contradictions or development. Contradictions occur when the player is unable to achieve her goal due to various reasons. We can infer the reasons by looking at the

elements of the activity system. For instance, is the contradiction within the tool? Or is the contradiction between the tool and the collective rules? Does the contradiction arise because of a player's lack of skills/knowledge or the inability of tools to support certain actions to achieve certain goals? Does the contradiction happen between players?

Development takes place when a goal is achieved; in some cases it means a contradiction is resolved. We examine what happens when development takes place: is a goal achieved? Are artefacts produced? Does it improve player's skills and knowledge?

When analysing the outcome, we scrutinise the movement of the outcome as well. We want to find out where the outcome moves to: does the outcome move back to the activity system from which is it produced? Does it move to another connected activity system? Does it transform other elements in an activity system?

With these methodological guidelines, I investigated in detail two issues, community building and social learning, on WoW. WoW is treated not only as a game but also as a new type of Computer-Mediated Communication (CMC) with 3D graphical representation of fantasy worlds and built-in fantasy goals. In the next section, I revisit CMC literature by looking particularly into this new form of CMC, which I call 3D CMC before I describe the methodology and the findings of the issue-based studies.

7.2 3D Virtual Space and Computer-mediated Communication

The advent of the Internet has changed social structure remarkably by transforming the way in which people communicate and connect to each other. The advancement in computer processing power and the increasingly common high speed network connectivity has brought about the significant innovation of CMC technology. We have witnessed the evolution of Internet technology, from personal communication such as e-mails to massive networking and community building websites such as MySpace (http://www.myspace.com/) and YouTube (http://www.youtube.com/). This phenomenon has attracted a lot of attention from

various fields of academic study, most notably media studies, social science and computer science.

Virtual spaces provide a new platform for social relationships. In a virtual space, communities are not formed around physical proximity (Korzenny, 1978). Rather, people from all geographical locations congregate based on common interests, ethnicity, beliefs, value systems, etc. It is also often quoted that prejudgement based on someone's appearance can be eliminated in CMC (Wallace, 1999).

In fact, the Internet not only changes our social life, but also how we work and learn collaboratively through the online medium. Scholars in areas such as Computer Supported Collaborative Work (CSCW) and Computer Supported Collaborative Learning (CSCL) have been conducting research on how computers, particularly networked computers can be designed to improve not only user experience but also productivity and learning outcomes.

Conventional CMC technologies are mainly text-based (Pfeil, 2007). Although the fundamental technology of CMC has not changed in the last decade (Preece & Maloney-Krichmar, 2003), the way of using it for human-human communication has evolved considerably, from e-mail and synchronous chatting to online forum, blogs and Wikis.

Recently, a new form of CMC has emerged, in which communication takes place in a 3-Dimentional (3D) virtual space. These 3D Virtual spaces, such as MMOGs and Second Life (Linden Lab, 2003) are thought to offer a much richer form of social interaction where users can not only communicate through text-based chat, but also interact with each other through virtual artefacts. As such, the interaction between the user and the CMC tool is considerably more complicated than the conventional text-based tool, enabling a broader scope of social interactions.

These 3D worlds often feature a large number of virtual locations users can visit and a variety of virtual artefacts users can use to interact with, with each other. In some cases, they can even construct new artefacts and locations utilising simple modelling tools and scripting languages. Whilst some 3D virtual worlds are

designed with game-like goal structures that impose obstacles or challenges, some are completely open, meaning that the users are free to do as they please.

Although sociability issues of conventional CMC are well studied and documented, we have very little understanding about social interactions in 3D CMC. Therefore, it is worth investigating user activities in such environments in order to cast some light on the community building process and other sociability issues.

7.2.1 Some related topics in CMC and 3D CMC

The research in online communities and sociability raises some intriguing topics, attracting a substantial number of scholars from diverse areas. It is interesting to analyse people's online behaviours and social mechanisms within a virtual setting and identify how it is different from its offline counterpart. From the point of view of Human·Computer Interaction design, researchers are keen to learn these online behaviours to design a better CMC system to facilitate such communication. This involves the detailed study of user online behaviours and interaction patterns. Fortunately, online communities contain a massive source of invaluable data. Analysing this data reveals how people interact with others and gives insights on the design of the CMC tool in use. However, this is a challenging task, especially in the case of 3D CMC applications as our knowledge on them is still deficient.

In this section, I outline some prominent topics surrounding CMC and how these topics can be related to 3D CMC to highlight the importance of studying sociability in 3D CMC.

- *Non-verbal cues*

Perhaps one major topic everyone studying CMC is bound to come across is the lack of non-verbal cues in the conventional text-based CMC technology. Some newer CMC media have attempted to address this issue through the implementation of video streaming, although a more common way is the use of "emoticons" that allows the users to express their emotions through graphical icons that show symbolic facial expressions. Other researchers, however, claim that the quality of communication through CMC technology does not suffer from the lack of non-verbal cues (Walther, 1992; Walther, Anderson, & Park, 1994).

This issue seems to be more intricate in 3D CMC, in which communication takes place both through texts and other "virtual actions" users can perform with their 3D avatars. Unlike the avatar in conventional CMC which is often a static graphical or animated representation of the user, in 3D CMC, the avatar can interact with other avatars directly in the virtual space. A 3D avatar can perform a wide range of actions on the 3D world and other avatars. For instance, it is not uncommon that avatars can hug, kiss or wave to each other. There is also research on the facial expression of 3D avatars (Clarkson et al., 2001), implemented in the 3D CMC context with the intention to enhance non-verbal communication. Moreover, given the fantasy theme of some 3D CMC environments, new sets of rules for virtual communication which are completely different from physical communication might arise. This is worth investigating as well.

- *Anonymity in CMC*

Identity and anonymity is another oft-studied topic regarding CMC since it is possible for users to hide their real identity simply by choosing a different name. In most cases, even the administrators do not know their real identity. Furthermore, users may treat CMC as an experimental environment and thus "play" with their identity and try out different personalities (Turkle, 1995).

The issue of identity in 3D CMC is often much more controlled. Although users can still hide their real identity in the 3D world, they are generally attached to their avatar that represents their identity in the virtual world. In 3D CMC, the user's real identity is sometimes known to the developer in order to prevent behaviours which are against the law (e.g. child abuse), although it is still possible for users to hide their identity from other users.

- *Friendships in online communities*

Some studies have been carried out to compare the nature of friendship in conventional CMC and offline communication. Wellman and Gulia (1999) for instance found that people have a higher number of online friends because it is easier to make friends online than offline. However, the quality of the relationship is

weaker in an online setting. Although Walther (1995) contended that it is possible to develop strong online friendship, it takes longer than in offline communication.

This topic is worth investigating in the 3D context. It is interesting to find out if the complex design of the 3D CMC application has an impact on the nature of relationships between users and how this relationship is different from other forms of online communication.

As aforementioned, MMOGs can be treated as 3D CMC with game characteristics. In the rest of the chapter that follows, I present two issue-based studies to demonstrate that the Social Play Activity Framework (SPAF) can provide a firm theoretical foundation to analysing social interactions in this 3D social environment setting.

7.3 Methodology

The aim of this chapter is to apply and validate the SPAF to analyse social interactions in a massive community of game players. To achieve this, a participant observation was conducted in a typical MMOG, known as World of Warcraft (WoW) to investigate two issues – community building and social learning – in order to find out what insights we can gain about these two issues from using the SPAF.

7.3.1 Data collection method

The data collection spanned across 30 days of participant observation in WoW. I selected WoW largely due to its popularity and its large number of users. This provided a platform to collect a massive amount of data covering various types of user activities.

I dwelt in the game for 30 days (about five hours a day), allowing myself to immerse into the virtual fantasy world, while from time to time stepping back from my game avatar to my real identity as a game researcher to observe and reflect on the activity I observed in the game. I also kept a game journal of my own account of the adventure in the game. Using the in-game chat-log function, I managed to keep a record of other players' activities throughout the study.

In order to obtain a deeper understanding on the interaction between players, I tried to interact with other users and observed their ways of interaction through conversations and actions. This was achieved by joining a party/a group of players to do quests. By joining the group I gained access to the chat log of the group chat which gave me insights into the nature of social interactions in such a relatively short-term and goal-oriented game sessions. I also joined a guild which gave me access to the guild chat channel. Sociability in a guild is relatively long term and it provides mutual support among the guild members. Another form of long term relationship is the friend function which is essentially players added into the friend list, players who are playing together frequently and giving support to each other.

I also observed public chat and public interaction. I visited several different areas (towns, wilds, dungeons, etc.) in which different nature of social interactions took place. Furthermore, I collected material about the game from the game manual in order to obtain a more comprehensive picture of the game. I also collected communication between players from other conventional CMC channels such as online forum and blogs in order to get a broader perspective of the game in general. All the data was loaded into a QDA software application for analysis.

7.3.2 Analytical method

The data analysis was based on the methodological guidelines derived from the Social Play Activity Framework (SPAF) (section 7.1.1).

First, in order to obtain a general picture of the activity, I read through the game user manual and my self-reflection data supported by other sources of online materials regarding the game, including unofficial Wiki sites and players' blogs. A generic description was generated based on some concepts of the SPAF, namely the game as individual and collective tool; individual and collective play (see section 7.4).

Then, the field notes were used to identify themes of collective play. Some examples of the themes include goal construction and negotiations; collective contradiction and so on.

These themes were then used to select material from the game logs for further analysis. When necessary, the themes were used to guide the collection of new data to strengthen the themes. The analysis was an iterative process where data analysis would direct further data collection. After that the data was sorted to identify excerpts that illustrate the themes.

The themes of actions were examined in detail on the issues of community building and social learning. For each theme, I analysed different aspects of the actions based on the methodological guidelines proposed in section 7.1.1. For instance, in the following block of data, I analysed types of actions (negotiating a quest), goals that motivate the actions (to agree on a shared goal to form a new group), tools that mediate the actions and the outcomes (development of the contradiction between individual goal and collective goal.

11:15:46.221 Player_GA says: wanna help me kill some harvest watchersS? (a type of monster you need to kill in a quest)

11:15:58.448 Player_GA says: please

11:15:58.776 Player_JI says: we've done harverst watcher quest sorry

11:16:51.984 Player_GA says: please help me with harvest watcher

11:16:57.425 Player_BR says: y (why should I do that?)

11:16:58.097 Player_GA says: good xp (experience points)

11:17:00.708 Player_GA says: ok?

Finally, to test the exploratory power of the framework, I used the theoretical constructs of the SPAF (in section 7.1) to generate a theoretical explanation for the particular themes. For instance, in the above observation, I could derive that the process of community building lies not only in strategic coordination in achieving a goal but also collective actions to negotiate and agree on a goal. Moreover, I could also identify secondary tools that mediate this kind of social interactions.

It must be emphasised here that the purpose of the study was not to provide an exhaustive account of issues, but to demonstrate the process of applying the SPAF by using it with a series of relevant examples.

7.4 Findings: Community building, a Perspective of the SPAF

In this and the next section, I present the key findings on social activities and how they could lead to community building and social learning. Apart from this analysis (presented in section 7.4 and 7.5), I also analysed general play activities based on my experience playing WoW, my own reflection and the game material I gathered. Due to the space limitation, I will not describe the general description here. Instead, refer to appendix E for the full account of it. In this section, I present the findings on the issue of community building.

Drawing from the theoretical constructs of the framework, I elucidate some activities of community building, more specifically how players connect to each other. The analysis revealed several interesting themes pertaining to community building in WoW:

- Progressive play and its goal structure
- Expressive play and fictional contents
- Expressive play at the collective level
- Socialising through reflective play
- Shared game tools
- Contradictions between collective goals and individual goals
- Guilds and community building

7.4.1 Progressive play and its goal structure

As mentioned in chapter 6 (refer to section 6.4.1), the object of intrinsic play is the process of intrinsic play itself that intrinsically motivates the player to engage in the play activity. I have also pointed out that there are different ways of categorising play, one of which is to classify it into progressive and expressive play (others being individual and collective play, as well as intrinsic and extrinsic play).

The motive of progressive play is to make progress in the game. Various goals are generated from this motive and some goals are pre-built into the game to motivate the players towards intrinsic play (the object). The most prominent built-in goal is the quest, designed to engage the players in a series of actions directed towards the goal stated in the quest.

A uniqueness of WoW is its goal structure which directs progressive play. It is unlike the Sims which imposes no built-in goal at all, giving complete freedom for the player to do as she pleases; or Super Mario Bros. 3 whose goals are built within a rigid structure, urging the player to complete the goals one after another. The goal structure of WoW is semi-open, signifying that there are built-in goals but the player has the freedom to choose not to execute the goals. In other words, players are given freedom to construct their own sequence of goals. The following observation demonstrates how this goal structure could promote social interactions:

1/24 13:04:34.361 Player_J says: do u know jangodole Mine
1/24 13:04:40.094 Player_JF says: yes
1/24 13:04:48.999 Player_JF says: wanna see it?
1/24 13:04:49.093 Player_J says: done the quest defias kill?
1/24 13:05:05.076 Player_JF says: share our quest?
1/24 13:05:13.759 Player_JF has completed that quest
1/24 13:05:23.912 Player_J says: oh u have completed the quest
1/24 13:05:35.707 Player_JF says: no problem
1/24 13:05:43.951 Player_JF says: i'll help you anyway
1/24 13:05:49.129 Player_J says: thanks!

Player_JF agreed to bring player_J to *Jangodole Mine* even though she had completed the particular quest. She did not gain anything from this in terms of her individual game progress. She was nevertheless able to temporarily put aside or even abandon her own individual goal in order to work towards Player_J's goal. This kind of observation is not uncommon. In WoW, it was found that players do not always focus on their individual goals as helping others and community development is the collective goal of play.

Note that if the goal structure of WoW was designed to be rigid, Player_JF would not have been able to abandon her goal because not achieving her goal would have led to a negative outcome. Abandoning the current goal is not penalised in WoW and one can always continue the goal later. This is also a crucial aspect of social learning. An important characteristic of social learning lies in the goal negotiation and agreement (this will be discussed in section 7.5.6).

- *Semi-open goal structure and group formation*

The flexibility of goal-shifting greatly promotes the group formation and community building. Forming a group is essential in progressing successfully in the game, therefore players are willing to negotiate and agree on a shared collective goal to be able to join a group. Even if the player joins a group which is doing a quest for which she is not eligible, she can still earn experience points (XPs, points needed to level up) and game-money, a goal which applies to everyone. The following observation illustrates the readiness of a player (player_R) to adopt the collective gaol of a group:

1/22 16:15:41.867 Player_R says: can i join your group?
1/22 16:16:11.882 Player_B says: will we let Player_R join
1/22 16:16:21.601 Player_R says: yea
1/22 16:16:44.492 Player_M says: ok
1/22 16:16:48.789 Player_B says: ok
1/22 16:16:49.851 Player_M says: if you want
1/22 16:16:52.773 Player_R says: thanks
1/22 16:16:55.508 Player_R cheers!
1/22 16:17:09.336 Player_R says: were we headed?
1/22 16:17:26.164 Player_M says: stone carin lake

7.4.2 Expressive play and fictional contents

It was observed that expansive play in WoW at the progressive level is limited to the interface modification. One possible explanation is that expansive play might cripple the complex mechanism and balance of the game. Since the game is played by a massive number of people, expanding the horizon of the game by certain groups of players might have a negative impact on others' play experience. For instance, if a player managed to expand the "gold earning" aspect of play and come up with a strategy to earn a lot of gold in a short time, it would result in the break down of the economy system of the game world. However, this does not lead me to conclude that expansive play does not exist in WoW. Rather, through the analysis, I found that expansive play manifests at the expressive level and that such expansive play contributes to both the enjoyment and community building in WoW.

The fictional contents of games are often criticised as being unnecessary for those who study games as intrinsic play at the individual level. The importance of fictions or narratives is denounced by some scholars to be *"just uninteresting ornaments or gift-wrappings to games, and laying any emphasis on studying these kinds of marketing tools is just a waste of time and energy."* (Eskelinen, 2001)

My analysis on a socio-cultural context of game play especially at the collective level has shown that this is not necessarily the case, as the design of fictional contents can be positively related to the emergence of expressive play, which is arguably a more prominent form of play than progressive play in WoW. Players appear to appreciate non-progressive aspects of the game as much as they enjoy progressing through the game challenges and overcoming the obstacles. Whilst both progressive and expressive play fulfils players' need at the individual level, in a social context like WoW, the satisfaction of play lies more in the collective level, particularly for expressive play.

As such, community building relies as much on expressive play as on (if not more than) progressive play. For instance, the weapon's appearance might count towards the player's choice as much as its damage point when playing collectively in a group. Although a player might use the weapon with the highest damage point regardless of the appearance when doing a quest, she might change her equipment so that the avatar appears "nice" when socialising with others. For instance, in the following example, Player_S was wearing a bandana because it increased her defence level, but upon meeting Player_J, she took it off because wearing a bandana made her look like one of the monsters.

2/5 12:40:15.902 Player_J: u look like them
2/5 12:40:25.590 Player_S: hahaha
[Player_S took off the bandanna]
2/5 12:40:34.199 Player_J: ahh now u look better
2/5 12:40:52.293 Player_S: u saw when i had the bandana right

7.4.3 Expressive play at the collective level

A wide range of play directed towards communication, self expression and socialisation was observed in WoW. This play, known as expressive play, is

omnipresent in the game despite the fact that it has no actual "benefit" in advancing the game. A possible interpretation is that expressive play creates a friendly and pleasant environment and hence a strong sense of community among players. In this section, I describe some of the most commonly observed forms of expressive play.

- *Socialising through expressive play*

I believe that expressive play is equally important in the process of community building. Expressive play occurs not only through verbal language, but also other signs such as gestures, emoticons and graphical images. The data below shows an observation in which Player_A was showing off her pet cat (Figure 7.2) to Player_J. While owning a small pet by all means does not mediate progressive play, it can trigger collective-expressive-play which is not oriented towards progressive game goals. This is similar to the observation on the player fancy outfits.

2/1 11:16:56.603 Player_A says: i forgot - look
[Player_A showed a pet cat]
2/1 11:17:08.228 Player_A says: look!!!
2/1 11:17:08.621 Player_J says: OH!
2/1 11:17:13.050 Player_J says: where did u get it!!!!
2/1 11:17:21.172 Player_A says: it was a gift!!
2/1 11:17:26.435 Player_J says: lovely!
2/1 11:18:19.798 Player_A says: hee hee

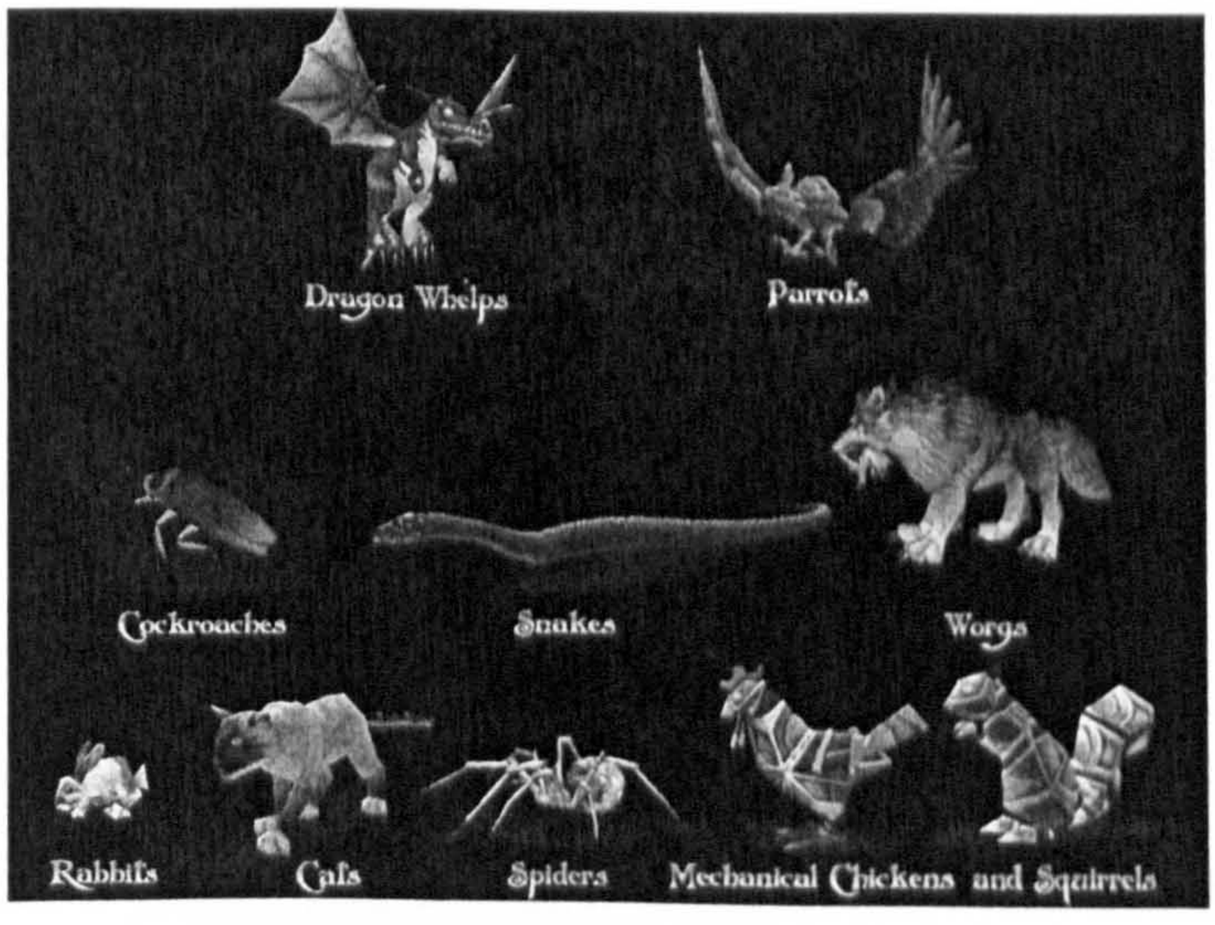


Figure 7.2 Small pets in WoW

- *Player's real identity*

This is perhaps one of the most prominent types of expressive play in the game, in which players reveal their real identities behind the 3D game avatars. The following observation shows a typical chat excerpt in WoW:

1/22 12:21:12.562 Player_C says: where you from?
1/22 12:21:20.220 Player_X says: Portugal
1/22 12:21:32.192 Player_C says: nice to meet you
1/22 12:21:38.490 Player_X says: you too
1/22 12:21:47.164 Player_C says: are you a girl or boy?
1/22 12:22:02.261 Player_X says: girl and you where are you from
1/22 12:22:10.935 Player_C says: england

I conjecture that this chat gives an extra dimension to the 3D fictional avatars and draws players closer to the avatars of other players. Through this expressive play, a "flat" avatar is transformed into a "lively" avatar with history and background. The entwined game fictions and real life stories enrich the game, creating a "*I met a Mage from England*" reality-in-fantasy experience. Consequently, the narrative experience of game arises not only from the built-in stories or the fictional virtual space crafted by the developer as the game tools, but also the external "tools" brought from outside the intrinsic play activity system. The player-identity chat can be attributed to as a form of "reflective-expressive-play" in which players step outside of their game avatars and become conscious of their play activities, but without the intention to progress in the game. As aforementioned, the player can reflect on different components of the intrinsic play such as the game tool, the game goal and in this case the player's background.

