

Games and Culture

<http://gac.sagepub.com/>

Computer Games and Sociocultural Play: An Activity Theoretical Perspective

Chee Siang Ang, Panayiotis Zaphiris and Stephanie Wilson
Games and Culture 2010 5: 354 originally published online 7 May 2010
DOI: 10.1177/1555412009360411

The online version of this article can be found at:
<http://gac.sagepub.com/content/5/4/354>

Published by:



<http://www.sagepublications.com>

Additional services and information for *Games and Culture* can be found at:

Email Alerts: <http://gac.sagepub.com/cgi/alerts>

Subscriptions: <http://gac.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

Citations: <http://gac.sagepub.com/content/5/4/354.refs.html>

Computer Games and Sociocultural Play: An Activity Theoretical Perspective

Games and Culture

5(4) 354-380

© The Author(s) 2010

Reprints and permission:

sagepub.com/journalsPermissions.nav

DOI: 10.1177/1555412009360411

<http://gac.sagepub.com>



Chee Siang Ang¹, Panayiotis Zaphiris², and Stephanie Wilson¹

Abstract

Various forms of play emerge around computer games. These types of play, known as out-of-game play or extrinsic play, take place beyond the original game context. Despite their significant contribution to the overall play experience, they are often neglected by the game research community. Conventional game theories such as ludology and narratology do not provide an insightful account of the sociocultural aspects of game play. Therefore, in this article, we report our observations and investigations into different forms of extrinsic play activities in an online virtual setting. Founded on activity theory, we articulate theoretical models that explicate game play in a sociocultural context. Our findings reveal that extrinsic play constitutes reflective play and expansive play, which transform the play activity and transport the players beyond the original boundary of play.

Keywords

activity theory, computer games, extrinsic play, sociocultural play

¹ School of Engineering and Digital Arts, University of Kent, UK

² Department of Multimedia and Graphic Arts, Cyprus University of Technology

Corresponding Author:

Chee Siang Ang, Jennison Building, University of Kent, Canterbury, Kent, CT2 7NT, United Kingdom
Email: csa8@kent.ac.uk

Introduction

Computer game research has witnessed a shift from conventional game software analysis to game study within a sociocultural context of play (Ducheneaut, Yee, Nickell, & Moore, 2006a,b; Krzywinska & Lowood, 2006; Mortensen, 2006). This is partly due to advances in the game industry toward the social aspects of play. Game developers have attempted to apply concepts of social connectivity and player community in the new generation of game consoles. Sony, for instance, has launched Play Station 3 Home (Sony, 2007), a 3D virtual social space, where players meet to socialize, share gaming experience, and play games together.

It is argued that collective play and sociability comprise a significant part of game play experience (Ducheneaut et al., 2006; Ducheneaut, Moore, & Nickell, 2004; Kolo & Baur, 2004; Wright, Breidenbach, & Boria, 2002; Yee, 2005). Social interaction is even embedded into what appears to be the individual play of a single-player game. Hence, game play is not merely limited to what is happening within the game software itself, but it also encapsulates a game culture that arises from it. A number of scholars have acknowledged the importance of collective play (Gee, 2003; Manninen, 2001; Squire, 2002), some (Bruckman, 1997; Turkle, 1997) even went further and studied play activities that extends beyond the computer screen, known as, extrinsic play.

Therefore, we believe 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. Although the oft-mentioned theories of game studies—ludology (Frasca, 1999; Juul, 2006) and narratology (Murray, 1998; Ryan, 2001)—do not include insights into the sociocultural perspective of computer games, there has been some relevant work in the area of sociocultural play that precedes and coexists alongside ludological and narratological game studies. For instance, substantial research has been done in the text-based multiuser domain (MUD) that investigated the emergent social play within and around the game (Bartle, 1996; Bruckman, 1997; Mortensen, 2006; Muramatsu & Ackerman, 1998). More recently, the graphical reincarnation of MUD, usually known as massively multiplayer online games (MMOG), has attracted a plethora of academic research from various areas ranging from psychology (Yee, 2005) to human computer interaction (Ducheneaut et al., 2006). Indeed, this type of research is starting to emerge and has provided insightful theoretical explanations in understanding out-of-game play phenomena. Although the practice of such play has been described extensively in game research, the concepts of extrinsic play have not been described clearly. We believe that there is a need for more inclusive frameworks at the methodological level, which will assist us in analyzing player–game and player–player interaction and activity (Mäyrä, 2006).

In this article, we report a study of extrinsic play around computer games, drawing from the third generation of activity theory (3GAT) that maintains that an

activity system does not exist in isolation but interacts with other activity systems (Engeström, 2001). Specifically, the goals are

- to examine and model various types of extrinsic play observed around computer games; and
- to identify the relations and connections between extrinsic play and intrinsic play (or in-game play).

The Boundary of Game Play

Innovation in computer games, either in terms of technologies (e.g. graphics engines, network capability, etc.) or in terms of game mechanics (interactivity), has brought about a transformation in the nature of play from manipulation to construction. This construction involves the creation of game avatars, architectural structures, weapons, and so on, in the virtual game space. More recent games also facilitate the construction of artefacts that can be used independently from the original game world. These artefacts include movies and 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, 2006a).

Not surprisingly, these game modification activities, sometimes known as “Mods,” are encouraged by game developers because they contribute to a massive variety and evolution of the game world, which cannot be readily achieved by the game developers alone. Apart from creating game content, some players also modify programming aspects of games, thus creating new patterns of play. For example, after Doom’s (Doom, 2008, February) release, some technologically savvy players began to create level editing programs, allowing other players to alter the game space. Players also swapped their Doom levels in online forums across the Internet.

Contributing to the player community through participation in the construction activity of games has become an integral part of 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 help generate a sense of community among players. It is not uncommon for players to gather their resources 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 game researchers maintain that player construction falls outside of the boundaries of the game and hence should not be studied as part of the game itself, others argue that game studies should include such extrinsic play (Steinkuehler, 2006b). As we are interested in the social aspect of games, we believe

that studying games in their sociocultural context could yield invaluable insights into game play. As Gee (1999) points out, while the game software partially constitutes the designed tool that mediates individual's play experience, it is the emergent culture around the software that gives it meaning.

