PARTICIPATION AT THE PERIPHERY:
BOUNDARY-CROSSING COMPETENCE IN MASSIVELY-MULTIPLAYER On-Line GAMES

by

Aaron Chia Yuan Hung
Teachers College, Columbia University

ABSTRACT

This article focuses on moments of boundary-crossing that players of massively-multiplayer on-line games (MMOGs) encounter, where boundary is seen as the border that individuals have to cross in order to participate in the community. Dana Walker and Honorine Nocon define "boundary-crossing competence" as "the ability, within a given context, to (a) understand and negotiate the meanings, through the use of material and symbolic artifacts and (b) to understand and negotiate the meanings, through engagement with others, of the practices of a group and of the roles of individuals therein" (2007, 180). Boundary-crossing competence implies an understanding of the practices on both sides of the boundary and the knowledge of how to get from one side to the other. This article presents data from an ethnographic study gathered over a two-year period from a group of Asian adolescent English language learners (ELLs) whose out-of-school literacy practices consisted of playing MMOGs. Kurt Squire (2008) notes that players from different cultural backgrounds can sometimes interpret the same game in very different ways. Consequently, this particular group was selected for this study to draw attention to how participants from differ-

ent linguistic, cultural and socioeconomic backgrounds engage with MMOGs. As such, the article addresses the questions: How do they learn about and acquire boundary-crossing competence? What kinds of challenges do these players encounter during moments of boundary-crossing? How do they succeed (or fail) at resolving these challenges?

MMOGs and virtual worlds have become increasingly popular domains of research for educators, many of whom argue that these environments provide players with opportunities to engage with a constellation of literacy practices (Wenger 1998), such as on-line discussions, digital film production, fan-fiction writing, and other user-generated content (Steinkuehler 2004, 2007; Black 2008). These "new" literacy practices tend to involve participatory forms of learning that challenge traditional, authoritative learning practices commonly found in schools (Lankshear and Knobel 2007). Some of the concerns over the disconnection between in-school and out-of-school literacies are that the students who have access to new literacy practices will find in-school learning irrelevant and uninteresting, and the students who do not have access to new literacy practices will be further marginalized if they do not have the opportunity to acquire skills needed for the post-industrial world (Gee, Hull, and Lankshear 1996; Gee 2004; Lankshear and Knobel 2006). However, researchers have also noted that access and participation cannot be alleviated simply by providing physical access to equipment and software (Alvermann 2008; Jenkins 2006). In addition, new technologies entail new forms of interaction that do not always fit in with a traditional schooling environment. Kevin Leander (2007), for example, argues that the misalignment between the social practices of traditional classrooms (where participation tends to center on the teacher) and new literacies (where participation is distributed and collaborative) creates problems for

teachers and administrators who expect new technologies to be subservient to the dominant, school-based practices. In his study, he shows that even though the students were well-equipped with laptops provided by the school, technology integration still failed because the social uses of the technology did not fit into the school's culture of learning.

While virtual worlds may have the potential to improve and transform how people learn and communicate, research must also address the social practices of virtual worlds, how interaction occurs, and how it evolves over time. Access to virtual worlds cannot be taken for granted. As Gillian Andrews (2008) notes, users of MMOGs and virtual worlds have to be able to afford the financial cost of participation, which include not only cost of the software and monthly fees but also the cost of equipment, Internet access fees, and other costs that often do not get addressed in research. The commercial success of virtual worlds such as World of Warcraft and Second Life have made them popular sites for research, but left many other virtual worlds underrepresented in the literature. Furthermore, previous research on MMOGs tends to focus more on what players do with the game, and seldom discuss how access is achieved, maintained, challenged, and even denied.

Boundaries in Communities of Practice

The notion of boundary-crossing implies the existence of a community with some sort of gatekeeping mechanism that one has to traverse in order to become a legitimate member of that community. This article situates its inquiry in Jean Lave and Etienne Wenger's (1991) notion of communities of practice, which has often been invoked in studies that focus on learning between novices and experts (Bransford, Brown, and Cocking 2000; Steinkuehler 2004; Varenne 2007; Gee 2003; Hung 2007).

