

## **Life in the Times of Whypox: A Virtual Epidemic as a Community Event**

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**Abstract.** Virtual communities have become a central part of children's social landscape. Some of them, called multi-player online games, invite thousands of children to join and play together. Their online interactions are structured around socializing, shopping, and e-mailings. At occasion, particular events such as player revolts, virus outbreaks, or organized ostracism bring together the geographically dispersed players of such online communities and constitute what we call community events. As a case in point, we focus on Whypox, a virtual epidemic that took place in Whyville.net, a teen online community with over 1.5 million registered players ages 8-16. To understand how events such as Whypox impact life in online communities, we analyze tracking data, chat content, newspaper postings, survey and interview descriptions and play interactions. We discuss implications of our findings in relation to Gee's (2003) notion of affinity groups, propose design parameters for designing community events, and outline educational applications.

In the past ten years, multiplayer games have increased in popularity with now millions of players spending dozens of hours or more online each week. Researchers have documented many aspects of the activities and motivations of players highlighting how players in these communities are defined by a common set of endeavors and social practices. Gee (2003) called game communities for this reason 'affinity' groups. Often particular practices such as avatar selling and adena farming or events such as warrior revolts and virtual elections are used to illustrate issues with community norms (Steinkuehler, 2006), ownership and freedom of expression (Taylor, 2002; 2005) in virtual worlds. With few exceptions

(Cassell, Huffaker, Tversky, & Ferriman, 2006), most of these practices and events have been emergent phenomena.

But it also possible to engineer such events and thus to create opportunities for interactions within an online community that could be harnessed for educational purposes. We propose to call them community or affinity events because they are key aspects of community life on a large scale. Such events should be of interest to organizers of online communities because they create a shared experience for community members and offer opportunities for engagement and inquiry.

With that in mind, we chose to launch and study Whypox, a virtual epidemic, as a community event in a teen MMO called Whyville.net. At the time of the study, it counted over 1.2 million registered users, mostly between the ages of 8 and 16, who collectively explored over 50 million pages pertaining to topics in science, economics, and citizenship. About once a year, an outbreak of a virtual epidemic called Whypox immerses the whole community. 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”). Whyvillians can track their disease in community graphs, post theories about its cause and transmission mechanisms, and make predictions about when the epidemic will end. They can also run simulations of the epidemic, read articles in the Whyville newspaper, and chat about it with each other. In early 2005, we observed the outbreak of Whypox and examined potential learning aspects of Whyvillians’ experience. We gathered information about participants’ online interactions and personal experiences with the disease to understand the impact of the event on different aspects of community life and its potential as a model for educational interventions.

## **Background**

As recent media reports and sale numbers indicate, massive multiplayer online role-playing games (or MMOs) are no longer a marginalized activity (Electronic Software Association [ESA], 2005). They are played by millions of people—children, teens, and adults alike. These environments are complex dynamic worlds in which players often spend thousands of hours to create their own avatars and engage in quests individually or together with others. Many researchers provide rich descriptions of what daily life in these online communities looks like (Castronova, 2005; Duchenaud, Yee, Nickell, & Moore 2006; Gee, 2003;

Taylor, 2006). These online communities have also been called affinity groups (Gee, 2003) because players, unconstrained by geographical boundaries and time zones, are united by a shared interests, enterprise and experience.

While many aspects of these communities are designed (i.e., computationally rendered) and controlled by companies, players' interactions and conversations determine the community dynamic. Recent events in commercial MMOs, such as the warrior revolt in World of Warcraft™ [WoW] (Taylor, 2005), selling of avatars (Taylor, 2002), and paid gaming (Steinkuehler, 2006) exemplify the dynamic nature of these communities. Not one of these events were foreseen by the game designers or players; they emerged through interactions between online users and game constraints. Discussions of these events have reached far beyond the game community because they touch upon universal issues: (1) freedom of expression: the warrior revolt in WoW was an online demonstration organized by players to demand redesigns of avatars from the company which resulted in suspensions of participating players' accounts (Taylor, 2005); (2) ownership: companies' resistance to the selling of avatars on eBay.com by players who had invested hundreds of hours to build up their inventories and powers (Taylor, 2002); and (3) racism: practices of paid gaming led to ostracism of Chinese players (Steinkuehler, 2006). Discussions of such issues are important aspects of community life, because they raise awareness and create shared experiences.

