

Real Arguments about a Virtual Epidemic: Conversations and Contestations in a Tween Gaming Club

Yasmin B. Kafai, University of California, Los Angeles, 2331 Moore Hall, kafai@gseis.ucla.edu
Jacqueline Wong, University of California, Los Angeles, 2331 Moore Hall, writejackie@gmail.com

Abstract: Recent studies have examined how argumentation around science is positioned and used in everyday interactions. Our research extends these investigations into a virtual world called Whyville.net and its annual outbreak of Whypox, a virtual epidemic. We observed and recorded players' conversations and contestations about Whypox in an after school gaming club. We found that club members' argumentation involved the use of warrants, rebuttals, and data as found in other studies of everyday argumentation. Players also developed different theories, some unwarranted, about the causes and spread of Whypox, and used the epidemic to position themselves as insiders. In our discussion, we address ways in which virtual epidemics connect to on-going research on everyday argumentation and provide starting points for students' learning about infectious diseases.

Introduction

The last decade has seen an increased interest in studying informal settings recognizing that outside school activities play a crucial role in students' engagement with and understanding of science. Most prominent has been research in science museums and after school clubs (Falk & Dierking, 2002), some of which has focused on identifying "learning talk" in museum visitors' casual conversations during interactions with exhibits (Allen, 2002; Callanan & Braswell, 2006). Other research has traced how museum activities connect to learning from family or school environments through the content of visitors' conversations (Crowley & Jacobs, 2002; Palmquist & Crowley, 2007). Recent work has taken a closer look at conversations of family visitor groups as dialogic inquiry, focusing on how learning is mediated by members of the group as well as materials such as exhibit texts and interactive elements (Ash, 2003). For the most part, this research has focused on activities and talk within the physical confines of a museum location or home.

Our research extends the line of inquiry to events in virtual worlds in which youth participate in large numbers. Virtual worlds can be defined as online spaces visited by thousands, if not millions, of players where they can engage in shared activities (Bartle, 2003). Unlike science museum exhibits only accessible for limited hours each day, virtual worlds offer access from anywhere and at anytime. These aspects of virtual worlds provide opportunities to participate in extended activities that require large number of participants (Bainbridge, 2007). A popular proposal is to use virtual worlds for simulating epidemic outbreaks to study people's behaviors and interactions; such outbreaks are difficult to replicate in real-world settings for ethical reasons alone (Lofgren & Fefferman, 2007). We focused on the educational prospects of the annual outbreak of a virtual epidemic called Whypox in Whyville.net, a virtual world with 1.5 million registered players ages 8-16, to study players' engagement and learning about infectious diseases. We were interested in ways that the participation in a virtual epidemic could provide a context for the type of argumentations previously observed in homes and museums.

To do so, we focused on the conversations and contestations about Whypox in an after school gaming club where we observed and video recorded groups of participants as they were visiting Whyville several times a week. During an outbreak of Whypox, infected Whyvillians show two symptoms: red pimples appear on their avatars and the ability to chat is interrupted by "sneezing" (i.e., typed words are replaced by "achoo"). Our research goal was to examine the content and structure of argumentation of our participants: Do club members engage in argumentation practices such as making claims and providing warrants when discussing different aspects of Whypox? What kind of theories do players develop about the cause and spread of Whypox? What role does Whypox play to position participants within the gaming club? In our discussion, we address the ways virtual epidemics connect to on-going research on everyday argumentation and provide starting points for students' learning about infectious diseases.

Background

Science education sees argumentation as a key inquiry practice (Duschl & Osborne, 2002; Kuhn 1993; Newton, Driver, & Osborne, 1999) because it is central to the practice of science (Latour, 1987). Numerous studies have focused on the particular challenges faced by students and teachers to bring argumentation into the classroom. For instance, students' problems in distinguishing between theory and evidence have been documented (e.g., Kuhn, 1993) and teachers' issues with orchestrating classroom discourse have been critically examined (Lemke, 1990). While part of this research focuses on written arguments (Bell & Linn, 2000;

Sandoval & Millwood, 2005), much attention is also given toward argumentation as part of classroom discourse (Kelly, Druker, & Chen, 1998; Driver, Newton, & Osborne, 2000). Whether they are written or spoken, students' arguments are generally analyzed in terms of the structures proposed by Toulmin (1958).