Lave and Wenger's notion of legitimate peripheral participation (LPP) suggests that meaningful participation in a community often depends on who has access to the right resources and who decides what activities count as legitimate forms of participation. Their definition of LPP is an integral part of their notion of communities of practice, where newcomers gain membership into different communities through forms of participation that are deemed "legitimate" by the expert members. LPP was not meant to describe only good or successful learning, but all contexts of learning. Lave and Wenger argue that "[LPP] is not itself an educational form, much less a pedagogical strategy or a learning technique. It is an analytical viewpoint on learning, a way of understanding learning" (1991, 40). These communities of practice change over time as the community's relationship to its resources change, and as newcomers become experts and redefine what constitutes legitimate participation. Lave and Wenger point out that membership in the community does not require "co-presence, a well-defined identifiable group, or socially visible boundaries" (1991, 98) and that participation is not merely about engaging in the right activities but also with having access to the right resources. They suggest that "[h]egemony over resources for learning and alienation from full participation are inherent in the shaping of legitimacy and peripherality of participation in its historical realizations. It would be useful to understand better how these relations generate characteristically interstitial communities of practice and truncate possibilities of identities of mastery" (Lave and Wenger 1991, 42). Virtual worlds represent a particularly interesting example of how changing resources can alter a community of practice. Before broadband access became widespread, people relied on dial-up connections to go on the Internet. These connections were typically slow and unstable. As broadband access expanded and technology advanced, virtual worlds became more sophisticated, and as wireless access became

more widespread, virtual worlds became portable. Participation in virtual worlds involves access to a shared activity instead of simply a shared space where a particular activity occurs. People who are involved with virtual worlds do not need to share the same physical space (although they sometimes do).

Since members of any community of practice change over time, so do the activities that are considered legitimate participation. Thus, it is important to pay attention to the role of time from both the point of view of the individuals and the community of practice as a unit. How individuals define legitimate participation may not always be congruent with how the majority members define it, thus there is constant tension and re-negotiation of what constitutes participation.

Sites of Inquiry and Participants

I met with a group of Asian adolescent video-game players in New York City over a two-year period. These participants were part of a larger ethnographic study of Asian adolescents playing video-games after school. For this article, I focus on three in particular—Kevin, Andrew, and Lien (all names are pseudonyms)—because of their specific interest in MMOGs. (While other players were also avid video-game players, they were mostly into other genres of games, and, as such, are not part of our discussion). The participants in the study were new Asian immigrants taking English as a Second Language (ESL) classes in New York City high schools. I met them all through a community center dedicated to helping Asian immigrants transition to society. Andrew and Kevin also knew each other from school, while Lien attended a different school. All three spoke primarily Cantonese, but were also relatively fluent in Mandarin. During our interactions, I communicated with them in Cantonese, unless there were phrases I had to clarify in Mandarin. The

data comes primarily from field notes taken during participant observations and informal interviews (Bernard 2002; Spradley 1980). In order to study their lived experiences, I followed them to the sites where they chose to play their games, which included Internet cafés in Chinatown, their homes, as well as a video-game research lab located at my institution. I tried to meet with the participants consistently, about once a week after their school day, for a duration of three to four hours per session.

The social practices described in this article serve as comparative case studies (Yin 2003) to demonstrate how play can be significantly different, even among players with apparently similar backgrounds. It also sheds light on the social practices of MMOGs underrepresented in research as well as the struggles that players go through to gain access and acquire boundary-crossing competence. With these participants, I was particularly interested in the connections between their onscreen and off-screen identities. Studies of MMOGs often focus on onscreen identities exclusively, without paying attention to how their off-screen lives can shape their onscreen interactions. A consistent theme that emerged from my observations was the effort they spent on organizing access and participation to their MMOGs. This involved finding the right people, location, and time to accommodate everyone's schedules and priorities. These deci-sions provided insights on how these adolescents delineated the nature of their shared activity, and thus, what constituted bound-aries of their practice. This delineation influenced the games they chose to play, the methods they used to gain access, and the types of interaction they engaged in while playing.

Andrew and Kevin were interested in finding games that fit into their social relationships. In the beginning, their com-munity included, first and foremost, one another as well as any other friend who was interested in playing with them. They spent most of their time after school at Internet cafés, where the net-

worked computers allowed them to play in the same space. For this group, the social interaction around them was just as important as the game itself, if not more so, as they took time to plan opportunities to meet, and treated the companionship of friends around them as part of the shared activity in the community of practice. Consequently, once they selected the game to play, it became more difficult for new players to join in because these novices would have trouble keeping up with their activity in the game.

