

## Reading in the Context of Online Games

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**Abstract:** Research suggests that text is an important component of videogame culture (Gee, 2003; Leander, & Lovvorn, 2006; Steinkuehler, 2007), but we have few empirical assessments of what kinds of texts are involved or youth's reading performance on them. This paper presents a series of four studies conducted to examine: What texts are a regular part of videogame play? What is their nature, function, and quality? And what is the nature of adolescent reading performance within such contexts? Our results show that *informational* texts, comprised of 20% academic language and with an 11.8 average reading level, are the most prevalent text type used for gameplay. Reading performance on such texts is no different than on school-related texts when topic and difficulty were controlled. However, when struggling readers when allowed to *choose the topic*, they performed at "independent" level (94-97% accuracy) even on texts that were 7-8 grade levels above their head.

In their recent *Reading at Risk* report (Bradshaw & Nichols, 2004), the National Endowment for the Arts documented a pronounced decline in reading in American youth and associated it with the equally pronounced increase in the use of "electronic media" such as television, videogames, and the Internet. Such technologies, the report authors claimed, "often require no more than passive participation" and "foster shorter attention spans and accelerated gratification" (p. vii); thus, the authors identified them as one (perhaps *the*) underlying cause of this new "risk" to reading among today's digital immersed youth. Emerging research on what youth actually do while engaged in such technologies, however, reveals a rich array of digital and print literacy practices (Black & Steinkuehler, 2007). They use text messages as a way to develop and sustain peer networks (Lewis & Fabos, 2005). They create elaborate textual representations of themselves on personal websites as an expression of identity (Guzzetti, 2006). They use the given narrative structures of anime, for example, as fodder for the articulation (and distribution) of their own stories (Black, 2008). And they engage in complex constellations of reading and writing around the videogame titles they play (Steinkuehler, 2007).

The goal of this investigation was to examine this latter phenomenon – reading related to naturally occurring online videogame play. Emerging research suggests that text is an often-hidden but nonetheless important component of participation in videogame culture (Commeyras, 2009; Gee, 2003; Leander, & Lovvorn, 2006; Steinkuehler, 2006, 2007, 2008), but we have few empirical assessments of what kinds of texts are involved in such activities, their quality and characteristics, or youth's reading performance on them compared to texts in other contexts. Precisely what kinds of texts are a regular part of videogame play? What is the nature, function, and quality of such texts? And how does the reading performance of adolescents on such game-related texts compare to their performance on school-related texts? Toward answering these questions, we conducted a series of investigations designed to explore the claims popular in "games and learning" literature that videogames do indeed entail rich forms of literacy. In this paper we detail a series of four studies we conducted in order to answer the three questions articulated above: (1) a survey of the textual resources gamers used as a regular part of their gameplay; (2) a quantitative and qualitative evaluation of the nature, difficulty, and quality of the text resources identified in study one; (3) a study comparing adolescent reading performance on appropriately leveled reading materials in the context of games versus school; and (4) a preliminary (yet suggestive) pilot study of videogame reading when difficulty level is not controlled. All four studies were conducted using the massively multiplayer online game *World of Warcraft* (WoW) given its overwhelming success on the market (Woodcock, 2009), robust online textual community, and general popularity with adolescents and young adults. In what follows, we detail the method and findings of each study.

### Study One: What Texts are a Regular Part of Gameplay?

#### Data Collection

Our first step in this investigation was to find out what texts were involved regularly in gameplay. Toward this end, we interviewed 25 expert and 21 novice WoW gamers (n=46) about the textual resources they used for gameplay. Each participant was asked to list to exhaustion any and all resources they used for the game and to judge the importance of each text listed by classifying it as either a "core resource" (a text they consult regularly and consider "core" to successful gameplay), a "frequent resource" (a text they refer to frequently but do not consider crucial) or an "infrequent resource" (a text they refer to but not with any regularity).