The Importance of Studying Extrinsic Play

Therefore, understanding contemporary computer games requires examining them in relation to a broader sociocultural 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 sociocultural 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. Moreover, this provides us with a better understanding of how and why extrinsic play emerges so that we can design game software that could facilitate extrinsic play. However, this area of game studies is often overlooked by both game scholars and game developers. A few studies reported by Poremba (2003), Salen and Zimmerman (2003) and Sotamaa (2005) discuss such play activities but are lacking in theoretical insight. We believe there is a need for theoretical models to understand this phenomenon through the analysis of empirical data.

Activity Theory

We propose using activity theory (Engeström, 2001; Leontiev, 1978; Vygotsky, 1930), particularly the 3GAT (Engeström, 2001) to model extrinsic play. 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 sociocultural theories originated in Russia, which stress sociocultural aspects in psychological development, claiming that human activities are mediated by cultural tools in which sociocultural knowledge amasses. The first generation of activity theory maintains that people do not interact with the environment directly; instead, the interaction is socially mediated with tools, be it signs (language) or external tools. Human activities are understood to be a purposeful interaction of the subject with the world (the object), and through the enactment of activities, human transforms the object while the object transforms human as well.

Drawing on this, Engeström (2001) views all human activities as contextual within an interdependent activity system. Engeström (2001) introduces the second generation of activity theory by adding collective mediation to Vygotsky's tool

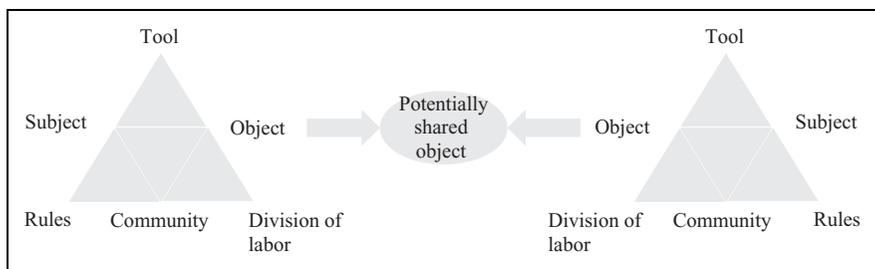


Figure 1. Two interacting activity systems.

mediation and presenting a detailed triangle model of activity system that consists of seven elements (Figure 1). The subject is the individual who is selected as the focus point 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 tools. Tools are the concepts, physical tools, artefacts, or resources that mediate a subject's interactions with an object. The community refers to those with whom the subject shares the same general object. The division of labor is the classification of tasks among the members of the community, while the rules are the regulations, norms, and conventions within the activity system.

This is then developed into the 3GAT, which claims that activity systems do not take place in a vacuum. In other words, they are not stand-alone; rather they occur in a complicated social setting. To understand networks of interacting activity systems, Engeström (2001) expands the basic triangle model to include minimally two interacting activity systems (Figure 1).

In the 3GAT, Engeström (2001) emphasizes specifically the object that is shared by two or more interacting activity systems. According to him, the object moves from an unreflected and situational state to a collectively meaningful object constructed by the system. He further contended that in the third generation, the object might be transformed 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 for the book to a more meaningful object such as sentences and paragraphs constructed by the author and then to an object shared with another activity system (e.g., publishing) such as a collaboratively constructed manuscript of the book.

We would like to highlight three other important concepts associated with the 3GAT, which are relevant to game studies.

The first principle is the contradiction, treated by Engeström as the central source for development of an activity system. Through its relation with other activity systems, an activity system adopts new elements and this causes a 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 become accustomed to in the writing activity.

This leads to the second 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 reconceptualized 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 third principle is the different level of tools. Wartofsky (1979) proposed three types of tools that mediate human actions and this was developed by Engeström (Engeström, 1990, 1999) 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; and (c) tertiary tools are imaginative tools that give “identity and overarching perspective to collective activity systems.” In the 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; and tertiary tools could be the imaginative vision as to how the book might serve as a screenplay for a movie that triggers the development of a new activity system.

Game Play and Activity Theory

We maintain that activity theory and 3GAT in particular provides powerful theoretical constructs for analyzing computer games in a sociocultural context. Although these theoretical constructs have been used by some activity theory scholars in various areas (Guy, 2003; Leadbetter, 2005; Roth, 2005), they have not been explicated in a clear manner in the context of computer games. In this section, we explain how they can be used to analyze computer games. First, let us look at game play in general.

Figure 2 shows that the motive of game play is “to have fun” and this results in the enjoyment the player experiences (the outcome). The play activity is mediated by the computer game software (the tool). In the multiplayer 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, health care training, advertising, socializing (e.g., *Second Life* [Linden Lab, 2003]), and so on. In this article, we focus on entertainment-oriented games and extrinsic play that arises from such games.

This motive can be instantiated into a series of motives that contribute to the overall enjoyment of game play. There are two types of play: intrinsic play and extrinsic

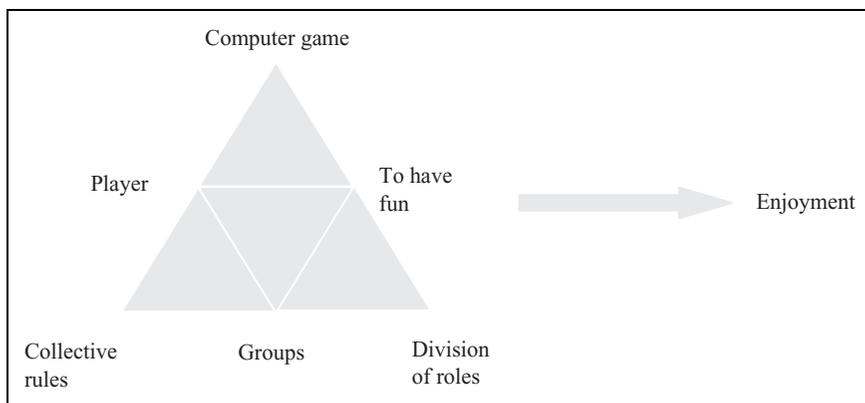


Figure 2. The game play activity in general.