Lien attended a different school, and his choice of game was not affected by what his friends from school were playing. Although he spent most of the time playing alone on his computer, Lien did interact with people he met through the game, and did his best to work around their schedules. Overall, Lien did seem more of a solitary player, and went through most of the game's campaigns on his own. Playing alone meant that physical location was less of an issue for Lien, as he possessed his own laptop and was able to play anywhere with an Internet connection. For Andrew and Kevin, who lived and attended school in different boroughs of New York City, location was more of a concern. Since the Internet cafés were located between their homes and school, they became the preferred locations to play, and the MMOG became a shared activity that bridged their school and family lives both socially and geographically.

Lien's schedule was more flexible because he was playing on his own, although he was interacting with some people on-line who were in other parts of the world, and thus in a different time zone. Since he often played from home, he had to share his computer with his family members whenever they needed to use it. Andrew and Kevin found it slightly easier to arrange time to play while school was in session. They rode on the subway together after school and usually stayed at the Internet cafés until 9 PM, after which they would head home together. During

the summer, scheduling became more of a problem, as they had to find summer jobs, thus putting them on different schedules. Moreover, when the school resumed, they had to prepare for high-stakes testing (i.e. the New York Regents exam) and college entrance exams, thus also cutting into their availability.

The decisions these players made regarding the community of practice can be considered their way of delineating the boundaries of the activity. In other words, these were the aspects of the shared activity that were important to these specific players, and while other MMOG players might have different arrangements, the importance of these decisions suggests that the same MMOGs are not the same to different players who play under different circumstances. Participation in a community changes over time.

Table 1. Stages of Participation in a MMOG as a Community of Practice

Stages	Main Activities
I – Delineating the boundaries	• Deciding which MMOG appeals to your style • Deciding which MMOGs you can afford • Deciding who you want to play with
II – Acquiring access (Peripheral participation)	• Understanding what it means to participate • Maintaining access to resources
III – Maintaining boundaries (Full participation)	• Engaging in activities that keep you within the community • Deciding relationship with potential participants outside the boundary
Exiting the community	• Outgrowing the needs or interests in the community or losing access • Deciding whether to join another MMOG

Table 1 summarizes the stages observed as the participants of the study moved through their virtual community, and serves as a broad illustration of how participation in a MMOG evolves over time. Communities are dynamic entities, and activities undergo continual change as new members enter and old members leave. Lave and Wenger (1991) note the need to study how access to resources and mediating technologies in terms of their roles in acting as gatekeeper to participation. In the early stages, when a player is still learning about the community, much of the participation has to do with having the resources that facilitate access and understanding the nature of the activity. Over time, once access has been stabilized, participation focuses more on what counts as legitimate participation. Exiting the community is not listed as a fourth stage because it is a trajectory that can occur between any of the stages. As the examples that follow illustrate, players can abandon access voluntarily or involuntarily for any number of reasons. Sometimes it can be because they lose interest in the MMOG because some aspect of their "real life" needs to take priority (e.g. exams, school schedules), or because they are locked out by the community.

Stage One: Delineating the Boundaries

It is easy to overlook the fact that many people have to struggle for resources that are needed to gain access to virtual worlds. Sophisticated MMOGs such as World of Warcraft require computers equipped with adequate amounts of RAM (typically 1-2 gigabytes), high-speed Internet access, powerful processors, and graphic cards to process the 3D images. The price of such machines, not to mention the monthly fees for the game and Internet access can be forbidding to many families. For my three focal participants, these kinds of games were not options. Instead, Andrew and Kevin selected a free MMOG called Drag-

onraja. Despite its relatively low technical requirements, Kevin's home computer was not adequately equipped for this game. This gave Andrew and Kevin even more incentive to play at Internet cafés because Kevin would frequently get disconnected from the game whenever he played from home. Playing away from home also meant that they were spared the frequent interruptions from parents and siblings. Lien, on the other hand, had a laptop that was equipped to handle most games, but his family did not want to pay for broadband, so his dial-up connection restricted his choice as well because most complex MMOGs require higher Internet bandwidths. Furthermore, since he was sharing his computer and phone line with the rest of his family, his access to MMOGs was often interrupted when someone needed to use the computer or phone line.

