Learning in Massively Multiplayer Online Games

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Abstract: Given their increasing domination of the entertainment industry and wide spread popularity among a wide range of populations, massively multiplayer online videogames (MMOGs) are quickly becoming *the* form of entertainment and a major mechanism of socialization. Researchers have taken notice, and educational MMOGs are now beginning to emerge; however, there is a paucity of research on the actual culture/cognition of MMOGameplay, despite its necessity for sound theory and viable design. This paper outlines an ongoing cognitive ethnography of a currently thriving MMOG. Using discourse analytic methods, this project is developing a "thick description" (Geertz, 1973) of naturally-occurring gameplay, paying particular attention to the forms of socially and materially distributed cognition that emerge, the learning mechanisms embedded within community practice, and the ways in which participation shapes and is shaped by the situated (on- and off-screen) identities of its members. After outlining the data collection and analysis methods used, I present an illustrative analysis of selected data and preliminary findings specific to learning within this new virtual space for play.

Massively Multiplayer Online Games?

Imagine an entire 3D world online, complete with forests, cities, and seas. Now imagine it populated with others from across the globe who gather in virtual inns and taverns, gossiping about the most popular guild or comparing notes on the best hunting spots. Imagine yourself in a heated battle for the local castle, live opponents from all over collaborating or competing with you. Imagine a place where you can be the brave hero, the kingdom rogue, or the village sage, developing a reputation for yourself that is known from Peoria to Peking. Now imagine that you could come home from school or work, drop your bookbag on the ground, log in, and enter that world any day, any time, anywhere. Welcome to the world of massively multiplayer online gaming.

Massively multiplayer online games (MMOGs) are highly graphical 2- or 3-D videogames played online, allowing individuals, through their self-created digital characters or "avatars," to interact not only with the gaming software (the designed environment of the game and the computer-controlled characters within it) but with *other players*' avatars as well. These virtual worlds are persistent social and material worlds, loosely structured by open-ended (fantasy) narratives, where players are largely free to do as they please – slay ogres, siege castles, barter goods in town, or shake the fruit out of trees. They are notorious for their peculiar combination of designed "escapist fantasy" yet emergent "social realism" (Kolbert, 2001): in a setting of wizards and elves, princes and knights, people save for homes, create basket indices of the trading market, build relationships of status and solidarity, and worry about crime. Such games are ripe for cultural/cognitive analysis of the social and material practices attending them: Given their increasing domination of the entertainment industry, wide-spread and growing popularity with people of all age groups, ethnicities, and economic classes, and purported addictive quality for those who plug in (Jewels, 2002), MMOGs are quickly becoming *the* form of entertainment and a major mechanism of socialization for young and old alike.

MMOGaming is "one of the few unambiguously profitable uses of the Internet, other than pornography" (Kolbert, 2001). Last year, the videogame industry made a reported $9.3 billion – *more money than Hollywood box office movies* ($8.1 million). As more and more games go online, the gaming industry will soon *out-profit both the record industry* ($14.3 billion) and *home video rentals* ($19 billion) as well (Snider, 2002). The virtual worlds created for such games are non-trivial. Thanks to out-of-game trading of in-game items, Norrath, the virtual setting of the MMOG *EverQuest*, is the seventy-seventh largest economy in the real world, with a GNP per capita between that of Russia and Bulgaria. One platinum piece, the unit of currency in Norrath, trades on real world exchange markets higher than both the Yen and the Lira (Castronova, 2001).

MMOGs are ubiquitous to contemporary pop culture, yet there is a paucity of research on the phenomena as an important site for learning. Despite frequent public dismissals and indictments, videogames do constitute a complex and nuanced set of multi-modal social and communicative practices, tied to particular communities and consequential for membership and identity (Gee, 2003). MMOGaming is participation in a discourse space, one with fuzzy boundaries that expand with continued play: What is at first confined to the game alone soon spills over into the virtual world beyond it (e.g., websites, chatrooms, email) and even life off-screen (e.g., telephone calls, face-to-face meetings). The discourse communities these practices serve likewise expand from collections of in-character playmates to real-world affinity groups. Understanding the forms of (voluntary) participation in complex communities and environments such as MMOGs, where learning is the precursor to playing – if not the very same thing – is crucial. Such virtual communities function as a major mechanism of enculturation for those engaged with them: "Playing one's character(s) and living in [these virtual worlds] becomes an important part of daily life. Since much of the excitement of the game depends on having personal relationships and being part of [the] community's developing politics and projects, it is hard to participate just a little" (Turkle, 1995, p. 184).