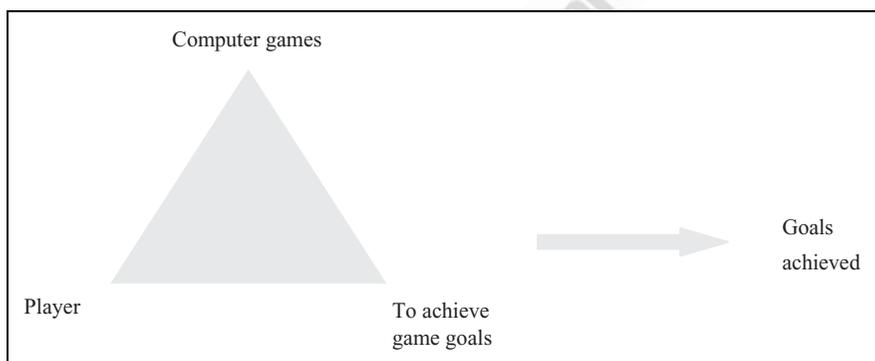


Figure 3. Intrinsic play.

play. As aforementioned, intrinsic play refers to the play within the predefined boundary of the game structure, while extrinsic play refers to the play that goes beyond this original game structure.

In an earlier study, we looked into intrinsic play with activity theory. Because the understanding of intrinsic play is crucial for this article, we describe briefly intrinsic play from the activity theoretical point of view (Figure 3). In intrinsic play, the object 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, which will directly and indirectly contribute to the overall enjoyable experience. The outcome could also be the inability to achieve the goal, and this is known as contradiction.

Although this level of activity analysis gives us an overview of the play structure in its long-term formation, a useful analysis 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 reconstructed (changed). In other words, activities are realized by individual and collaborative actions and the chains of networks of these actions that are related by the same overall motive.

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 nonstructural (or expressive). Progressive play actions are actions mediated by the game tool to progress through the game structure. Expressive play actions are actions mainly mediated by signs and language, which are directed toward free-form play such as expression through the game avatar, socializing with other players, and so on.

Finally, 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, and so on.

The main aim of this article is to analyze extrinsic play around computer games and to develop models of extrinsic play from a sociocultural perspective. In the following section, we describe the methodology of the study.

Methodology

To identify extrinsic play within online communities, we investigated the activities in game community Web sites. We collected more than 100 pages from 30 game Web sites of four genres of games, based on the taxonomy proposed by Lindley (2003). The selection was based on fundamental differences in the mechanics of the games: Super Mario Bros. 3 (ludic; Super Mario Bros. 3, 2008, February), Myst (narrative; Cyan Worlds, 1993), The Sims (simulation; Maxis, 2000), Art of fighting 2 (Art of Fighting, 2008, February), and Shock troopers 2 (multiplayer; Shock Troopers, 2007, November). The Web sites consisted of official and unofficial game Web sites, discussion boards, online forums, and online communities of the games. For instance, there are a substantial number of official and unofficial Web sites that support player community for The Sims. These Web sites contain not only player out-of-game interaction in term of verbal exchanges but also fan-constructed artefacts such as the family albums, in-game 3D models, *machinima* videos, or even an entirely new game based on the original game. Through analyzing the artefacts, we were able to infer the activities in the out-of-game context.

For each of the selected game, we started by browsing and reading the information from a popular Web site of the game (usually the official site). For older games without an official site, we started our data collection from <http://www.mobygames.com/> (a database of all computer games) and Wikipedia (<http://www.mobygames.com/>). This served two purposes: first to get a general overview/impression of what kinds of information (and thus possible extrinsic play activities around the game) were available and second to identify more Web sites associated with the game. Through this

Table 1. The Themes for Extrinsic Play

	Rule-Based Element	Content-Based Element
Around the game (discussion on and exchange of game experience)	Discussion on game rules, game strategy	Discussion on the game stories, sharing the game images, fan journal
Beyond the game (use of the game to play in a different way) and breaking the game (modification of the game)	Sims Idols	Fan fiction, movie making, comic strips
	Changing the game code	Changing skins, wallpapers, using level editors to create new stories

process of snowballing, a number of Web sites dedicated to the particular game were selected. The selected Web sites were not limited to just one particular version of the game but included all franchises of the title. For instance, for Super Mario Bros. 3, we came across fan Web sites that are dedicated to the game protagonist Mario in general.

After that, each selected Web site was browsed at a high level, to examine its structure. Through this, we were able to quickly identify the major information types (such as the stories of the game, tips, and strategies, etc.) on the Web site. 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 Web site. Therefore, irrelevant information such as information about other unrelated games, the help function of the Web site, and so on, was ignored.

Information ranging from textual contents, images, to other media such as video, sounds, and animations was extracted from the Web site and stored in a qualitative data analysis tool. The same process was carried out for the other Web sites for the same game. 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.

Essentially, thematic analysis approach was adopted to identify the themes of extrinsic play. Reading through the data, we identified types of play activities observed at the Web sites for each game. Emphasis was put on issues that occurred frequently or that were deemed of fundamental importance. For instance, although extrinsic play such as “Sim Idols” (SLproduction, 2006) only occurred once, it was considered an important theme because of the complex nature of the extrinsic play. We then categorized these activities to obtain a set of more consistent and generic themes (Table 1). Table 2 shows some examples of the data. For each type of activity, we visualized it with an activity triangle by identifying the goal/objective, the outcomes, tools, and so on. Once we had modeled all the types of extrinsic play, we attempted to generalize the activity systems so as to obtain a generic activity system that could illustrate all the extrinsic play activities that fall under the same theme.