There are also situations when real life information is crucial in progressive play. I will discuss this later in section 7.5.7.

- *Humour*

Humour is present in the game extensively, in which players make jokes and perform some gestures or actions through their avatars to amuse each other. The following shows an example how humour manifested in WoW.

1/22 12:23:22.873 Player_C says: had a few fights been killed a lot

1/22 12:25:06.552 Player_E says: i died more times here in the last hour than in one year rc

1/22 12:25:11.288 Player_C says: do you want to see me dance like a chicken?

1/22 12:25:20.962 Player_E says: yes

1/22 12:25:26.197 Player_X says: yes lol

1/22 12:25:26.213 With arms flapping, Player_C struts around. Cluck, Cluck, Chicken!

1/22 12:25:34.043 Player_X laughs.

1/22 12:25:40.763 Player_C bursts into dance.

1/22 12:25:48.624 Player_E applauds. Bravo!

Humour places the players in a closer relationship to one another as it temporarily moves them away from the predominant game actions such as killing monsters, collecting items, etc. In this example, the players gathered in a town after getting "killed" repeatedly. It could be very frustrating being "killed" frequently in the game, but through humour they were able to temporarily move to another dimension of the game. One possible motive of such play is tension release as progressive play can be quite tense after a while.

Furthermore, group unity is created and enhanced as players ground their humour extensively by reflecting on their past or current play actions (e.g. in doing group quest). Past research in CMC has shown that humour often appears as a form of response to other people's messages (Baym, 1995). This type of humour is known as responsive humour. In 3D CMC like WoW, responsive humour also presents but in a different form. Instead of drawing humour from players' messages, it is based on players' actions. In other words, intrinsic play actions become an object of humour play. In the excerpt below, Player_J was trying to make a joke based on their actions of hunting for "snouts of wild boars" as parts of the task in the quest.

2/2 14:38:58.457 Player_J: WOT SORT OF BOARS HAVE NO SNOUT

2/2 14:39:09.504 Player_S: hahaaa

2/2 14:39:14.192 Player_J: soo strange

- *Politeness*

Interestingly, greetings and polite expressions appear as a key type of expressive play in WoW. Individual players use linguistic and gesture displays (the tools) to present a positive self-image in the virtual social world.

As a matter of fact, in WoW, politeness emerges as an exclusive form of expressive play, separated from instrumental communication (or progressive play). Some research on conventional CMC concludes that no matter how instrumental a session of communication appears, it is always carried out by the individual conscious to project a positive self image in public (Morand & Oc, 2002).

However, this claim does not hold true in WoW. It seems that politeness in WoW is always expressed explicitly and separately rather than embedded into instrumental communication. Statements such as "could you kill the monster please" are rare or even non-existent. A more common form of politeness is usually an expression of "thank you" followed by a non-polite instrumental communicative statement such as "kill it", only after the monster has been killed. The following excerpt of an observation shows the expression of thankfulness and politeness after the group completed a dungeon quest. The group did not appear to be polite during the quest:

[during the quest]
2/5 13:29:10.181 Player_A: stick to the wall
2/5 13:29:15.721 Player_S: back
2/5 13:29:31.684 Player_S: lure them over here
2/5 13:44:02.112 Player_D: make your pet passiv [not to attack the monster]

[after the quest was completed]
2/5 15:00:17.552 Player_A: yeah it was good party
2/5 15:00:28.713 Player_A: really nice and polite people you are :)
2/5 15:00:59.350 Player_D: thanks :D

- *Chats about the WoW game (the tool) and other games*

The game tool is "clothed" in realistic 3D images, representing real or fantasy worlds graphically. Interestingly, these graphical tools alone trigger socialisation between players, as shown by the following example (Figure 7.3):



Figure 7.3 A snowy location in WoW that triggers socialisation between players

2/5 15:45:06.583 [party] Player_S: pretty huh

2/5 15:45:18.521 [party] Player_S: i m getting cold just looking at it [the snowy land]

2/5 15:45:20.959 [party] Player_J: does it snow sometimes?

2/5 15:45:32.928 [party] Player_S: hmmmm i think it does

2/5 15:45:42.709 [party] Player_S: i bet ur bird [a small pet] is cold

Had the game been designed in a non-narrative or abstract setting, this type of socialisation would not have taken place.

It is also common that players talk about other similar games, and make references to other popular cultures. This type of expressive play is important in community building as it reveals the background of the players, connecting them through sharing and the exchange of information drawn from other games. That is to say, player relationship is mediated not only by the game-related information (intrinsic game tool) but also other off-topic resources (external tool).

1/22 12:24:10.946 Player_E says: i used to play runescape [another MMOG]

1/22 12:24:38.921 Player_C says: which one do you prefer?

1/22 12:24:42.140 Player_X says: i played once but it was more difficult i think

1/22 12:24:54.987 Player_X says: i prefer this one

- *A good deed to others (polite actions)*

Apart from being nice or polite through verbal communication, community building is also encouraged by "polite actions" or good deeds to other players.

The most common form of good deeds is probably what is usually known as "buffing" within the WoW community. Buffing means casting beneficial magic spells to other players. It can occur randomly, i.e. a random player casts the "resurrection spell" to resurrect a "dead" player. In another observation, I also noticed that some players gave away game items such as weapons and armours to other players. Buffing also occurs in a highly coordinated collective play in order to increase the fighting/defence ability of group members, thus the chance of success.

One prominent observation in respect to good deeds is the support that takes place through communication as well as actions. Apart from being polite, players also provide "support" to each other, through utterances that would encourage and motivate other players. However, an interesting finding is that, unlike other conventional CMC, a more common type of support in WoW is carried out through "actions" instead of verbal communication. Although non-verbal actions are facilitated through the use of emoticons in conventional CMC, the range of actions is not as diverse as in WoW. My observation highlighted that support is normally "implicit", carried out through actions, rather than explicitly spelt out in words. Consider the following:

1/30 15:08:38.881 Player_D: i think we [Player_D and Player_A] should stay around here -- 1 for the dragons and 2 - xp for Player_J!!

The above observation shows some of the few instances of explicit speech-related support. Player_D and Player_A were more high-level than Player_J, and they decided to help Player_J to increase her level. What is more interesting is the "actions" that entailed. The players were helping each other to kill monsters; they

cheered when someone levelled up; they gave items to those who needed more; and many other instances in which support manifested through actions.

I argue that a possible motive of this kind of "good deeds" is oriented towards not only projecting a positive self image, but also raising one's status and respect in the player community. When a player offers help, often she imposes her opinion and judgement implicitly and this creates a division of role. For instance:

2/5 11:23:12.486 Player_V: when we get there let me handle the fighting
2/5 11:23:18.275 Player_V: just stand back and enjoy
2/5 11:23:39.627 Player_V: just try not to agro the mobs

The above data illustrates a case, in which Player_V who was more high-level imposed her judgement, forming a temporary division of role within the group; she was responsible for killing and the other players picking up the items from the dead monsters.

- *Under what circumstances do players engage in collective-expressive-play?*

I have identified several major types of expressive play in WoW and provided an explanation as to what and how these types of play emerged. I examined both players' actions/communication mediated by the game tools and language (and other signs). I also inferred the motive and the mechanism of such activities in the social context of play. In this section I summarise, based on the findings, what triggers this type of play.

First, "persistent contradictions" are a main contributor to socialisation among players. Since the goal structure of WoW is semi-open, players can easily change their goals or construct new goals when contradictions occur. However, if contradictions persist, where players repeatedly fail to achieve their goals, they would divert their attentions to another dimension of play, i.e. expressive play, which effectively reduces the players' frustration. WoW does not impose a strict set of goals onto the players and they have freedom to switch or abandon the goals altogether to engage in socialising or expressive play.

Second, the development of play actions/activities also creates an opportunity for the players to socialise. When development occurs, especially when the players

complete a quest, they tend to pause and socialise before they pursue another quest. When a quest is completed, the player would chat to others by reflecting on and sharing her play experience as a means to get closer to other players who might have also done the same quest. This can be explained as the "hall of fame" phenomenon as players show off their achievement within the community. An example is presented below in which a player managed to achieve the goal of becoming "mounted" (the ability to ride an animal, which is considerably difficult for average players as one needs to be at least level 40 and it requires a lot of "game-money" to buy the animal). This development triggered a series of chats among the group members.

1/31 16:51:24.945 Player_S: haha aparently "im mounted"
1/31 16:51:37.741 Player_M: oooooo any pictures?? [of your mount]
1/31 16:55:37.148 Player_T: how much is a mount ?
1/31 16:55:50.226 Player_P: 100 g
1/31 16:55:50.866 Player_Z: 90g
1/31 16:55:58.554 Player_C: that's the epic
1/31 16:56:04.366 Player_E: mount prices has changed
1/31 16:56:12.507 Player_C: i've heard u can buy it for 40g
1/31 16:56:15.069 Player_P: yeah but u gotta pay for riding skill
1/31 16:56:25.944 Player_G: yeah, they charge Priests more, hehe
1/31 16:56:29.632 Player_E: oh hom much is riding skills these days
1/31 16:56:44.413 Player_P: 90 g

Sociability arising from the development of actions is more evident if a shared collective goal is attained by a group as they share the same historical background (the completed quest) and therefore collectively reflect on the quest as an act of socialising.

It is also noteworthy to point out that in some cases, socialising play has become a ritual in the game where players greet and salute each other before and after a group quest. Before the quest, players try to encourage and motivate each other through socialising and after the quest, players thank each other for being a good team mate. I also observed that being funny, humorous and kind seems to be a norm of WoW as such behaviours project a positive self image, making the particular player welcomed in the community.

Finally, when carrying out repetitive and manual actions which require little cognitive processing, players turn to socialising play. These actions, including travelling a long journey from one location to another, grinding (killing monsters repeatedly to level up), farming (killing monsters to gain items and game-money), waiting for players to do a group quest, etc. are often boring but inevitable. Being able to socialise with other players regardless of their locations in the game offsets the potential boredom as a result of these manual tasks.

7.4.4 Socialising through reflective play

As mentioned before, contradictions cause players to stop acting on the current goal and shift from intrinsic play to reflective play in order to reflect on their intrinsic actions. Despite this, reflective play is not always triggered by contradictions. In some situations, the goal of reflective play is not directed to resolving contradictions. Players engage in reflective play not only for progressive but also socialising purposes. The following observation is an example, in which three players were reflecting on their past intrinsic play that took place the day before. Interpreting their chats with the SPAF, it is found that this type of reflective play is not driven towards solving a contradiction; rather it is mainly a process of socialising.

2/2 15:15:27.714 Player_S: am i gonna need to save ur assa gain today Player_A
2/2 15:15:44.808 Player_V: thats technically my job.
2/2 15:15:54.933 Player_V: especially since today i have a day off :)
2/2 15:15:57.277 Player_A: absolutely no doubt about it.....:)
2/2 15:16:20.886 Player_S: if its ur job ur not doing it very well
2/2 15:16:32.527 Player_V: oh really now
2/2 15:16:40.949 Player_S: i had to rescue her and her group yesterday
2/2 15:16:55.121 Player_V: lol :) thats what happens when i have to go to work :P
2/2 15:17:27.183 Player_S: the only diffence is that i didnt have to rescue you aswell :P
2/2 15:17:48.449 Player_A: and you did it very well scat - thanks again!!!
2/2 15:18:18.981 Player_A: i did almost die when it was ten against me and you refused to heal me lol
2/2 15:18:27.153 Player_V: lol :P
2/2 15:18:50.778 Player_A: i was getting bashed - i cant heal when they are attacking me!!it cancels it out ;((

7.4.5 Shared game tools

The game tool plays a very important role in mediating collective actions that shape the community. In fact, some aspects of the game tool are designed intentionally to support community building. For instance, there are some shared tools/functions in the game which promote "effortless community building", making it easier for players to participate in a group. These tools, like the automated group searching function, the friend list function, the build-in guild function, etc. simplify the collective operation of the group forming process. There are also tools that aid coordinating players' collective actions, the most obvious tool of such being the chatting function. The following observation shows the importance of a shared tool (the mini map tool) in coordinating group collective actions:

1/26 10:49:22.521 Player_A: Player_J - can u see me?
1/26 10:50:40.826 Player_J: where are u Player_A
1/26 10:50:49.308 Player_A: are you under ground?
1/26 10:51:59.880 Player_A: I'm on the hill
1/26 10:52:06.273 Player_A: by th gnolls
1/26 10:52:18.917 Player_A: guide me to you

The mini map is an indicator of the locations of all players in the same group. In this observation, the mini map failed to display the third dimension of the location (the depth). The map showed that Player_A was at the same location as Player_J, but in reality they were not because Player_J was inside a mine while Player_A was on a hill which was directly above the mine.

Shared information also becomes an important tool for coordinating group play. In WoW, the player has access to a certain degree of information about other players. Although some information is not available publicly, the chat function is utilised to publicise the information of player status within the group. The following observation demonstrates that Player_J2 run out of "mana" (energy needs to cast magic) and it was crucial for her to reveal this information to the other group members so that they would not rush towards another group of monsters as they needed magic spells to succeed.

1/25 13:32:51.460 Player_J says: i finished my mana

1/25 13:32:53.959 Player_J2 says: lets wait
1/25 13:32:58.285 Player_J says: ok

7.4.6 Contradictions between collective goals and individual goals

Various forms of contradictions can be observed in WoW. Analysing contradictions is fruitful as it could provide some insights into the social phenomena in the game. I would like to underline the contradiction between individual goals and collective goals that persists throughout the game, in which players constantly evaluate various individual and collective goals.

If a player decides that a certain individual goal is important for her, she can draw resources from the community to support this goal. On the other hand, if she decides that a certain role in the community is more important than her individual goal, she will give up the individual goal in order to pursue the collective goals. In other words, the players do not always pursue only their personal goals. Instead of focusing solely on individual development, the players also aim at collective development by helping other players.

1/26 11:12:27.643 Player_R: can i have hntin pants?
1/26 11:12:34.831 Player_A passed on: Hunting Pants
1/26 11:12:46.253 Player_R has selected Need for: Hunting Pants
1/26 11:12:46.378 Player_R won: Hunting Pants

In the above example, Player_R announced that she wanted the hunting pants. Everyone in the group passed it on and she obtained the item. The collective goal (to be nice and supportive to create a friendly community) overrides the individual goal (to be strong or to earn more game-money) as the players could have sold the item for money instead of giving it away.

7.4.7 Guilds and community building

There is a built-in mechanism in WoW that explicitly supports community building: the guild system. Most activities in a guild do not differ greatly from activities in a group or a friend list. The guild system is usually regarded as larger scale and longer term group formation. There are two themes I would like to emphasise here pertaining to the guild system.

First of all, resource sharing is probably one of the most prominent factors of a guild that augments community participation. Apart from acting as a platform for mutual help in quests, a guild functions as a large pool of resources for its members. Take a look at the following example:

> 1/25 13:49:49.078 [Guild] Player_S: has our guild gotten a tabard
> 1/25 13:49:53.424 [Guild] Player_V: Player_D our tabart is white?????
> 1/25 13:49:59.521 [Guild] Player_V: yes Player_S
> 1/25 13:50:02.507 [Guild] Player_D: i put all my cash in 2 get it started but will send u 20silver 2 get u started :)
>
> 1/25 13:53:33.639 [Guild] Player_V: can anyone borow me 50s for tabart?? i'll give it back tonight

This is a typical example of resource gathering. It is common to collect game-money from the members of the guild to purchase and design the guild tabard in order to afford it sooner, as it is rather expensive. Higher-level members help lower-level members to purchase their tabard which serves as a symbol of belongingness within the guild.

Another prevalent observation is that the guild explicitly rewards friendly behaviours of its members. Although the game in general strives for a friendly and supportive atmosphere, friendly players are not directly rewarded by the game system although they might be rewarded indirectly because friendliness is a key criterion of group member selection. As the game progresses, it is nearly impossible to complete a quest on one's own. Therefore, being able to form a group is crucial in the success of the game.

In a guild, a friendly and supportive environment is nurtured through explicit rewards, and this kind of environment is regulated by the guild leader and other "officers".

> 1/25 12:42:52.534 [Party] Player_V: pls tell Player_D [the guild leader] that i've helped u
> 1/25 12:43:03.153 [Party] Player_V: i need recomandations for a rank

7.4.8 Summary

I have described different types of social interactions and inferred how communities could be formed in WoW. The social interactions that arise from the game comprise a wide range of components and processes as explicated in the SPAF.

It is clear from the analysis that collective play is not limited to functional or instrumental actions (i.e. progressive play) to achieve the game goals and to progress towards winning the game. What is also equally crucial is the creative side of play, namely expressive play. Players are not only bound together by coordinated progressive play as the findings suggested that communities of players are formed by means of expressive play, in which players tell jokes, show off their avatar appearance, chat about the game world, etc.

It is also obvious that intrinsic play is inseparable from extrinsic play in computer games. For instance, players shift from intrinsic play to reflective play from time to time, either to resolve a contradiction in order to make progress in the game or to socialise with other players based on the reflection on their past intrinsic play experience. In this way, reflective play becomes a basis of community building.

I summarise below some possibilities of designing sociability to facilitate community building in computer games.

Apart from designing shared goals or shared objects for players to work on together (as pointed out in section 5.3), game developers can also consider the design of the goal structure of the game as a whole. WoW has a semi-open goal system, which gives flexibility for players to construct their own goal structure. The findings showed that such semi-openness encourages players to play together through negotiations and agreements on the goal. Instead of dictating a shared goal to the players, the WoW world is full of possibilities for players to negotiate. This implies that instead of designing game tools that facilitate the play activity to *achieve* the game goal, the design of game tools that mediate the play activity to *construct* the game goal could be considered.

In section 5.3, it was mentioned that sociability can be driven by the design of shared tools which need to be collectively operated by the player group in order to achieve the game goal. This addresses the progressive aspect of social interactions. Another aspect of social interactions, collective-expressive-play, should also be taken on board, as suggested by the findings. I argue that modifiable and expandable fictional contents enhance expressive play experience and therefore enrich social interactions. In addition, the tool should also be able to mediate reflective play, particularly at the collective level, by enabling communication and construction among players.

7.5 Findings: Social Learning, a Perspective of the SPAF

Analysing collective play not only reveals another dimension of enjoyment in games through socialisation, expression and reflection, but also the learning process in the game through peer-teaching and peer-learning. By social learning, I mean the process of learning to play the game and become more skilled, by collaborating with other players.

Social learning is essential in learning the collective tools, namely collective rules and division of roles, since they are usually not stated in the game manual or the in-game hints/help system. In order to play with others and to be accepted by the player community at large, a player has to learn and abide by the collective rules. Some rules are global within the game across groups while others (which are negotiated and agreed spontaneously) only apply locally to a specific group. The player has to learn to play her role to coordinate the actions in a group in order to maximise the chance of success.

Apart from learning the game tools (interfaces, entities and locations), interacting with others also enables the player to act more strategically, as the player needs to be aware of the actions and the conditions of her group members. In this section, I examine the process of social learning in WoW and present a theoretical explanation of this issue through the SPAF.

I describe the observed collective actions which indicate the possibility of social learning. Note that there are no evidences to prove that learning has indeed

occurred. My intention is to describe collective actions that will potentially lead to learning. I explain it through the following aspects:

- Learning mediated by the community
- Emergence of norms that mediate social learning
- Collective knowledge construction
- Collective-reflective-play and social learning
- Collective contradictions between players
- Individual goal construction
- Shared game tools (information sharing)
- Homogeneity and heterogeneity in social learning

7.5.1 Learning mediated by the community

Analysing activities and actions is a fundamental way of understanding learning in games from the perspective of Activity Theory. However, the analysing should not be limited to examining how players learn through interacting with the game software (the tool), i.e. how skills and knowledge are transferred from the tool to the player (behaviourist) or how knowledge is constructed (constructivist) by the player on her own. We must not neglect the analysis of object-oriented and tool mediated activities in the collective context. Analysing the social context allows us to understand collective knowledge construction (an outcome of play) which could eventually lead to the internalisation of knowledge either within an individual or the whole community.

A study by Oliver and Pelletier (2005) on learning in single-player games using the activity theoretical constructs serves as a good starting point in this direction (see section 3.3.2). Their work focused on the learning process of a player acquiring identifiable skills which are stable and well defined. In single-player games, it is often assumed that there is a "complete" game tool which can mediate the player's learning. The play actions are pre-defined and are "out there" to be learned. The problem is that in MMOGs, some types of learning are not stable or defined ahead of time. Players must learn new information or new forms of actions which are not yet "there". These actions or information are learned as they are being

constructed. There is no complete tool as it keeps evolving and expanding through player-player interaction.

Therefore, in the WoW context, learning is not only mediated by the game tool but also mediated by other players (through collective rules and division of roles that arise). To start with, the game consists of a massive virtual world and is content heavy, featuring a huge variety of locations, items, monsters, etc. In addition, quests and dungeons are designed to impose challenges, requiring players to devise strategies and learn to collaborate with others. The following are some forms of collective actions which could result in social learning:

- One of the most common types of social learning is by observing others' actions and the outcomes of the actions. Players learn to perform some actions and other strategies through observation.

- Contextual teaching also occurs in the game, in which a more experienced player walks a less experienced player through many tasks and provides in-situ information to the player.