Videogaming (let alone MMOGaming) is a nascent topic in educational research, yet the broader topic of online virtual communities has a long history. A quick perusal of the proceedings of the International Conference of the Learning Sciences (ICLS) over the past several years, let alone its sister organization Computer Supported Collaborative Learning (CSCL), indicates the widespread interest in online communities and virtual worlds within the field of educational research. This interest is hardly new: Online technologies provide new opportunities for "anytime/anywhere" social interaction, and the number of innovative curricular designs that incorporate online collaborative environments has been steadily increasing since such technology first emerged. Yet, as Lave and Wenger (1991) argue, understanding the shape of learning in *naturally occurring* contexts and not just formal ones (e.g., classrooms) is crucial if we are to forward educational theory and practice beyond the contexts we ourselves contrive. Innovative initiates such as the Games-to-Teach project at MIT (Jenkins, Squire, & Tan 2003; Squire, 2003) or Stanford University's recent Media X "Gaming To Learn" Workshop are beginning to investigate how we might leverage gaming technologies toward educational ends. Some projects, such as Barab's Quest Atlantis (Barab et al, in press), have begun using MMOGs as sites for formal learning. However, before designing virtual learning environments that might capitalize on MMOGs' capacity for "retribalizing" people across time and place, we ought to investigate more naturally occurring, self-sustaining *indigenous* virtual cultures so that our *theory* might be a more accurate reflection *of* them and our *practice* a better reflection *on* them in days to come.

Research Questions

This ongoing research project aims to establish a basis and beginning for just such work by examining the Discourse (Gee, 1999) of MMOGaming – how participation in an MMOG is constituted through language and practice both within the game (e.g., virtual social interaction and joint activity) and beyond (e.g., the creation of written game-related narratives and websites). Four core questions lay at the center of this investigation: (1) What are the social and material practices of MMOGaming? Specifically, (a) what does participation on the individual level look like (e.g., what is the shape of a game day)? and (b) what are the routine social and material practices that constitute MMOGame play, both within the actual game space and beyond? (2) What does it mean to be literate in this social space? Which is to ask: What forms of participation mark community membership in such settings? Which practices are valued? (3) How does one become a member of this community? In other words, (a) what means for learning are embedded not in the game as designed but rather in the community practice of those who inhabit it? and (b) what does an individual trajectory of learning look like? And finally, (4) what import does participation in this community have for the situated (on- and off-screen) identities of its members? All four core questions are approached from a perspective that focuses on the ways in which cognition is socially and materially distributed – a perspective most now call, for the sake of simplicity, the Learning Sciences.

Cognition as (Inter)action

From a Learning Sciences perspective, *cognition is (inter)action in the social and material world.* This body of theory and research includes work in activity theory (e.g., Engestrom, Miettinen, & Punamaki, 1999), d/Discourse theory (Gee, 1999), distributed cognition (e.g., Hutchins, 1995), ecological psychology (e.g., Gibson, 1979/1986), ethnomethodology (e.g., Garfinkel, 1967), mediated action (e.g., Wertsch, 1998), situated learning (e.g., Lave, 1988; Lave & Wenger, 1991), sociocultural theory (e.g., Vygotsky, 1978), and situativity theory (e.g., Greeno, & Moore, 1993). Despite its *vast* internal diversity, the Learning Sciences share a focus on interactive systems of activity of which the individual is only one part. Cognition, from this perspective, cannot be adequately accounted

for by computational models of structures and processes "in the head"; rather, one must look to the intact activity systems in which the individual participates – systems which necessarily include social relationships, physical and temporal contexts, symbolic and material resources (such as artifacts and tools), and historical change. Within such systems, cognition is "a complex social phenomenon… distributed – stretched over, not divided among – mind, body, activity and culturally organized settings (which include other actors)" (Lave, 1988, p.1). Of interest, then, are the interactional structures of such social and material systems, not structures in the individual mind per se.