Their socioeconomic identities also influenced their relationships with one another, specifically in shaping which actions were legitimate within their activity system. Kevin often teased Andrew by calling him the "rich kid" because his family was in a better financial position. When Andrew decided to spend money on virtual goods for his avatar, Kevin mocked him for "being stupid," even though he also admired the equipment that Andrew bought. These purchases were rare, because, if Andrew was to continue buying more equipment for his avatar, this would have put him and Kevin on a different footing, and thus disrupt their relationships with one another and with the game. Since their shared participation was central to this activity, Andrew chose not to give his avatar unfair advantages. In addition, they were able to defuse any potential tension by sharing avatars, a point I return to later in the article.

Players were also influenced by the cultural representation of the game. Andrew and Kevin's MMOG, Dragonraja, is an interesting example because it is based on a book series of the same name, written by Korean author Lee Yeongdo (Wikipedia 2009).

Both the book and the MMOG are set in a world that resembles Lord of the Rings, with character classes such as wizards, archers, priests, and warriors. Lien, on the other hand, preferred MMOGs from Asia that reflected the Chinese literary genre called wuxia. (Many readers might know this genre through the 2000 Ang Lee film, *Crouching Tiger, Hidden Dragon.*) Most, if not all, adolescents growing up in China, Hong Kong, and Taiwan would be familiar with the wuxia genre, owing to its near ubiquitous existence in books, comics, television, film, and, of course, video-games. Interestingly, the actual theme of these MMOGs did not seem to make a significant impact on the gameplay itself, as these games share similar kinds of activities – fighting monsters, gaining experience, joining guilds, purchasing goods, leveling up, and so on – thus some of the learning can easily be transferred from one MMOG to another.

Stage Two: Acquiring Access

Although Dragonraja supports multiple languages, its common language—or lingua franca—is English. Since Andrew and Kevin were ELLs, being in the same physical location made communication easier, as it allowed them to shout across the room instead of typing it in the chat channel. When they encountered other players on-line, many of whom also appeared to be ELL, they had to resort to English. However, these barriers did not prevent them from staying with Dragonraja, even though they could have selected another game that would allow them to communicate in Chinese more easily.

Lien, however, had slightly different issues with access, even though he possessed a fairly well equipped laptop and interacted with primarily Chinese-speaking players. In the two years I observed him, he had to switch MMOGs several times. The first game I observed him play was Dreams of Journey to the

West (meng huan xi you) – a MMOG inspired by the Chinese folktale Journey to the West. After playing for a year, someone hacked into his account and drained the resources he had accumulated. Out of frustration, he told me that he decided to switch to another game - called Demi-Gods and Semi-Devils (tian long ba bu), a Hong Kong-based MMOG inspired by the wuxia series of novels of the same name. However, like many MMOGs, Demi-Gods needed players to register an account, and the game distributor (www.gameone.com) required a personal identification number to verify the identity of the user. After registration, the account generates a security code that lets users log into their game. Lien was able to register through someone living in Hong Kong, but after playing a few months, someone hacked into his account again. Since each account is connected to a unique personal identification number, not only was he locked out of the account, he was unable to use the same identification number to re-register a new account.

His problems did not end there.

Lien got a new laptop a year after I met him. This was a treasured purchase that he nicknamed his "wife." Since he was more familiar with the Windows XP interface, he asked a friend to install an interface overlay to make his Windows Vista resemble the Windows XP interface. Unfortunately, this created some compatibility issues, as his drivers failed to load when the laptop was turned on. This meant that his audio devices and dial-up connection would not work, and since he connected through dial-up from home, this barred him from connecting to the Internet altogether. Furthermore, Lien was also unaware of the risks of viruses and other malware, and as his laptop was not protected with antivirus software, it was soon infected by malware that gradually slowed his system. I was able to help him get rid of the malware, but in order to get rid of the incompatibility issues, his laptop had to be restored to factory conditions. Lien, once

again, found himself at the periphery, because even though his laptop was still under warranty, technical support by phone was only available in English and Spanish. In the end, I was able to contact technical support on his behalf and get his laptop fixed.