Table 2. Some Examples for Extrinsic Play

Theme	Example
Discussion on game rules and strategy	“The game randomly selects neighbors to walk around Sim Lane. A neighbor will stroll by your house at the following times: 10:00 a.m., 2:00 p.m., 4:00 p.m., 8:00 p.m.”
Game chat about game stories/ narrative backgrounds	“The Mario Bros. consist of Mario Mario and Luigi Mario. They are the Mario Brothers because their last name is Mario.”
Creation for third-party applications	
Changing the game code	(Mario-themed skin for a music player) “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.)”
Fan journal	“One is a blank journal which I am taking with me to record my thoughts. There are six other books here—silver. They are the prophecies of the Watcher.” (from a player of <i>Myst</i>)

We also abstracted the relationship between intrinsic and extrinsic play, drawing from the theoretical constructs of activity theory: contradictions and development. We identified “cross boundary” elements from the intrinsic play activity system to the extrinsic play activity systems we just modeled. By examining the nature of the “boundary crossing” process, we generalized 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.

Further data collection and analysis was done until analyzing more data no longer yielded new insights. To ensure the reliability, a focus group with three colleagues was run to validate the results. We 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 to obtain the final models.

Findings: the Extrinsic Play Activity Models

Studying game play from a broader context, taking on board the play activity and enjoyment the players experience not only within the game but also beyond, we

found that extrinsic play can be further broken down into reflective play and expansive play, which are significant to be examined on their own.

Reflective play involves the process of externalizing various aspects of intrinsic play through communication, sharing, and discussion. When reflective play occurs, players step out of the predefined game boundary and reflect on their intrinsic play activities. Expansive play refers to play activities that transgress the original game boundary and transform intrinsic play in an unexpected way. Expansive play generally involves modification of intrinsic play, which results in a new pattern of play that goes beyond the original game context. This study indicates that understanding social interaction in computer games requires the analysis of these two types of play.

These two types of play could occur at both the individual and collective levels. For example, our observation revealed an interesting collective dimension of reflective play, in which players are coreflecting their play activities by externalizing their actions through the construction of external artefacts such as Wiki-based game strategy guidebooks. 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. In the next sections, we describe in detail each of these types of play and their relationships with intrinsic play.

Reflective Play Activity Model (RPAM)

According to Leontiev's (1978) hierarchy of activity, when a contradiction occurs, the subject stops working toward the goal 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 analyzed 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 the players' internal thoughts are externalized through signs such as texts, videos, and 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 4 shows the reflective play activity system. We would like to call it the RPAM. The object of reflective play lies in the process of the intrinsic playing itself. This object triggers the motive that 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).

We identified three types of reflective play actions.

- discussion
- construction
- exchange and sharing

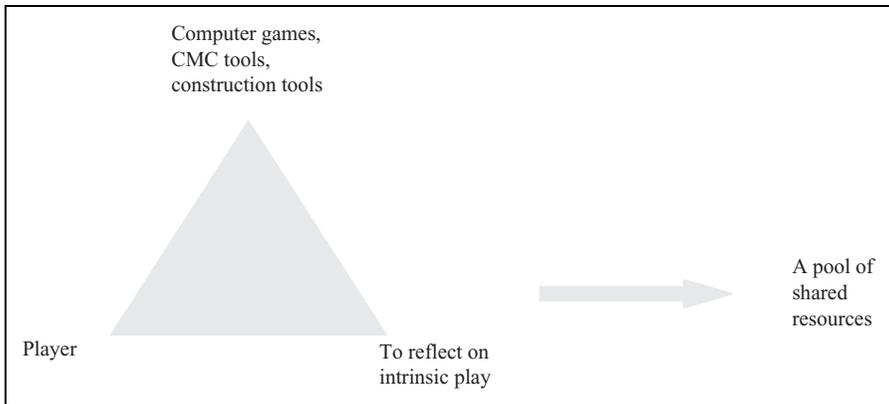


Figure 4. Reflective play activity model (RPAM). CMC = computer-mediated communication.

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 toward 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, and so on, via computer-mediated communication (CMC) channels such as discussion boards and online forums.

Players also externalize 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, and so on. 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 our 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 game analysis of Ducheneaut et al. (2006) 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. Juul (2007) for instance also recognized the importance of high score tables as part of the social play surrounding games.

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 that 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 discussion to relate their reflective play experience to the intrinsic one.

It is also noted that game play does 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 generates a pool of resources (the outcome of reflective play at the activity level). The outcome could also be artefacts. For instance, players externalize their reflection by constructing walkthroughs and strategy guidebooks. It also involves the narrative aspect, such as the externalization of the game stories and fictional elements through the use of symbols (including writing, images, videos, and sounds).

In reflective play, the game software becomes a secondary tool that consists of externalized 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, and so on. 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.

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. We 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 multiplayer games, because 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 that are novel and appropriate/useful. Usefulness in the context of play in games refers to the production of not only useful artefacts (Eales & Perera, 2006) but also other useful outcomes (e.g., the enjoyment,

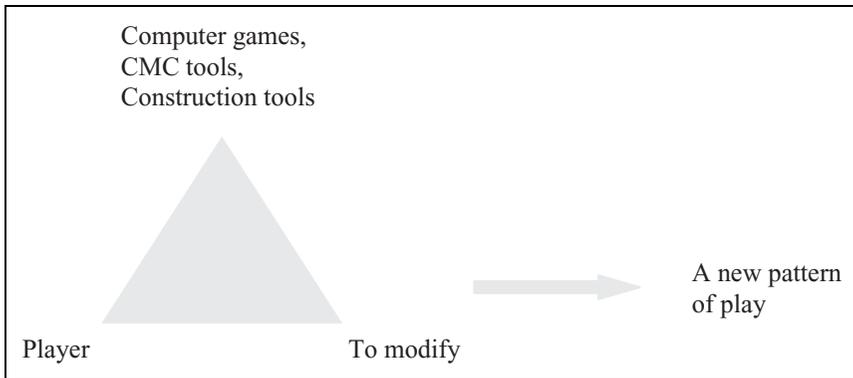


Figure 5. Expansive play activity model (EPAM).