Through participation in a community of practice, an individual comes to understand the world (and themselves) from the perspective of that community. Here, semantic interpretation is taken as part of what people do in the lived-in world; it arises through interaction with social and material resources in the context of a community with its own participant structures, values, and goals (Greeno & Moore, 1993). For example, an individual becomes attuned to a particular object's constraints and affordances through the regular pattern of interaction that individual has with it, but this regular pattern of interaction is shaped by the individual's membership in a particular community for whom the object has meaning, usefulness, and relevance for a given task with a given (individual or collective) goal. Such activities have direct import for the *identity* of the individual. Who one is determines, and is reflexively determined by, one's participations in various communities (Gee, 1999; Greeno, 1997). "A community of practice transforms nature into culture; it posits circumscribed practices for its members, possible ways of being human, possible ways to grasp the world—apprehended first with the body, then with tools and symbols—through participation in social practices in relationship with other people. Knowing is this grasping that is at the same time a way of participating and relating." (Packer & Goicoechea, 2000, p. 234) Changes in knowing become changes in being: through participation in a given Discourse community (Gee, 1999), an individual does more than merely acquire and reorganize symbolic knowledge about the world; she is ontologically transformed by it.

Learning, from this perspective, is progress along "trajectories of participation" (Greeno, 1997) and growth of identity within a given community of practice (Gee, 1999). Thus, accounts of how an individual interacts with their material and social contexts, and how these interactions change over time, replace accounts of individual knowledge construction occurring "in the head." It is the gradual transformation of an individual from "legitimate peripheral participant" (Lave & Wenger, 1991) to central member of a community through apprenticeship and increased participation in values community practices. At the aggregate level of the community, this learning process takes the form of an emergent reorganization of the patterns of member participation coupled with a growth of shared knowledge through changing practices and artifacts; at the individual level, however, it is ontological in nature, "a process of coming to be, of forging identities in activity in the world" (Lave, 1988).

Data Collection & Research Methods

Context of the Research

The primary context of study in this research is an MMOG entitled *Lineage*, a game set during medieval times, featuring elves, knights, mages (magicians), and prince/sses, in which guilds or "blood pledges" vie for control of various castles within the virtual kingdom (see Figure 1). Although several leading MMOG's on the market are included peripherally in this research as a means for validating inferences and checking generalizability, the game *Lineage* was chosen as the central site for investigation based on its success on the American market (Xander, 2002) and its purported *depth of play* (Lafferty, 2002; Warso, 2002).

Lineage's reputation for "depth of play" stems from its complex "blood pledge system," a system tightly coupled to both the guiding narrative and the virtual world's economic system. "Like chess, the prince or princess is frail and must be protected" (Foster, 2001), therefore they must compete with one another to recruit other classes of characters into their pledge as both protection and armed forces for castles siege. Within- and between-pledge activities are the yarn from which *Lineage* history and narrative is woven: Pledges (and individual players) quickly gain reputations over daily affairs, wars break out over who said/did what to whom, alliances are made and broken, and stories of intrigue perpetually fill the air (or, more specifically, the chat window). Such pledge politics drive the entire kingdom's economic system: Each castle in the kingdom collects taxes from the local area, allowing the currently holder to set the local tax rate and distributes castle income as she sees fit. Yet, her decisions have political consequences; for example, local village members can revolt should the tax rate be set to high. "After joining a [pledge], players develop a pride and loyalty that is unique to the multiplaying world. Until now, online games had not been designed to wholly incorporate players' actions into the over-arcing story of the game… The potential for ego boosting and bashing, epic [pledge] feuds, and history-making battles is so great for *Lineage* that it is hard to

imagine" (Murphy, 2001). The end result is a complex social space of affiliations and disaffiliations, constructed largely out of shared (or disparate) social and material practices – ways of behaving, communicating, interacting, and valuing that are "forms of life" (albeit virtual) through which individuals enact not just their character class, be it elf or princess, but the "kinds of people" (Hacking, 1986) that they construe themselves to be and that others can recognize. Gamers call this *depth of play*; from a Learning Sciences perspective, it is *shared Discourse*.