Lien did devise some innovative ways to acquire boundary-crossing competence on his own. He was relatively adept at searching through on-line discussion boards for codes to gain access to games or solutions to puzzles within the games. Since he often played on his own, he depended more on the on-line communities for support. However, this support was useful insofar as it was in Chinese. With technical problems that required a more advanced understanding of how operating systems and drivers work, the on-line support was less useful (and occasionally misleading). Lien's case demonstrates that ELLs, at least in the United States, sometimes have to acquire additional boundary-crossing competences before they can participate in virtual worlds. These challenges might not be issues for people who have the linguistic resources to use technical support or search for solutions on-line, but for ELLs, these challenges can serve as real barriers to access. Researchers have noted that access to participation is a complex issue that goes beyond having ownership of resources (Jenkins 2006; Alvermann 2008) and Lien's case demonstrates that many hidden constraints impede the path to fuller participation.

Stage Three: Maintaining Boundaries

In discussing onscreen and offscreen identities, I draw on Lave and Wenger's definition as well as James Paul Gee's (2004) notion of "shape-shifting portfolio people" and Hervé Varenne and Ray McDermott's (1998) notion of "self." Lave and Wenger (1991) see identity as an integral part of becoming a member of a community of practice, as the individual goes from being a

newcomer to an old-timer through participation. Gee discusses identities in terms of "shape-shifting portfolio people" (2004, 105), or Millennials (Howe and Strauss 2000), whose diverse life experiences enable them to redesign their identities according to the requirements of the situation. Gee (2004) uses Wan Shun Eva Lam's (2000) study of an ELL, Almon, as an example. Almon, who was labeled as a low-achiever in school, escaped his stigmatized status by engaging with people on-line, where he gained not only friends and respect but also skills in communicating and expressing himself in English as well as demonstrating his expert knowledge of an Asian pop icon. Lam shows that Almon is able to design his on-line identity as an imagined self, distinct from his real-life personality. "Shape-shifting" can be seen as a form of boundary-crossing competence that allows individuals to balance between different identities, depending on which side of the boundary they are on. In Lam's study, Almon was able to demonstrate the competence of being an ELL on the Internet and gain the respect and support of others on-line who appreciated his knowledge of popular culture. Consequently, through his interactions with these people, he was able to acquire competence in English over time as well. Varenne and McDermott (1998) conceive of "self" in a slightly different manner. They described Adam, a young boy labeled with a learning disability (LD), whose "self" changed when he is in different contexts. At school, his LD status was made visible through a battery of tests and assessments that served to categorize students into successes and failures. At other times, such as when he was telling a story or playing basketball, his LD status and its associated stigma disappeared, and he became just another child. Varenne and McDermott argue that Adam's status as a child with LD was defined by his cultural conditions, which brought out different facets of his self on different occasions. Adam might not be a good reader but this did not stop him from going about his everyday activities. It

was only when he was asked to publicize his knowledge or skills when his LD reared its head.

At the risk of oversimplification, I suggest that these theories of identity/self articulate different facets of the same concept, each taking a unique but related perspective on how one's life trajectories and circumstances affect one's identities. These diverse perspectives are needed to analyze the complex ways that identities shift constantly in MMOGs, both in the short-term (e.g. over the course of one game session) and in the long-term (e.g. over the course of a year or more).

Part of how players manage their onscreen identities in virtual worlds depends on how the game is designed. These three participants all invited me to join them in their game as a player. Typically, when players go through a quest together, the experience points earned through a successful quest is divided equally among the players. Dragonraja does not allow advanced players (i.e. players with a high level of experience points) to share their experience points with novices. This design is likely implemented to prevent novices from leveling-up rapidly by tagging along with experts on advanced quests, and forces novices to start at a slower pace. Andrew and Kevin had to create new avatars with no experience levels in order to accommodate me in the game. Shadowing Lien was less problematic but also less interactive because he was used to playing alone.

When playing together, Andrew and Kevin had their own accounts and avatars when playing Dragonraja. However, occasionally, with the other's permission, they exchanged avatars. When one was in control of the other's avatar, they agreed not to modify the avatar without the owner's permission. This form of play changed their relationship with their avatars, and made their avatars into shared entities instead of personal belongings or unique identifiers. It also required them to act more as a spokesperson than as an owner when they were in control of someone

else's avatar. The fact that they shared avatars also shaped their relationships with their own avatars as well as their gameplay because it meant that resources and rewards became communal property.