#### Findings

Using the resources generated by participants as our basis, we then inductively developed the following five categories of text based on function:

- (1) *Information resources* are online reference materials providing detailed information about the game, strategies for playing it, and the history of the game's lore. The three most common resources referenced were wowhead.com, wowwiki.com, and thotbot.dom, which are database backed websites that organize information about in-game materials and quests that are written, harvested, and then discussed, revised, and scrutinized by the players themselves. Such sites are structured as encyclopedic, dynamically generated, online reference books and function as user manuals to the game that are created and maintained by those who play.
- (2) *Discussion forums*, sponsored by the game company or various public or private sub-communities within the game, host text-based, asynchronous collective problem solving about complex systems in the game – activities which evidence informal science literacy characteristics such as evidence-based argumentation and model-based reasoning (Steinkuehler & Duncan, 2009).
- (3) *Group organization resources* are online tools and texts that help groups within the game (such as guilds or raid groups) organize their collaborative gameplay, providing detailed instructions for specific activities, scheduling information and sign-up tools, for example.
- (4) *UI mod sites* (short for “user interface modifications,” also called “add on’s”) are online hubs for freely downloadable, player-generated bits of software that change the user interface of the game in some way (e.g., wowcurse.com) to enhance performance or player experience. Prior case study work suggests that, for some players, the use of such tools transitions into critique, debugging and “beta testing” practices that provide an important gateway into software development practices (Steinkuehler & Johnson, 2009).
- (5) Finally, *fandom media* include creative fiction and non-fiction digital media literacy artifacts such as YouTube movies, fan fiction about the game, fan artwork, and other creative “literary” resources that the player community creates around the game.

Table 1 presents the each functional category of resource by number of unique members that were referenced during the interviews, their importance rating, the average number of references per member of the category, and an average weighted score of their importance calculated as [(number of core ratings)\*10 + (number of frequent ratings)\*3 + (number of infrequent ratings)\*1] / (total number of references)].

Table 1: Game-related texts by functional category and rating of importance to gameplay.

Category	Unique Members	Importance Rating				Average Number of References per Member	Average Weighted Importance Rating
		Core	Frequent	Infrequent	Total		
Information Resources	31	52	55	77	185	5.97	4.11
Discussion Forums	31	11	13	32	56	1.81	3.23
Group Organization Resources	34	31	15	21	48	1.41	7.8
UI Mod Sites	16	18	9	18	45	2.81	5.0
Fandom Media	9	9	4	7	20	2.22	5.45

*Information resources* were by far the most common, with participants referencing unique members within this category three times more frequently than any other type of resource (roughly six citations for each member on average compared to two). In contrast, *group organization resources* were rated as more important to regular gameplay with an average weighted importance rating (7.8) followed by player production and UI-Mod resources (5.45 and 5.0 respectively), and finally information resources and discussion forums (4.11 and 3.23 respectively). Figure 2 below shows the proportional make up of the “constellation of literacy” that comprises online gameplay (Steinkuehler, 2007). Thus, information resources comprise the majority of the texts related to games but group organization resources are viewed as more important to regular gameplay. The result is a complex picture where the *main body of game-related text* consists of standard expository and procedural text with the *most valued resources* being for in-group coordination.

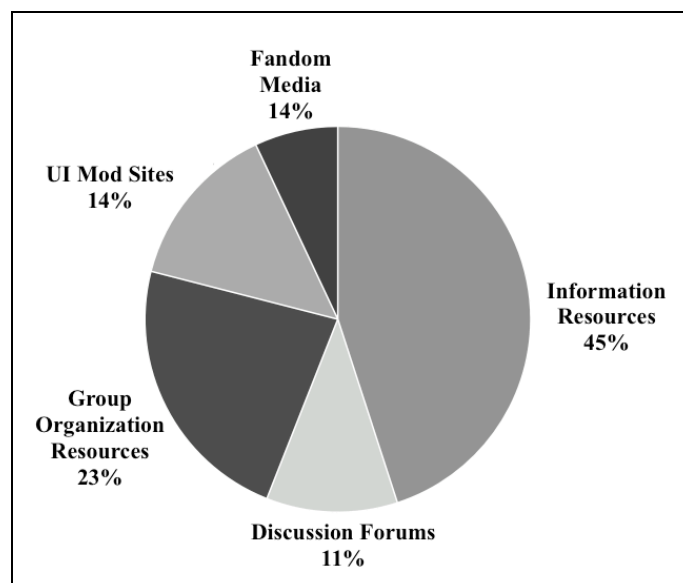


Figure 1. Proportional breakdown of the “constellation of game-related texts” by functional category.

## Study Two: What is the Nature and Quality of Game-Related Texts?

### Methods

Using the list of resources obtained in the first study, we identified the top three resources used by gamers as part of their play based on the total number of references: thotbot.com, wowwiki.com, and wowhead.com. All three similarly structured, database-backed websites function primarily as *information resources*. In order to assess the nature and quality of such texts, we randomly selected 50 pages total across the three identified resources for quantitative assessment (grade-referenced reading level, lexical analysis) and one representative page for detailed qualitative (multimodal, structural, and genre) analysis. Quantitative assessment of the 50-page random sample included statistical calculation of average reading level using three separate statistical approaches – Flesch-Kincaid reading level (Flesch, 1948), Fry Readability (Fry, 1968), and SMOG reading level (McLaughlin, 1969) – and a lexical analysis (Laufer & Nation, 1995) to highlight the range of vocabulary used in such texts. Qualitative analysis of the single representative page included a survey of the modes of information used, the structure of the information presented, and the genres of text included.