- Players participate in group discussion to collectively reflect on certain issues of the game. The reflection is always contextual, drawing from the play actions that happened recently. This results in the sharing of information and knowledge within the community.

These findings might appear banal but upon a closer analysis from the perspective of the SPAF, they reveal a deeper meaning. In a single-player game, secondary game tools (tools used to mediate the understanding of the primary tool) are created and maintained by the game developer to facilitate the learning process. These secondary tools might include in-game tools such as textual tutorials/hints, videos/cut-scenes that show how certain tasks should be carried out correctly, Artificial Intelligent (AI) agents that offer *in-situ* teaching to the players when they are baffled by some tasks, and other interactive tutorials at the beginning of the game. The design of such in-game secondary tools is essential to ensure a smooth learning curve. They might also be external secondary tools such as user manuals, official/unofficial guide books and other supplementary materials. Assuming that the player is playing the game individually, the game tools have to provide structured

guidance to the player. In this case, the learning process is exclusively mediated by the game tool.

However, such situations rarely exist in reality even in a single-player game, let alone in MMOGs such as WoW which are designed deliberately to include other players as part of the learning process. In WoW, there is little need to implement sophisticated AI agents as these agents are in fact "played" by the players. Only basic tutorials are included in the game and the rest is up to the communication between players. Instead of implementing a complete and structured help system, a platform is provided for the player to "play" as the help system.

In other words, the term "secondary tool" carries a significantly different connotation in WoW. I argue that the conventional CMC tools such as chatting functions, online forums, Wikis and blogs associated to the game become the secondary tools in the game, facilitating communication among players and thus leading to social learning via community mediation. Secondary tools in WoW also comprise construction tools such as video and screen capture functions, video/image/text editing tools, etc. which enable the players to construct user manuals and video tutorials.

Clearly, the players are not simply using the game tools to achieve the game goals; instead they become tool creators and the mediators of social learning for each other. In other words, the player community mediates the learning process. In the following sections, I will look into such mediation in social learning closely.

7.5.2 Emergence of norms that mediate social learning

Collective-progressive-play – in which players collaborate to achieve goals to progress in the game – requires players to communicate and coordinate. These collective actions result in the emergence of social norms (or collective rules) and division of roles. Often, these norms can only be learned through the means of social learning as most of them are not stated in the official game manual or the in-game help system.

Let me demonstrate this with an example. Player_J was a warrior with low attack and high defence while Player_J2 was a *Mage* (a class of characters that casts

mainly destructive magic spells) with low defence but high attack. In the following observation, Player_JF initiated an attack and she became the attack target of the monsters. Due to her low defence, she was nearly "killed". Through this, a division of role was formed between them, where Player_J was responsible to initiate the attack while Player_JF supported the attack through a long-ranged magic spell. In this way, the monster would focus the attack on Player_J with higher defence.

1/24 13:19:23.530 Player_J says: save [saved Player_J2 from being killed]
1/24 13:19:30.375 Player_JF says: thx
1/24 13:19:36.891 Player_J says: u shoudlnt attack first
1/24 13:19:46.862 Player_JF says: i know, sorry

[a while later]

1/24 13:46:24.457 Player_JF says: you first [to attack the monster]

The emergence of division of roles is dependent greatly on the design of the game tool. In WoW, players can choose from different classes with different abilities (thus different game tools) which are well balanced in a way that the class is dependent on each other in order to success. This design enforces social learning as players need to learn from each other especially to coordinate their actions in a group.

In some situations, collective rules and division of roles are not transferred from one player to another as these rules are constructed through negotiations and agreements. This type of social learning is known as expansive learning by activity theorists, in which the learning not only causes the development within an individual player but also the development of the entire activity system. In other words, the learning process is not simply referred to as the improvement of the players' abilities or skills to operate the tool and act on the gaol. Rather it is the expansion of the activity system, e.g. new tools and new collective rules are constructed.

7.5.3 Collective knowledge construction

By means of group discussion, exploration and experimentation, new information/knowledge is constructed. The outcome of reflective play could be

knowledge construction, which would not be possible (or would take much longer) when an individual player interacts only with the game tool. This motivates the players to interact with each other. Let me illustrate this with an example:

1/22 12:45:35.454 Player_J says: hi
1/22 12:45:41.499 Player_J says: pls tell me where guard thomas is
1/22 12:46:09.099 Player_Y says: read in your quest log
1/22 12:46:30.076 Player_J says: it says eastern Elwym bridge
1/22 12:46:33.278 Player_J says: no idea where it is
1/22 12:47:00.315 Player_Y says: is'nt it just to follow the road to the east?
1/22 12:47:07.735 Player_R says: guard thomas is after easrvale
1/22 12:47:23.354 Player_J says: is it? from here all the way to the east
1/22 12:47:28.150 Player_J says: ok will try
1/22 12:47:30.680 Player_J says: thanks
1/22 12:47:39.692 Player_Y says: havent been there yet but thats my suggestion

The above example shows a process of social learning through collective construction. Evidently, knowledge was not transferred from one person to another. Instead, it was constructed through player-player interaction. Upon inspecting the context of the observation, it was found that the goal of this series of actions was to complete the "Guard Thomas" quest. However Player_J did not know where Elwymn Bridge was located. She attempted to use the game tool (the map) to achieve the goal, but the bridge was not marked on the map and it was not explained explicitly on the quest log (another tool) either.

Note that this observation shows a typical individual contradiction and therefore a shift of goal. The goal was transformed into "to find Elwynn bridge". Her action was no longer motivated by an intrinsic-play-motive (to make progress in the game); instead it was motivated towards a reflective-play-motive (to learn more about intrinsic play).

She could have engaged in individual reflection by, for instance, reading the game guide book (a secondary tool) to resolve the contradiction. However she decided to mediate her reflective action with the player community. Player_J was co-reflecting the goal with Player_Y and Player_R through the tools (quest log, chatting

windows) and language (symbolic tool) (refer to section 7.5.4 for more details on collective reflection).

However, we must be informed that such social learning only makes sense if the players are within the zone of proximal development (ZPD), the definition of which is stated as follow:

"the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1930)

A learner's actual developmental level is the higher level of mental development at a particular time. It indicates the functions that have already matured. A learner's ZPD is those functions that have not matured yet, but that are in the process of developing.

We can look at an example of two learners who can both under normal circumstances answer questions that other average learners at their age can also answer. Their mental ages might be said to correspond to their chronological ages. But if when aided by others, one of these learners could successfully answer questions corresponding to a higher mental age the other could not, it could be said that the first learner's ZPD growth is greater than the other's.

Hence, if one of the players was not within the zone of proximal development, she would not have been able to interact with other players in a meaningful way. To take a very simple example, if Player_J had not yet learned where "Easrvale" was located, she would not have made the construction of the knowledge about the quest.

Lastly, it is observed that collective-reflective-play brings about the accumulation of knowledge constructed the community. Therefore, the outcome of reflective play is, as rightly described by the SPAF, a pool of resources useful for the game community (recall section 6.4.2).

[Much later]

1/22 14:01:56.613 Player_X says: can anyone tell where is [Elwynn] bridge

1/22 14:02:10.395 Player_J says: eastern [Elwynn] bridge?

1/22 14:02:16.254 Player_J says: all the way to the east

This data shows that the newly constructed knowledge was shared within the player community. In the next section, I will explain in depth the role of reflective play in knowledge construction.

7.5.4 Collective reflective play and social learning

The process of reflection is a core component in learning. As identified in the SPAF, reflective play is usually characterised as the process of resolving the contradiction that stops the individual from working towards the original goal. For instance, when trying to save the princess (the goal) in a game, the player might come across some aspects of the game items (the tool) she is not familiar with (a contradiction). When this happens, she has to pause and reflect on the tool and her actions of using the tool so as to resolve the contradiction.

Since WoW is inherently a social medium, reflection happens collectively, in which players externalise their internal reflection and resolve their contradictions inter-personally. Hence, it can be said that reflective play occurs collectively, drawing from multiple sources and multiple perspectives (from other players). When a player reflects, we witness a shift of goals. What is more, in game play activities, reflection usually means that the player steps back from the game world into reality and think about the play. In other words, it is a meta-play activity and it often implies the occurrence of contradictions. Reflective play can arise from various occasions (recall in section 7.4.4 that reflective play can also be motivated solely by the need to socialise). In this section, I would like to focus the discussion on the reflection that is due to contradictions in intrinsic play. I identified three situations where reflection is triggered by contradictions:

- contradictions arising from the player's own intrinsic play
- contradictions arising from other players in the community
- contradictions that might potentially occur

- *Contradictions arising from the player's own intrinsic play*

Contradictions could arise from all aspects of intrinsic play, forcing the player to step back from intrinsic play and shift to reflective play. For instance, players can reflect on the goal (e.g. is the goal appropriate to the player level, should the player change the goal), the action (e.g. how can the player improve the strategy to achieve the goal), the tool (e.g. how can the tool be used to perform certain actions), etc.

In a social context, players often externalise their reflection through language and signs to collectively reflect on the contradiction with other players. From the point of view of social learning, this leads to what is called guided reflection (Johns, 1994). Through guided reflection, a player is able to increase its potential level of development via collaboration with peers. This kind of learning is known as Zone of Proximal Development (ZPD) which has been discussed earlier (refer to section 7.5.3)

Social learning can be seen as collective-reflective-play mediated by various tools (e.g., words, signs, symbols, etc.) and the player community, generating knowledge which is then internalised within an individual player. The following observation shows how reflection was externalised verbally and how two players guided Player_J in reflection.

1/25 13:36:31.952 Player_J says: where we can find this thing [hops]?
1/25 13:36:37.286 Player_A says: m
1/25 13:37:17.223 Player_JB says: 5 hops.. [a quest that requires the player to collect five hops]
1/25 13:37:21.800 Player_JB says: neevr seen
1/25 13:37:26.941 Player_J says: me too
1/25 13:37:30.358 Player_A says: they are a plant?
1/25 13:37:48.351 Player_J says: sorry my english is not too good
1/25 13:38:02.536 Player_J says: they must be nesrby
1/25 13:38:32.911 Player_J says: keep search

1/25 13:39:18.443 Player_J says: hey i already have 1 hops
1/25 13:39:24.964 Player_JB says: where did u find it, did you get them from here? [Westfall]
1/25 13:39:44.869 Player_J says: %^&* i don't remember

1/25 13:45:52.280 Player_J says: harvest machine [the hop is from the harvest machine]

It is clear in this example that Player_J was externalising her reflection and it triggered collective-reflective-play mediated by Player_JB and Player_A, who offered suggestions and information (as tools).

- *Contradictions arising from other players in the community*

It should be noted that in the social context of play, reflection occurs not only as a result of the contradiction of the player's own actions as players also reflect on the contradiction that arises from other player's actions. Drawing from the previous example, analysing from the perspective of Player_JB and Player_A, it was found that they were in fact engaged in collective reflection triggered by a contradiction of Player_J.

In addition, contradictions not only arise from the limitation of the tool or the lack of skills/knowledge of the players, but also from the limitation posed by other players (refer to section 7.5.5 for a more detailed description). This should not be seen as something that deters the game play experience, but a motivation for social learning, as according to Activity Theory contradictions are a main source of development.

- *Contradictions that might potentially occur*

An interesting phenomenon regarding the shift from intrinsic play to reflective play is that such a shift is sometimes triggered by a potential contradiction which has not yet happened, but might possibly happen.

Through interacting with other players, intrinsic play can switch to reflective play without being triggered by an "actual contradiction" that has happened. Social learning could occur through a player pointing out a potential contradiction to another player, engendering reflection among the players such as the following example:

1/24 13:10:12.316 Player_J says: hav to wait?

1/24 13:10:13.926 Player_JF says: but south is full of it

1/24 13:10:18.757 Player_JF says: yes

1/24 13:10:19.022 Player_J says: shall we go?

1/24 13:10:22.852 Player_J says: south

1/24 13:10:29.042 Player_JF says: south are stronger

1/24 13:10:35.655 Player_JF says: too much for us

1/24 13:10:46.128 Player_J says: any other better ideas

In this observation, Player_JF informed Player_J that there would be a potential contradiction in the south. As a conclusion, the community of players acts as a mediator that provides not only information needed to succeed in the game, but also contradictions which might result in learning (refer to section 7.5.5).

- *How the game tools support collective reflection*

In synchronous CMC, particularly WoW with fast-paced actions especially when players are engaged in a battle, there is a challenge to facilitate reflection which is essential to social learning. The challenge lies in the overwhelming player-player interaction (on top of player-game interaction) especially with the chat session. Owing to the large number of simultaneous players, communication could be chaotic, especially if the player has to juggle with multiple chat channels (guild chat, public, group, etc). In addition to chatting, communication manifests in forms of actions as well. Interpreting the results of the study, I found that there are some aspects of WoW tools that facilitate reflection. For instance, the text colours of the chat are different for each channel so that players can effectively ignore texts from irrelevant channels.

Although the game can be extremely fast paced at times, players can switch to the non-battle play mode without much difficulty. By this I mean the non-hostile locations in the game which are designed to encourage socialising activities and reflective play. Whilst in the majority of offline games, a player can pause the game to reflect on a challenging situation, players of WoW are unable to do so, as the game world is real time and persistent. This problem can be solved through the design of non-hostile locations within or in the vicinity of battle areas. Players can usually move to these "safe zones" to reflect on a contradiction. Furthermore, in the

case when players are "killed" and their "spirits" are transferred to the nearest graveyard, they have but to walk back to their "corpses" to resurrect in order to resume the game. During this travel the players are invincible. Unsurprisingly, it was noticed that some players utilised this travel time to co-reflect on their previous unsuccessful actions to improve their strategy.

Finally and perhaps most importantly, the semi-open goal structure of the game also facilitates reflective play. Players can usually stop a quest at anytime and continue the quest later without having to start from the beginning. This gives an opportunity for them to "pause" the game and shift from intrinsic play to reflective play.

To sum up, compared to individual reflection, reflection guided by peers evokes feedback from different perspectives. It also engenders a sense of closeness as players share similar experiences with others. Therefore, collective reflection is not only a key factor for community building, but also for social learning.

7.5.5 Collective contradiction between players

Interestingly, community mediation generates not only resources such as knowledge and skills for the players, but also contradictions, a main source that could lead to learning.

In a single-player game setting, contradictions occur only between the player and the game system. The game is designed to provide challenges and trigger contradictions, urging the player to develop. In a social setting however, contradictions might come from the interaction with other players; and this could provide an opportunity for individual and collective development. Consider the following:

1/22 14:03:38.083 Player_J says: invite me into ur group
1/22 14:03:49.255 Player_X says: i dont no how

This simple example demonstrates that Player_J "imposed" a contradiction on Player_X by asking her to perform an action she has yet to learn. The following observation shows another example:

2/14 12:01:53.208 Player_A: wait for respawn [the re-generation of the monsters]

2/14 12:02:34.855 Player_A: this is where we came in, we need to wait for the respawn

2/14 12:02:46.863 Player_A: wont be long

2/14 12:02:55.358 Player_M: just get first hit

The players were hindering each other in a quest, causing contradictions in this example. Player_A and Player_M were doing a group quest in which they needed to kill a certain number of "Vile Fang" and "Tainted One" (two different types of monsters) in a mine. The mine was crowded with other players doing the same quest and the number of monsters was limited. Thus, players who were not in the group became an obstacle and created a contradiction for Player_A and Player_M, posing difficulties for them in completing the quest. A strategy was formed from this contradiction, which was to "*get the first hit*". In the game, a monster "belongs" to the player (and her group) who initiates the first hit, meaning that the player (and her group) gets all experience points and "drops" (items from the monster) even if other players join in and kill the monster after the first hit. The strategy they developed was not to attack monsters which "belonged" to other groups and to get the "first hit".

The following is another interesting example of a contradiction between two players and how such contradiction could serve as an opportunity to learn the collective rule in a group.

2/2 15:39:36.223 Player_D: roll for it [the treasure chest]

2/2 15:40:13.755 Player_J: ? [and Player_J took everything in the chest]

2/2 15:40:18.864 Player_D: wtf!!!!!

2/2 15:40:29.145 Player_D: u roll for chests when in groups!!!

2/2 15:40:34.786 Player_J: sorry!!!! i dint know

2/2 15:41:13.302 Player_D: in future when in a group -- type /roll and it will roll for u!!

In the observation, the players found a treasure chest and both of them wanted the chest. Not knowing the rule, Player_J took the treasure and it resulted in a contradiction with Player_D.

As a summary, the emergence of collective contradictions is an opportunity for social learning. In the WoW setting, contradictions as a result of interacting with other players might urge the player to learn.

7.5.6 Individual goal construction

The player community not only mediates learning through collective reflection and knowledge construction, but also through co-constructing individual goals which shape the direction of individual actions. As aforementioned, WoW has a semi-open goal structure, denoting that instead of imposing a series of goals that pre-shapes the player's actions, it provides a space consisting of a variety of unstructured goals and the possibility of constructing new goals not anticipated by the game developer.

That is to say, the structure of the goal in WoW is determined by three factors: the developer, the player and the player community. In an offline game, the design of the goal structure is decisive for ensuring natural learning. Ideally, goals are designed to pose gradually increasing challenges to the players. In games such as WoW, the player community plays an important role in structuring personal goals and therefore the learning direction. Due to the openness and the massiveness of the game world, it is expected that most average players need guidance with the direction of their actions. Therefore, social learning exists not only in forms of peer-teaching or knowledge construction to achieve a goal, but also collaboration to construct the goals.

In this game excerpt, we can observe the construction of an individual goal by Player_X, mediated by other players:

1/22 12:27:08.001 Player_X says: i need to up my level and gain more money
1/22 12:27:34.773 Player_E says: says: how can y get money in this game?
1/22 12:27:49.870 Player_X says: fight wolfs
1/22 12:28:15.672 Player_X says: you wil gaind things or money
1/22 12:29:02.940 Player_X says: if you want come with me i will show you wolfs
1/22 12:29:08.975 Player_K says: skin them as well
1/22 12:29:29.904 Player_X says: how do i skin them

The initial goal of Player_X was to gain level and earn game-money by "fighting wolves". However, player_K mentioned "skin them as well" and she became

interested and tried to figure out what it was about. Here, we witness a construction of new individual goal caused by the interaction with other players.

Occasionally, goal construction is motivated by the player's observation of other players without interacting with them directly. One recurring example of this phenomenon is the acquisition of "small pets". It was observed that the player was often intrigued by the small pet of another player and shifted her current individual goal to "get a small pet".

The construction of goals is important for social learning in an open virtual space such as WoW as players especially novices are unaware of the immense possibility of the game. Although in-game hints give some basic help about the game (mainly the basic control), to become a proficient player, one must learn not only the skills/knowledge to achieve game goals, but also what goals are possible. In some cases this information can only be learnt through social interactions with other players.

7.5.7 Shared game tool (information sharing)

As explained earlier, revealing players' real identities could be regarded as a form of expressive play that connects players together, enhancing community belongingness in the game. However it is also found that revealing real identities can be a form of progressive play as well. Under some circumstances, it is important to reveal the situation of the player in "real life" as it affects the coordination within a group. Let us consider the following:

1/23 14:00:29.767 Player_A says: al my army is on red hehe
1/23 14:02:12.162 Player_J says: maybe we kill wolves
1/23 14:02:23.584 Player_A says: okey
1/23 14:02:26.662 Player_J says: folow me
1/23 14:02:42.334 Player_A says: i was talking in the tellephone the same thime

In this example, we noticed that Player_A revealed information about her avatar status (her armours are red – breaking) which was not available to Player_J, and also her situation in real life (that she was on phone) in order to coordinate collective actions.

In another example, Player_B asked Player_G if she had completed the quest they were working on together:

> 1/24 11:23:11.610 Player_B says: ow many more ? [how many Watchers do you need to kill to complete your quest"]

Player_B was helping Player_G with her quest and wanted to find out if Player_G had achieved her individual goal so that Player_B could adjust her actions to coordinate in the group accordingly.

Learning and being aware of other class abilities is crucial to coordinate actions. In the following instance, Player_J cast a magic that turned a monster in a harmless sheep because the number of the monsters was too many for the group to handle. But if another player hit the sheep, it would transform into a monster again.

> 1/25 14:48:07.852 Player_J says: i'll use sheep spell
> 1/25 14:48:20.539 Player_J says: don't hit sheep

7.5.8 Homogeneity and heterogeneity in social learning

Playing in a massive virtual world with a large number of players engenders an enormous possibility of grouping with different players for various reasons (goals). It is found that social learning can occur in two types of groups, homogeneous and heterogeneous, each contributing to different aspects of learning. Let us consider this matter a little more closely.

- *Homogeneously motivated actions and homogeneously mediated actions*

In a homogenous group, the players' actions are either motivated towards the same goals or mediated by the same tools (usually implying that they are of the same class with the same set of abilities). Social learning can take place homogenously, as the players sharing similar traits help each other in the game. Although homogenously mediated actions are unusual, homogenously motivated actions prevail in the game.

Homogeneously motivated actions (by the same goals) are probably the most common collective play in WoW. In fact, in most situations, players prefer playing towards the same goal. This was clearly observed in the process of group formation:

1/24 11:31:48.402 Player_G says: wanna help me kill some watchers?

1/24 11:32:03.146 Player_D says: with quest is it?

1/24 11:32:05.491 Player_D says: then i do it to [to do the same quest as Player_G]

1/24 11:32:26.646 Player_G says: accept? [she shared the quest with Player_D]

1/24 11:32:28.709 Player_D says: ok yes

Generally, negotiations and agreements on a shared goal are common, or perhaps essential, especially in quest-driven group formation. To facilitate this, the game is designed with appropriate tools, such as the quest sharing function. This is crucial in social learning because a shared goal allows players to learn from each other about the particular goal as well as skills/information/strategy involved in achieving the goal.

On the other hand, homogeneously mediated actions (by the same tools) in WoW in essence refer to the collective actions of players of the same class (e.g. warriors or mages), sharing similar tools like battle functions, weapons and armours, etc. With this similarity, players are more likely to improve their skills of using individual tools since they can learn about their class from each other. The idea of players learning and mastering their individual tools before coordinating with players from different classes has been pronounced in section 5.2.2.3 as group coordination depends very much on how skilled the player is in her own class ability.