More recently, researchers have focused on the study of argumentation in everyday contexts asserting that this is the space in which youth learn and practice argumentation. While the structures of claims, data, warrants, and backings offer a powerful analytical tool for looking at arguments, many everyday arguments seem to lack these explicit structures. However, research has shown that many of these same structures emerge when elements that are left implicit by the speakers, such as assumption of shared knowledge, are taken into account (Bricker and Bell, 2007; Simosi, 2003). For instance, in Simosi's study of argumentation in a workplace, warrants and backings that seemed missing at first were apparent when considering the company's official rules and assumed norms. Bricker and Bell traced argumentation among parent-child or peer-to-peer conversations across multiple contexts including science classes, home and play. These cross-contextual analyses provided evidence that speakers often make references to past events — and not just rules and norms — which are often missed in research that focuses on one single context.

We expanded this study of everyday argumentation into the contexts of virtual worlds increasingly popular with children. Previous studies about the virtual epidemic Whypox focused on 6th grade classroom discussions directed by teachers (Neulight et al., 2007) or online chat content (Author et al., 2007). We documented that students often likened Whypox to naturally occurring infectious diseases they had learned about in their science curriculum. The chickenpox-like qualities of Whypox – its red pimples – might have led students to draw these conclusions (see Figure 1). In the analysis of online chat content we found a significant increase and drop in Whypox-related words concurrent with the outbreak and fading of the virtual epidemic (Author et al., 2007). The examination of players' face-to-face conversations about Whypox in the gaming club while simultaneously online in Whyville.net allowed us to continue the investigation of multiple contexts seen by Bricker and Bell (2007) as instrumental in understanding peer-to-peer everyday argumentation.



Figure 1. Whyville.net: Whyvillian with Whypox (left), Beach with infected Whyvillians (right).

In addition, we were interested in the kind of explanations or theories that players developed about the causes and spread of Whypox. Related research about tweens – a common term for youth around the age of 10 to 12 – and their understanding of the computer virus (Author, 2007) indicated that most of them focused on behavioral aspects of the virus, i.e., what it does, but were not able to provide biological explanations, i.e., how it functions. Our focus in this analysis was less on students' conceptual understanding of a computer virus but more on the explanations that players offered in the context of their interactions about the causes or the length of the virtual epidemic. We were interested in how the ideas or legends about Whypox spread through the community (Windschitl, 2001) as an indicator of the kind of ideas that contribute to the theory building of what a computer virus like Whypox might be like.

Finally, we place the study of argumentation about virtual epidemics within the larger context of research about the value of games for children's development. Most relevant here is prior research on children's conversational practices in games; these studies have shown how arguments serve to position players and communicate understanding (Goodwin, 1985; 2006). The Whypox virtual epidemic immerses players of the whole community because participation in it is not a matter of choice. Thus even those players who do not catch Whypox participate in the game as they make decisions whether or not to avoid the disease that might impact their online social contacts and interactions. We have proposed elsewhere (Author et al., 2007) to consider Whypox as a community or affinity event (Gee, 2003) because it creates a shared experience and history among its players. As such, participation in Whypox offers multiple points of connection into understanding the causes, symptoms and duration of infectious diseases (Au, Romo, & deWitt, 1999; Kalish, 1999; Parmelee, 1992) and thus have possible instructional applications.

Methods

Research Settings

Whyville.net is a multi-user virtual environment (MUVE), with over 1.5 million registered players at the time of the study, that encourages youth ages 8-16 to play casual science games in order to earn a virtual salary which youth can then spend on buying and designing parts for their avatars (virtual characters), projectiles to throw at other users, and other goods (Author, et al., in press). Social interactions with others are the highlight for most Whyvillians and consist primarily of chatting on the site where users are visible to each other on the screen (see the picture of the Beach in Figure 1).