All of the examples above were spontaneous and unintended events. However, it is also possible to create such events by design. One example is the election process of leaders for a summit meeting in a virtual teen community (Cassell et al., 2006). Although this event was predominantly examined as a study of language in leadership, it can also be seen as a shared event for this particular community that brought together thousands of youth from different continents. Most of the existing research around affinity groups has focused on describing their shared norms, practices and endeavors (Gee, 2003). We wanted to introduce the concept of a community event within the context of affinity groups to highlight the importance that shared experiences have for the life in a community. While endeavors may point to a common goal that members collectively aim to achieve in the future, the experience of a community event, positive or negative, can serve as a magnifier of what's critical and valued in this community. The design of such events for virtual communities and their potential impact for education has received little attention to date and is the focus of our study.

In our case, we have chosen a virtual epidemic as a community event. Unlike the virtual elections, participation by members of the online community was not voluntary because players had no choice whether or not to experience the epidemic and its consequences. Historical accounts of the Bubonic plague (Kelly, 2005) or the 1918 influenza outbreak (Kolata, 2001) testify to the large-scale impact these epidemics had on every aspect of community life. According to Jared Diamond (1999), epidemics have impacted societies' survival or extinction over the course of the last 14,000 years.

The Whypox epidemic in Whyville is not the first instance of an epidemic in a virtual community. In May 2000, a lethal guinea pig killed Sims players (BBC, 2000). In September 2005, the unplanned outbreak of a deadly virus in World of Warcraft™ became a story in the mainstream news media (Ward, 2005). It is easy to dismiss these events prematurely. After all, they take place in a game world. Unlike their historical counterparts no player experienced physical harm or loss of life. Only players' avatars and accounts were wiped out. However, this represented a loss of hundreds of hours of time invested. Consequently, it created a great deal of frustration – and excitement.

Our interpretation of these events is that they serve as illustrations of particular aspects of virtual life: They actively create community as members voice their opinions about particular events and express their belonging in positive or negative terms. Regardless of the reaction, this engagement can be seen as an expression of affinity (Gee, 2003). Our investigations started with some simple questions that transcend the headline grabbing aspect of these events: How do such events impact community life? What traces do they leave? Who participates and who does not? The answers to these questions are not trivial. They are of interest not only to designers and organizers of large-scale MMO's, but also to educators as opportunities for learning (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005; Bruckman, 2000; Dede, Nelson, Ketelhut, Clarke, & Bowman, 2004).

## Methods

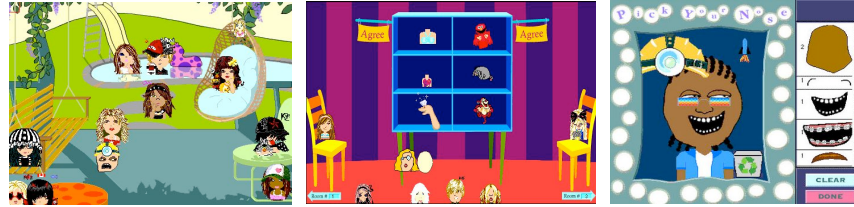
Our study took place in 2005 in collaboration with Numedon, Inc., the company that hosts Whyville and collected the tracking data and online surveys for us. The study sample is comprised of over 595 Whyville players who were recruited via announcements on the web site. The sample is representative of Whyville's gender and age distributions (68%

are girls; median age = 13 years). Included in our sample are 41 children between the ages of 10-14 from two after-school programs whom we observed in person during their engagement with Whyville (Leander & Kim, 2003).

The data collected over a six month period includes (1) log files that recorded all Whyville-based actions of consenting Whyville participants, including information about locations visited, time spent there, and chat content (~70 million data points); (2) online surveys (pre- and post-epidemic) that asked participants (with a combination of multiple choice and open-ended items) about their science and technology interests, understanding of infectious disease, and experiences and preferences in Whyville activities; (3) field notes and video recordings of classroom students and after-school club participants while on Whyville; (4) face-to-face interviews with selected participants about their Whyville interactions, and (5) embedded ethnography that chronicled Whyville community life before, during, and after the virtual epidemic. We used a mixed models approach (Onwuegbuzie & Johnson, 2004) to complement and triangulate these data sources.