Lastly, the homogeneity of players is not merely determined by the fantasy attributes of players in the virtual setting. Rather it spreads across the real world, for instance the establishment of nationality-oriented or language-oriented guilds.

- *Heterogeneously motivated actions and heterogeneously mediated actions*

Whilst the significance of homogeneity of a group is not to be trivialised, social learning that happens in a heterogeneous group is equally important. In a heterogeneous group, players with different traits or motivations help each other; the most obvious example being a group consisting of players from different classes (warriors and mage), operating different tools in their play. Other examples include players with different goals or quests, players from different guilds, and even players

of different nationalities. Although heterogeneously motivated actions are unusual, heterogeneously mediated actions prevail in the game.

It is more common to observe heterogeneously mediated actions, in which a group of players from different classes (thus different tools) are playing collectively. In a group with different classes of players, players learn about other players, the tools and different skills of other players. Furthermore, collective actions tend to be more coordinated in heterogeneous groups as players learn to adjust their individual tool in accordance to other players to improve coordination.

Heterogeneity in social learning also applies to the goal of the group, signifying that each player in the group works on different individual goals, instead of a same shared goal. Take a look in the following game excerpt:

> 1/25 11:40:48.338 Player_J says: i have finished all westfall quest
> 1/25 11:40:56.386 Player_J says: gain exp [by helping other with quests]
> 1/25 11:41:04.574 [Party] Player_A: cool
> 1/25 11:51:32.473 Player_J2 says: we do defias and gnoll back and forth [doing two quests at the same time, since defies needs respawn , while waiting they can do another quest]

In this observation, the three players had their own individual goals as Player_J had already finished all the quests while Player_J2 and Player_A were doing different quests.

Having reviewed the findings, I claim that often it is not desirable to form an entirely homogeneous or heterogeneous group. Like communities in other medium (CMC or face to face), users in a community are likely to share some similar characteristics but possess different features at the same time. My findings have led me to conclude that the players generally form a group which is motivated homogenously towards the same goal, but with actions mediated heterogeneously with different tools.

Apart from these, the homogeneity aspects of a group, such as the pre-existing shared social norms and object (e.g. to create a supportive and friendly environment) are important. In this way, homogeneity creates a shared background

and a common goal, bringing players closer. However, a community does not merely consist of homogenous people as sharing different skills and knowledge benefits the whole community.

7.5.9 Summary

This section presented some themes of social interactions which are closely related to the issue of social learning in WoW.

According to the findings, it is obvious that learning to play WoW is a social experience. The learning activity/action is not only mediated by the game tool but also by other players in the community. To play successfully, players have to learn to deal with the game situations and also other players' situations so as to coordinate collective actions. The interaction between the players with each other results in the expansion of the players' zone of proximal development. This occurs not only through the transfer of knowledge from one to another but also the collective construction of new knowledge within the group of players.

It is also clear from the argument in section 7.4 that reflective play is a key factor that binds players together, thus initiating the formation of player communities. Reflective play is also crucial in the learning process in which players externalise their individual reflection and share it within the community.

As I have mentioned elsewhere in this thesis, contradictions are the main source of learning. In the context of social play, contradictions are both the result of challenges or obstacles imposed by the game tools and of those imposed by other players. In other words, the player community contributes to social learning by constructing or transferring knowledge as well as by providing sources of contradictions.

Incidentally, research in the area of learning in games has been centred on strategy development, skill improvements and in the case of collective play, player coordination. My investigation, aided by the SPAF, revealed that analysing goal construction is indispensable since there is a need for players to learn about possible goals, negotiate and agree on shared goals in the group. Last but not least, it was found that community building is oriented towards achieving homogeneity in player

backgrounds and goals but heterogeneity in individual tools in order to optimise social learning.

7.6 Unique Characteristics of 3D CMC

I have expounded comprehensively some prevalent themes of the two issues I investigated, namely community building and social learning in WoW. In addition to the findings of the two issues, some themes pertaining to the unique characteristics (in terms of social interactions) of 3D CMC emerged from the analysis. I briefly describe these themes in this section.

Unlike its offline counterpart, WoW is not simply a computer game as it bears a lot of resemblance to CMC that facilitates human communication and arguably human relationships, resulting in the formation of communities. However, unlike conventional CMC, WoW has some unique characteristics that qualify it as a game, and due to this reason, some aspects of social interactions in WoW are distinctively different. In this section, I would like to point out the main differences between WoW and conventional CMC such as online forums and discussion boards. This will set out a direction of possible future research in the area of CMC.

- *Collection actions mediated by language and other signs*

Perhaps the most apparent feature of WoW as a CMC tool is the nature of its collective actions. In conventional CMC, actions are predominantly verbal actions mediated by language and the limited use of non-verbal symbols such as emoticons. Although verbal actions constitute a considerably large part of the communication in WoW, actions mediated by other signs such as gestures are equally, if not more, common. Apart from these, users' physical actions such as clicking the mouse or pressing the key are effectively translated into fantasy virtual actions such as running, performing magic, wielding swords, etc. More importantly, users collectively perform these actions to interact with each other. In conventional CMC, physical actions do not carry such narrative interpretations to the users. As such, WoW offers a virtual environment that potentially facilitates a broader range of social interactions. Hence, WoW supports richer expressive play in which players can express themselves through not only words or signs but also through a whole range of virtual actions.

- *Identity play in WoW*

Identity play has always been a topic of research in the area of online communication. Even in the most serious discussion boards such as academic discussion, users are inclined to act differently than their offline communication patterns because of the different nature of the communication medium. Since anonymity is possible in most CMC, people feel safer when they act anonymously and therefore also feel safe to play with different roles or identities (Turkle, 1984). In WoW, identity play is even more conspicuous as users interact with each other through 3D avatars. Unlike avatars in conventional CMC which are basically a static visual representation (usually a portrait picture of the users or a fantasy character), 3D avatars in WoW are more "animated" in the way that these 3D avatars are typically designed with a background story and are highly customisable in terms of the look and the ability they can "perform" in the virtual world. As such, WoW is sometimes known as a Massively Multiplayer Online Role Playing Game (MMORPG). Users take on a pre-fabricated fantasy identity from the start and as the game progresses they project their own version of identity to the avatar. Thus the user's identity is a mix of fantasy and reality (recall the example of identity play in section 7.4.3). The avatar is not static as it transforms and develops over time. The fantasy identity embedded in the avatar mediates the player fictional actions in the virtual world.

- *The environment provides an intrinsic object (fantasy theme)*

Third, the 3D CMC environment of WoW is designed with an intrinsic goal structure, meaning that the 3D CMC tool itself could become an object of social activities. A conventional CMC is entirely open-ended with no pre-designed object and the users can use it to mediate their own objects (such as education, health support, etc). Conversely, WoW has a loose goal structure which provides shared goals that trigger social interactions. Furthermore, the fantasy themes and background stories of the game set out a common background for the players and create a homogeneous aspect within the community.

- *Community support is implicit through actions rather than explicitly spoken out*

Due to its richer interaction between players, WoW communities give support to each other in an "implicit" way. Quite often, support does not manifest as a form of verbal communication through words. WoW players help each other by "doing" rather than merely "saying" (recall the example of polite actions in section 7.4.3).

- *Contradictions of the tool are necessary*

Since the goal structure is built into the game environment, contradictions of using the tool plays a crucial role in community building. It is safe to claim that in conventional CMC, the tool is normally designed to eliminate or minimise the contradictions at the tool level so that users can focus on the "real" object (to communicate rather than to resolve the contradictions arising from the tool). Yet, my findings showed that the occurrence of contradictions causes the formation of objects for reflective play, which is one of the main types of social interactions that strengthen the bound between players. It can be therefore assumed that the game tool is pre-designed to produce contradictions. Thus, the game tool itself becomes a common object for social interactions.

7.7 Discussions and Implications

Let us revisit the goals of this chapter. Through the lens of the SPAF, I.have given an elaborated account of explanations for the social play activities in WoW on the issues of community building and social learning. The theoretical constructs of the SPAF (see section 7.1) can be used to provide insights into the social interaction of the game (see sections 7.4.8 and 7.5.9).

First of all, the individual-collective distinction enables us to focus on the collective aspect of game play, and talk about collective actions and collective tools without overlooking the individual dimension of the observation. For instance, I was able to differentiate and discuss collective and individual goals, as well as their relationships. This led to the emergence of important themes, such as goal negotiations. As described in the findings, game players sometimes give up an individual goal in order to pursue a collective goal which, in turn, produces new individual goals.

The difference between game rules (paidea rules) and collective rules is also a main concept of the SPAF. While analysing the tool, it is useful to differentiate collective rules that arise from the player group and game rules that are pre-built into the game software. This enables us to examine the influence game rules have on the emergence of collective rules, and casts light on how collective rules are formed within the player community.

Furthermore, examining game play from the collective perspective reveals the collective dimension of reflective play. Such collective-reflective-play elucidates the process of socialisation in the game, which evidently is a major foundation of community building, as the findings showed that socialising activities in WoW are primarily a result of collective reflection. Apart from these, investigating collective-reflective-play also clarifies some issues on social learning. It was found that players tend to externalise their individual contradictions so that the player community can reflect on and consequently resolve them collectively. In this way, the players are able to learn within their zone of proximal development.

The SPAF also emphasises the collective level of contradictions. Instead of analysing the contradiction between the player and the game tool or the game goal, we must also consider the contradiction between the player and other players. These contradictions are known as collective contradictions. Collective contradictions can occur either due to the player-player conflict over goal attainment, or past contradictions experienced by the players which are shared with others.

When analysing WoW through the SPAF, it is also advisable to relate individual tools to different types of play. One example is the connection between fictional contents (the tool) and expressive play, in which the design of fictional contents triggers players' motivations to communicate and socialise. For instance, players equip armours or weapons of different shapes and designs in order to express their artistic value in the game. Through this I argue that the narrative aspect of games contributes to social interactions. In addition, analysing the hierarchy of tools and its connection to play activities yields invaluable insights. For instance, my investigation on secondary tools of reflective play showed that secondary tools comprise not only symbols/signs/language that mediate the understanding of primary tools, but also tools for constructing such signs and symbols.

It is worth noting that although the study reported in this chapter dealt with collaborative play, situation where cooperation was achieved through conflict resolution was not observed. In collaborative play, goals are positively correlated; when one player achieves her goal all players with whom she is cooperatively linked achieve their goals (Johnson 1979; Johnson & Johnson 1999). In a socially complex environment such as MMOG, there is a big opportunity for conflict, involving property, relationships, identities and so on. Not surprisingly, since the emergence of e-commerce, online dispute resolution has become a field that investigates how online systems can be developed to resolve conflicts arising both online and offline. Often this involves more than just the design of the software as there is a need for a third party mediator to manage and structure communication. Two methods of conflict resolution have been identified (Katsh 2004). Rule-oriented dispute resolution requires that clear and unambiguous rules are written, accessible and authoritative. Another method, known as alternative dispute resolution (ADR) refers to negotiation and mediation of the parties involved without abiding to rules to achieve a solution as long as the outcome is not illegal. Thus, it is particularly interesting to see how ADR could work in the context of MMOG.

However, mainly due to the selection of PvE (player versus environment) server for the issue-based studies in WoW, I must acknowledge that the exploration of collaborative play behaviour did not include cooperation through conflict resolution. In a PvE server, conflicts rarely occur since there is an explicit code of conduct that dictates how players should behave. The developer of WoW employs what is known as "game master" to monitor player's behaviour. In the case where conflicts occur, they can be usually solved through rule-based process mediated by the game master. The interesting aspect of collaborative play through ADR however could be explored in PvP (player versus player) server in which the players have a greater ability to resolve disputes on their own (WoW website).

7.8 Conclusion

This chapter addressed research question 4 (What kind of insights can the play activity framework developed in the thesis give in terms of analysing social play activities in MMOGs?) by demonstrating the practicality and applicability of the SPAF

in analysing WoW (through its methodological guidelines and theoretical constructs). Using the framework, I cast new light on the issues of community building and social learning. It was found that certain aspects of game design, such as the emergent goal structure (which gives players freedom to choose the goals) and the rich narrative elements, contribute to social interactions in the game community. Analysing social learning through the SPAF also revealed new insights, in which the learning process is not only limited to the acquisition of knowledge to achieve the goals, but it also involves the learning to identify and construct the goals.

To conclude, I would like to restate the major contributions of the SPAF:

- It gives an in-depth explanation to the social interaction from the observation through its theoretical constructs
- It highlights important aspects of the analysis – goals, tools, actions, outcomes – some of which are often overlooked by game theorists

8 Discussion and Conclusion

This chapter provides a summary of the thesis and concludes with a discussion of the research findings, their implications and future directions.

Throughout the course of this thesis, I presented a series of insightful research studies into computer games from a socio-cultural perspective. Drawing from Activity Theory and grounded in empirical data, the Social Play Activity Framework (SPAF) was developed. The framework provides a set of useful theoretical constructs to describe play activities in a social context. A set of methodological guidelines was also derived to give focus to social gaming analysis. Employing the framework as a basic theoretical foundation and utilising the methodological guidelines, two issue-based studies were carried out in order to provide a detailed understanding of some aspects of social interactions in a Massively Multiplayer Online Games (MMOG).

Let me now summarise the thesis. Chapter 1 presented the background motivating the research and the formation of research questions. Chapter 2 provided an extensive review of game literature from different angles, while chapter 3 explained Activity Theory in detail and its application to research areas including games. Chapters 4, 5 and 6 were devoted to the development of the SPAF, while chapter 7 presented two issue-based studies to demonstrate the usefulness of the framework.

8.1 The Research Questions Revisited

Let us revisit the research questions out in the thesis. The research questions were addressed through a series of studies presented in chapters 3-7. As a result, a framework known as the SPAF was developed. A summary of the findings that tackled research questions 1-3 was presented in Table 7.1, Table 7.2 and Table 7.3 in section 7.1. I explicated the theoretical constructs of the SPAF which can be used to model social interactions in the context of computers in general, and computer games in particular. The discussion of research question 4 was presented in sections 7.4.8 and 7.5.9, in which I highlighted the insights I gained through analysing a MMOG with the SPAF.

I now summarise how each of the research questions has been addressed.

1. How can Activity Theory be used for modelling computer-mediated social interactions?

This question was addressed directly in chapter 3 (through literature review on Activity Theory), chapter 4 (through the study of an online community) and indirectly throughout chapters 5-7. I chose Activity Theory as the main theoretical foundation for this research largely because of the fact that it focuses on the individual without neglecting the collective aspect in analysing human activities. This is crucial, as to some extent, game play is primarily a form of personal enjoyment even though it takes place in a social context. Through the studies reported in this thesis, I found that Activity Theory allows analysis at different levels and perspectives, ranging from the individual action to the interaction of several activity systems (refer to section 8.4.5 for the implication for activity theorists). The CMAM, which is based on Activity Theory, underlines some important aspects of computer-mediated social interactions such as the dynamic process of activities and the understanding of individual-collective dimensions. Activity Theory can be used to analyse these social interactions through its theoretical constructs and vocabulary.

2. How does individual play and collective play arise within computer games and how can this in-game play be modelled?

This question was addressed in chapter 5 in which an observational study was conducted to examine individual actions mediated by the game tool and collective actions mediated by the collective tools in intrinsic play. The play actions were modelled and various aspects of individual and collective play were distinguished. The developed model, the IPAM, explains the dynamic process of individual and collective play through contradictions and development in the game context. Individual and collective play occurs through tool mediation and construction (i.e. negotiations and agreements), and is directed towards the objects (the game goals or the in-game artefacts).

3. How do various types of play emerge around game play and how can this out-of game play be modelled?

This question was addressed in chapter 6 in which two types of extrinsic play, namely reflective and expansive play, were identified and modelled through the analysis of online communities of game players. The developed models, the RPAM and the EPAM, broaden the horizon of game studies in which playing games is no

longer regarded as an individual action within a strict boundary of game rules. Instead these actions spill beyond the game boundary which is fluid and mutable through transformation and expansion (refer to section 8.4.1 for the implication to computer game studies). The interaction between intrinsic and extrinsic play can be explained through the movement of the outcome from one play activity system to another.

4. What kind of insights can the play activity framework developed in the thesis give in terms of analysing social play activity in MMOGs?

This question was addressed in chapter 7 in which two issue-based studies were conducted with a MMOG. The developed framework, the SPAF, consists of three models of play, a vocabulary of theoretical constructs and a set of methodological guidelines. The framework is useful practically as its methodological guidelines provide focus and structure for game analysis. The theoretical constructs of the framework are able to give an insightful explanation to understand play activities in a 3D social environment (refer to section 8.4.2 for the implication to CMC research). Most importantly, the findings have shown that social interactions take place at three levels of play (intrinsic, reflective and expansive, see section 7.4 and 7.5 for the detailed findings).

8.2 Thesis Contributions

This thesis has contributed to the current state of game research by presenting a framework, known as the Social Play Activity Framework (SPAF) that emphasises the social aspects of gaming. Through qualitative methodologies, I collected and analysed data that covered a broad range of play activities, particularly social interactions within and around computer games. Based on the analysis, I identified and modelled three types of play (intrinsic, reflective and expansive play) with Activity Theory. I also provided a theoretical explanation of the process of each type of play and the connection between them. Three contributions of the thesis are highlighted below:

8.2.1 The Social Play Activity Framework (SPAF)

Activity Theory can be used to explain the hows, the whats and the whys of certain observations and thus it reveals interesting insights into the observations. Similarly, the SPAF is able to shed light onto the observations in the game context. For example, when observing an action, e.g. humour in WoW, I wanted to know how it happened and through the lens of the SPAF, it was found that humour can be understood as a process of intrinsic-reflective play shift (recall section 7.4.3).

An ethnographic interpretation provides a generic narrative account of what we observe the players doing in the game. But with the SPAF we can focus our analysis on important conceptual issues. For instance, we not only can observe the actions (or the communication) but also identify the tools used, the goal that motivates the actions etc. We can also investigate the contradictions and the development that entails the actions, which could explain certain observed issues such as social learning.

I believe that the SPAF can provide a theoretical explanation and thus a more in-depth understanding of the social interactions observed in computer games. Overall, the framework

- features three major types of play activity models (intrinsic, reflective, expansive play) that encapsulate a wide range of socio-cultural play
- explains the connection between tools and play activities
- provides an explanation of the shift of different types of play through the formation and transformation of goals
- stresses the outcome as a means of describing the dynamics of play activities through the examination of contradictions and development

The framework purports to study the socio-cultural context of game play instead of focusing merely on game software or individual aspects of gaming. It must be emphasised that it is not the intention of this framework to replace conventional game research. Instead, the framework is founded heavily on Activity Theory and thus the concept of tools (the game software or even hardware) is taken seriously in the analysis of computer games. In addition, the individual aspects of play are not overlooked but are expanded to incorporate the social context around them.

Like Activity Theory from which it originates, the framework describes an action or an activity with its theoretical constructs and provides a theoretical explanation of the social phenomenon of play. It retains its descriptive power as a framework from Activity Theory. When attempting to understand a theme or an issue of interest arising from an observation – either through participant or non-participant observation – it is often very useful to provide an insightful description instead of a generic one. The framework has a vocabulary of theoretical constructs for researchers to further understand a specific issue. For instance, the concept of outcome being not the final state of an activity but a state of an action at any given time of play casts light on the dynamics of activity systems.

In addition, the framework casts light onto the development process of the entire play activity system rather than merely the personal development of the player. Although it is common in conventional game research to examine the development of the player (in terms of the learning process that occurs when playing the game), the development of the play activity itself is rarely studied. The whole play activity system is treated by the framework as a continuous expansive system which expands through player actions and activities.

8.2.2 Methodological guidelines

The second contribution is the set of methodological guidelines derived from the framework. The guidelines are helpful for analysing rich qualitative data, since they provide focus and structure to the analysis process, by highlighting important perspectives of the play activities under investigation.

The guidelines underline some aspects of the observed activity/action which would otherwise be unnoticed. Researchers can analyse an observation from various perspectives (e.g. what is the motive and goal? Is it collective or individual?) and examine different aspects of the action (what is the tool that mediates it? Is it an individual or collective tool?) since the analysis is always informed by the whole context of the interacting activity systems.

The guidelines stress the importance of analysing not only the hierarchy of objects (objectives and goals) that motivates a specific action, but also the construction and formation of the objects which are often overlooked in game

research. Furthermore, action analysis should be carried out within the context of the object that motivates the action. All these give directions to game researchers when dealing with the data.

8.2.3 Findings of issue-based studies

The issue-based studies were conducted mainly to demonstrate the applicability of the framework in analysing social play activities. As the result of the studies, I also identified some intriguing themes (refer to section 7.4 and 7.5) regarding the characteristics of WoW as an online community.

This thesis has placed a substantial emphasis on social interactions within and around computer games and the framework has revealed a very important aspect of sociability in games that occurs at the reflective level. Through the analysis, I found that reflective play emerges as an activity system that appears to be oriented towards solving contradictions of intrinsic play and becomes a predominant way of socialising in games. It is partly due to the fact that players externalise their reflection through language and construction of artefacts (such as videos or texts) that allows other players to share their reflection. This results in a pool of game resources that will benefit and thus strengthen the game community.

The SPAF also provides an explanation of the social interactions that is in line with past research in social gaming. It reinforces the finding that social interactions are not restricted to goal-oriented progressive play. Rather, social interactions are equally common through expressive play.

These findings serve as an impetus for the research in the emerging area, 3D CMC, often referred to as 3D Virtual social environments, an example of which is Second Life. The findings showed that there are substantial differences in terms of the social interaction patterns between 3D CMC and conventional CMC. For instance, support is mediated through virtual actions as well as verbal communication. I firmly believe it is worth pursuing future research in this direction. Apart from these, these findings of social interactions could be transformed into recommendations of sociability design particularly in the context of games.

8.3 Validation Issues

Validation in the context of qualitative research refers to the mechanisms used during the process of research to ensure the rigour of the study. These mechanisms are embedded into every step of the study by identifying and correcting errors before they are built in to the developing framework (Morse et al., 2002). Validation can also be done at the final step of the research to further enhance the results.