In early 2005 we set up an after-school club at a school where 20 tweens ages 10-12 came to play on Whyville for an hour most days after school for three months. Most tweens were new to Whyville, though one had played for the year before the club started. Some of the youth were also students in one of the classes where Whyville was used as part of their infectious disease curriculum (see also Neulight et al., 2007). The players distributed themselves among 10 computers, often sharing a computer or wandering around the room talking to others. While the club began as a quiet place, it quickly became loud and lively as participants learned about the site and began to shout advice to each other, arrange parties on Whyville, chat, throw virtual projectiles at one another virtually, and critique each other's avatars. Often clusters of tweens would form around one computer when something interesting happened on Whyville.

Data Analysis

In order to study the youth's conversations at the after school club, two video cameras were set up to focus on small groups of youth clustered at tables with two to three computers. The Whypox epidemic lasted three weeks, 11 days of which were videotaped at the club. After an initial logging of the video data, we identified all conversations that were directly related to Whypox. As the novelty of Whypox subsided, the amount of Whypox talk decreased in later conversations. For that reason, we focused on the first two days when Whypox-related talk was most concentrated and analyzed the transcripts. We analyzed club members' inquiries about the nature of Whypox, such as identifying symptoms or making inferences and predictions about the duration or source of the sickness. We also highlighted social positioning and play where Whypox was incorporated into the group dynamics and activities of the tweens.

Findings

Whypox as a Context for Discussing Claims and Evidence about Virtual Epidemic

We found extensive conversations and discussions about Whypox in the gaming club where the tweens were both online and in a shared physical space. The virtual epidemic quickly became the subject of conversations since it impacted the two most popular aspects of Whyville: appearances of avatars and socialization. As such, the immediate concerns of the youth were to find out each other's infection status and to avoid getting sick. The following is an example of how one group reacted to and argued about the status of a boy's infection status.

Blake: Hey Dude, don't get me sick.
Scott: You're already sick man.
Blake: No, I'm not.
Scott: Yes you are, look, where are you.
Blake: I'm right here.
Scott: That's you?
Blake: Yeah I changed me.
Leslie: Where are you?
Blake: Right here.
Leslie: Oh you're not saying ah choo.
Blake: I know, I don't have the Whypox...

Scott claimed that Blake was already infected with Whypox. Based on their understanding that an avatar with Whypox would sneeze and have pimples, Scott and Blake both referred to Blake's avatar as evidence for their claim and rebuttal respectively. Eventually, the argument was settled when Scott and Leslie realized that they had mistaken another avatar for Blake's and confirmed that Blake's was "not saying ah choo." While this argument seemed incomplete at first, structural components such as warrant and backing emerged when we



Figure 3. Excerpt from a Whyville Times article addressing Whypox and its duration.

youth at the club that day when everyone was gathered together at the beginning of the club session. Leslie summarized for the convened club members that “you first... well... the thing [avatar] says achoo a lot, and then you start getting these pink bumps all over your face.” Aidan was also a student in one of the classes that used Whypox as part of their infectious disease curriculum. In class he had read an article on Whyville's virtual newspaper in which one Whyvillian described her symptoms from the 2002 Whypox epidemic, including the fact that her pimples first appeared on the second day of infection (see Figure 3).

A more specific crossover of classroom Whyville knowledge into conversations and arguments at the club concerns the duration of Whypox. One popular claim at the club was that it took seven days to recover from Whypox. Aidan seemed to be the main source of this idea at the club. The same article that he read also put forward the idea that Whypox only lasted for seven days in 2002 (see Figure 3). This idea propagated within the club and was subsequently repeated and accepted by other members. While Aidan and others who read the article based their claim of the seven-day duration on information from the article, it is interesting that the reference was not necessary once this information was accepted as a fact and commonly known among the club members. In many instances, the seven-day rule was invoked readily by club members in their conversations:

Blake: Aidan, it takes you *a week* to heal?