## **Life in Whyville before Whypox**

Like many MMOs, Whyville provides a home to thousands of players that visit the community on a regular basis (Kafai & Giang, in press). On a typical day Whyvillians log into Whyville and check their y-mail accounts (intra-Whyville email) for new messages and their salary ledger for current account status. Whyvillians can earn (at every login) a regular salary paid for in “clams,” the virtual currency. Whyvillians then go to popular locations such as the virtual beach or teleport to one of the planetary colonies to chat with others. They can also play checker games or complete more science-focused activities to increase their salary. They can read articles posted weekly and written by members of the community in the Whyville Times for updates on community life. Frequently, they will go to the virtual mall, Akbar’s, to browse through the latest offerings of avatar face parts for purchase (e.g., eyes, hair, lips, clothes, accessories, etc.). They can also sell and trade face parts at a virtual trading post (see Figure 1).



**Fig. 1.** Whyville Places: Playground (left), Trading Post (middle), and Avatar Design (right)

While there are an abundance of potential activities available in Whyville, some are more popular than others (see Table 1). From our analysis of the tracking data, we found that Whyvillians spend most of their time constructing their avatars (shopping for, designing, and assembling face parts) and chatting in the social spaces on Whyville (see the “face” and “social” categories in Table 1).

**Table 1**  
Distribution of Location Visits

Location Category	BEFORE	DURING		AFTER
	Jan 21 to Feb 4	Feb 5 to Feb 18	Feb 19 to Mar 4	Mar 5 to Mar 18
Face	105138 (32%)	222717 (34%)	242559 (32%)	218724 (31%)
Game	9530 (3%)	16583 (2%)	20129 (3%)	19853 (3%)
Null	66106 (20%)	137559 (21%)	151550 (20%)	145818 (21%)
Other	21857 (7%)	49538 (7%)	50004 (7%)	50995 (7%)
Salary	6701 (2%)	12197 (2%)	13826 (2%)	118235 (2%)
Science	11262 (3%)	24626 (4%)	36159 (5%)	24700 (4%)
Social	90756 (28%)	169182 (26%)	196387 (26%)	193725 (28%)
<b>Whypox</b>	<b>1758</b> (1%)	<b>2342</b> (0%)	<b>5386</b> (1%)	<b>3154</b> (0%)
Whyville	16353 (5%)	28666 (4%)	33516 (4%)	34034 (5%)
Total	329461 (100%)	663410 (100%)	749516 (100%)	702838 (100%)

In our local observations of the after school club, we found gender differences in the ways kids socialized on Whyville, though not in the amount of time and effort spent on avatar design. While both boys and girls frequented the same social spaces and y-mailed friends from the club and new friends on Whyville, boys tended to spend more time organizing complex projectile-throwing play (the Whyville equivalent of tag or a food fight) and collecting girlfriends (one boy claimed to have 20), while girls focused more on filling their address book full of “friends” and y-mailing each other frequently (Kafai, in press). So when these two vital aspects of life on Whyville (avatar appearance and chatting) were affected by the onset of Whypox, it affected the community in some aspects but not all.

### **Arrival of Whypox in Community**

When Whypox hit Whyville, it had an immediate affect on Whyvillians there, largely because it manifested in the two most popular activities: designing avatars and socializing. The first symptom of Whypox is the appearance of red dots on one’s avatar. The second symptom is the random interruption of chat with an “Achoo.” In addition, Whyvillians had trouble teleporting to other planets. Instead of “teleport moon,” a person with Whypox might say “Achooteleport moon” and have to re-type the command in her chat bubble. It also affected projectile throwing. So where normally someone could type “throw mudball masher47” and a mudball would travel from the thrower to the intended target before the target saw the throw-command, with Whypox it might come out as “Achoothrow mudball masher47” at which point the intended target (in this case masher47) would have time to move before getting hit. While these features of Whypox may at first seem funny or a nuisance, they interrupted valued social functions and activities.

Below is an example of how one boy first encountered Whypox and his curiosity, inquiry, and then frustration with it (see Figure 2). According to our tracking data, masher47 (pseudonyms are used for all participant names and screen names) logged on to Whyville on Saturday morning February 5, the day Whypox began from 5:16 – 6:54 p.m. (or 17:16 – 18:54). At 17:16:00 (times are listed in hours:minutes:seconds), almost immediately after logging in, he teleported to Mars and saw a friend from the club, Trevor. Then he engaged in his typical practice of making friends and flirting with potential girlfriends by going around Whyville and saying “hi” or “asl” (age-sex-location). After a couple of minutes, at 17:18:29 he noticed someone sneeze (say Achoo) and