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 5 shows the expansive play activity system. We would like to name it the EPAM. The object of expansive play lies in the process of the intrinsic playing itself. This object triggers the motive that 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.

We identified three types of expansive play actions.

- Transgression
- Construction
- Expansion

We 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 but also modifies the rules. This happens through negotiation and agreement on new sets

of rules to play or even hacking the game codes. Transgression can happen to achieve the designed game goal or a completely new goal constructed by the player. For instance, we found that *The Sims* is used for a new type of game known as *Sims Idol* (SLproduction, 2006). *Sim Idol* is a user-created play style with an online community Web site. Players submit their singing files and their avatars to the community Web site, and the Web site owners (also players) compile the music files and avatar animations into videos and distribute them online. This type of play, known as “deviant strategies,” which are often not in line with the intention of game designers is also discussed by Corneliussen and Rettberg (2008).

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, for example, changing the graphic of the games and the appearance (skin) of the game characters.

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

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

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 our observation, analyzing the outcome from sociocultural perspectives casts some light on the cross-boundary process of the play activity. Let us look at some key types of cross-boundary processes we identified in the study:

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. We 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 or he is acting on to resolve it before she or he 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.

- **Artefact-object**

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

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 that 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.

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 becomes the tools for discussion in which such knowledge mediates the reflective play activity.

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 skillfully (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 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 strips become a tool for reflective play to reflect on and share the intrinsic game play experience.

The Continuum of Intrinsic and Extrinsic Play

The article so far has treated game play as if it was an activity categorized rigidly into two levels: intrinsic and extrinsic (which is further broken down into reflective

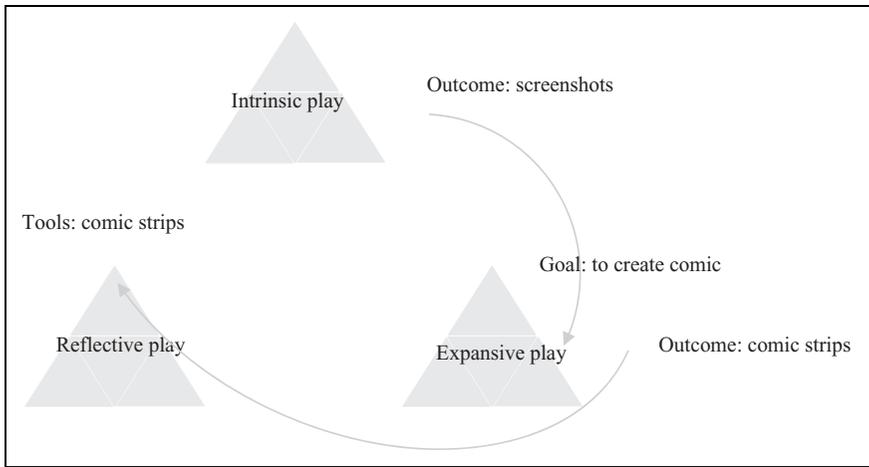


Figure 6. An example of the network of play.

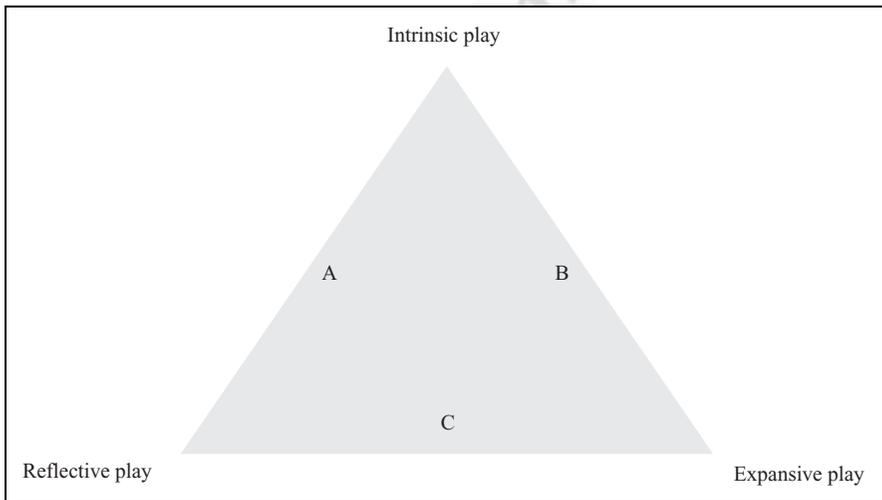


Figure 7. The dimension of play.

and expansive). We would like to accentuate that it is not our intention to dichotomize play activity into this binary dimension. Rather, we should treat this division as a continuum, with “in-between play” across the plane. Figure 7 shows the dimension of play (this triangle should not be confused with the activity theory triangle).

It is rare that a player plays a game strictly at either the intrinsic or extrinsic ends. When playing a game, most players are simultaneously engaged in various levels of play. However, there are times when players are driven more toward certain levels of

play. For instance, at the area marked by A in Figure 7, players are engaged in between intrinsic and reflective play. The players are emotionally involved in such play activity, in which they are performing intrinsic play and reflecting on the game (through an analysis of game rules, tools, and strategy) at the same time. Although this process of analyzing game rules can be regarded as reflective play as it is described in Section Reflective Play Activity Model (RPAM), it happens while the players are engaged with the game itself (intrinsic play).

Similarly at B, players are engaged in play between intrinsic and expansive play. An example would be the case of role-playing game, in which the players could extend the play activity outside the game, transforming the game rules while still keeping the narration of intrinsic play. Indeed, suspension of disbelief is not the only factor that triggers intense emotion while playing and this is demonstrated by the kind of play that takes place at C in Figure 7. There, players are reflecting on their expansive play. Note that even when engaged in such kind of play, the players are still emotionally involved in intrinsic play. It is rare that players are completely disengaged from intrinsic play even when they are performing extrinsic activities (which would have resulted in C being placed right at the baseline of the triangle).