One of the strengths of qualitative research is that researchers study a phenomenon through various perspectives, drawing on the researchers' knowledge and theoretical positions. The main aim of such research is to provide a rich description and understanding of the observed phenomenon. (Golafshani, 2003)

The aim of this thesis was to generate a framework (based on an existing theory) that reflects and explains the collected data, as opposed to verifying the theory. Thus the issue of reliability and validity in the thesis should be treated differently than in quantitative research. The validation of the framework was taken care of through three parameters which are relevant to qualitative research (Glaser & Strauss, 1967):

- Credibility: ensuring that the framework generated is understood and is based on the data from the study
- Trustworthiness: extent to which one can believe in the research findings
- Usefulness: practicality and applicability of the research outcomes to help explain a phenomenon

- *Credibility and trustworthiness*

Triangulation was used to give multiple perspectives for the play phenomenon I observed. This was ensured through the collection of various types of data, ranging from textual information, images and videos to virtual artefacts. This data came from multiple sources through different data collection methods, including observation, virtual ethnography, interviews and questionnaires. The research also employed a combination of active engagement with the participant and passive observation.

Hence, I was able to observe and interact in various contexts (in-game, online game community and massively multi-player contexts).

Another technique used to validate the research was peer debriefing with colleagues who are experts in this area. This was done at different stages of the research through focus groups in which the data was shared with the colleagues. During the process of the framework development, I explained the analysis to the colleagues and asked for feedback. They were also asked to code a few transcripts in order to enhance trustworthiness of the analysis.

Prevention of premature conclusion of data was also taken, in which the data analysis was run through several times. The first run was to get a general picture of what was going on. Then a preliminary analysis was run on a small section of the data to devise the analytical method before the actual analysis was carried out. In addition, a thick description was generated before further analysis was carried out in order to retain as much as possible the detail and complexity of the observation.

Credibility was ensured through theoretical sampling. With this sampling technique, I sampled various groups based on on-going data analysis. For instance, when the on-going data collection and analysis showed that a specific interesting type of play was observed, the data collection and observation was directed towards sampling such play in order to capture a thick and rich set of data regarding this issue.

An effort was made to gather an appropriate sample, consisting of participants and games which were representative of the population. This ensured that sufficient data to account for all aspects of the phenomenon have been obtained (Morse et al., 2002). This was handled with care during the process of selecting games for the study so that they represented different genres. In addition, in the study reported in chapter 5, participants were also cautiously matched to the game in order to elicit richer data. As of the study in chapter 6, the websites with the most amount of interesting material were paid more attention.

It should be reiterated that this qualitative research was iterative rather than linear. I moved back and forth across various stages of the study to ensure the coherence between research questions, literature, methodologies and findings.

- *Usefulness*

The validation of this research was further complemented by the concept of pragmatism or usefulness of the framework. In chapter 5 and 6, the development of the model was accompanied by a discussion section (see sections 5.3 and 6.6) that demonstrated the practicality of the model to analyse game play. The issue based studies in WoW demonstrated the strength of the framework in giving specific insights to social play activities.

8.4 Implications of the Thesis

8.4.1 Implications for computer game research

This thesis has expanded the current state of game research. One implication is the expansion of the "magic circle" as I presented in section 6.5. The magic circle of a game should not be treated as something immutable, pre-defined by an absolute set of rules. We can infer from the SPAF that the magic circle is in a state of flux through the interaction of intrinsic play, reflective play and expansive play.

Moreover, the framework also casts light onto the outcome of play, which has been a topic of discussion by game scholars. Examining game play in a socio-cultural context shows that apart from "fun" and "enjoyment", something tangible is produced and eventually "consumed" within the activity system that produces it or within other connected activity systems. The players produce the symbolic value (meaning) and media products (texts, videos, etc) as they play games.

As such, game play becomes an act of production in which it "produces" objects and needs to be satisfied with the object. Pearce (2006) argues that the boundaries between play and production, and between media consumption and media production are increasingly blurring. Translated into the case of computer games, it means the "pre-defined magic circle" is beginning to blur and blend into the bigger circumference of the "constructed magic circle" in which the definition of magic circle is continuously negotiated and altered.

Analysing leisure activities such as game play using work-based theory, namely Activity Theory, reveals that game play is not after all an "unproductive" activity as claimed by some classic game scholars (Huizinga, 1944).

8.4.2 Implications for CMC research

Although the main topic of this thesis is the computer game, the work reported here has some implications for CMC research since I studied not only individual and collective game play but also the social activities of game communities. The issue-based studies on WoW in particular highlighted some interesting findings which are closely related to CMC. MMOGs such as WoW are as much games as they are CMC tools that mediate communication. In fact, MMOGs incorporate conventional CMC tools into their design. The most unique feature of MMOGs compared to conventional CMC tools is the 3D graphical virtual environment.

Recently there is an emergence of 3D virtual environments which, unlike games, are not designed with a goal structure. The most prominent example is probably Second Life (Linden Lab, 2003). The design structure of Second life is completely open-ended, meaning that it does not have pre-defined story lines or goals that direct players' activities. Thus almost everything can be done virtually in this technological social system. Already we have witnessed a variety of activities spawning in this virtual world such as business, education, and other social events such as concerts, charity run, etc.

My findings have shown that these 3D virtual environments facilitate richer social interactions than conventional text-based CMC. Users are no longer restricted to textual communication. Instead they can interact with each other through "virtual actions" mediated by the 3D avatar (see section 7.6 for findings of the characteristics of 3D virtual environments). Although non-textual communication is possible in some CMC, the level of interaction provided by real-time rendering 3D graphics is far higher than, say, video streaming. Through 3D avatars, the users are not only able to express themselves (through gestures, dressing up the avatar, various actions such as dancing) but also interact with other users (through their avatars such as hugging, kissing or even "killing" each other).

In addition, 3D representation is not the only feature of this new type of CMC. Collaborative constructionist activities in the community also transform online communication dramatically. This is often known as Web 2.0, a second generation of web services which facilitates collaboration and sharing between users. Some non-3D examples include Youtube and Wikis. 3D CMC adds a 3D dimension into such environments in which users can construct not only media materials such as videos but also virtual artefacts such as furniture and houses. As such, developing and designing CMC tools for expressive and expansive play might be an interesting area to explore and I believe that the framework developed in this thesis is appropriate in analysing such online communication mediated by 3D environments or what I call, 3D CMC.

8.4.3 Implications for collaborative Work

Whilst game research is borrowing techniques and methods from other areas such as HCI to enrich its increasing body of knowledge, some other areas are also eager to seek solutions to their problems from the game industry. Computer games used for non-entertainment purposes are usually known as serious games (Stokes, 2005). Two most commonly researched areas of the serious use of games are computer-supported collaborative work (CSCW) and game-based learning.

A number of previous studies have looked into the relationship between games and CSCW. CSCW researchers have been interested in understanding the social interaction among game players as these game systems are becoming increasingly collaborative since the inception of Internet technology which connects players through networked computers. For instance, a systematic analysis was carried out by Muramatsu & Ackerman (1998) in order to examine the social arrangement and activities that give meaning and structure to the players.

In addition, some research has attempted to find ways to utilise game solutions in CSCW by acquiring greater understanding of player interactions to derive techniques to be applied in CSCW applications. For instance, Dyck et al. (2003) analysed several game interfaces looking for ideas that could be applied more widely to general user interfaces to support sociability in CSCW applications. They examined the design of 14 computer games from several genres in order to

identify contributions that provide clear benefits to game players, contributions that could also be employed to help improve usability in non-play applications.

The research reported in this thesis drew on the theoretical tradition from the field of CSCW to inform the framework development. Most obviously, I adopted the CSCW perspective of applying Activity Theory in analysing computer games, the focus of which lies in the analysis of human activity mediated by computerised tools. As such, play activity is approached through the theoretical lens of work or labour activity. On the other hand, the findings generated through such game research might have implications and contributions to CSCW although currently they are indirect and potential. Therefore this thesis calls for future work, especially for those who are fascinated by computer games and wish to apply game design techniques in developing CSCW. Some ways of expanding the work to CSCW are :

- Modelling social interactions: many computer games are designed to afford social interactions among the players. By understanding the design model or structure of these games, CSCW designers could apply similar social interaction models in creating collaborative work environments.

- The analysis of CSCW tools such as the interfaces that enhance user motivation and sociability: second, computer games are designed to be enjoyable and motivating. Many games are extremely successful at creating highly user friendly and pleasurable user interfaces that not only support player-game but also player-player interaction.

- Reflective/expansive play and community building concept: third, even in a single-player game, the community building happens almost automatically. This aspect is even more visible in multi-player games. This community mechanism might provide insight for CSCW community design.

The framework is hopefully generalisable to other work-based collaborative environments and could also be used practically to analyse games for informing designs of sociability of CSCW.

8.4.4 Implications for educational games

Another oft-mentioned serious use of games is educational games. In a way quite similar to studies of collaborative work, research in game-based learning accentuates the natural and in more recent studies collaborative learning process in the game. Understanding this learning will inform the design of educational games developed explicitly to support the learning of a subject matter.

Until recently, the education potential of computer games was largely ignored by most educators, as they saw only the negative social consequences of playing games. In fact, there is almost no doubt that one does learn something from the game while playing it. Since the widespread popularity of Pac-Man (Pac-man, 2007, June 9) (Figure 8.1) in the early 1980s, a few, though not many, educators believed that the "magic" of computer games could apply in the classroom to engage students, making learning more enjoyable (Squire, 2003). A few educators have undertaken such projects, defining elements of game design that might be used to create a more engaging learning environment (Bowman, 1982; Malone, 1980).

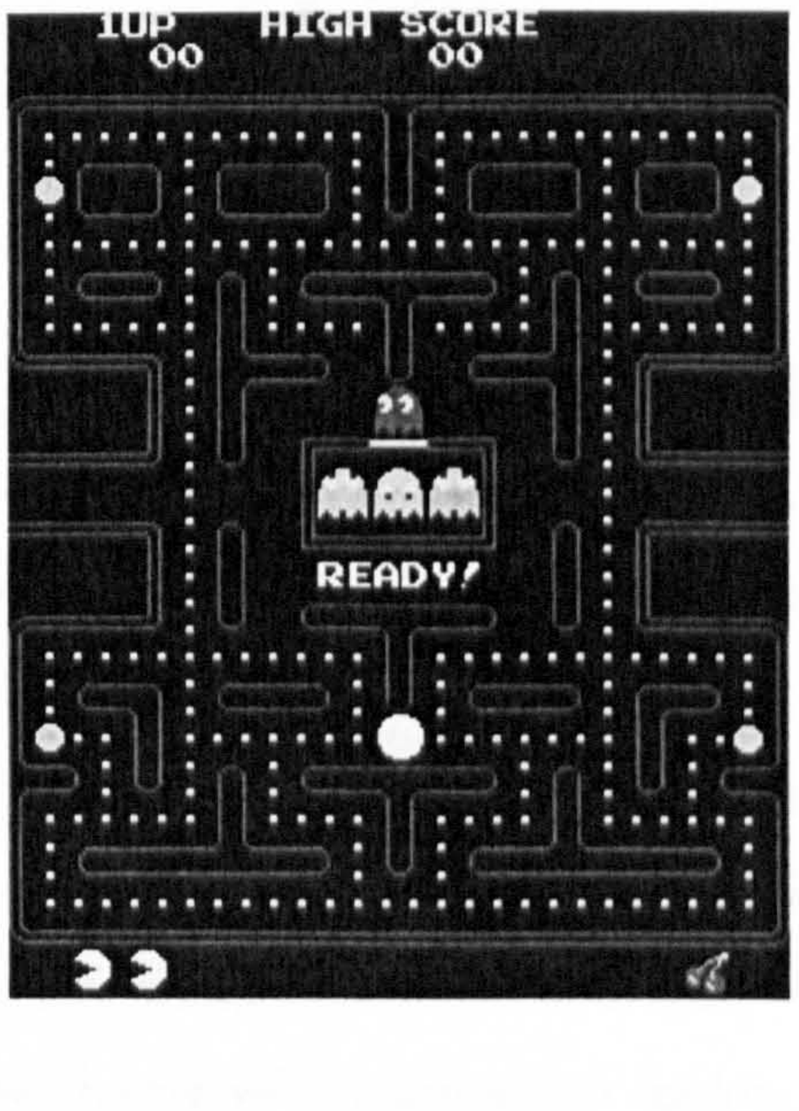


Figure 8.1 A screenshot from Pac-man

An earlier piece of work by Malone (1980) proposed three main elements that contribute to the fun factor of computer games: challenge, fantasy and curiosity. It is clear that Malone's heuristic framework of fun does not incorporate the social dimension of play as computer games at that time were mainly individualistic. In

more recent literature, Gee (2003) described gaming as a complex social practice where game players engage in high order thinking that requires complex cognitive effort. The overarching idea is that they learn to participate in new domains by playing computer games. They learn to make sense of new areas, not only on their own, but also by engaging with their peers, discussing and sharing information.

The SPAF, developed in the game context, could be applied to analyse the social practice in a game-based learning community. The framework purports that play activities are not confined within the "intrinsic interaction" with the game (i.e. intrinsic play). Instead, the enjoyment of play also lies in extrinsic play activities. This argument might hold true in the game-based learning context, in which the learning activity propagates into the extrinsic use of the educational games. Therefore, educators should see educational games not as a tool that mediates learning, but a tool that mediates the process of community building.

I have presented in section 7.5 how social learning could occur in WoW. Studying learning activities within computer games with the framework might produce some useful implications for designing educational games and the learning communities around the games.

8.4.5 Implications for Activity Theorists

The thesis also underlines some important aspects of Activity Theory as a theoretical framework for analysing computer-mediated social interactions. I found that Activity Theory provides multiple levels of analysis which are remarkably useful in analysing human activities. Apart from using Leontiev's hierarchy of activity (activity-action-operation), we can look at a social phenomenon through different generations of Activity Theory (Figure 8.2). I would like to reiterate that I did not attempt to expand the theoretical tradition of Activity Theory. In this section, I try to highlight some aspects of the theory which are worth looking into when analysing computer-mediated social interactions based on my experience.

In my work, I found it quite useful to focus on three generations of Activity Theory: the individual level, the collective level and the whole activity level. For each generation, two types of analysis can be performed: component analysis and relation analysis.

When doing component analysis, we can scrutinise the elements/components of the activity such as the tools, objects etc. When doing relation analysis, we can examine the connections and links between the components such as the contradiction between tools and objects or the contradiction (and transformation/development) between two related activity systems.

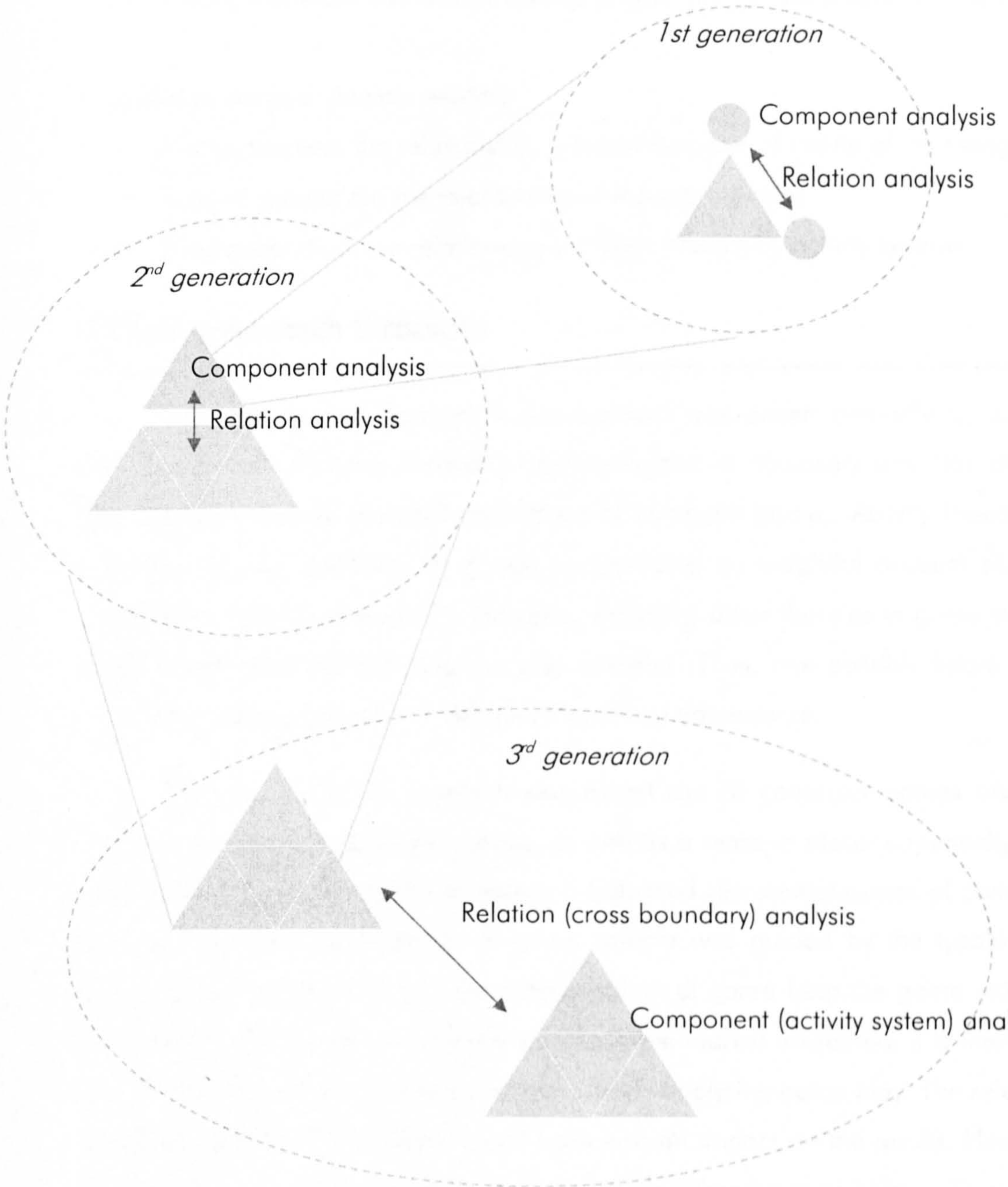


Figure 8.2 Using Activity Theory to study games: component and relation analysis

- *Component analysis: (mainly descriptive)*
  - First generation: each element of the tip of the triangle (the individual level) such as game tools, goals and outcome
  - Secondary generation: each sub-triangle of the whole triangle such as player-rules-object, player-tool-community, etc
  - Third generation: the activity system such as the intrinsic play activity system

- *Relation analysis: (mainly analytic)*
  - First generation: the relationship between elements of the tip of the triangle
  - Second generation: the relationship of the sub-triangles
  - Third generation: the relationship between interacting activity systems

8.5 Future Research Directions

The analysis and framework development was driven primarily by Activity Theory. I believe that this theoretical preconception is necessary and has proven beneficial to the study of social interactions of computer games. Activity Theory has cast new light on sociability of games by providing an insightful account of such phenomena (refer to chapter 7). However, adopting other theories in game studies might reveal other aspects of game play activities. Thus, one possible future study could be analysing games with different theoretical frameworks.

The analysis of this research was based on 10 computer games and the online communities around the games, as well as a massive player community of a MMOG. Extra care was taken to ensure a balanced representativeness of computer games. Therefore, the selection of game sample was guided by the typology of games from past research and the categorisation of genre from the game industry. Due to the huge variety of computer games in the market nowadays, it is inevitable that games researchers have to be selective when analysing game play. The selection of games used for this research might have had an impact on the results. Hence, a possible direction of future research is to include other types of games. This might provide a more detailed explanation to the models and the framework.

Apart from these, analysis of extrinsic play can be expanded to include offline game communities, or communities mediated by other types of technological

artefacts such as the mobile phones. Analysing different types of game communities might give us further insights into the issue of socio-cultural play. Another possible expansion is the inclusion of non-digital games which is beyond the scope of this thesis. The study of non-digital games and offline game communities can help validate the applicability of the framework in non-digital settings. In addition, comparison between digital and non-digital game play can be made in order to expand the framework if necessary.

I believe that the framework could be transferable to "physical" face-to-face communication in studying game communities. The framework can also be applied to analyse traditional games such as board games, children's play, toys, sport games etc. However, future work is needed to verify these by analysing games in an offline setting to reveal more extrinsic play aspects and more detailed connections between various types of play.

Furthermore, the framework has potential in tackling various issues of sociability design in computer games. For instance, future investigation can be undertaken to explore how the framework can be applied to other modes of multi-playing, such as Xbox Live (Microsoft, 2002)in which console-style social interactions are mediated through internet technology. Other design issues might arise and it will be interesting to see if the framework can help analyse such interaction styles. The framework can also be further validated by studying game play with novel interaction techniques (different console systems with novel modes of interaction such as Nintendo DS (Nintendo, 2007) with a microphone and a touch screen, handheld/mobile devices such as mobile phones) in different contexts of play.

It should be mentioned that the research reported in this thesis focused predominantly on the cooperative aspect of social interactions. However, my observation showed that competitive interactions also occur even in a collaborative gaming environment. Since competition constitutes an important part of social interactions in games (Zaphiris, Ang, & Law, accepted), it will be quite interesting to analyse it through the framework in future. This will further validate the framework and its applicability.

Finally, more issue-based studies can be conducted in the similar direction, particularly of non-battle oriented or non-fantasy themed MMOGs such as The Sims Online (Maxis, 2002). The nature of social interactions and the process of community building might be different in a non-fantasy setting in which the very focus of the game design is socialising instead of fighting monsters. Moreover, the emergence of non-structured and open-ended game-like 3D environment also opens a new door to sociability studies. I believe the framework is able to provide a theoretical understanding particularly of goal formation and shifting in analysing such 3D environments.

Finally, as explained in section 7.7, a possible future research is to conduct further studies to explore cooperation through conflict resolution with the SPAF in order to test the explanatory power of the framework. New data from the PvP (Player versus Player) server can be collected in order to achieve this.