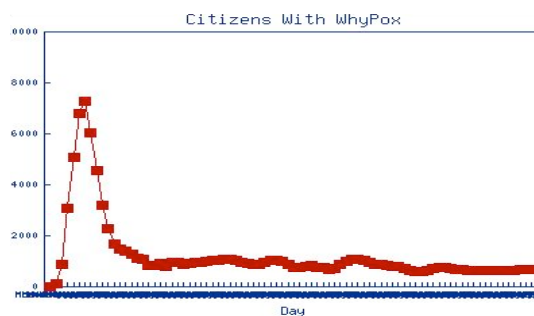
whispered “bless you.” Probably having noticed a number of people saying “Achoo” he then went to the Moon and then back to Mars to see if the sneezing was happening everywhere and asked, “what is wrong with everyone?” (17:21:28). Notice that these questions are in public chat that everyone can see (the equivalent of yelling to a room full of people) whereas whispers are used for private conversations with someone, usually in a follow-up to a “hi” or his question of what’s wrong. At 17:26:06 he realizes that he himself has caught Whypox, and now Achoo appears in his chat and whisper and even interrupts his teleporting (17:36:44). In fact, he even notices someone starting to say “Achoo” after talking with him and asks, “Achoo did i get you sick” (17:43:20).

17:16:00 chat teleport mars	<i>Goes to Mars and says hi to his friend from club</i>	
17:16:22 whisper what's up Trevor		
17:16:48 whisper hi		
17:17:16 whisper hi		
17:17:53 whisper hi		
17:18:09 whisper asl?		
<b>17:18:29 whisper bless you</b>		
17:20:11 chat teleport moon		
<b>17:21:28 chat what is wrong wti everyone?</b>		<i>Goes to Moon and Mars to see if the sneezing is happening everywhere, asks people what is going on</i>
17:21:56 chat teleport mars		
<b>17:22:42 chat what is wrong with everyone</b>	<i>Catches whypox Realizes he has caught whypox</i>	
17:23:14 whisper yes		
17:23:37 whisper ok		
<b>17:25:50 whisper Achoowat</b>	<i>Asks for help with whypox</i>	
<b>17:26:06 whisper no</b>	<i>Others start to react against his whypox</i>	
17:26:17 whisper Achoono		
<b>17:26:47 chat help</b>	<i>Shows his frustration with whypox</i>	
17:28:08 whisper thank you		
17:28:17 whisper sure		
17:29:07 whisper Achoot you got some thing against me		
17:29:31 whisper you		
17:30:15 whisper hi		
17:31:19 whisper Achoo. this stinks		
17:32:17 whisper Achoo see ya		<i>Goes to Moon</i>
17:32:48 whisper hi		
17:33:57 whisper hi		
17:34:45 chat teleport moon		
	<i>Failed attempt to go to Mars</i>	

17:35:08	whisper	hi	<i>Realizes that he might have given whypox to someone</i>
17:35:52	chat	Achoo hi you two	
17:36:16	whisper	Achoohi	
17:36:44	chat	Achoo teleport mars	
173722	chat	teleport mars	
173817	whisper	Achoohi	
173859	whisper	hi	
173924	whisper	Achoohi	
174106	whisper	Achoo hey nice hair	
174207	whisper	hi	
174239	whisper	Achoohi	
<b>174320</b>	<b>whisper</b>	<b>Achoo did i get you sick</b>	

**Fig. 2.** Log file of Masher47 on Day 2 of Whypox

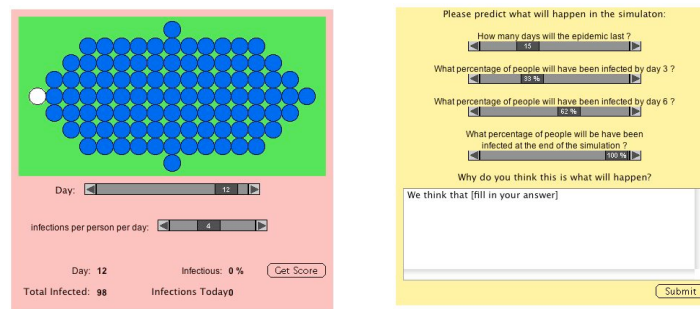
What masher47 experiences on a personal level reverberates through the community. The virus spreads fairly quickly and within three days of its launch, the disease has peaked and infected more than 4000 community members. In the clubs and online, Whyvillians freely offered advice and folk cures for Whypox just as they shared other insider “expertise” (Fields & Kafai, 2007). It is at this point that the virtual CDC established in Whyville becomes important. On the opening screen, Whyvillians can see a regularly updated graph that displays actual levels of infection throughout the community (see Figure 3).