Discussion and Implications

Let us now revisit the aims of this article. Analyzing the sociocultural context of game play, we identified two major types of extrinsic play and their connection to intrinsic play. Through this analysis, we 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 an interesting point of view. The oft-cited taxonomy of play (to achieve, to explore, to socialize, and to kill) presented by Bartle (1996) explains mainly the motivation of intrinsic play. Through our analysis, we 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 part of the player community; and
- players are also motivated to explore what they can do with the game to test the game boundary and to expand the game through expansive play.

As we 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 that focus largely on intrinsic play, we pointed out that players are also experiencing fun by reflecting on intrinsic play they are engaged in. Reflection is externalized, 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, we also found that social interaction in game play happens at three levels. In intrinsic play especially in a multiplayer game, players are interacting with each other to achieve a shared goal to progress through the game. However, social interaction is not limited to play directed toward intrinsic play goals, as every now and then, players pause and reflect on their intrinsic play.

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

Expansive play also triggers social interaction 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 the emergence of game communities. Apart from sharing, expansive play could be collective, resulting in interaction among players. For example, an original single-player game can be turned into a game that involves other players playing together. Thus, we believe that social interaction arises not only at intrinsic play level but also possibly more at reflective and expansive play level.

The findings also highlighted some implications for the computer game studies. One major concept that has gained much popularity in game studies is the magic circle introduced by Huizinga (1944) and adopted by computer game researchers (Salen & Zimmerman, 2003). 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)

Their discussion of magic circle explicitly emphasized that games do not assume separate space and time, nor the games are constrained by the absolutely binding rules. The rules of modern day computer games are under constant negotiations and renegotiations depending on the situation of the game. Many computer games are released with level editors and content editors, which allow the players to modify the games. 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 use global positioning

system (GPS) that incorporates real world into the game world. Activity theoretical analysis on sociocultural play supports the immutability of the magic circle in which it expands and contracts through reflective and expansive play.

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

First, we 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 we developed, we are able to analyze the game tools, play actions, goals, and outcomes to understand the relationship between intrinsic and extrinsic play. This can provide insights into how games can be designed to facilitate social interaction.

Second, game play is mediated not only by the game software alone but also by the other tools such as 3D modeling tools, video/image editing tools. In particular, CMC tools play an important role, given the online context of game play we 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). These external tools can be analyzed 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, our 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 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 sociocultural context, we found that the outcome of game play is more than “fun” as it could be the production of something “tangible” such as videos. In other words, alongside with “fun,” game play also produces tangible products. In addition, we treat outcomes as not only the “final result” of an activity but also the “state” of actions at a particular time. Thus, analyzing outcomes involves analyzing contradictions and development, which are important not only to study the evolution of an activity system but also to provide a theoretical explanation to the evolution of the network of activity systems. We can also examine how extrinsic play influences intrinsic play and vice versa.

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 interaction among learners. Based on the models we proposed, social learning could take place at the level of reflective play in which players externalize 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 reflect on individual roles, goals, and knowledge shared in the group.

Conclusion

In this article, we presented a different perspective of game studies in which we investigated sociocultural game play through the analysis of empirical data and based on activity theory. We illustrated in-depth extrinsic play and the relation with intrinsic play by highlighting some theoretical constructs that are useful in analyzing game play as cultural phenomena. 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. Besides, game play is becoming a “productive” activity.

Possible future work involves analyzing more games from various genres using the proposed activity models to reveal more extrinsic play aspects and possibly more detailed connections between various types of play. This model can also be used to guide analyzing and interpreting qualitative data regarding computer game play either in individual single player gaming or in social play especially MMOGs, to validate its practicality in game studies.

Finally, there are two important issues of generalizability of the model. First, although all community building and extrinsic play examined in this study are mediated through computers, we hope that such observation is transferable to “physical” face-to-face communication. Further study can be undertaken to validate this issue. Second, the generalizability of the model to other noncomputerized games can also be looked into by applying this model to traditional games such as board games, children’s play, sport games, and so on.

Declaration of Conflicting Interests

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding

We would like to express our sincere thanks to City University London for funding the study and making this publication possible.

Appendix A

List of Web Sites

1. <http://www.freewebs.com/simidol2006/>
2. <http://thesims2.ea.com/>
3. <http://www.thesimsresource.com/>
4. <http://www.simidol2006.proboards2.com/>
5. <http://thesims.ea.com/us/>
6. <http://forums.thesimsresource.com/>
7. <http://www.machinima.com/>
8. <http://www.smbhq.com>
9. <http://themushroomkingdom.net/>
10. <http://www.neoseeker.com/forums/6991/>
11. <http://board.acmlm.org/>
12. <http://www.fanfiction.net>
13. http://www.mariowiki.com/Main_Page
14. <http://chem.csustan.edu/JTB/Games/Myst/myst-help.htm>
15. <http://www.myst.com/>
16. <http://www.dpwr.net/goldenKI.php>
17. <http://www.mystworlds.com/>
18. <http://cho.cyan.com/arachnid/riveneggs.html>
19. <http://forums.ubi.com/eve/ubb.x?a=cfrm&s=400102&f=882104541>
20. <http://www.dpwr.net/>
21. <http://www.uruobsession.com/forum/index.php>
22. <http://www.visi.com/~cpj1/myst/myst1/myst1.html>
23. <http://www.mysterium.ch/>
24. <http://home.wi.rr.com/scraper/Mysterium/>
25. <http://www.ultimatemk.com/cguide.php?character=kabal>
26. <http://www.darktemplarz.com/combovids.php>
27. <http://www.gamefaqs.com/coinop/arcade/game/584177.html>
28. <http://www.neo-geo.com/forums/showthread.php?t=15818>
29. <http://www.mobygames.com/home>
30. <http://www.wikipedia.com>

References

- Art of Fighting. (2008, February). *Wikipedia, the free encyclopaedia*. Retrieved February 25, 2008, from http://en.wikipedia.org/wiki/Art_of_Fighting
- Bartle, R. (1996). Hearts, clubs, diamonds, spades: Players who suit MUDs. *Journal of MUD Research, 1(1)*, Retrieved January 27, 2010, from <http://www.mud.co.uk/richard/hclds.htm>
- Bruckman, A. S. (1997). *Moose crossing: Construction, community, and learning in a networked virtual world for kids*. Unpublished PhD thesis, MIT, Cambridge, MA.