This multiplicity of identities is even more salient in Lien's case. While playing Dreams of Journey to the West, Lien signed on to as many as four different avatars simultaneously. Owing to the relatively low-technology requirements of the game, he was able to open up several game windows at the same time. He did not have a vested interest in all of these avatars, but since each avatar can carry a limited number of items with them at any given time, Lien created additional ones to serve as storage units for any items he could not accommodate. He was able to keep track of all of these separate avatars at the same time, sending some off to battles while managing the others on the side. Typically, he was not paying particular attention to any of the avatars, because some of them were on "auto-pilot"; that is, he set them to keep repeating an activity (e.g. gathering treasure) until it was completed. On top of all this multitasking, he was often also watching a downloaded movie or television show on a separate window on his laptop, so his attentional focus was constantly shifting (Lankshear and Knobel 2002; Lemke 2007). In addition, two of Lien's avatars were male and two were female. The other players he encountered often demonstrated that they were aware that the avatar might not necessarily reflect the actual gender of the person in control; when a male avatar approached one of his female avatars to discern whether Lien was a female player, Lien would give an ambiguous response (e.g. "Maybe," or "What do you think?") and play along with the situation. Lien explained that they were "hunting for wives," and that there were certain benefits when two avatars get married, such as the sharing of resources. In other words, this was a pragmatic move that had less to do with the literal gender identity of the avatar and more

with what the game allows through its rules. Lien and his fellow players demonstrated an understanding of how avatars are used in MMOGs. When Lien encountered a familiar avatar, he would usually ask "Are you the player (ni shi ben ren)?"; or, in other words "Do you own this avatar?" This question reflected the awareness that players sometimes hired others to control their avatar in order to increase their experience and resources when they were unable to play in person. If he discovers that an avatar is not controlled by the actual player who created him/her, Lien would end the conversation, knowing that any interaction at this time would not really count towards their relationship.

The players' ability to "shape-shift" their identities reflects that they possessed a sophisticated understanding of boundary-crossing competence and were able to switch relatively seamlessly between their onscreen and offscreen identities. They had to negotiate their identities with other players in other spaces and decide, for example, whether it matters that Lien's female avatar was not controlled by a female player. In the context of the game, it did not matter whether the avatar's gender reflected the player's. Using Varenne and McDermott (1998), we can see that these multiplicities are determined by the conditions set by the rules of the game—such as rules regarding whether players can use multiple avatars simultaneously and whether avatars are allowed to get married (and if so, what happens)—as well as cultural conditions—such as the practice of hiring others to level-up your avatar. Andrew and Kevin also shared resources, but they managed to pool their resources by sharing avatars.

Discussion and Implications

The aim of this paper is to look at participation in virtual worlds in terms of the boundary-crossing competence needed for individuals to be able to access and participate in these com-

munities of practice. The participants in the study were ELLs and from a lower socioeconomic background, and thus, were not able to afford the sophisticated virtual worlds such as World of Warcraft. Consequently, their interaction revealed a new set of competences required for them to achieve and maintain access to the MMOGs they were involved in. Their interaction with the virtual worlds also depended on the community they delineated for themselves. On the surface, it may seem that Andrew, Kevin, and Lien shared many similar characteristics in terms of their cultural and linguistic backgrounds and their preference of playing MMOGs. However, the analysis here suggests that the way players choose to define their community—in other words, how they play and who they play with—can radically change their trajectories through the community of practice. In Andrew and Kevin's case, being able to play in the same game in a shared physical space was a significant part of their activity, whereas for Lien, it was not. Technological constraints affected all of them but at different points in time, and some of them had constraints that others did not have to face. Lien was free to purchase virtual goods because it did not have any impact on his social relationship, whereas Kevin and Andrew had to be more cautious about how much they use the offscreen resources to boost their onscreen identities.

Andrew's and Kevin's relationships to their MMOG centered primarily on their friendship. Over time, this created an additional boundary that others who wished to play with them had to cross. For example, when one of their friends from their class (also an Asian immigrant with the same linguistic background) wanted to join their game at a later stage, he was not welcome because of the game's design of preventing novices and experts from sharing experience. Over time, these boundaries became stronger due to the efforts Andrew and Kevin invested in their avatars. While time strengthened the bond Andrew and Kevin

had to their MMOG, it had a counter effect in Lien's case, especially when he got locked out of the game; the more time he invested in a game, the more frustrated he became when he was denied access.