**Fig. 3.** Level of Whypox Infections in Whyville Community at CDC

The Whyville CDC also features an archive with information about previous infections and a bulletin board where players posted

predictions about the causes of Whypox and when it would go away. Within these postings, most Whyvillians agreed that people got better within two weeks, but there was greater variety in their predictions about how Whypox was spread. Common responses were from chatting or y-mailing with someone infected, getting hit with a projectile from an infected person, or just being in the same place as other infected people. Others thought you became infected from the sun or not wearing warm e clothes when it was cold outside. One reason for the variety in responses, besides that there was more than one way to become infected, is because for each idea posted, others would post counter ideas. These often cited a time when someone did an activity that should have infected them and didn't get infected. In fact, being in the same virtual space with already sick Whyvillians was the main vector for infection during this launch of Whypox. In previous years, other vectors such as chatting or ymailing had been used by the company. In addition, there are two simulators that allow players to run small-scale and short time simulations of epidemics (see Figure 4). In both types of simulators players make predictions given the parameters they set and then compare their predictions to the results from the simulation. Visiting the Whyville CDC and participating in these and other activities was not a required part of community life, a forthcoming study will investigate those players who visited the CDC and participated in activities that provided a more in depth analysis of Whypox and infectious disease (Quintero, in preparation).



**Fig. 4.** Epidemic Simulations at CDC

We know from our tracking data that visits to the CDC before the outbreak of Whypox are close to non-existent with the exception of the occasional curious peek or accidental visit by players. This all changes

once Whypox arrives and the number of visits jumps to 5,386 in a two-week window (see Table 1). Of particular interest are the experimental simulations that Whyvillians could use to test hypotheses about rates of infection and epidemiology. We found that the frequency of use peaks during the Whypox outbreaks: over 1,400 simulations were performed by 171 study participants. While 30 of them were one-time events, we also saw that 116 Whyvillians engaged in some form of more systematic investigation by running the simulations three or more times. Of these, 57 (49%) demonstrated significant improvements in the accuracy of their predictions (Feldon & Gilmore, 2006).

Outside of the CDC, Whypox leaves visible traces that intensify and then recede over time as the disease fades away. Most prominently, these changes manifest in avatars, which are covered with red pimples (see Figure 5). As Zachary, one after school club members states, “Besides, it’s really weird, sometimes it’s not in the body, like the hair.... Dot dot dot on the neck, dot dot dot on the body.”



**Fig. 5.** Whyvillians with Whypox

According to surveys completed after the outbreak, the introduction of Whypox into the Whyville community elicited a wide range of emotions from Whyvillians. The majority, 61.5%, said that Whypox made them feel “bad.” Of those who had Whypox, 23.1% saw nothing positive about the experience, and 37.6% cited the hurt social interactions from the sneezing (interruption of chat) as the worst thing about Whypox. This is compared to the 16% who felt that the spots were the worst part of the experience: “I tried to get rid of them cause they felt like- disturbed me- like when I was trying to go on Akbars and I have these big red things on my face and that makes it different when you’re trying on things.”

It is, however, the impact of their chat interactions that bothers Whyvillians the most. We examined chat content for the occurrence of certain Whypox-related terms such as ‘pox’, ‘sick’, and ‘spot’ (see also Table 2).

**Table 2**  
Distribution of Whypox-related Terms in Public Chat Before, During and After Whypox Outbreak

Whypox terms	BEFORE	DURING		AFTER	Total
	Jan 21 to Feb 4	Feb 5 to Feb 18	Feb 19 to Mar 4	March 5 to March 18	
Pox	4	1114	110	65	1293
Sick, ill	68	328	79	73	548
Spot	68	37	63	42	210
Cough	15	42	20	11	88
fever	0	6	1	1	8
sneeze	2	24	4	2	32
Vaccine, vax	0	2	0	0	2
cdc	2	13	0	1	16
cure	0	24	5	2	31
achoo, Acho,					
Ach-oo*	4	359	23	21	407
Achoo	35	4591	278	361	5265

Notes: \*Faked or user-initiated sneezes became a feature of chat, as Whypox became a social phenomenon. Three common fake spellings of Achoo are listed in the second to last line above.

When analyzing the chat interactions before, during, and after the outbreak of Whypox the frequency of these terms increases significantly with the outbreak and then disappears again. Technically there isn’t an exact end point for the virtual epidemic when the outbreak has been eradicated. It’s the presence of spots and achoos that is no longer visible and thus not reflected in chat interactions.