8.6 Conclusion

In this thesis, I developed a play activity framework, namely the SPAF, which is driven by rich empirical data and a solid theoretical foundation to analyse social interactions of computer games in different contexts: intrinsic interaction, extrinsic online community and 3D CMC (i.e. MMOGs). It must be emphasised that the main contribution of the thesis is the development of the framework rather than the analysis of trends in game play and design. Given the rapid advancement in technologies and interaction designs in the game industry, I believe that it is more beneficial to provide a general framework of social interactions which can be applied to analyse interaction patterns in various game settings. Therefore, the specific trends of game play were not the main focus of this work. Instead, they served as examples to demonstrate the validity of the framework

Approaching game studies through this socio-cultural perspective broadened our understanding in computer games as a social phenomenon. It also expanded the current game research by underlining the social enjoyment the player may experience through different types of social interactions around the magic circle of play. With the advent of Internet technology and growing IT literacy among players, games are becoming increasingly social, a trend which makes contemporary games

more similar to traditional non-computerised games. In other words, computer games are becoming not only more social but more open in terms of design structure. In most non-digital games such as Monopoly, playing individually is almost senseless and the rules are not immutable but negotiable. This thesis emphasised these aspects of gaming and social interactions in different contexts. It contributed not only to game research in particular but also CMC in general especially with the emergence of new forms of 3D online communication that facilitate richer social interactions.

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Appendix A: Glossary

Term	Definition
CMC	Computer-Mediated Communication. Computerised medium that facilitate the communication between people. It refers to human-human communication facilitated by the use of technologies particular computers
CSCL	Computer-Supported Collaborative Learning. An area of research that deals with the use of computer technologies to aid collaborative learning
CSCW	Computer-Supported Collaborative Work. An area of research that deals with the use of computer technologies to aid collaborative work
QDA	Qualitative Data Analysis. A type of analysis in research which deals with the description and interpretation of texts, images, audio, videos, and other qualitative data. The aim of such research is usually to generate theories to understand a phenomenon in depth, rather than to prove a theory
HCI	Human Computer Interaction, a branch of computer science and psychology that deals with human behaviours when interacting with computers. Recently, this area has expanded to include the social mechanisms that arise from the computer use
Emoticon	A graphical icon used to represent emotion in a CMC tool
Avatar	A representation of the player in the game world. It is often represented graphically. Often avatars impose some forms of fictional identities to the players. Similarly, the player also imposes her own version of identity to her avatar
Playability	The equivalent of usability in the context of play and games, which refers to the overall enjoyment and experience of game play
Sociability	In the HCI context, sociability refers to the social aspect of computing, i.e. the user-user interaction. Sociability design means the design of the computer tools that facilitate social interactions. In some cases, sociability implies friendship or other forms of relationship that emerges in an online setting
Social Interaction of games	Also known as sociability of games in this thesis. It refers to the player-player interaction when playing the game, as well as the interaction beyond the context of game, e.g. in online forums and discussion boards

Game play	The entire experience of play that arises from the game mechanic and the game narrative. In the context of this thesis, it also includes the out-of-game play experience around the game
Game mechanic	The underlying rules and the goal structure that define the player interaction of the game
MMOG/ MMORPG	Massively Multiplayer Online Game/Massively Multiplayer Online Role Playing Game. A type of game which is played by a large number of players (up to thousands) simultaneously in an online setting. Such games usually feature a massive game world and a large number of quests to be completed collaboratively
First person shooter	A genre of game that feature shooting enemies with different weapons in a 3D virtual world in which the player is put in the perspective of a first person view
RPG	Role Playing Game. A game that puts players into fictional roles in a fictional world
NPC	Non-Player Characters. Game characters controlled by computer AI (Artificial Intelligent) that interact with the player character (characters controlled by players)
Ludolology	The study of computer games as simulation systems, focusing on different types of rules and the goal structure
Narratology	The study of computer games as a form of interactive narratives, focusing on the fictional spaces, characters, plots and stories.
Paidea	A type of play. Free play that is not restricted by rules
Ludus	A type of play. Structural play that is defined by rules
Paidea rule	A type of rules that defines the mechanisms of the game. It defines how the game world works; what can or cannot be done in the game
Ludus rule	A type of rules that defines the conditions to end the game. It is usually the game goal, upon (the failure of) attainment, will end the game
Narrative/fiction	Narrative elements/fictional contents of the game as opposed to the rules. These include storylines, plots, characters and fictional spaces, as well as audio visual elements that constitute the game world
Constructionism	A learning theory that advocates the importance of construction of external artefacts. It claims that learners need to externalise their internal thoughts and update/construct their knowledge through interaction with tangible artefacts

Activity Theory	A philosophical/theoretical framework originated from developmental psychology. It is also an approach to understand human beings and their social context. It has been used in research of various human social activities ranging from organisational work, collaborative learning and play activities
3GAT	Third Generation of Activity Theory. It maintains that activity systems are not standalone but interacting with other activity systems
Development	From the activity theoretical point of view, development can happen at different levels. Vygotsky claimed that development takes place inter-psychologically (collective development) before it happens intra-psychologically (individual development). According to Engeström, development not only transforms the subject and the community but also the horizon activity system and how the activity system is connected to other activity systems (the context in which the activity system is situated)
Contradiction	From the activity theoretical point of view, a contradiction is a situation when the objective or the goal is unable to be achieved. At the action level, contradictions drive the development of the individual and the community. At the activity level, it is believed that contradictions are always perceived as the objective which can never be fully achieved. Contradictions are thus treated as a source of development of the activity system
Tool and artefact	Within the context of the this thesis, tools mediate the interaction between the subject and the object, while artefacts are a more general concept referring to human-made articles which might be or might not be used for mediation. An artefact could be the outcome or the object of an activity. Note that artefacts might be transformed into tools through development
Object	The object or the ideal object (objective) that motivates the subjects to act to satisfy their (physiological, psychological or sociological) needs
Division of labour (DOL)	The division of responsibilities of the subjects in the community. Each subject has her own obligation in the community to achieve the goal
In-game play/Intrinsic play	Play activities within the original boundary of games

Out-of-game play/Extrinsic play	Play activities beyond the original boundary of games. It means play activities such as discussion, modification, etc.
SPAF	Social Play Activity Framework, the framework developed in this thesis which treats game play as a socio-cultural phenomenon, involving various types of play activities within and around games
CMAM	Computer-Mediated Activity Model, a generic model developed in chapter 4 of this thesis, based on Activity Theory for analysing CMC, or computer-mediated social interactions
IPAM	Intrinsic Play Activity Model, a model developed in chapter 5 of this thesis to describe intrinsic play activities (in-game play) in computer games
RPAM	Reflective Play Activity Model, a model developed in chapter 6 of this thesis to described reflective play activities in computer games. It is claimed that social play includes not only the "actual" in-game play activities, but also the process of reflection, involving discussion, construction, exchange and sharing
EPAM	Expansive Play Activity Model, a model developed in chapter 6 of this thesis to describe expansive play activities in computer games. It is claimed that in-game play activity systems are not static but changing due to expansion of the play through transgression, construction and expansion

Appendix B: List of Games

The game description is adapted from http://www.mobygames.com

Game	Description
Art of Fighting 2	A typical 2D fighting game. The player controls a character and fights against the computer AI or another player using some skills which can be performed by pressing a combination of buttons
Civilisation II & III	Civilisation is often seen as having the widest scope of all strategy games. The goal is to become the dominant civilisation in the world, either by wiping out everybody else, being the first to get a space ship, etc. To achieve the goals, the player builds cities, develops military units, establishes diplomatic relationship with other civilisations, makes advances in science and technology, etc.
CSI: Dark Motives	Based on the TV series Crime Scene Investigation (CSI), the player becomes a detective and solves crime cases. The player has to interrogate witnesses, search crime scenes for clues, find evidence and then analyse it with the latest forensic tools.
Deus Ex	Deus Ex is a dark cyberpunk RPG in which the player assumes the role of JC Denton, an anti-terrorist agent. The player must interact with characters, pick up weapons and complete objectives. One main feature of the game is that it is fairly open to accommodate different approaches to solving the same problems, depending on the player's preferred style of play
Earth and Beyond	Earth & Beyond is the first galaxy-themed MMOG. Players create unique characters and star-ships and can affect the galaxy. Players can also build their characters and careers in three distinct ways: exploration, trade, and combat
EVE: The second Genesis	EVE Online is another galaxy-themed MMOG. Like Earth and Beyond, the main focus of the game is open-ended space travel with combat, territorial control, trade, and politics.
Grand Theft Auto: San Andreas	The game takes place in a fictional city that is supposed to be Miami, Florida in the eighties. The player plays as Tommy Vercetti, a gangster who just arrives in Vice City and is in debts with his boss. In the game, the player travels in the city with various vehicles, ranging from cars, motorbikes or even helicopters. She will also obtain different kinds of weapons to

	achieve the game goal: to raise enough money to pay back her debts and to take control over the city.
Harry Potter: the chamber of secret	An adventure game based on the Harry Potter world and the story. In this game, the player takes the role of the wizard boy, Harry and wanders in the magical world. She can collect cards, beans and interact with other characters. She must defeat all sorts of monsters and ultimately the monster in the chamber of secret.
Myst	Myst is a first-person point-and-click adventure where the player controls a character known as The Stranger. Magically transported into the world described in the book, she needs to explore Myst Island and solve its mysteries. The game is presented as a series of scenes where the player acts with the environment by clicking and manipulating objects. There are no enemies and it is not possible to die. Through Myst Island, the game is further divided into mini-worlds set in different ages accessed through different books
Neo Bomberman	As Bomberman, the player must kill all the enemies in the level before proceeding to the next. To do this, the player clears the path of blocks by setting bombs that will detonate a few seconds later, and then uses the bombs to wipe out enemies. Some blocks will uncover power-ups, and depending on which ones she collects, the player will receive more bombs, more lives, more time, manual bomb detonation, expanded blast zone, and the ability to move faster. The player can collaborate with or play against another player
Pac-man	The player controls Pac-man and gobbles dots in a maze while ghosts attempt to gobble Pac-man. If the player eats one of the four power dots in the corners of the maze, for a short time, the player can eat ghosts too
Second Life	Its status as a game remains controversial. In Second Life the player ventures into a virtual world with the ability to do literally whatever she wants in it. The player can socialise, play games, fight, listen to music, shop, or just hang out. The player can also create objects and scripts using the built-in script editor, to allow her to essentially do anything in the virtual world
Shock Trooper 2	Shock Troopers is a 1-2 player game where the player selects a character to play as. Each character has her own attack mode. The goal of the game is to go towards the end of the level and defeat the end-of-level boss, which is usually a huge vehicle. Crates that are scattered throughout the levels can be broken

	into to reveal new weapons and power-ups
SimCity 3000	The player is the mayor of an up and coming town. She must manage the city's infrastructure, zoning, transportation and population. Fight crime and pollution and other catastrophes that might befall to the city
Star War Galaxies	A MMOG. Players are invited to be part of the Star Wars galaxy with options to become one of the eights different species as well as a range of different job types. Players can also build their own world (from weapons and droids to homes and shops)
Super Mario Bros. 3	The player has to explore level after level, and overcome a series of obstacles. Power-ups include the mushroom, which increase your size and power, the fire flower, allowing the player to shoot fireballs at enemies, and the ever important star for a short burst of invincibility.
Tetris	Blocks fall from the top of a playfield to rest on the bottom; fit the pieces together, and the line they form disappears. If the pieces do not form lines and eventually stack up to the top of the playfield, the game is over
The Magical Quest 2	It is a typical platform game, in which the player plays as Mickey or Minnie. The player explores levels, overcomes obstacles in each level and the ultimate goal is to defeat the final boss. It can be played collaboratively by two players.
The Sims	The player takes control over the lives of simulated people (known as the Sims). Create a family and build them a home. Then help the Sims pursue a successful career, earn a lot of money, make friends, and find romance - or totally mess their lives up
Ultima Online	One of the first successful commercial MMOGs. Ultima Online is a fantasy world that borrows its story from the offline Ultima series of games. Players create their virtual characters of Britannia to follow a multitude of paths. The game features a huge game world which is broken up into a huge mainland, and a number of islands
WoW	World of Warcraft is probably the most popular MMOG at the time of writing of this thesis. Like Ultima Online it is a fantasy MMOG based on its offline cousin, Warcraft

Appendix C: Intrinsic Play Methodological Guidelines

The principles of Activity Theory are rather abstract to be applied to the actual analysis of design and evaluation of computer games. To make it practically useful, I applied the theoretical model (Intrinsic Play Activity Model – IPAM) and the experiences I gained from analysing the data to derive six aspects of analysis so as to capture the social aspects of game play from large volumes of observation data. Each aspect is summarised below together with some evaluation questions:

- *Aspect 1: individual action towards the object*

What actions occur between the players and the game? What goals are these actions serving? Do these actions fit the goals? Are they intrinsic goals that determine the actions? Is the actions' focus on tools rather than on goals?

- *Aspect 2: individual operation on the tool*

What tools are involved in the actions we observe? What are the operations on the tools? What are the already learned operations/tools before play? How do the players learn the operation? Where do they get the information from? What (if any) information about the operation that the players need to achieve the goals is unavailable? Are the tools capable of helping the players achieve the goal? In what way are the tools influencing the way of play?

- *Aspect 3: collective action towards the object*

What actions occur between the players and other players, or between a group of players and the game? What goals are these co-actions serving? Do these co-actions fit the goal? Are they implicit goals that determine the co-actions? Is the actions' focus on collective rules/role rather than on a goal?

- *Aspect 4: Collective operation through the rules and the division of roles*

What collective rules/roles are involved in the co-actions we observe? What are the co-operations through the collective rules/division of roles? What are the already learned/agreed co-operations/collective rules/division of roles before the play? How do the players learn/agree on the co-operation? Where do they get the information from? Are the collective rules/division of roles capable of helping the players achieve the goal? In what way are the collective rules/division of roles

influencing the way of play? Have the players agreed to co-operate through the available collective rules/roles?

- *Aspect 5: relationship between individual and collective play activity*

In what way individual tools affect collective play and vice versa? In what way individual play/tools rely on collective play and vice versa? How is collective play limited by individual play and vice versa? How is collective play expanded by individual play and vice versa?

- *Aspect 6: contradiction and development*

What contradictions are observed in the play and what are their consequences? How do the players respond? Why do contradictions happen? Are the contradictions resolvable? If so how? Do the players construct and introduce new elements into the play activity. If so what are they? Do the players modify existing elements? Does collective/individual play result in the development of individual/collective play/tool? These questions should be asked together with aspect 1-5.

Appendix D: List of Websites

The Sims (representing simulation games)
http://thesims.ea.com/us/ http://thesims2.ea.com/ http://www.thesimsresource.com/intro/ http://www.freewebs.com/simidol2006/ http://en.wikipedia.org/wiki/The_Strangerhood http://www.machinima.com/forums/viewforum.php?f=24 http://en.wikipedia.org/wiki/The_Sims
Super Mario Bros (representing ludic games)
http://www.smbhq.com/main.htm http://www.themushroomkingdom.net/ http://www.neoseeker.com/forums/6991/ http://www.fanfiction.net/game/Mario/ http://en.wikipedia.org/wiki/Super_Mario_Bros._3 http://www.mariowiki.com/index.php/Main_Page http://acmlm.overclocked.org/download/filelist.php?id=3
Myst (representing narrative games)
http://www.worldvillage.com/wv/gamezone/html/reviews/myst.htm http://chem.csustan.edu/JTB/Games/Myst/Myst-hints-linked.htm http://www.linkingbook.com/myst/index.html http://www.myst.com/ http://www.mystworlds.com/ http://forums.ubi.com/eve/ubb.x?a=cfrm&s=400102&f=882104541 http://www.dpwr.net/myst3faq/mystrules.html http://www.uruobsession.com/forum/index.php http://www.visi.com/~cpj1/myst/ http://en.wikipedia.org/wiki/Myst http://www.mysterium.ch/ http://home.wi.rr.com/scraper/Mysterium/
Other multi-player games (same geographical locations)
http://www.ultimatemk.com/cguide.php?character=kabal http://www.darktemplarz.com/combovids.php http://www.gamefaqs.com/coinop/arcade/game/584177.html http://forums.shoryuken.com/ http://www.neo-geo.com/forums/showthread.php?t=15818 http://en.wikipedia.org/wiki/Art_of_Fighting

Appendix E: WoW General Observation

a) The WoW game as individual tool

At first glance, WoW looks almost identical to other offline 3D adventure games, where the player navigates her avatar in various fantasy locations consisting of towns, desserts, forests, etc., which are populated by various game characters like monsters and villagers. Figure 0.1 is a typical screenshot of WoW.

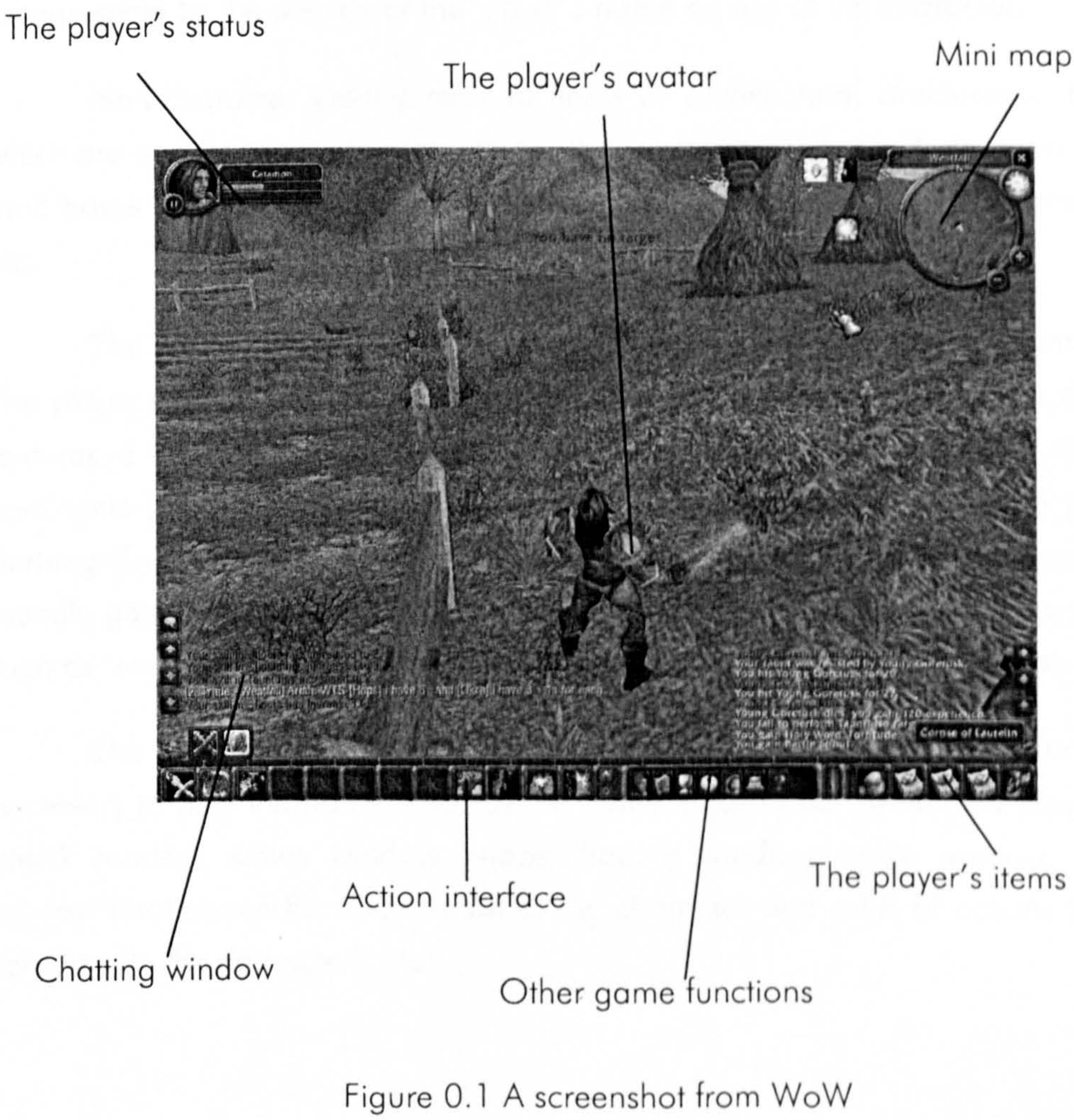


Figure 0.1 A screenshot from WoW

Apart from interacting with these characters and locations, like any other adventure games, the player needs to interact with the game interfaces to perform some actions such as attacking, consuming items, equipping armours, trading, etc. Here I discuss in as much detail as possible WoW as a game tool, which upon closer inspection, can be categorised into three kinds: game entities, locations and interfaces.

Game entities can be divided into character and non-character entities. Character entities are game characters (usually known as Non-player Character, NPC) which usually have some extent of automatic actions and are interacting with the player actively. These include friendly characters such as quest givers which give players quests, quest characters which are involved in quest completion, battle pets which help players in battles, merchants, villagers, and hostile characters which are monsters. Information about these characters is displayed in a small window when the player moves their mouse cursor over them. There is another group of game characters unique to MMOGs like WoW; human characters which are controlled by other players participating in the game world. Human characters are easily recognisable by the display of the player's name on top of the character.

Non-character entities refer to items or architectural structures in the game which are usually passively interacting with the players. These include treasure chests, mail boxes (which allow players to send e-mails to another player), chairs, portals, etc.

The second game tool is the location which is populated by the game entities. The player needs to travel from locations to locations to complete quests and WoW features a massive game world with a large number of locations in two major continents (a third continent is added with the release of the expansion pack, The Burning Crusade). The location consists of cities and towns (generally populated by friendly game characters), wilds such as desserts and forests, as well as dungeons such as mines and towers (generally populated by hostile game characters).

The third game tool is the interface which provides some in-game functions necessary to play the game, such as the battle function bar (which lets players select attack modes), status window, maps, trading window, quest window, character window (that shows the information of the character and a list of actions the player can do with the character), etc.

b) Individual play

- *Individual play in general (player-game interaction)*

The game, though with its main focus on social interactions, is however highly individual especially in the beginning of the game. As I have pointed out in the earlier chapter (refer to section 5.2.2.3) collective play cannot happen meaningfully

if the player has not learned, to a certain degree, to play individually. In this section, I describe some types of individual play in WoW.

The very first thing the player has to do after logging on is to create an avatar from a variety of visual features and attributes such as genders, races, classes. After creating the avatar and selecting the realm, the player enters the world and is immediately presented a cut-scene (short cinematic video) narrating the background story of the game. Right after that, some hint messages pop up, showing the basic control of the avatar and introducing a game goal, i.e. to get a game quest from the quest giver (a special type of NPC, marked by an "exclamation mark").