Data Collection: Cognitive Ethnography

Given this Learning Sciences perspective, the proper unit of study for work on cognition is not the individual "head" but rather the intact interactional structures of social and material activity. As such, the proper method of research is *cognitive ethnography* (Hutchins, 1995): a "thick description" (Geertz, 1973) of the socially and materially distributed cognitive practices that constitute the game. As with most ethnographies, the researcher participates overtly in the daily life of the game (to date, in this study, for a period of over 19 months), observing what goes on within the virtual world, taking digital video recording and fieldnotes, listening to what is said, asking questions, and generally "collecting whatever data are available to throw light on the issues that are the focus of the research." (Hammersley & Atkinson, 1986, p.1) From such data, patterns of routine cognitive/cultural activities can be discerned, (answering research question 1 above). Moreover, because meaning is "not in anyone's head, but embedded in the history and social practices of the group" (Gee, 1999, p. 105), answers to the remaining research questions, such as what and where learning occurs and what it means for the identity of participants in the gaming culture, are inaccessible without such groundwork. In addition to routine observation and fieldnotes, informants of varying ages, ethnicities, socio-economic statuses, and levels of expertise/social status within the community are recruited and interviewed repeatedly in unstructured (e.g. informal conversation within the game), semi-structured (e.g. telephone interviews about particular topics of interest), and structured (e.g. repertory grid interviews, Fransella & Bannister, 1977) formats. Finally, community documents (such as player-authored user manuals, fan sites, and fan fiction) and transcripts from game-related discussion boards and chatrooms are also collected in order to capture gameplay not only within the virtual game space itself (between login and logoff) but also beyond.

Analytic Method

The various theories of mind and meaning embedded in different strands of the Learning Sciences are each useful for gaining insight on different aspects of cognition as (inter)action in the social and material world. In particular, this research draws on Gee's d/Discourse theory and method of analysis (1999) as a tool for answering those research questions whose answers are beyond the purview of basic cognitive ethnography. Understanding which and how particular social and material practices mark membership in the MMOGaming community (question 2) and how participation in those practices shape, and are shaped by, participants' identities within and beyond the game (question 4) requires understanding the *situated meanings* individuals construct (not just the information they process), the definitive *role of communities* in that meaning, and the inherently *ideological nature* of both. Coming out of the New Literacy Studies (e.g., Gumperz, 1982; Halliday, 1978; Kress, 1985; Street, 1984), d/Discourse theory provides a way to maintain the Learning Sciences' focus on intact interactional structures while, at the same time, foregrounding the role of d/Discourse (language-in-use / "kinds of people") in such interactions. I am keenly interested in socially distributed cognition and its role in learning; thus, a theory of language more nuanced than the typical transmission container model (cf. Vera & Simon, 1993) is crucial to developing any viable account of the situated meanings people construct and the definitive role of communities in that meaning-making process.

Therefore, data collected from the ongoing cognitive ethnography are analyzed using *discourse analysis* (Fairclough 1995; Gee, 1999; Gumperz 1982; Halliday, 1978): "the analysis of language as it is used to enact activities, perspectives, and identities" (Gee, 1999, p. 4-5). Such analyses focus on the configurations of linguistic cues used in spoken or written utterances in order to invite certain interpretive practices – for example, word choice, foregrounding/backgrounding syntactic and prosodic markers, cohesion devices, discourse organization, contextualization signals, and thematic organization. Configurations of such devices signal how the language of the particular utterance is being used to construe reality in terms of: (1) *semiotics*, what symbol systems are privileged, how they construe the relevant context (the world), and on what epistemological basis; (2) *the material world*, what objects, places, times, and people are relevant and in what way; (3) *sociocultural reality*, who is who and what their relationships with one another are, including the implied identity of the speaker/writer and who the audience is construed to be, all in terms of affect, status, solidarity, and (shared or disparate) values and knowledge; (4) *activities*, what specific social activities the speaker and her interlocutors are taken to be engaged in; (5) *politics*, what social goods are at stake and how they are and "ought" to be distributed; and finally (6) *coherence*, what past and future interactions are relevant to the current communication (Gee, 1999). Particular configurations of linguistic

cues prompt specific situated meanings of these six aspects of "reality," meanings which evoke and exploit specific cultural models which are indelibly linked to particular Discourses, allowing speakers and hearers to display and recognize the "kind of people" each is purported to be. Through microanalysis of how group members' utterances construe the world in particular ways and not others, we are able to infer the cultural models and concomitant Discourse(s) as play. With such analyses comes explication of the full range of social and material practices with which they are inextricably linked, since the meaning of those practices is done with and through language-in-use. Through such discourse-analysis-based ethnographic work, then, we capture the sense human beings make of the social and material world and their (inter)action with it – in other words, we finally get at the phenomena of cognition itself, in all its unbounded, situated, distributed, social, and ideological messiness.