Perhaps our video records of the Whyville activities illustrate most vividly how Whypox and the CDC affect kids’ activities. In the transcript below (see Figure 6), three members of a classroom where Whyville was played engage in trying to figure out how Whypox is passed between citizens. First, when Aidan (aka masher47, a couple days after he caught Whypox in the transcript above) logs on, he and his friends notice the many spots on his face (lines 1-2). Then they decide to go talk to people on the beach and see if they catch Whypox when Aidan chats with them (lines 3-5). Kyle theorizes that there are enough people with Whypox at

the beach that “there everybody’s going to get sick no matter what” (line 7). They perform what they think necessary in order to make a new case study at the CDC, and go to the CDC where Aidan is struck by how many people now have Whypox, and Molly reads off the graph the number of people now infected (lines 27-29).

1	<b>Molly:</b>	<b>Oh- yeah you have 'em.</b>	<i>Molly sees spots on Aidan's avatar and confirms that he has Whypox.</i>
2	Aidan:	I have booils! ((laughing))	
3	Molly:	You have to go to um, go to the beach	<i>The three decide to go to the beach and talk to people so they can report something about Whypox.</i>
4	Aidan:	Oh wait, wait wait wait.	
5	<b>Kyle:</b>	<b>You have to go talk to people.</b>	
6	Aidan:	Aw who's this guy, he looks cool.	<i>At the beach they identify people with Whypox, talk to others, and come up with something they want to report at the CDC.</i>
7	<b>Kyle:</b>	<b>See there everybody's going to get sick no matter what.</b>	
8	:	Achoo - here that guy said achoo. Achoo achoo.	
9	Aidan:	I don't see Gabe.	
10	Kyle:	So?	<i>Aidan types to someone, apparently waiting to see if that person says "Achoo" after he chats with him.</i>
11	Molly:	Okay, talk with someone and then go to-	
12	Aidan:	CDC.	
13	Aidan:	Hi per-son	
14		Hi person.	
15		Hi person.	<i>Aidan is shocked by the peak in the graph. Molly points out how many people have Whypox.</i>
16	Kyle:	What was that?	
17	Aidan:	I said hi person.	
18	Molly:	Here, go to CDC	
19		CDC	
20	Aidan:	Achoo?	
21		Bye person.	
22	Molly:	Oh no you're passing, you're passing CDC.	
23	Aidan:	CDC's right there.	
24	Molly:	CDC stop!	
25		CDC.	
26	Aidan:	C-D-C.	
27		<b>Whoa!</b>	
28	<b>Molly:</b>	<b>It's up to eight thousand ((pointing)).</b>	
29		Up to eight, oh seven thou- oh um, eight thousand or so.	

**Fig. 6.** CDC visits in after-school club [transcript excerpt]

At the same time that Whypox was peaking, articles begin to appear in the Whyville Times. In the February 6, 2005 and February 13, 2005 issues, when Whypox was the most prevalent, 3 of 20 and 5 of 21 articles, respectively, appeared in the weekly issues. In these articles, Whyvillian authors discussed when and where they discovered Whypox,

theories for how it was transmitted, and even a scam where some Whyvillians “offered” to heal those infected if only they would be given passwords to accounts so that they could use their “computer genius” to cure people. Some even wrote poems about it (See Figure 7). Interestingly, many articles reported discovering Whypox the same way that masher47 did. They saw it in one place and thought it might be a joke, then went to another place and realized that something different was happening. As one author described it: “Other times before this morning, people would go around faking the Whypox and saying Achoo. I played along this morning, fake sneezing like everyone else. But little did I know, they were sneezing beyond their control.”