The player could of course ignore the quest and does anything she would like to do such as exploring new locations, chatting with other players, fighting monsters, or even starting forming groups with other players (these actions will be described later). The structure of the game is open. However, to progress through the game, it is advisable that the player accepts and completes quests.

- *Character growth: level up and profession development*

Perhaps the most predominant individual action is character growth which can happen through many ways. It is rather enjoyable and rewarding to build up the character so that the player is able to fight tougher monsters and do harder quests. The most common aspect of character growth is the character level which determines largely how strong a character is in fighting monsters. The character level increases by accumulating experience points (XP) through killing monsters (obtaining XPs through killing monster repeatedly is called "grinding") and completing quests.

Moreover, a player can also enhance the character abilities by equipping better armours and weapons which could be bought from shops or obtained through quests. There are also non-fighting aspects of character growth such as the profession. A character can learn some professions such as alchemy (for brewing potions) and engineering (for creating machines). Through completing quests, players also build up the reputation of their character in WoW cities.

- *Obtaining new items/equipment/money*

Another type of individual play is known as "farming", which is to earn game-money by collecting items from dead monsters. Some monsters carry money and valuable items (that can be sold for money). Money plays a central role in the game as players need money to do certain things such as learning fighting skills, buying consumable items (potions, food, etc), flying from a location to another, repairing

armours, etc. It is also common for players to collect some rare equipment so that their character looks unique and nice, apart from enhancing the character fighting abilities. Some players also obtain items such as a cat or a parrot pet solely for decorative purposes.

- *Exploring new areas*

  Each area has a unique geography ranging from forests, desserts, snow lands, underwater worlds to some cities or towns with different architecture design. Since the WoW world is massive, discovering new locations can be a rewarding experience in individual play. Although the game does reward XPs for each new area discovered but the XPs are not substantial enough for level up. Sometimes based on the time of year (in real life) special events take place at certain area, such as the Darkmoon fair in Elwyn forest (Figure 0.2) and lunar new year.



Figure 0.2 The Darkmoon fair which is held every month for a week

- *Quest*

  Accepting and completing quests is one of the most important actions in the game as WoW has more than 2000 quests which include the follows (the list shows the most common types of quest and is not exhaustive):

  - to kill certain types of monsters
  - to collect/loot certain items
  - to search for NPCs
  - to explore a location
  - to escort NPCs to a specific location

  More often than not, doing quests involve a combination of the above actions. Players receive tasks from the quest giver at various game locations although

they can share quests with other players. Completing quest earns players XPs, reputation points for each major city in the game, some items (equipments or consumable items), or new character skills, etc. Some quests are designed for an individual player although as the player progresses in the game, many quests are individually unattainable and require the formation of player groups.

- *Individual player development: learning through quests*

Unless the player is already an expert of WoW replaying the game with a new character or playing with others (e.g. friends in real life) who can guide her through the game, individual play is essential to learn the game at the early stage.

Through doing quests, players learn some basic game interface functions and controls such as to fight (the most important action in the game), to consume items (to restore health), to equip the avatar with appropriate armours/weapons, etc. The player also learns the location and navigation of the game world. Some individual quests in the early stage of the game involve exploring locations, searching for some important NPCs (such as class trainers, professional trainers and weapon trainers for character growth) and learning the monster characteristics. Many quests require that the player kills specific types of monsters.

The player has to understand and know a combination of aspects of the game tool to carry out the quests successfully. For a quest requiring killing monsters only found at certain locations, the player must learn to get hold of the monster information through the character window, reading and understanding the quest by accessing the quest window (Figure 0.3) (the interface aspect), the name of the location, where the location is and how to get there from the quest giver (the location aspect), the monsters such as how strong they are, what they look like, their attack modes (close physical attack or long range magic attack), their behaviours (whether they attack in a group, runaway when their health point is low), etc (the entity aspect).

Hint windows pop up occasionally especially when the player encounters new situations in the game. In addition, there is also an in-game help system sorted thematically and it is searchable.

Having learned the basic controls and functions, the player begins to develop certain strategy of play. For instance, the player may learn to use some short-cut key

to help switch on the inventory window while fighting so that she has access to healing potions quickly while fighting. When playing the game alone, doing quests is probably the only way of learning the game story progression as the quest giver always narrates the background story of the quest. Of course doing the quest by exploring locations, learning names of characters (monsters or other NPCs) help the player make sense and understand the story.



Figure 0.3 The quest log interface, the player can store up to 25 quests at a time

c) The WoW game collective tool

As aforementioned, the enjoyment of MMOGs such as WoW is centred heavily on social interactions between players. From my own experience, a simple form of social interactions happened after about two hours into the game. As I progressed through the game, social interactions became much more important and complicated until at some point I found it almost not possible to play the game individually in a meaningful or enjoyable sense. Let us now look at the social aspect of this game in general.

Since the game itself is intrinsically social (meaning that unlike single-player games which rely on extrinsic play for socialising, the intrinsic play itself of WoW is social), some collective rules and social functionality are built into the game tool. In addition, most game tools are designed to support and encourage social interactions among players directly or indirectly.

- *Collective game interfaces*

A large part of social play is supported by the game interface. Perhaps the most important social aspect of the game interface is the chatting window that enables the players to communicate with others through different channels including private chat to a single player, public chat to everyone in the specific location, group chat to the group members, and guild chat to guild members. Player can click on a player avatar in vicinity to chat privately to her or a friend in the friend list no matter where she is.

Friend list window (Figure 0.4) allows the player to add other players as friends and it shows the level, the class and the location of the friends so that the process of finding suitable friends for certain quests is simplified. The quest window also features the share function to share quests among players. According to my observation it is an extremely important function as it provides a commonly shared goal which encourages coordination.

The map and player status windows also support group coordination. The location of the group members is marked on the map, and the basic information of the players can be accessed through status windows.

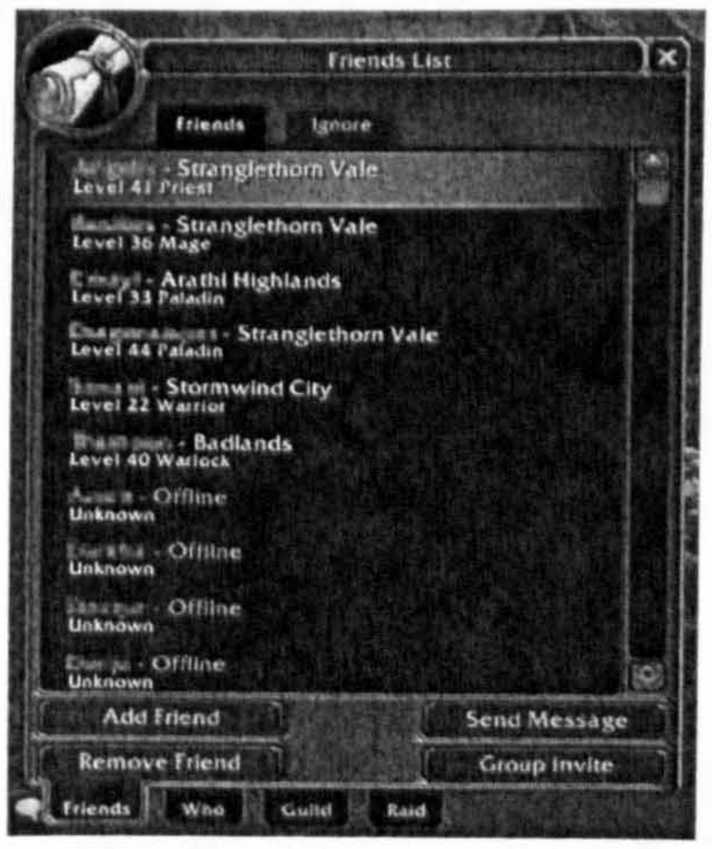


Figure 0.4 The friend-list interface



Figure 0.5 Group auto matching function interface

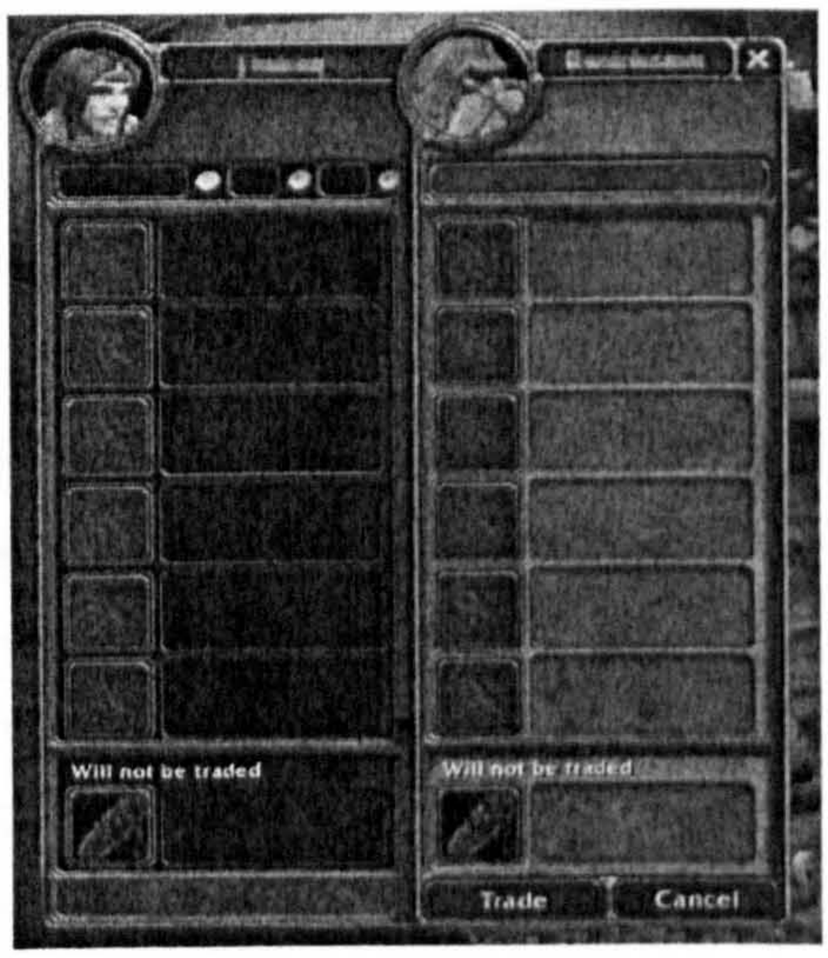


Figure 0.6 The trading function interface



Figure 0.7 The guild interface

The game also provides in-game group member search functions that automatically search and match players based on their locations and their interest in quests (Figure 0.5). Other social interfaces include trading functions (Figure 0.6), guild windows (Figure 0.7), grouping functions, etc. which greatly simplify collective play.

- *Collective game entities*

The design of game entities also contributes to the emergence of collective play. One example is the monster group. A player can usually easily handle an isolated monster about the same level as her, but when fighting a group of monsters, it is very likely that the player will get "killed" because there is no enough rest time to recover the health point (HP) and mana (needed for using magic) before taking on another monster in the group.

Monster bosses which are much higher level than other monsters in the same location are an entity that forces collective play in a more sophisticated and structured way. I observed that a group of players often pauses to formulate strategy when a monster boss appears (usually a monster boss comes with a group of other monsters). When fighting the boss, I also found that players become much more coordinated in their actions to optimise the strength of every player in the group. This does not hold true if the player levels are far too higher than all the monsters. Therefore the game is designed in a way that players get no XPs at all killing monsters with low level to ensure social interactions.

Other entities such as NPCs (in quests whose objective is to escort an NPC safely to a location) also ensure that players stick together in the group instead of wandering off and doing things individually without coordinating. Another example of collective entities is the drop (treasure left behind by a monster when it is killed) which causes the group of players to negotiate and agree on sharing the treasure.

- *Collective game locations*

The locations also become a factor in which different types of social interactions emerge. Some locations are designed specifically for social interactions. For instance, in a friendly location such as a town, players socialise and chat about either game-related issues or off-game topics. Players can also trade with each other in a friendly location as there is no disruption from the monsters. Apart from these,

some locations are also designed exclusively to support a particular type of social interactions. The auction house for example facilitates auctioning play among players.

In a hostile location such as the wild, social interactions are limited to coordinating actions instead of friendly chat because chatting takes away the player's attention from fighting the monsters. In dungeons, such coordinated collective play is even more evident because dungeons are designed to be highly challenging and thus require much more structured interaction between the players of a group.

- *Collective game goal*

Some quests are deliberately meant for engendering collective play. For example, in some quests, the player has to investigate an area crowded with a lot of monsters which keep re-spawning (monsters re-generate after a while they are killed). In such a case, it is not possible to complete the quest alone as you always need other players to distract the monsters while you are investigating the area.

- *Collective rules*

Apart from the game tool designed to support collective play, players need to learn collective rules in order to interact with other players. WoW developers have pre-imposed some collective rules into the game. Such rules are not built into the game at the programming level, but through monitoring activities from the game masters who are basically in-game support staff. Some rules are listed below:

- No offensive language
- Naming rules
- Harassment
- In a role play realm, players should not act inappropriately which will break the story immersion
- No using bot (automated agents) to play your avatar

More information can be accessed here: http://www.wow-europe.com/en/policy/

It is noted that some collective rules are pre-programmed into the game tool. For instance:

- No more than five players in a group
- Only the leader can add more members in a group/guild

- You cannot simply kill other players (at least in a normal PvE realm)

Some collective rules are agreed prior to group formation such as being nice to the members. Pretty much like in real life, people are inclined to projecting a good image to others. In WoW, it is generally agreed that people should be friendly to others so that it is more likely to get invited into a group as group play is crucial in the game.

Collective rules are negotiated among players especially when playing in a group. I observed that often the higher the game challenge, the more coordinated the group becomes. When fighting monsters with lower level, group members tend to act more individually. When encountering a stronger group of monsters (e.g. a group with a monster boss), players pause to coordinate their actions, assigning roles to the member. For instance, players with long range attack weapons (such as bow, gun) are responsible to draw the monster from a group to the players; healers should stay back and pay attention to the health status of other players and heal them when needed; casters (players who cast magic spells) should also stay out of the attack range of the monsters and cast magic spells from a distance; players with higher defence (usually known as tankers) should attack the monsters to protect healers and caster whose defence is generally low.

Moreover it is important for the success of the group to decide the leader. Although the leader is decided by the game mechanics to be the player who initiates the group, often the players in the group will discuss to decide the "actual leader". Generally the actual leader is the player who knows more about the quests and with higher level.

Other collective rules might include concentrating every player's attack on a specific monster until it is killed before trying to kill another one, rather than spreading the attack over a number of monsters at one time; deciding to kill strong monsters first since they have more deadly attacks; waiting for the mana to recover; revealing the player's real life situation which might cause disruption in the group play, e.g. talking on a phone thus unable to play for a while; rolling (based on random numbers) for a chest found in a location to decide who should get the treasure. It is noticed that some agreed collective rules differ from one group play session to another, while some become general throughout the game.

Another crucial collective rule is the conversation rules such as the use of acronyms. Acronyms and abbreviations are used extensively due to the multi-tasking nature of such play in which players need to communicate to coordinate actions with

group members and at the same time attack the monsters. Although a player doesn't necessarily need to use acronyms, its use is rampant in the game and it is some form of collective rules which one must abide to in order to play.

d) Collective play

Collective play is defined as any type of play which occurs between two players or more. Instead of interacting with the game tool, the players interact with each other through the game tool in collective play. Various types of collective play emerge in the game, which improve the learnability and enjoyment of the game. I explain below the most common types of collective play I observed.

Some MMOG literature has identified two major types of social interactions: progressive and non-progressive. Progressive social interactions refer to play directed towards achieving certain game goals while non-progressive social interactions refer to play which is not related to game goals such as simply hanging out with friends.

- *Progressive collective play*

Players interact with each other to achieve the game goals. Although the goal of collective actions could be the same as individual actions, I recognised some interesting collective play patterns.

Individual goals such as character growth are shared by most players. Therefore social interactions revolving around this goal are obvious. With the help from high level players, players can combat monsters higher level than themselves and are able to level up more quickly.

An interesting phenomenon known as "power level" is observed in which high level players help low level players to develop their character levels without forming a group, meaning that the XP is not shared. Usually it means the low level player initiates a fight with the monsters; after that the high level player intervenes and kills the monsters. This way the XPs are not shared, and the low level player earns all the XPs.

Another example is the use of profession skills such as alchemy skill to enhance the equipments and thus improve the ability of the player. Character development also includes temporary character enhancement known as "buffing" in which players cast beneficial spells to other players and temporarily (might last up to 30 minutes) increase certain abilities.

The trading function gives players an opportunity to exchange items, equipments and game-money. This function leads to a type of collective play known as "twink". It refers to the phenomenon in which a high level player gives disproportionately powerful items or equipments to a low level player. Although this is a controversial issue in WoW because it alters the game mechanics, it is made possible by the trading function and the expansive use of such in-game function.

Players can use the trading functions to sell items they create with their profession skills such as leather-making and engineering. Players also exchange items for their profession development (e.g. herbalists exchange linens with tailors for herbs). Collective rules emerge around this type of social play such as deciding the items to exchange and the value of the items. It is also a common practice that players give something for free to another player especially friends or players in the same guild.

Teaming up with other players also makes discovering new locations easier if your team mates are already familiar with the place. This is especially true for group members from a different race/class as each class has a different "starting location" when they start the game. Not all the locations are well labelled in the map, and some quests require players to explore or to look for an item at a very specific location which can take some time to find without help from others.

Quests are probably one of the most compelling motivations why players team up and play collectively. Some quests are specifically marked as "group quests" which are generally much more difficult than individual quests, involving killing high level monsters or elite monsters (elites are built to be two levels higher than their level displayed on screen).

In order to give a general picture of group play in a quest, here I describe a common pattern of social interactions I observed when players form a group for quests or dungeons.

Once the group is formed, players clarify which quest the group is doing. If there is a conflict on the quest, they negotiate and agree on a quest. Then the quest is shared to members who have not yet acquired the quest from the quest giver. Knowledge about the quest is shared as well; for instance which location do they need to go, how they can obtain certain quest items, etc. Once everyone has a clear idea what the quest is about, players with beneficial spells (players who play as paladins or priests) cast spells to other players to temporarily enhance their fighting abilities (buffing).

When doing the quest (group quest usually involving killing groups of powerful monsters), players either assign roles for each member explicitly, or each player assumes certain types of spontaneous role divisions, or no role division at all (in the case the group is much stronger than the monsters). Players also make sure that other players are aware of their own status (both avatar, e.g. low health point or real life, e.g. on phone) and also the situation of their quest (e.g. how many more item A do you need?). Group members generally make sure everyone has completed their quests before the group is disbanded.

- *Non-progressive collective play*

Not all types of collective play are progressive, directed towards achieving game goals or quests. The enjoyment of the game also lies in non-progressive play between players, in which players engage in leisure chat and some actions which are obviously no directed towards the progress of the game.

It is observed that such socialising play builds up the sense of community and creates a friendly environment, which I believe is an essential factor for the success of such games. Let us take a look at some common socialising play patterns in WoW.

First, it is observed that players engage in friendly conversations to encourage and support each other by telling jokes, greeting, saying thanks, etc., which enhance the bond of the community. Ill behaviours are generally not accepted in the game world. Players who are not well behaved (being rude and offensive) are boycotted by other players or even banned from a guild. Harassments are controlled by WoW staff (known as game master) and are strictly prohibited and might result in account suspension.

Second, players also share their game experiences with each other, such as funny things that happen when they are doing certain quests, their interesting experiences with other players, new or rare things that they see in the game, etc. Players also tend to chat about their avatars and information about the avatar not available publicly to other players such as the amount of game-money they have, their HP, mana, defence points, etc.

Another common type of socialisation in the game is the disclosure of the players' real identity. The most common real life information is the geography location, age, real gender, and their daily routine, etc. It is found that some information about player real identity is important for game play. For example, knowing the daily routine is important for coordinating play time in the game. Players

also chat about topics totally unrelated to themselves or the game, such as other games. All these make players feel that they belong to the game community.

Even though chatting and conversation are the predominant way of socialising, they are not the only way. Players also act through their avatars with other players as a means of socialising. There are some in-game "emotions" players can use to express themselves non-verbally, e.g. laughing, saluting, bowing, kneeling, hugging, dancing, etc. Players can for instance dance with another player by clicking the player avatar and choose the dance emotion option. Other social actions include game world exploration, such as walking around and viewing scenery, sight seeing in a city, etc which is not motivated directly towards game quests. It is also common that players do a good deed to other players such as buffing (casting beneficial spells) to a random player, helping kill the monsters other players are fighting, giving unwanted items to other players, etc.

All these actions which have no direct benefits to the player who performs them, help project a friendly image of the player, and result in the invitation to a quest group. This indirectly increases the chance of success in the game.

The nature of social interactions in WoW varies greatly from random encounters to relatively long term relationships. Random encounters refer to brief interaction between players. Examples include buffing, healing or resurrecting a random player in needs, killing a monster a player is fighting, trying to sell something to a player. Temporary groups are primarily progressive as the main motivation of forming such groups is to complete quests. Temporary groups are formed through various ways:

- spontaneous inviting a player at the location where the quest is being carried out
- inviting players at cities or towns before setting off to do the quest
- using the "yell" command to invite players interested in doing similar quests
- using the general chat channel to invite players
- using the group search function that automatically matches the players to appropriate groups.
- inviting a friend of the group member

Long term groups are both progressive and non-progressive. In WoW, there are two types of long term groups: friends (from the friend list) and guilds. Players can add other players into their friend lists especially if they enjoy playing with the particular players. Once friends are added in the friend list, the player can chat with

them no matter where they are in the game world (provided they are online). Players can also see their friends' locations, check their status, etc. Players can easily invite their friends to join a temporary group for a quest. Guilds provide more or less the same kind of support but usually on a larger scale and are managed by leaders. Guilds offer a lot of advantages to players including items or quest items, opportunities for groups, helps in quests, and professional skills through gathering guild members.