Apprenticeship into Doing Being a *Lineage* Elf

Before discussing some of the project's preliminary findings on learning in MMOG environments, I want to ground the previous discussion of data collection and analysis methods with an example of the kind of ethnographic data collected and ways in which discourse analytic procedures can be leveraged to unpack what is happening in such activities. The following (semi-raw, semi-processed) transcript and subsequent analysis is an example illustrating the kinds of learning built into *Lineage* not as designed object but rather as a *social practice*. Discourses such as those constituting MMOGaming are not mastered by overt instruction but rather through *apprenticeship* (Gee, 1999; Lave & Wenger, 1991; Tharp & Gallimore, 1988). Gamers who have already mastered the social and material practices requisite to game play enculturate, through scaffolded and supported interactions, newer gamers who lack such knowledge and skill. The following excerpt, transcribed[1] from digital videodata collected during the summer of 2002, illustrates this process In it, a rather "newbie" female elf named JellyBean (level 10, played by the researcher) and a more experienced female elf named Myrondonia[2] (level 25) jointly engage in the routine elven activity of hunting for mithril.

First, a bit of context: Prior to this exchange, JellyBean ran into a bit of trouble with a monster ("mop") in an area called the Elven Forest. While making her escape, she cried for help. In response, a female elf named Myrondonia came to help. Realizing that JellyBean was a newbie, Myrondonia offered to take her hunting for mithril, a requisite raw material for many elven goods. Mithril is a rare drop from monsters in all areas except one: the Elven Dungeons. Two kinds of mops inhabit the dungeons: undead zombies, which frequently drop mithril, and orcs, which rarely drop anything of any value. Orcs are herd monsters: Should you hit a single one of them, they rest will gang up on you and bludgeon you to death. The following transcript is a full account of how Myrondonia apprenticed JellyBean into the elven social practice of gathering mithril.

Figure 1. The apprenticeship of JellyBean.

JellyBean and Myrondonia are walking through the Elven Dungeons, in search of zombies to kill for their associated mithril drops. The two are discussing the glut of dangerous orcs in the area.

JellyBean: I'm scared I will click on one just walking
Myrondonia: I know a secret
JellyBean: what?
Myrondonia: hold your mouse key down

I try out this navigation strategy, clicking down when the cursor is over empty ground, causing my avatar JellyBean to move to the screen location just clicked.

Myrondonia: wait [meaning, don't release the mouse key yet]

I do as instructed, causing JellyBean to move fluidly across screen.

JellyBean: wow
Myrondonia: there you go
JellyBean: that's so cool!

A zombie rounds the corner into the room. JellyBean shoots and kills it. It falls to the ground.

Myrondonia: another rule
JellyBean: ok
Myrondonia: quickly use your mouse cursor over the dead bodies
Myrondonia: make sure they didn't drop

I run my cursor over the zombie corpse as instructed and find a piece of mithril on the ground.

JellyBean: oh wow
JellyBean: I never new that
Myrondonia: sometimes it's sneaky
Myrondonia: you don't want to lose a mithril

A zombie walks into the room and attacks Myrondonia. Meanwhile, JellyBean is walking over to pick up the mithril on the ground from their last kill.

Myrondonia: no
Myrondonia: take this one [the zombie hitting her]
Myrondonia: try to look for zombies & hit them

JellyBean does as instructed. The two continue the hunt, moving into a corridor. Another zombie approaches; JellyBean kills it and grabs the mithril on the ground.

Myrondonia: good

The two continue their way to the end of the corridor. An unknown elf named IrisArker passes by.

Myrondonia: another rule
JellyBean: yes?
IrisArker: ^_^ [smiley face gesture while walking by]
Myrondonia: If you see someone go one way, go the other
Myrondonia: hi [to IrisArker]
Myrondonia: we are all here for mithril

Throughout this episode, Myrondonia, the more knowledgeable elf, apprentices JellyBean into a highly valued and routinely engaged-in practice in all the classic ways: She engages JellyBean in *joint participation* in a meaningful activity with a mutually understood and valued goal. She scaffolds her students by modeling successful performance, focusing her attention on key material, social, and contextual aspects that are crucial to its success (such as attending first to the incoming and attacking zombies, second to the busywork of collecting one's mithril), entrusting more and more control over the ongoing actions to the apprenticeship, and allowing numerous opportunity for practice and situated feedback. Information, such as how to navigate the virtual territory or what to do should another mithril-hunting elf cross your path cross, is not orated prior to actually engaging in joint work. Rather, the information is given "just in time," always in the context of the goal-driven activity that its actually useful for – and made meaningful by – and always at a time when it can be immediately put to use.