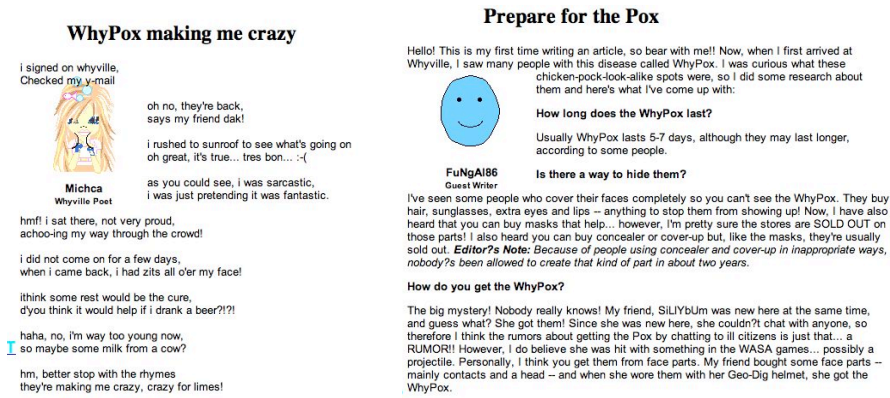


Fig. 6. Excerpts from Whyville Times in 2005

## Life after Whypox

By all accounts we have evidence that Whypox as a community event impacted various aspects such as navigations, conversations, and announcements of life on Whyville. Many Whyvillians (43.9 %) felt that Whypox was like a real infectious disease, citing its contagious nature as the most realistic feature. Thus, if Whypox came back, 54.8% said that Whyvillians should isolate themselves. This is also consistent with the 65.7% of Whyvillians who did not try to cover up their Whypox with face parts, “I didn't do anything because it doesn't mader what you look like, & if you covered it up...that doesn't mean you don't have it ne more!” Not everyone was so modest, as 32.3% cited their looks as the reason they attempted to cover up their pox.

When pressed to give a positive view of the Whypox experience, the most common response, 12.8%, was that Whypox helped improve social interactions; everyone had to go through it, making you more a part of the community. One Whyvillian said, “It made me feel like if someone made fun of another dude/ett everyone would have ypox and everyone would stick together. And help that one person cause it doesnt just affect that person it affects everyone with whypox around that same person. And I felt I was proud of having ypox at that time...” This is consistent with the 17.4% of Whyvillians who did not get Whypox, but wanted to. Going through the experience of Whypox was an integral part of Whyville community life.

From interviews with after-school club members, we know that having Whypox impacted movements on Whyville regarding where players would go. As Alex states, “Some people with Whypox would go to the mall so I would go to another place so I wouldn’t catch it.” It also affected social interactions. Although some remained normal (e.g., “I treated the same people normally. Cause it’s like they’re having a cold”), social ostracism also occurred: “And uh I mean it wasn’t that great cause un no one really trades or gets near you and what’s that word, you can’t chat with people because if you had Whypox and another person had Whypox you can both chat with each other but if you... if this other person doesn’t have Whypox he’s not going to want to talk to you cause he doesn’t want to get they Whypox” (Emmet).

It also created a forum for developing theories about the cause and promoted the spread of Whypox. Some club members pointed to different sources such as face parts (“Well, I didn’t cover up my face because I thought it had something to do with the face part. And changing them a lot and I thought that carrying it was the face part and that’s why...”) or standing on someone that in contact might infect a player “I figured if you stand over someone like right on top of them they’ll have the Whypox.” Others thought that having scarves purchased on Akbar’s would help fend off getting the disease. “My friend gave me a scarf so...yeah. I put it around my neck and that’s what helps.”

## **Discussion**

What can we say about the virtual plague that sought out Whyvillians? We put forward the case that Whypox could be considered a community event along the following criteria: outreach, interactions, and reactions. One way to look at large scale impact is just to look at the sheer number of

Whyvillians that were infected with Whypox and the rate of infections. Judging by the community graph, thousands of active Whyvillians had visibly contracted the disease. Beyond quantity, Whypox also affected key aspects of community life on Whyville, appearance and communication. The most apparent changes were the avatars that represent players in Whyville. These avatars are personal constructions as each player selects and purchases his or her own face parts and accessories. The red pimples covered everything, and players undertook various actions such as buying scarves or paper bags that would cover up the signs of the disease.

An additional and even more important aspect of Whypox was its impact on chat. We know from the analysis of key words related to Whypox (e.g., pox, ill, spots, etc.; see Table 2) that having or observing the disease was a topic of conversation during its outbreak and then disappeared again once it was over. By examining the content of chat and whisper conversations it became clear that participants were also debating more substantial issues such as the causes of disease and possible protections. Whyvillians' reflections on the Whypox experience also indicated multiple dimensions of affective responses that ranged from avoidance of infected members to pure ostracism and from feeling distressed to annoyed and clearly uninterested. Whypox left its impact across players' looks, feelings, and actions.