### Findings

The average reading level of the 50-page random sample was  $M = 10.86$  ( $SD = 2.30$ ) on the Flesch-Kincaid,  $M = 12.98$  ( $SD = 2.08$ ) on the Fry, and  $M = 11.56$  ( $SD = 2.56$ ) on the SMOG test. Thus, the most prevalent texts related to WoW are written at an average grade level of 11.8, placing it somewhere between *Sports Illustrated* (grade 11) and *Time Magazine* (grade 12). Although there is some variation in the reading level of game-related texts (roughly 2 grade levels), overwhelmingly such information resources require reading skills at the high school or high school graduate level.

Lexical analysis of the same 50-page sample reveals that 70% of the vocabulary used within the texts were words found within the most common 1000 words of the English language (K-1 words). A full 20% of the vocabulary used were “academic words” (Academic Word List words) – vocabulary common to school textbooks across a range of academic disciplines such as “compensation,” “implication,” and “obtainable”. Only 4% consisted of game-related “specialized discourse” (Gee, 2003)– highly specialized terms relevant only to WoW gameplay itself such as “respec,” “frost,” “crit,” (Off-List words). Thus, as predicted by Gee (2003) and others, game-related texts appear to be a useful bridge into academic forms of language.

Qualitative assessment of the one page representative sample nature reveals that such game-related texts are dense and complicated information sources in at least three ways. Figure 2 gives a simplified diagram articulating some of this complexity. First, symbolic information is thoroughly multimodal, including images, icons, symbols, color and font demarcations to specify information type, and hyperlinks to additional details (which display as call-out boxes on one’s cursor) or link to related pages within or beyond the site itself. Second, only tacit page layout characteristics are used to cue the reader as to the source of information contained within a given page. The center of the main page features information “harvested” from the game engine automatically through site-related UI mods or “add-ons” that automatically users voluntarily use while playing. These “add-ons” collect information about the game and contribute those data back to the website

database to be aggregated automatically as content within the main pages. The bottom of the page, however, features multiple tabbed sections including crucial threaded commentary and discussion of the information harvested and then re-presented in the main body of the page. In effect, the bottom half of the page provides human interpretation and analysis of the machine-generated data presented in the top half, creating a complex “split attention” effect (Mwangi & Sweller, 1998) requiring readers to synthesize information from two sources quite disparate in terms of multimodal tendencies, page layout formats, and underlying source or author.

Third and finally, such texts are particularly complicated due to their mix of genre. While the primary genres of game-related information resources are *expository* and *procedural*, each page within such sites actually features multiple forms – including transactional, narrative, and persuasive text as well as expository and procedural – with few clear demarcations among them. For example, a description of a single in-game quest very often begins with details about where the activity begins and ends (expository text), then shifts to quoted text delivered orally by the relevant “quest giver” character in the game world (narrative, first person text), followed by step-by-step instructions on how to complete the quest (procedural text), which are then quickly succeeded by player-written, collaborative arguments for why a given quest is important or not important to complete (persuasive texts), and finally, drifting conversation where players best one another in reports of how easy a given quest was overcome (transactional texts). Thus, if structural cues are one tool a reader uses to help predict and parse the content of a given text (Coiro & Dobler, 2007; Goldman & Rakestraw, 2000; Weaver & Kintsch, 1991), then multimodal, multi-authored, and multi-genre texts such as these present interesting challenges, even for strong readers.