- Corneliussen, H., & Rettberg, J. W. (2008). *Digital culture, play, & identity: A 'World of Warcraft' reader*. Cambridge, MA: MIT Press.
- Cyan Worlds. (1993). *Myst*. Retrieved February 25, 2008, from <http://www.mystworlds.com/us/>
- Doom. (2008, February). *Wikipedia, the free encyclopaedia*. Retrieved June 4, 2008, from <http://en.wikipedia.org/wiki/Doom>
- Ducheneaut, N., Moore, R. J., & Nickell, E. (2004). *Designing for sociability in massively multiplayer games: An examination of the "third places" of SWG*. Paper presented at the Other Players Conference, Copenhagen, Denmark.
- Ducheneaut, N., Yee, N., Nickell, E., & Moore, R. J. (2006a). Building an MMO with mass appeal: A look at gameplay in world of Warcraft. *Games and Culture, 1*, 281-317.
- Ducheneaut, N., Yee, N., Nickell, E., & Moore, R. J. (2006b). *Games and performances: "Alone together?" Exploring the social dynamics of massively multiplayer online games*. Paper presented at The SIGCHI conference on Human Factors in computing systems CHI'06, Canada.
- Eales, R., & Perera, D. (2006). *The quest for computer-supported creativity*. Paper presented at the International Symposium on Culture, Creativity and Interaction Design, London, UK.
- Engeström, Y. (1990). When is a tool? Multiple meanings of artifacts in human activity. In Y. Engeström (Ed.), *Learning, working and imagining: Twelve studies in activity theory* (pp. 171-195). Helsinki: Orienta-Konsultit Oy.
- Engeström, Y. (1999). *Expansive learning at work: Toward an activity-theoretical reconceptualisation*. Paper presented at the Seventh Annual International Conference on Post-Compulsory Education and Training, Australia.
- Engeström, Y. (2001). Expansive learning at work: Toward an activity theoretical reconceptualisation. *Journal of Education and Work, 14*, 133-156.
- Frasca, G. (1999). Ludology meets narratology: Similitude and differences between (video) games and narrative. Retrieved June 4, 2008, from <http://www.ludology.org/articles/ludology.htm>
- Gee, J. P. (1999). *An introduction to discourse analysis: Theory and method*. New York: Routledge.
- Gee, J. P. (2003). *What video games have to teach us about learning and literacy*. Basingstoke, UK: Palgrave Macmillan.
- Guy, E. S. (2003). *Patterns as artefacts in user-developer collaborative design*. Paper presented at the ECSCW 2003, Finland.
- Huizinga, J. (1944). *Homo ludens a study of the play-element in culture*. London: Routledge and Kegan Paul.
- Juul, J. (2006). *Half-real: Video games between real rules and fictional worlds*. Cambridge, MA: MIT press.
- Juul, J. (2007). Without a goal. In Tanya Krzywinska & Barry Atkins (Eds.), *Videogame/Player/Text*. UK. Retrieved January 27, 2010, from <http://www.jesperjuul.net/text/withoutagoal/>

- Kolo, C., & Baur, T. (2004). Living a virtual life: Social dynamics of online gaming. *Game Studies: The International Journal of Computer Game Research*, 4, 2-4.
- Krzywinska, T., & Lowood, H. (2006). Guest editors' introduction. *Games and Culture*, 1, 279-280.
- Leadbetter, J. (2005). Activity theory as a conceptual framework and analytical tool within the practice of educational psychology. *Educational and Child Psychology*, 22, 18-28.
- Leontiev, A. N. (1978). *Activity, consciousness, and personality*. Englewood Cliffs, NJ: Prentice-Hall.
- Linden Lab. (2003). Second life. Retrieved June 21, 2007, from <http://www.secondlife.com/>
- Lindley, C. A. (2003). Game taxonomies: A high level framework for game analysis and design. Retrieved August 27, 2008, from http://www.gamasutra.com/features/20031003/lindley_01.shtml
- Manninen, T. (2001). *Virtual team interactions in networked multimedia games-case: Counter strike multi-player 3D action game*. Paper presented at the Proceedings of PRESENCE2001 Conference, Temple University, Philadelphia, PA.
- Maxis. (2000). The Sims. Retrieved June 26, 2007, from <http://thesims.ea.com/>
- Mäyrä, F. (2006). *Welcome to mapping the global game cultures: Issues for a socio-cultural study of games and players*. Paper presented at the Gaming Realities conference proceedings, Greece.
- Mortensen, T. E. (2006). Wow is the new mud: Social gaming from text to video. *Games and Culture*, 1, 397-413.
- Muramatsu, J., & Ackerman, M. S. (1998). Computing, social activity, and entertainment: A field study of a game mud. *Computer Supported Cooperative Work: The Journal of Collaborative Computing*, 7, 87-122.
- Murray, J. H. (1998). *Hamlet on the Holodeck*. Cambridge, MA: MIT Press.
- Poremba, C. (2003). *Remaking each other's dreams: Player authors in digital games*. Paper presented at the New Forms Festival '03, Canada.
- Roth, W. -M. (2005). Publish or stay behind and perhaps perish: Stability of publication practices in (some) social sciences. *Soziale Systeme*, 11, 129-150.
- Ryan, M. -L. (2001). Beyond myth and metaphor-the case of narrative in digital media. *The International Journal of Computer Game Research*, 1(1), Retrieved January 27, 2010, <http://www.gamestudies.org/0101/ryan/>
- Ryberg, T., & Ponti, M. (2004). Constructing place: The relationship between place-making and sociability in networked environments. Retrieved January 10, 2008, from http://www.ell.aau.dk/fileadmin/user_upload/documents/research/kaleidoscope/jeirp_publications/05_Constructing_Place_-_The_Relationship_Between_Place-Making_and_Sociability_in_Networked_Environments_Ryberg.pdf
- Salen, K., & Zimmerman, E. (2003). *Rules of play: Game design fundamentals*. Cambridge, MA: MIT Press.
- Shock Troopers. (2007, November). *Wikipedia, the free encyclopaedia*. Retrieved February 25, 2008, from http://en.wikipedia.org/wiki/Shock_Troopers
- SLproduction. (2006). Sim Idol. Retrieved September 5, 2007, from <http://www.freewebs.com/simidol2007/ShowInfo.html>