Aidan: Yeah.

And later:

Lela: What is whypox?

Paolo: You only get sick if you're around sick people.

Lela: Well, I'm not around sick people.

Paolo: Good, then you're healthy.

Leslie: It's only *a week*, no big deal.

Blake: I know it does only last like *a week*.

Tracing the idea of a seven-day rule from a classroom Whyville task to the casual conversations at the after school club illustrates how a common knowledge base can form around the youth's shared activity (Windschitl, 2001). This shared knowledge was present in the youth's conversations as they bantered with each others and tried to convince each others of their claims about Whypox. These arguments and demonstrations of Whyville knowledge took place in the broader social context of the youth's interactions at the club. As such, conversations about Whypox were also ways for the youth to position themselves within the club's Whyville community. The next section will revisit one of the excerpts above concerning Blake's infection status within its social context.

Whypox as an Affinity Event: Insider/Outsider Positions

Our last finding pertains directly to players' positioning as participants in Whypox. Unlike many traditional games that have established activity structures the organization of which can be negotiated in play

		Argument	Social Context
1	Blake: Hey dude, don't get me sick.		Does not want whypox
2	Scott: ... You're already sick man.	Claim (Whypox status)	Checking and stating gamers' status.
3	Blake: No, I'm not.	Rebuttal	
4	Scott: Yes you are, look, where are you.	Data	
5	Blake: I'm right here.	Data	
6	Scott: That's you?		
7	Blake: Yeah I changed me.		
8	Leslie: Where are you?		
9	Blake: Right here.		
10	Leslie: Oh you're not saying ah choo.	Confirming rebuttal	
11	Blake: I know, I don't have the Whypox, I wish I did.		Expressing desire to have Whypox.
12	Leslie: Why? (In a bitter voice).		
13	Blake: A choo. Ah choo.		
14	(Blake types aloud): Let go, let's go to the mall. Let's go to the mall. Oh fine I'll go to Mars. Teleport...Mars.		
15	Blake: Ah choo, poor guy.		Sympathy
16	Scott: Ah choo poor guy, that girls really sneezing. I don't sneeze that much.		Sympathy
17	Blake: You don't have the Whypox?		
18	Scott: No. I just sneeze.		
19	Blake: I don't want Whypox.		Does not want whypox
20	Leslie: Then get away fro, those people!	Claim (Spread by proximity)	Fear of getting whypox
21	Blake: No, but everyone here has Whypox.	Claim (Everyone has whypox)	
22	Leslie: Get away from those people.	Repeat claim	Fear of getting whypox
23	Blake: This is my friend.		Importance of socialization in whyville.
24	Scott: But he has Whypox, unless you want to catch it.	Data and repeat claim	Stigma and inconvenience of whypox override importance of talking to a virtual friend.
25	Blake: Yeah I want to catch it. No, just kidding.		Whypox as the basis of an insider joke.
26	Leslie: I read in this article, someone said that Whypox is sexy.		Whypox as the basis of an insider joke.

Figure 4: Analysis of the youth's arguments within their social context.

(Goodwin, 1985), it was not clear to some club members whether or not they wanted to be infected with Whypox at the beginning. On the one hand, Whypox disrupted the important social aspects of online chat and avatar appearance. At the same time, Whypox was becoming a topic of conversation and source of attention, with youth sharing complaints and strategies about the disease. Blake's reactions to Whypox provide a good example (see Figure 4). Within one conversation, he changed from his initial negative "don't get me sick" response to a positive "I don't have Whypox, I wish I did". Soon following this comment, he expressed sympathy toward an infected player on Whyville, a sentiment shared by his club friend, Scott. Later in the same conversation, Whypox became the context of the group's joke, with Blake repeating again that he wanted to catch the disease, although "just kidding" this time. Leslie responded by commenting that "someone said that Whypox is sexy", which prompted the group to laugh.