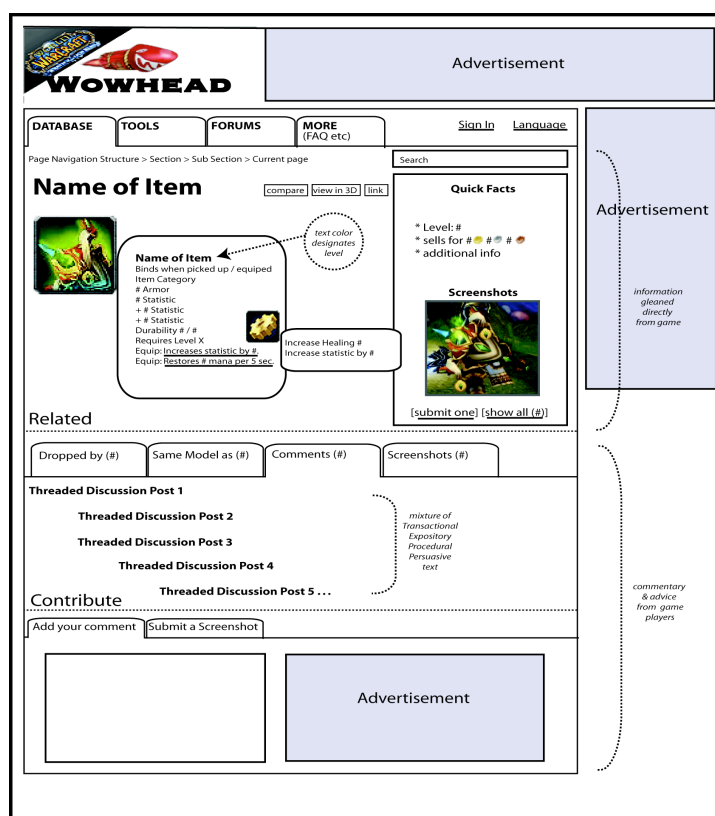


Figure 2. A schematic overview of the game-related sample page selected for qualitative analysis.

## Study Three: How Does Reading Performance Compare on Game-Related Texts versus School-Related Texts?

### Methods

Our third step in this investigation was to examine adolescent WoW players' reading performance (Clay, 1993/2002; Ekwall & Shanker, 1993; Goodman, Watson, & Burke, 2005) and comprehension strategies (Pearson & Johnson, 1978; Taylor, Graves, & van den Broek, 2000) on game-related text versus school-related text. Seventeen adolescent boys participated in the study, all of whom played WoW. Participants' reading levels were first assessed using the Qualitative Reading Inventory (QRI) (Leslie & Caldwell, 2006). They then read two texts aloud: (1) a passage from a social studies textbook, and (2) a game-related text that had been downloaded from one of the resources identified in study one. Each of the two texts were chosen by the

researchers to match the “instructional reading level” of the participant as determined by the QRI and the order of the two test texts were counterbalanced to mitigate ordering effects. The activity took about 90 minutes on average. Data included running records (Clay, 1993/2002) which noted the various reading behaviors of the students including substitutions they made in text, self-corrections, repetition of words and sentences, and attempts at word solving. Text retellings and responses to comprehension questions were used to assess reading comprehension. Finally, short interviews were conducted with each student to assess students’ attitudes toward the texts and their perceived potential uses in the lives of students.

## Findings

Table 3 shows the quantitative findings from study three. All 17 adolescent boys who participated in this study read at or below grade level ( $n=10$  and  $n=7$ , respectively). With reading selection calibrated to match each participants’ reading level as determined by the QRI, there were no statistical differences between participants’ accuracy or comprehension on the game related text ( $M = 0.96$ ,  $SD = 0.03$ ) versus the school related text ( $M = 0.97$ ,  $SD = 0.02$ ). Overall then, reading performance was remarkably consistent across the two texts.

Table 2. Participants’ reading performance on the QRI, the game-related text, and the school related text.

Student	Age	Grade	QRI Reading Assessment	QRI Text: Miscues	QRI Text: Comprehension	Game Text: Level	Game Text: Miscues	School Text: Level	School Text: Miscues
Andy	11	5	5	0.95	0.75	8	0.94	7	0.89
Ben	13	7	7–8	0.94	0.90	8	0.89	7	0.96
Carl	13	7	6	0.98	0.87	8	0.97	7	0.98
Dexter	12	7	7–8	0.98	0.80	8	0.95	7	0.98
Ed	14	8	5	0.95	1.00	8	0.92	7	0.94
Fred	14	8	6	0.95	0.87	8	0.94	7	0.97
Gary	14	9	6	0.99	0.87	8	0.99	7	0.98
Harry	14	9	7–8	0.97	1.00	8	0.95	7	0.93
Isaac	16	10	7–8	0.97	0.90	8	0.95	7	0.96
Jack	16	10	HS	0.97	0.90	10	0.99	7	0.99
Kurt	16	10	HS	0.98	0.80	11	0.99	12	0.98
Lee	16	10	HS	0.99	0.90	11	0.99	12	0.98
Mark*	16	11	6	0.98	0.75	8	0.97	7	0.96
Ned	16	11	HS	0.98	0.70	10	0.98	7	0.96
Otto	17	11	HS	0.98	0.80	11	0.99	12	0.98
Pete*	16	11	HS	0.98	0.90	11	0.99	12	0.98
Quincy	18	12	HS	0.95	0.80	11	0.96	12	0.98