One may wonder about the implications beyond this event itself. The archives serve as a form of community memory for this event documented in the Whyville Times and the bulletin board. Thus, they can serve as a reference point for future cohorts of Whyvillians joining the community. More important, discussions around Whypox provide some form of shared communal experience that is indicative of affinity groups. While Gee (2003) described the organized experience of guilds in multi-player video games or bird watching in clubs as key activities in affinity groups, we would argue that casual participation in community events such as Whypox can also create an affinity experience. Teens who join virtual communities such as Whyville come from different geographical regions spread across the country and continents. While dating and flirting are prominent on the site, community events such as Whypox can create a common bond not found in their lives outside of Whyville. As found in the surveys, whether or not Whyvillians were actually infected with Whypox was not important – the experience of living with the infections or with the infected affected all members of the community. Even choices, such as going places where nobody has Whypox or not coming online at all are choices that reflect impact and the simple act of avoidance

acknowledges Whypox's existence. In the next section we want to discuss how we can leverage our outcomes for designing different types of community events and designing them for learning.

### **Designing Community Events**

From a design perspective, community events offer a unique opportunity for community management. It might be worthwhile to think what the minimum parameters for such interventions are. The virtual plague affected large number of participants over several days in visible and invasive ways. In contrast to the plagues observed in the Sims and WoW, no long-lasting harm was done, as players did not "die." Tator Day is a different type of community event that only lasts a day but targets a core feature of Whyville community life: avatar's online appearance. During Tator Day, all heads are turned into blue faces thus removing all of the personal customizations efforts by Whyvillians. When players decide to join Whyville, their assigned face is a blue oval with eyes. Newcomers thus are very visible during their first days when they visit the site until they have accumulated enough clams to purchase face parts at Akbar's.

It seems now possible to conceive of a matrix of key dimensions for community events: a *temporal* dimension that defines the length of the community event (from one day to several days or weeks), an *impact* dimension that is based on the core features of community life (online appearance, online discussions), and *choice* dimension that describes the event participation being either by choice or by presence. For example, in the World Summit elections (Cassell et al., 2006), youth could decide to participate in this event whereas in Whypox community members had no choice but to experience the event unless they opted to not visit at all. A possible fourth dimension not explored here would be the *scale* of impact, whether the whole community or just a subsection will participate by choice or experience in the event. In Whypox all players participated whereas the World of Warcraft™ virtual outbreak was limited to a particular server section. In future research, it might be worthwhile to investigate different combinations of these dimensions.

### **Educational Applications of Community Events**

A further application of community events is the opportunity for instructional engagement and inquiry, an aspect of games under discussion in policy and practice (Glazer, 2006). Researchers like Gee (2003) have

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argued that game communities showcase many promising features of successful learning communities: gamers engage in problem solving, information searching and collaboration – all strategies considered to be important learning strategies. We have evidence from prior and on-going investigations in our research on Whyville how community events such as Whypox can become instructional opportunities outside and inside the classroom. The most interesting but also most difficult investigations concern those in the realm of informal education, in other words what Whyvillians choose to participate in on their own volition and time. Visits and activities in the virtual Center for Disease Control (CDC) on Whyville can offer us a glimpse of how participants engage in learning more about Whypox. We know that a small number of CDC visitors engaged in more systematic investigations with the simulators (Feldon & Gilmore, 2006). In visits to the CDC we also had signs that the participation in this event initiated information searching. Further research is on the way to examine what kind of Whyville participants went to the CDC and what they did there (Quintero, in preparation).

In a further step, we investigated how community events such as Whypox can be integrated within a classroom science curriculum about infectious diseases. The case of Whypox provides a promising context for learning about infectious disease because it allows players to immerse themselves in various aspects of the infectious disease experience. For one getting the disease offers an experiential component that is not feasible for ethical reasons to be replicated in real life. Due to increased immunization most children do not experience any more the traditional staple of childhood infectious diseases of measles, mumps, or chickenpox. When Whypox became part of the infectious disease curriculum of two sixth grade science classrooms, the teacher discussed with students similarities and differences of natural and virtual infections. Students also reported how they experienced ostracism or avoided others who had Whypox on Whyville (Neulight, Kafai, Kao, Foley, and Galas, in press). We also investigated children's understanding of Whypox as a computer virus (Kafai, in press). We found that students between the ages 10-16 have a mostly naïve understanding of a computer virus influenced by mythological or anthropomorphic perspectives; only few were able to describe computational elements. If we are to use community events such as Whypox for instructional purposes, it is clear that we also need to build conceptual bridges between natural and computer viruses for learning of infectious diseases and with virtual epidemics in the school science curriculum. These are promising investigations that will help us

understanding how to design community events not just for social but also for instructional purposes.

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