Later on the same day, Blake was infected with Whypox as well. Despite expressing his earlier wish for Whypox, he complained that he was sick and joined others in expressing frustrations about the symptoms. On the next day, when it became apparent that Ben didn't know about Whypox, Blake led the others in expressing disbelief and ridicule:

Blake: You don't know what the Whypox is?
 Ben: No.
 Blake: He doesn't know what the Whypox are.
 Leslie: Oh my god.
 Blake: That's just sad. You should already know.

While the conversations mentioned here around Blake were particularly rich with Whypox references, the sentiments expressed were common. One frequent response to seeing avatars with Whypox pimples, including one's own, was verbal disgust (e.g., "Ewww...") accompanied by drawing nearby club members to witness "how ugly my person looks". One's Whypox status could invoke both positive and negative reactions, with club members expressing pleasure (e.g., "Yes!") when they remained uninfected or displeasure (e.g., "I hate the Whypox.") when dealing with symptoms. Since many assumed that the disease could spread by proximity, Whypox also induced social ostracism, with frequent exclamations of "Get away from those people!"

At the same time, other club members had shared Blake and Scott's sympathy towards those who were infected (e.g. "poor guy"). The conversations described here serve as examples of how Whypox became a part of the club's Whyville community and created affinity between those who were in the know and those who weren't. The argumentation about Whypox's infection status, causes, and duration took place within this social context and was one way through which the youth participated in the club's Whyville community and demonstrated their insider status.

Discussion

Our findings illustrate how participation in the Whypox virtual epidemic initiated arguments among peers. We found evidence that claims in regard to several aspects of the virtual epidemic (e.g. causation, spread, and symptoms) were stated and club members either sought to confirm or rebut those statements using different data sources as evidence (e.g. observation, data check in records, and exceptions to rules). We saw that the argumentation in this context was not as tightly structured as in scientific contexts because participants assumed shared understanding (Simosi, 2003). We witnessed how quickly particular aspects such as the "seven-day rule" of Whypox became common knowledge, like an urban legend. It is possible that club members stated this to comfort others who had succumbed to Whypox, suffering from disgraced appearance and reduced chat ability. While no one club member could explicitly point to the particular source of this rule, it became conventional wisdom in the club that the virtual epidemic would only last seven days. Our knowledge of related activities in the classrooms illustrated that everyday argumentation makes not just reference to shared understanding such as the 'seven-day-rule' but also connects participation across different contexts such as the Whyville virtual environment, the classroom, and the club (Bricker & Bell, 2007).

Perhaps the most interesting finding concerns the conversations among club members about the desirability of having Whypox and what one should know about it. We know from analyses of the online chat records that some Whyvillians deemed Whypox important enough to fake one of its symptoms by typing 'acho' into their chat bubbles. These observations provided pointers that experiencing Whypox generated the desired 'affinity' characteristic of gaming communities (Gee, 2003). We have argued elsewhere that affinity events such as Whypox have the potential for educational impact because they affect the community at large and create motivation for further investigation (Author et al., 2007). We know from related research that the emotional impact associated with Whypox was one of the main reasons for Whyvillians to choose to engage in further investigations in Whyville's virtual Center for Disease Control to examine the bulletin board postings or to use the disease simulators. (Author et al., under review).

One aspect that deserves further investigation is the breadth and depth of the arguments we observed in the face-to-face club setting when compared to the rather sparsely worded exchanges in online chat or the limited participation in the bulletin board postings. We initially expected that club members would make only occasional and short references to Whypox, not the kind of extended conversations and contestations we recorded in the video transcripts. Our expectations were based on prior analysis of the online chat records (Author et al., 2007) which indicated that Whyvillians were mentioning Whypox (and related terms) in their online interactions. It is possible that the bubble format of the online chat is partially responsible for the lack of connected claims and rebuttals. The bulletin board setting in the virtual Center for Disease Control also lacks the color and social setting found in other online spaces in Whyville. It might be worthwhile exploring what can be done to bring the conversations we observed in the club setting into the online space.

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