We then identified two contrasting cases from within our data set (see asterisked rows in Table 3) for more detailed qualitative exploration in order to explore potential differences in participants’ reading comprehension strategies and how they positioned themselves relative to the two text types. Pete (pseudonym) was in grade 11 and appropriately reading at the high school level; Mark (pseudonym) was also in grade 11 but reading at only the sixth grade level. While Pete scored 0.90 on the QRI measure of reading comprehension, Mark only scored 0.75. We transcribed and reiteratively coded each boy’s retelling of the QRI text, the game text and the school text to identify similarities and differences between the two participants.

Both Pete (stronger reader) and Mark (struggling reader) used the structure of each reading to organize their retelling, but Pete adhered to school expectations when retelling school text, providing sundry details on each and given concise overviews at the beginning of each retelling episode. In contrast, Mark provided only inaccurate and sparse details on each reading and gave unclear and inconcise overviews for each text. Even when Mark (struggling reader) seems to understand the content of what was read, he had a hard time conveying

it to tester. Both participants use I-statements in relation to the gaming text, but Pete (stronger reader) took on the role of “text analyst” of sorts, readily assuming an analytic position toward both texts and freely giving his opinion on the authors’ craft. In contrast, Mark (struggling reader) did not position himself as an evaluator or critic of text except in relation to his own purposes and needs for the content the text contained. For example, while discussing the school-related textbook excerpt, Pete (stronger reader) states, “I thought it was quite informative, used fairly simple and straight forward vocabulary and um, sentence structure and the like. So it was easy to understand, easy to tell it’s from a textbook.” (Pete, stronger reader) In contrast, Mark (struggling reader) discusses the purpose of the text only when directly queried, stating, “Our vocabulary...um, cause there were a lot of words in here that you had to try at” except when that assessment related to his own purposes and needs. When his own interests are evoked, his responses and evaluations become more elaborated. For example, when asked the purpose of the game-related text, he states “to explain the use of duel wielding - off-handed, one-handed, two-handed. To explain damage meters, whether DPS is better with two weapons or one two-handed weapon. To help you with the numbers I was gonna use it on my um, warrior and then my rouge to, like, go through different weapons I have in my bags and see which ones are better.” Thus, one notable difference between the two boys who contrasted in terms of reading comprehension performance was the extent to which each positioned himself as a critical consumer of the text: Mark (stronger reader) analyzed and critiqued the text’s composition and rhetoric without restriction while Pete (struggling reader) only engaged in such analysis when it was directly related to his own interests, preferences, and uses of the content of the text.

### **(Pilot) Study Four: How Well Do Struggling Readers Perform on Difficult (Game-Related) Texts of Their Own Choice?**

#### **Methods**

Based on the qualitative differences found in study three – with contrasting readers (Mark and Pete) positioning themselves differently toward the text except when individual interests, preferences, and uses of the text content were evoked – we decided to conduct a follow-up study that might take individual choice (and therefore agency) better into account. In study three, we chose the text participants read and ensured that each text (school-related or games-related) was appropriately leveled to their reading ability as determined by the initial QRI. In study four, currently only in pilot phase [1], we allowed the participants to *choose the topic of the text* and *did not artificially lower its difficulty* (recall that the average reading level of game-related texts was found to be 11.8).

Three struggling readers from study three were recruited for participation. We asked each boy to specify three game-related topics he was interested in reading about. We then selected one reading for each boy that met the following criteria: (i) it was on a topic the given participant expressed interested in, (ii) it was from one of the three most frequently cited information resources identified in study one, (iii) was at least as difficult as game-related text generally (i.e., reading level of 11.8 or higher), and (iv) was at least two grade levels above the participants current reading level (as determined by the QRI in study three). Each participant answered preliminary questions assessing their attitudes toward reading generally and prior knowledge about the topic and then read the text aloud while the researcher took a running record (Clay, 1993/2002) using the same procedures as in study three. Participants were then asked to give a retelling of the text (used to assess reading comprehension) and to answer two follow-up questions assessing attitudes toward the text topic itself.