- Sony. (2007). PS3 home. Retrieved January 10, 2008, from <http://www.homebetatrial.com/>
- Sotamaa, O. (2005). *Have fun working with our product! Critical perspectives on computer game mod competitions*. Paper presented at the DiGRA Conference, Changing Views: Worlds in Play, Canada.
- Squire, K. (2002). Cultural framing of computer/video games. *The International Journal of Computer Game Research*, 2, Retrieved January 27, 2010, <http://www.gamestudies.org/0102/squire/>
- Steinkuehler, C. A. (2006a). The mangle of play. *Games and Culture*, 1, 1-14.
- Steinkuehler, C. A. (2006b). Why game (culture) studies now? *Games and Culture*, 1, 1-6.
- Super Mario Bros. 3. (2008, February). *Wikipedia, the free encyclopaedia*. Retrieved February 25, 2008, from http://en.wikipedia.org/wiki/Super_Mario_Bros
- Turkle, S. (1997). *Life on the screen: Identity in the age of the Internet*. New York: Simon & Schuster.
- Vygotsky, L. (1930). *Mind and society*. Cambridge, MA: Harvard University Press.
- Warr, A., & O'Neil, E. (2005). *Understanding design as a social creative process*. Paper presented at the C&C '05, London, UK.
- Wartofsky, M. W. (1979). *Models: Representation and the scientific understanding*. Boston: D. Reidel Publishing Company.
- Wright, T., Breidenbach, P., & Boria, E. (2002). Creative player actions in FPS online video games playing counter-strike. *The International Journal of Computer Game Research*, 2, Retrieved January 27, 2010, <http://www.gamestudies.org/0202/wright/>
- Yee, N. (2005). The psychology of MMORPGs: Emotional investment, motivations, relationship formation, and problematic usage. In R. Schroeder & A. Axelsson (Eds.), *Avatars at work and play: Collaboration and interaction in shared virtual environments*. London: Springer-Verlag.

Bios

Chee Siang Ang is a lecturer in the School of Engineering and Digital Arts, University of Kent. He is interested in human interactions and social tendencies in the virtual world, particularly Second Life, from a sociological, psychological, and HCI perspective. He has a PhD in HCI from the City University London, an MSc (Information Technology) from the Multimedia University Malaysia and a BSc (Computing) from the Technology University Malaysia. His PhD investigated the social aspect of game play in a sociocultural context. His main research interests include the psychology and sociology of computer games, virtual worlds or 3D computer-mediated communication (CMC), learning theories particularly in gaming, and digital media such as interactive narrative and simulation.

Panayiotis Zaphiris is an Associate Professor at the Department of Multimedia and Graphic Arts of the Cyprus University of Technology. Before returning to Cyprus he was a Reader at the Centre for Human-Computer Interaction Design, School of Informatics of City University London. Before joining City University, he was a researcher at the Institute of Gerontology at Wayne State University from where he also got his PhD in Human-Computer Interaction (HCI). His research interests lie in HCI with an emphasis on inclusive design and social aspects of computing. He is especially interested in HCI issues related to the elderly individuals and people with disabilities. He is also interested in Internet-related research (Web

usability, mathematical modeling of browsing behavior in hierarchical online information systems, online communities, e-learning, computer-aided language learning (CALL), and social network analysis of online human-to-human interactions). Panayiotis was the principal investigator of the JISC Information Visualisation Foundation Study and a coinvestigator of the DRC Formal Investigation into Web Site Accessibility (managing the automatic testing of 1,000 Web sites) and the JISC Usability Studies for JISC Services and Information Environment projects.

Stephanie Wilson is a senior lecturer in the Centre for HCI Design. Her current research interests include modeling and interaction design for health care environments, usability evaluation, and social software for e-learning. She is a principal investigator for Ghandi, a major new project funded for 3 years by the EPSRC to investigate clinical handover from both theoretical and practical perspectives. She was the coinvestigator of Ghandi's predecessor, the ACE project, which was funded by the ESRC/EPSC/DTI under the PACCIT scheme to investigate adverse events in clinical settings from the theoretical perspective of distributed cognition. Stephanie is a member of the JISC Users and Innovation Community of Practice and was the coinvestigator of the JISC-funded "Usability Studies for JISC Services and Information Environment" and "Information Visualisation Foundation Study" projects that looked at usability and information visualization in the context of online learning environments. She is the first supervisor for Olivia Walkinshaw's PhD on enjoyability and sociability in e-learning environments and second supervisor for Valentina Lichtner, Chee Siang Ang, Areej Al-Wabil, Ulrike Pfeil, and James Downie. Stephanie is a research tutor for HCID, handling matters related to PhD admissions and administration, and is also responsible for organizing Center meetings and seminars. She teaches "HCI design" and "evaluation of systems" to undergraduate and postgraduate students in the School of Informatics. She supervises many student projects in the area of usability evaluation as well as in the broader field of HCI.

**Fonte: Games and Culture, v. 5, n. 4, p. 354-380, 2010.
[Base de Dados]. Disponível em: <www.sagepub.com>.
Acesso em: 17 dez. 2010.**