Appendix F: Data Sample

a) Data sample of Chapter 5 (intrinsic play)

Social/collective rules
Analysis memo new rules that arise which are not built into the game 06:33 (Player_SO) wait (for me) (as he is waiting for the jack-in-box thing to get back to the box)
Structural play: negotiation (collective action)
10:51 (Player_DA) we always change the side, ok? (Player_SO) yea 18:01 (Player_DA) one after another (now facing the swing) (Player_SO)no, both [do together]
Objective: player defined objective
Analysis memo this exists even in games with well defined goal 20:26 (Player) maybe it is good to start again so that I can get the cat (when he shrunk into small Mario he lost motivation to play and somewhat tried to get killed) Interview excerpt if we played it longer, we would try to collect more points and compete who got more coins
Non-structural play: identifying role
Analysis memo This theme later became expressive play; individual role was identified when mapped to the activity triangle 11:22 (Player_CH) u got big boobs (refer to Player_MA's character)

0:33 (Observation) Player_SO quickly chose Mickey during the character selection and was smirking. But he in fact selected Minnie cuz he wasn't sure if he was player 1 or 2
Contradiction: between players
13:13 (Player_SO) man u are so slow! (Observation) the same problem occured over and over when they crossed the river as Player_SO was quite fast while Player_DA lagged behind Analysis memo this leads me to identify the contradiction between individual goal and collective goal
Contradiction: with the game elements
13:59 (Observation) He chose stage 4. Then he stepped on a floating platform which would fall once it was stepped on. So he fell into the pit and died (Player) oh no..the screen keeps pushing me
Outcome: update agreement
Analysis memo development of collective operation 05:00 (Player_CH)oh we can choose (the location) (Player_MA) let's take this one (the navy) (Player_CH) ok
Outcome: update objective
Analysis memo This theme was identified in individual play observation and it became extremely useful later when I observed collective play, in which players negotiated and updated objective 04:47 (Player) (reading the research window) oh now I got a court house now? No.... uhhh (80 gold) how do I get more gold? 11:20

(Player) so let's do something new ... I should build more things...I don't know...maybe I should buy something... so I can't buy a settler becasue I got no enough money (Player) so how do I get more money
Cross-boundary: Applying knowledge from online community
Interview excerpt: I want to know some secret things. I want to know the rules of the game, to know how to play the game better You need to know the strategy as well You can learn how things are done from more advanced players

b) Data sample of Chapter 6 (extrinsic play)

Construction: tools (external)
Analysis memo Game software is not the only tool in game play Player_C What program can be used to record The Sims 2 or just anything on the computer??? looking for sometihng free. Player_M The SIMS2 actaully has its own recordinf function in the game. While playing you just hit the V key and it'll record what you are doing in AVI format. you can also adjust the adjust the
Sharing information and construction
Analysis memo This theme was later changed to reflective play; exchange information is a sub class of reflective play Download 3,715 KB video/x-ms-wmv My Uploads



Title:16 Starter Street
Type: Lot
Date Uploaded 06.14.2005
Rating: *****
::

* I have submitted content 5.65% (191)

show off your greatest adventures of the game

Out of game: emergent goals

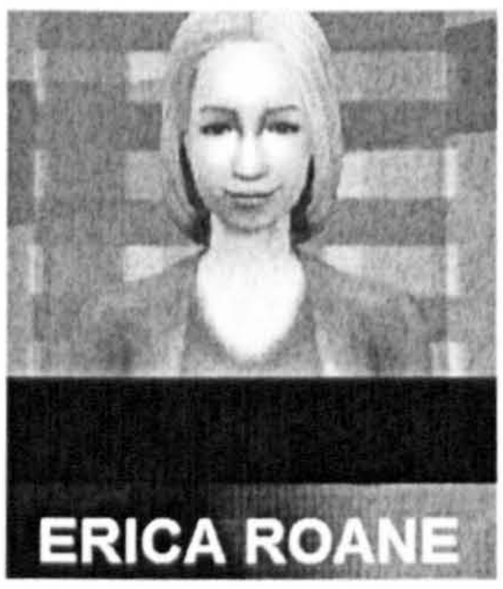
Analysis memo
Goals which are motivated by other activity system; this theme is useful for cross boundary analysis to identify the relationship between intrinsic and extrinsic play

Topic: The Sim Idol! (Read 107 times)
What are the prizes for the Sim Idol 2006?

RE
Sim Music Videos using their singles [about 2-3 of them]

RE
Thats an awesome prize. I always love to see what my "sim" would look like. Each creator

Out of game: fiction



BIOGRAPHY: Followed last year & who was your favorite? No. Unfortunately I didn't know about the contest then, so I didn't have a favorite. Who is your idol? Why did you try out? I don't really have an idol per say, I just try to be the best that I can be. I get my inspiration from Susan Tedeschi, Martina McBride, Etta James and many others. Do you think you can win this and why?

Construction: external tool: Third party software

Furthermore, I don't understand the meshes. I've tried using the Home Crafter thing I

downloaded and it won't let me do anything except reclassify whether something is considered tile vs.carpet, etc. Blueprint.....where are the creations? Started by Player_CHR 1 64 Posted by Player_AL March 9th, 2000 06:30 PM I downloaded the Bluebrint program to create new furniture, etc for my sims....but due to my lack of talent I deleted the program
Cheating: rules breaking
Water_tool dilemma Started by Player_RT 1 113 Posted by Player_CT March 5th, 2000 11:24 PM I was curious what the "water_tool" cheat was, so I entered it in. Not realizing what I was doing, I put 4 water spots in my house. One is in a doorway and I can't get rid of any of the spots. Now when the Sims leave the house they have to go out the back door & around the house. Is there something I can do to get rid of the water spots? I tried everything!! I need your help, please... Thank you RE It's either 'shift' or 'ctrl' key... jus hold it down and click wherever there is water you want to remove.
Out of game play: communication tool
Analysis memo It become an important secondary tool There are quite a few people on the lists who are phenomenal singers...some from other online forums where you can hear them sing--this is going to be a competitive and highly entertaining season! Again, I just know it! 8-) "TheSims.com" has a page to search for houses and it has a map. Go to their "Sims Exchange" page.

c) Data sample of Chapter 7 (World of Warcraft issue-based studies)

- Field notes

Themes	Segments of field notes
Free form play	do something more fun like getting a small pet. (instead of killing and levelling)

(Collective) role division	The warrior take the damage at the front while attacking, two of them back her up by casting attack magic and healing magic.
other players impede your achieving goal	the problem is that, there aren't many defias outside the Mine and other players are also killing them.
benefit of grouping	but grouping definitely helps accomplishing quests more quickly
reveal real life information	also you start to learn more about each other real identity. for example player_D has a 5 month old baby! and you are also revealing a bit about yourselves as well
chat about the game world in general	Player_X was sitting on the street when Player_D joint her and they started some friendly chat about the game world.
info of members	joining a guild is very helpful because you can see the location, level of all members and you can talk to them and ask for (mutual) help, they are generally very supportive.
good deeds to earn ranking	Player_V asked us to send an email to the leader of the guild to tell him that he helped us with our quest because he needed ranking.
helping quests	then I asked my guild if anyone can help. Player_V immediately answered and he asked us to just stand back and he would kill all the monsters, we just collected the pendant we insisted on helping player_V and got killed after that we just waited and collected
deciding leader	Then player_A joint us in a quest and after completing the quest she said I should have the leader skills as a leader by managing the members giving orders. She said the behaviour of the group members is important in maintaining the group. and that there is someone who could teach me all these and next time she would invite me on a quest with that person.
waiting for a player	she replied immediately and said that she has an hour she is waiting for her members for a group quest
coordinate actions	then we headed off the deadmine, it is much deeper than I thought and we fought several monsters and bosses. when the boss was coming up, we stopped and

	discussed strategy , we were doing pretty well until we fought the final boss, we managed to kill it but all of us get killed as well
group combination	he was a padalin who can cure and I was a warrior who fought at the front. then we invited a mage who cast magic. three of us worked like magic. I took the damage at the front while attacking, two of them backed me up by casting attack magic and healing magic. We wiped off all the harvest watchers very quickly and gain 1000 xp for completing the quest.
explore places	then she decided to show me around and she showed me a really massive dragon inside the wood
social rules	roll for the chest if you are in a group a new rule I learn type /roll and every member of the group will roll for the treasure chest
power levelling	what he did was, he kept following me when I fougt the monster. I initiated the battle (so that I got all the xp) and he helped along. I did not know what sort of benefits he got because obviously he didn't get any xp by helping me this way. maybe he was just being very kind.
being polite	then after she finished helping me, she bowed at me and I did the same
humour play	then we found our corpse and left the mine through the exit. We thanked each other. and then the leader said he dint get any xp, we started dancing and doing some performance to reward him. he clapped and said bravo. then the group disbanded.
give items to people/fix armours etc	also D asked me to give him my brace and vest so that he could upgrade it with his tailor skill, and so I did. we used the trade function to exchange the items, and he did give them back to me after upgrading. he did the same for player_C
cast a good spell to strangers	also, sometimes some players just walked by and cast a good spell on me
mutual help to achieve goals	Player_D made some bags for me, so I could help him collect clothes and linens as I promised
observing other players play	I learnt a lot by observing Player_DO play. For instance, I learnt to charge on a target and I learnt to

	pull a monster out of his group so I dealt with only 1 monster.
shared objects	then a huge monster was roaming in duskwood again, strange enough everyone near the monsters attacked the monster although it is not part of the quest. it is just a shared object by all other players
object contradiction between players	but in the end they diverted their objective and ended up doing something completely different. so my quest remained unsolved. and very often, we ended up fighting monsters randomly without any aim and kept dying.

- Chat logs

Small group formation
11:41:24.746 Player_J says: hi, anyone going to fargodeep mine , i wanna collect gold dust 11:42:22.337 Player_J says: i wanna collect gold dust 11:42:25.806 Player_J says: can lent me a hand? 11:42:32.120 Player_M says: i can show u 11:42:47.436 Player_J says: will u go withme? the monsters are groupy 11:42:51.391 Player_J says: kind of hostile 11:43:02.627 Player_M says: i can go whit u yes 11:43:18.381 Player_M joins the party.
Quest negotiation
16:16:11.882 Player_BE says: will we let Player_RU join 16:16:21.601 Player_RU says: yea 16:16:27.179 Player_GI says: going west if you wanna join me 16:16:27.976 Player_MI says: what you say 16:16:41.367 Player_BE says: he wants to join 16:16:44.492 Player_MI says: ok 16:16:48.789 Player_BE says: ok 16:16:49.851 Player_MI says: if you want 16:16:52.773 Player_RU says: thanks 16:16:55.508 Player_RU cheers!
Information transfer
14:01:56.613 Player_XA says: can anyone tell where is edwin bridge 14:02:10.395 Player_JI says: eastern edwynn bridge? 14:02:16.254 Player_JI says: all the way to the east

14:02:21.207 Player_JI says: i am going there wanna join? 14:02:22.942 Player_XA says: but where too 14:02:30.536 Player_SE says: cab you follow me? 14:02:31.348 Player_XA says: nrthshire 14:02:49.379 Player_JI says: let me really sure, did u mean Eastern Edwynn Bridge? 14:02:58.223 Player_XA says: yes 14:03:00.442 Player_JI says: if so we can go together cuz me gointg ther as well 14:03:15.505 Player_XA says: thanjs
Reveal real identity
12:20:58.387 Player_CH says: hi 12:21:06.639 Player_XA says: hello 12:21:12.562 Player_CH says: where you from? 12:21:20.220 Player_XA says: Portugal 12:21:32.192 Player_CH says: nice to meet you 12:21:38.490 Player_XA says: you too 12:21:47.164 Player_CH says: are you a girl or boy? 12:22:02.261 Player_XA says: girl and you where are you from 12:22:10.935 Player_CH says: England
Strategy coordination
10:45:18.896 Player_PW says: ok 10:45:22.834 Player_PW says: fixed it 10:45:39.431 Player_PW says: ill hjeal u kill 10:46:22.954 Player_PW says: nice 10:46:23.720 Player_JI says: so how was it 10:46:24.986 Player_PW says: we can do it 10:46:27.783 Player_JI says: lets do more 10:46:34.409 Player_PW says: ill keep healing u
Share play experience
12:22:17.952 Player_EN says: hi everybody i just started playing for the first time 12:22:32.564 Player_XA says: hy Player_EN 12:22:57.070 Player_EN says: its all kind off difficult for me 12:22:59.508 Player_XA says: im not fihting yet just making quets 12:23:22.873 Player_CH says: had a few fights been killed a lot 12:23:23.857 Player_XA says: i started playens yesterday 12:23:42.064 Player_CH says: do you like it 12:23:43.690 Player_XA says: i only fiht with wolf 12:24:02.085 Player_XA says: and those monsters in the mine
Negotiation individual goal and collective goal

11:15:46.221 Player_GA says: wanna help me kill some harvest watchersS?
11:15:58.448 Player_GA says: please
11:15:58.776 Player_JI says: we've done harverst watcher quest sorry

11:16:00.449 Player_PW says: i cant learn any more skills from my trainer in northshire
11:16:23.074 Player_PW says: do u no why bratoc ?
11:16:27.827 Player_BR says: y
11:16:35.692 Player_PW says: lol
11:16:36.380 Player_BR says: y
11:16:51.984 Player_GA says: please help me with harvest watcher
11:16:57.425 Player_BR says: y
11:16:58.097 Player_GA says: good xp
11:17:00.708 Player_GA says: ok?
11:17:02.975 Player_GA says: thx
11:17:09.011 Player_GA joins the party.

Collective rules – creative play

10:40:26.777 Player_JI says: Murioc village, whre it is?
10:40:41.902 Player_RE says: hehe
10:40:41.902 Player_JI says: up north?
10:40:52.382 Player_RE says: first duel
10:40:57.531 Player_RE says: and i tell u
10:41:03.617 Player_JI says: ok

Division of role

11:32:36.669 Player_JI says: actually i am a bit frustrated, i cant find the second lost guard
11:32:53.325 Player_DO says: i just found him.. i help
11:33:04.794 Player_JI says: Morluc village?
11:33:09.216 Player_DO says: yes
11:33:16.685 Player_JI says: full of murloc monsters
11:33:21.154 Player_DO says: yes
11:33:22.497 Player_JI says: how did u get around, u are just level 7
11:33:52.326 Player_JI says: ah u are a warior as well, do u know if we can learn healing skill?
11:33:55.154 Player_JI says: i keep dying
11:33:56.623 Player_DO says: a lvl 11 character did the killing

Appendix G: CV

Chee Siang ANG

Gender: male
DOB: 14th July 1979
Centre of Human Computer Interaction Design
City University
Northampton Square, London EC1V 0HB
Phone: +44(0) 20 7040 8994
Email: cf559@soi.city.ac.uk

Research Interest

Interactive media studies (computer games & interactive narratives), cognitive & social psychology, computer-aided learning, internet research, socio-cultural theories

Education

Ph.D. (Computer Science) specialising in Human Computer Interaction — Feb 2006 - Anticipated 2007
City University London
Supervisor: Dr Panayiotis Zaphiris, Stephanie Wilson
Topic of research: Social Interactions of Computer Games

M.Sc (Information Technology) by research — 2002 -2004
Multimedia University, Malaysia
Supervisor: Dr. GSV Radha Krishna Rao
Thesis title: A game theoretical framework for multimedia learning

B.Sc (Computer) specialising in Multimedia — 1998 - 2002
University Technology of Malaysia, GPA 3.80 (first class degree)
Thesis title: A 2D tile-based game engine for role playing games

Relevant Coursework
Multimedia: Interaction Design; Communication Design; Computer Graphics; Computer Animation
Programming and methods: C ++ programming; Object oriented methods(Java); Web-based programming(PhP, Java script); Database design; System analysis

Honours & Awards

Research fellowship, City University London	2007 – present
Doctoral Studentship, City University London	2005 – present
The best poster award of the BCS HCI conference 2005	2005
Dean's List	1998 – 2001

Working experiences

Teaching assistant City University London Human Computer Interaction Design	Autumn 2005
Teaching assistant City University London Advanced Human Computer Interaction	Spring 2006
Lecturer International University College of Technology Twintech Taught programming, multimedia and HCI modules at HND and BSc levels (University of Wales, Newport and University Technology of Malaysia franchise programmes) Involved in syllabus development and validation for the new university degree courses, supervision of students' projects at HND and BSc levels	Feb 2003- Dec 2004
Intern programmer Axis Software House, Malaysia	May-Nov 2002
Substitute Teacher Tit Bin Primary School, Malaysia	Sept 1999

Service and Volunteer work

The scientific committee of the conference "GAMING – G2008	2007-2008
Member of the International Conference on Online Communities and Social Computing Program Board of HCI International	2007 - present
Guest editor for a special issue on Interacting with Computer, "HCI issues in computer games" (acceptance rate: 24%)	2006
Guest editor for a special issue on Interactive Technology and Smart Education, "Computer Game Based Learning" (acceptance rate: 25%)	2006
Reviewers for Interacting with computer	2006 - present
Member of the referee board of The International Journal of Distance Learning	2006 - present
Operational Editor of Book series of Advances in Technology and Human Interaction	2007 - present
Reviewer for Internet Research 8.0 Conference	2007
Reviewer for Internet Research 7.0 Conference	2006
Reviewer for HCI 2006 conference, London	2005
Reviewer for CHI 2006 conference, Montreal	2005
Reviewer for STC 2006 conference	2005
Book chapter reviewer for Human Computer Interaction Research in	2005

Web Design and Evaluation (Ed. Dr. Zaphiris and Dr. Kurniawan)

Book chapter reviewer for User-Centred Computer Aided Language Learning (Ed. Dr. Zaphiris and Dr. Zacharia) 2005

Student volunteer in The 19th British HCI Group Annual Conference 2005

Training

NVivio training (using a qualitative data analysis application, NVivo in supporting qualitative research) – 2 day Professional Development Seminar at City University London 2006

Focus group training (conducting focus groups and analysing data from such methods) - 2 day Professional Development Seminar at City University London 2006

Serious game seminar (the use of computer games in politics, learning and health care, etc) – 1 day training at Imperial College London 2005, 2006

Statistic and quantitative research – Whole module at City University London 2005

Qualitative research method - – Whole module at City University London 2006

Other

Languages: Fluent in spoken and written English, Chinese and Malay; Intermediate knowledge in Japanese and German

Publication
Refereed Journals
Ang, C.S., Zaphiris, P., Wilson, S. (under review) Activity theoretical model for social interaction in computer games. Submit to Behaviour and Information Technology

Ang, C.S., Zaphiris, P., Wilson, S. (accepted - based on cfp expected publication is end of 2007). CONTACT: A Case Study Analysis of a Constructionist Knowledge Building Community With Activity Theory. Computer and Human Behaviour Journal (Journal Impact Factor: 1.116)

Zaphiris, P., Ang, C.S., Law, D. (accepted) Individualistic Vs. Competitive Game-based E-learning. Advanced Technology for Learning (ATL) International Journal.

Ang, C.S. & Rao, R.K. (accepted). Computer Game Theories for Designing Motivating Educational Software: A Survey Study. International Journal on E-Learning

Ang, C.S., Avni, E., Zaphiris, P. (accepted), Linking pedagogical theory of computer games to their usability. International Journal on E-Learning

Ang, C.S., Zaphiris, P., Mahmood, S. (2007). A Model of Cognitive Loads in Massively Multiplayer Online Role Playing Games. Interacting With Computers, 19 (2), 167-179 (Journal Impact Factor: 1.225)

Zaphiris, P., Ang, C.S. (2007) Computer game based learning. Interactive Technology and Smart Education, 3 (4), 255-258.

Zaphiris, P., Ang, C.S. (2007). HCI issues in Computer games. Interacting with Computers, 19 (2), 135-139.

Ang, C.S. (2006). Rules, Gameplay and Narratives in Video Games. Simulation & Gaming: An Interdisciplinary Journal of Theory, Practice and Research, 37(3), 306-325.

Pfeil, U., Zaphiris, P., Ang C.S. (2006) Cultural Differences in Wiki Collaboration. Journal of Computer Mediated Communication (JCMC), 12 (1), 88-113.

Ang, C.S. & Rao, R.K. (2004). Designing Interactivity in Computer Games a UML Approach. International Journal of Intelligent Games and Simulation, 3(2), 62-69.

Others

Ang, C.S., Zaphiris, P., Wilson, S. (in press). The social aspect of computer games: an activity theoretical model. HCI International Conference 2007, Beijing, China

Ang, C.S. & Zaphiris (in press) Computer Games and Language Learning, Handbook of Research on Instructional Systems & Technology, Ed. Kidd, T., Idea Group

Zaphiris, P., Ang, C.S, Laghos, A. (in press) Researching Online Communities, HCI Handbook, Ed. Jacko, J and Sears, A., Lawrence Erlbaum Associates

Ang, C.S., Zaphiris, P., Mahmood, S. (2006). Cognitive Load Issues in MMORPGs. Fun and Game 2006 Conference. Preston, UK.

Ang, C.S. (2006). Computer, games and culture. Interfaces, 66 Spring 2006

Ang, C.S., Zaphiris, P. (2006). Developing Enjoyable Second Language Learning Software Tools: A Computer Game Paradigm. User-Centered Computer Aided Language Learning, Ed. Zaphiris, P., Zacharia, G., Idea Group

Ang, C.S., Zaphiris, P., Wilson, S. (2005). Wiki-supported Collaborative Narrative Construction in Game Communities. The ECSCW'05 workshop on Computer Games & CSCW. Paris, France

Ang, C.S., Zaphiris, P., Wilson, S. (2005). Wiki-mediated Collaborative/Distributed Narrative Construction of Game Communities. The First International Wikimedia Conference. Frankfurt, Germany. Available at http://en.wikibooks.org/wiki/Wikimania05/Paper-CS1

Ang, C.S., Zaphiris, P., Wilson, S. (2005). Social Interaction in Game Communities and Second Language Learning. The 19th British HCI Group Annual Conference. Edinburgh, UK (the best poster award)

Ang, C.S. & Rao, R.K. (2004). E-learning as Computer Games: Designing Immersive and Experiential Learning. PCM (2) 2004, 633-640. Tokyo, Japan.

Ang, C.S. & Goh, W.W. (2004). An E-learning Structure at the Workplace: A Narratological Approach. Seventh International Conference on Work With Computing Systems. Kuala Lumpur, Malaysia.

Ang, C.S. & Rao, R.K. (2003). Theories of learning: A Computer Game Perspective. IEEE Fifth International Symposium on Multimedia Software Engineering, 239-245. Taipei, Taiwan.

Professional Membership

ACM SIGCHI (3239168)	2007-2008
BCS HCI (990137270)	2007-2008