#### **Findings**

Table 3 presents the pilot findings of this fourth and final study. All three participants were struggling readers with two participants reading three levels below their grade in school and one participant reading five levels below their grade in school. The game texts used ranged from grade level 12 in difficulty to grade level 14 (college), meaning that the boys were asked to read text that was seven to eight grade levels above their current reading level. Despite this large difference between text difficulty and current reading level, however, all three boys read at the “independent” level with an accuracy rate of 94-97%.

Table 3. Participants’ reading performance on difficult game-related text when individuals chose the topic.

Student	Age	Grade	QRI Reading Assessment	$\Delta$ (Grade – Reading)	Game Text Level	$\Delta$ (Text Level – Reading Level)	Accuracy
Ed	14	8	5	-3	12	+ 7	94.0%
Fred	14	9	6	-3	13	+ 7	98.0%
Mark*	16	11	6	-5	14	+ 8	97.0%

Of those errors that were made, the majority consisted of vocabulary words that were unfamiliar to the participants (e.g. “coup d’etat”) or words they had read silently before but had never heard aloud (e.g. “subtle”). All three readers exhibited a high percentage of self-correction rates (37%, 31%, and 57% respectively), suggesting that one potential source of the performance difference between study three (assigned texts, reading difficulty controlled) and study four (texts on topics of their choice, reading level substantially higher than their current purported ability) is an increased willingness to correct errors during reading performance. In other words, in the face of challenge or difficulty, it may be that increased interest in the content of the text results in increased persistence in the face of frustration leading to higher overall achievement.

## Conclusions

While it may sometimes be tempting to see “electronic media” like videogames as something distinct from reading and in competition with it, a view expressed unequivocally within the *Reading at Risk* report (Bradshaw & Nichols, 2004), our findings suggest that games (and perhaps similar media) are not replacing text reading but rather sit in a complex and productive ecology with them. Perhaps like all new media before them, games simply highlight the enduring importance of text and text based literacy practices to everyday life. In study one, we found that, while group organization resources were considered the most important form of textual resource for regular WoW gameplay, *information resources were the most prevalent* type of text used. Closer analysis of such information resources in study two revealed that such materials read at the high school graduation level (11.8), which places them in terms of overall difficulty somewhere between *Sports Illustrated* and *Time Magazine*. This higher level of difficulty stems not from the use of highly specialized “gamer” discourse (which accounted for only 4% of the text overall) but rather from frequent use of academic vocabulary (20% of the text sample) and densely multimodal, multi-authored, and multi-genre nature. In study three, we examined adolescent reading performance on such texts versus adolescent reading performance on school textbook samples of comparable difficulty in order to ascertain whether or not there were any differences between these two contexts. Quantitatively, we found surprising consistency across both texts types in terms of accuracy and comprehension. Subsequent qualitative contrasting case analysis revealed no notable contrasts in the way one strong versus struggling reader positioned themselves toward the text and task *except* when the reader’s own interests, needs, and uses for the text were evoked. Therefore, we conducted a fourth and final study (in pilot phase at the time of this writing) in which participants were able to choose the topic of the text and where we did not artificially ensure that its difficulty would be appropriate to their reading level. What we found was surprising in some ways yet predicted (Gee, 2003): All three “struggling” readers, when allowed to choose the topic, read text seven to eight grades above their reading level (as diagnosed by the QRI) with 94-97% accuracy rate – the highest level of mastery: independent.

Together, a picture emerges from these findings in which the reading activities that occur as a regular part of videogame play entail informational texts that include academic language and are structurally complex. Reading such game-related materials appears to entail the same reading performances and processes of reading activities required in classrooms. However, the fact that that activities related to them are *interest driven* appears to give them a serious edge over assigned and selected (school type tasks), potentially in particular for readers who are otherwise “struggling.” This notion is not all that new, although this may be the first empirical evidence for it of this particular ilk. Scholars who study games and learning have noted that children and young adults, within their affinity spaces (Gee, 2004), often read text that is far more complicated and difficult than what they (are willing to) read in school. If such is the case, and our preliminary findings suggest it is, then we need to ask ourselves to what extent we are testing “interest” and calling it “ability.” We may also need to consider whether the most powerful aspect of “games based learning” is not the complex system simulations they entail or the rules or roles or systems that constitute them but rather the fact that they are, in a way, Trojan horses for bringing interest-driven learning back into the frame of what we, as educators and learning science researchers, might think worth serious consideration.

## Endnotes

- [1] At this time, we have completed only the pilot study with three participants; the full study (n=20) will be conducted in early November 2009, after submission of this paper but before the final conference event.

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