However, more is happening here than mere training in a routine practice. Using discourse analysis, we can tease out how Myrondonia construes various aspects of the game world – here, most notably, the *political* or ideological aspect – what social goods are taken to be at stake and how they "ought" to be distributed. Myrondonia is socializing JellyBean into certain ways of being in and understanding the virtual world, ways that are tied to particular *values*. This is most apparent toward the end of the excerpt, when Myrondonia explains what to do should you run into another elf during a mithril hunt: you go a different way. Why? Because the elves in that particular area

can all safely be presumed to be there for the same thing: mithril. By avoiding the same areas, one can display oneself as "people like us" (like Myrondonia), the kind that display courtesy by not stealing drops, by sharing hunting territories, and, yes, even by responding to newbie elf's cries for help. Two distinct but related things are being taught here: one is the social *practice*, the other is the *kind of person/elf* Myrondonia wants JellyBean to be.

Preliminary Findings

This research project is not complete; however, preliminary data analysis offers some suggestive answers for the research questions outlined above. In terms of (3a) the mechanisms or means for learning embedded in the community practices of those who inhabit the MMOGaming space, several patterns consistently emerge. As the previous excerpt illustrates, newcomers learn the game through full participation in genuine game play with more knowledgeable/skilled others. You not only "have to play to learn," (Turkle, 1995, p. 70), but you also have to play *with others* if you ever hope to develop genuine expertise. During collaboration, the focus is on the *activity*, with information (e.g., manuals, guidebooks, websites) playing only a secondary and supporting role (unlike most classrooms). There is early over-learning — extended practice coupled with immediate feedback from both the game system (e.g., error-produced death) and other participants (e.g., "Dude, that rocked.") — and one's progress and accomplishments are clearly represented in some way, if only by a displayed increased level of experience and its concomitant increase in social status. *Failure functions as feedback*: What you do risk by failing is minimal and easily recovered (cf. the high stakes testing practices implemented by the Bush administration under the No Child Left Behind Act), particularly in the early stages of game play, and performing at the outer edge of one's current competency, which seems to sustain engagement (cf. notion of flow, Csikszentmihalyi, 1993; zone of proximal development, Vygotsky, 1978) and to constantly pull one forward into more complex and demanding tasks, is highly valued and socially promoted (challenging yourself earns you bragging rights as "hardcore," regardless of level). From the very outset of game play, the individual engages in the virtual social and material world as a complex, ill structured, dynamic, and evolving system, not some watered down version of it. Finally, there is a socially-sanctioned precociousness and *wonder*, that simple secular instinct that provides motivation for scientific inquiry (Fisher, 1999): Gamers transform design curiosities into empirical questions by collecting data (in spreadsheets), building mathematical models based on that data, and then placing those models in competition with one another to see which can most accurately predict (read: exploit) the system (i.e. minimaxing). Little wonder parents have to worry about addition to gaming (which is, by definition, learning) but never to deskwork.

Implications

Serious commendations are due to those educational technology designers who are leveraging gaming technologies toward educational ends. By far, videogames (MMOGs in particular) are the most important entertainment media in the lives of the millennial generation — those who have grown up on the PlayStation rather than Atari 2600 (or to go back even further, your basic pinball). However, two caveats are needed. First, we need to better understand what contemporary informal online learning environments do well and do miserably if we want to leverage those features that are productive and eschew those that are not. Designing in the dark is neither efficient nor advantageous. We know that kids are thoroughly engaged by MMOGs and some/many of us are fairly convinced that what they do there is far from cognitively trivial. However, without the kind of basic ethnographic work conducted here, it will remain difficult to tease out what practices, understandings, and identities MMOGaming recruits from those who play and whether or not they are portable, plausible, or productive. Second, this research suggests that the mechanisms for learning entailed in gameplay in virtual cultures/worlds are contingent on the game not only as a *designed object* but also as a *social practice*. This moral of this story is a long familiar one for Learning Science researchers: Designing learning environments is not merely a matter of getting the curricular material right but is crucially also a matter of getting the situated, emergent community structures and practices "right." In this case, unless we are designing appropriate social structures to accompany such technological systems (a feat which may very well not always be possible, given their situated and emergent nature), we cannot easily leverage the learning mechanisms within MMOGs *for play* in creating MMOGs *for instruction*. Still, an understanding of the cultural/cognitive structures at play in online worlds might one day improve our understanding of those that emerge in life beyond them.

Endnotes

(1) The transcript excerpts are verbatim save changes for ease of reading, such as expansions of truncated words, typographical corrections, and supplementation of dietic references with appropriate referents (in brackets).
(2) I am using pseudonyms in place of all actual avatars names in order to protect (virtual) confidentiality.

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