The findings suggest that physical space can also transform the social use of MMOGs. Andrew and Kevin felt that their shared activity became a different event when they had to play from a distance, as it not only affected how they communicated, it also barred them from looking over at one another's screen or shouting across the room. The space of the Internet café also reduced their concerns regarding technological requirements, as the computers at the Internet cafés were equipped to handle their games. The technical expertise of the Internet café owners meant that Andrew and Kevin did not have to worry about issues such as viruses and malware. Lien, however, who had access to the equipment, also had to bear the burden of ensuring that the context of the physical space (e.g. phone lines, family sharing, etc.), the technical requirements of the game, his access to resources, and his own know-how of technology were adequate. Lien's predicament with his laptop might not have been a problem for someone with the linguistic access to the available resources, and his case shows how those lacking the linguistic or cultural or socioeconomic background can be locked out of these literacy practices.

There is considerable interest in the potential of using virtual worlds and video-games for educational purposes. One of the key arguments is that the forms of learning that occur in these new media spaces are more relevant to today's society than the traditional forms of learning seen in schools (Gee 2004). However, the precise learning process on a moment-by-moment basis remains unknown, and further qualitative studies are needed to verify how interaction occurs among different cultural groups (Squire 2008) and whether learning transfers to other contexts

(Squire 2002, 2006). There may be learning principles in virtual worlds that would enrich traditional educational institutions, but there are broader issues that researchers need to take into account. The findings revealed here suggest a darker side of participation in virtual worlds that has to do with unequal access to resources and technical skills. It could be that those who wish to incorporate virtual worlds into education would have to teach novices about fundamental boundary-crossing competences, such as how to maintain their hardware and how to effectively ask for help on their own.

Learning to acquire any kind of competence is a struggle of sorts, and acquiring boundary-crossing competence is no different. While researchers point out that participation in virtual worlds gives players access to a constellation of literacy practices (Steinkuehler 2007), the exact make-up of these constellations vary according to players' backgrounds and access to resources. These literacy practices, such as creating user-generated content (i.e. fan-made videos, fiction, art), have boundaries of their own. This is evident in Lien's case when he went on-line to look for support in forums, which were only useful to the extent that he could understand them linguistically and technically. Even then, there continued to be pitfalls that led him to malware or down blind alleys. As Lave and Wenger (1991) point out, participation in a community of practice is about learning trajectories (or "trajectories of participation" in their terms), and these trajectories are unique for each individual or group as they pass through these communities. Those with the right backgrounds and easy access are likely to have more control over these trajectories, while those with less access face more challenges and have less control.

However, it is important to remember that, although Andrew, Kevin and Lien faced challenges to access, they were all able to eventually join a MMOG, and the types of learning

they achieved once they were able to participate did resemble the newer forms of literacy that Gee (2004) described as part of the new post-industrial work environment. In order for Andrew and Kevin to share avatars, they had to have a fair amount of trust and cooperation between one another, resembling Gee's description of project-based collaboration, resource sharing, and distributed learning. Lien's navigation of his multiple identities demonstrates his ability to shift between various identities and resources and his ability to multitask and spread his attentional focus. These are skills that are more difficult for schools to teach because it requires the learner to interact directly with tools and knowledge within their environments, and not as abstract and decontextualized topics.

Boundary-crossing competence is a complicated but crucial aspect of one's involvement in any community of practice and an integral aspect of LPP. This competence is arguably the primary prerequisite to join any community of practice because we cannot participate in a community without knowing its boundaries and how to cross them in the first place. In our eagerness to study virtual worlds, we must not forget that access to these worlds can be challenging for some players. Understanding how access is achieved, what resources are needed, and how they are maintained over time can help us better understand the social practices of users from diverse backgrounds. The players discussed in his article demonstrate that they learn about and acquire their boundary-crossing competences through confrontations with obstacles, which can be social, technical, and/or financial in nature. Much also depends on how they choose to play, and whether their social relationships take priority over the game or vice versa. More research would have to be conducted on a broader group of players to see if they confront additional obstacles. Understanding these obstacles can help us learn how to redesign these communities to make them more accessible

to a wider range of people. Researchers have already noted the importance of studying the relationship between onscreen and offscreen identities (Ito 2008; Stevens, Satwicz, and McCarthy 2008). These studies suggest studying virtual worlds without understanding their offscreen "real" lives only tells us part of the story. As research on virtual worlds moves forward, we will have to attain a more comprehensive picture of how interactions in these worlds unfold, using more diverse research methods, participants, genres, and social contexts.

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