

Stealing from Grandma or Generating Cultural Knowledge? Contestations and Effects of Cheats in a Tween Virtual World

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ABSTRACT

Much research has described the various practices of gaining access and participation in multi-user game communities. Cheat websites that are a prominent part of the game culture and industry have been debated because of their illegitimate nature but received little attention in terms of their educational value. In this paper we analyze the cheat sites created by players for a tween virtual world called Whyville.net, which encourages youth ages 8-16 to participate in a range of social activities and play casual science games. Analysis of a sample of 257 cheat sites resulted in typologies for both the cheats and sites in terms of quality and quantity of science content. In addition we followed a particularly active cheat site over the course of eight months and investigated formal discussions of the Whyville community concerning cheating. Implications of these findings as cultural artifacts of the game community and as guides for designing informal online learning activities are discussed.

Author Keywords

Cheats, economy, learning, situated play

INTRODUCTION

The phenomenon of cheating is gaining increasing traction in discussions of gaming practices in multi-user virtual environments (MUEs). In an upcoming book titled *Cheating: Gaining Advantage in Videogames* [5] Mia Consalvo outlines early practices and current debates about cheating by players and within the game industry. According to her being a member of a game culture is more than just playing games and playing them well. Cheating provides players with *gaming capital*, a reworking of Bourdieu's cultural capital [3], which can be defined in this context as "being knowledgeable about game releases and secrets, and passing that information on to others. It's having opinions about which game magazines are better and the best sites for walkthrough on the Internet". Such a conceptualization introduces a new perspective to our understanding about the psychology, purposes and politics of cheating. The acts of cheating then gain relevance beyond individual players' illegitimate transgressions and

places cheating within the larger gaming culture in which players aim to participate legitimately.

The few studies that have discussed cheating in game culture have focused almost entirely on adult and commercial game versions [5]. Most commercial MUEs have large fan communities that sprout numerous fansites, among them cheat sites where players post explanations of how to complete various games, hints for how things work, and even discovered or manufactured (i.e., hacks) shortcuts through games. Gee [8] sees cheat sites as part of the vast network of knowledge that players gather and learn about the games, and many companies actually sponsor official guides that provide hints or outright answers for how to complete a game and forums where players post their own solutions or strategies (see also [22]). So numerous are the variations that Salen and Zimmerman [18] developed a typology of the kinds of cheats found in games, particularly computer and video games.

For our purposes, we wondered whether we could observe similar cheating phenomena – sites and discussions – in non-commercial MUEs aimed at younger players in their tweens. One could argue that the presence of cheat sites and discussions are evidence of an active game community and thus all players (young or adult) in all games (commercial or not) should be interested in sharing insider knowledge and strategies. In educational games, the cheating is twofold as players not only learn how to play the game but also (presumably) something about the subject matter integrated in the game. In this case, designers and promoters of cheats not only disseminate gaming capital about the game itself but also about the subject matter at hand. For the most part, discussions about cheating have focused on the consequences for the game; here we are concerned with what benefits could be gained for designers and players by providing explanations about disciplinary content and strategies as part of their cheats.

In this paper we look at the cheat sites created by players of one MUE, Whyville.net, that encourages youth ages 8-16 to play casual science games in order to earn a virtual salary

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(in ‘clams’), which youth can then spend on buying and designing parts for their avatars (virtual characters), projectiles to throw at other users, and other goods. The general consensus among Whyvillians (the citizens of the virtual community of Whyville) is that earning a good salary and thus procuring a large number of clams to spend on face parts or other goods is essential for fully participating in the social world of Whyville [11, 12]. Thus the science games are a means to an end: the more games one plays and the higher levels one reaches, the higher one’s salary. The end-goals of looking good and having lots of friends are vitally important in considering the role of the cheat sites that many Whyvillians have designed. With this in mind, we focused our investigation on the nature of cheat sites, types of cheats, and discussions about cheating.

BACKGROUND

MUVES as learning environments have gained increased attention in the past few years. MUVES are large-scale virtual worlds that thousands of players can join to socialize with each other and organize events and quests. Gee [8] argued that the collaborative problem solving, networking, cultural learning, and complexity of these worlds made them ideal learning environments. Since then, a number of researchers have investigated commercial MUVES such as Civilization [19], World of Warcraft [22], and Lineage [21], for their learning of history, reading, and problem solving and thinking skills. Other researchers have started designing MUVES which promote explicit educational goals such as science inquiry skills in River City [6] or social responsibility in Quest Atlantis [2].

One aspect in MUVES that has received little attention so far is cheat sites, player-generated websites where players share strategies (or answers if applicable) for solving problems in the virtual games. Salen and Zimmerman [18] developed a typology of the kinds of cheats found in computer and video games which include easter eggs, cheat codes, game guides and walkthroughs, walkarounds, true cheating, hacks, and spoil-sport cheating. From this description alone, it is clear that cheat sites created by players display cultural knowledge about the game environment. The debate whether cheats are illegitimate has largely been influenced by industry practices to publish short cuts in their magazines, thus legitimizing the dissemination [5]. Even among players there are no clear standards on what counts as cheating and what the repercussions are. For this reason the concept of gaming capital developed by Consalvo [5] offers a fresh perspective on cheating. It allows us to examine cheating within the larger context of gaming and how players become participants in these dynamic and complex worlds. While these worlds are designed by companies that maintain control of many aspects [24], player interactions determine community norms [21] and are in constant flux.

With this in mind, we approached the investigation of cheat sites for Whyville with the following questions: How do Whyville players design cheat sites? What does a site

consist of, how do they change over time, who creates them and what are their motivations? How are cheats discussed within the public realm of the virtual community? Moreover, what does this reveal both about the designers of the sites and the nature of the science games themselves? Our analysis will consider the cultural dimensions of cheat sites that offer tips and suggestions about participating in the game community and thus could be considered an insider’s guide to Whyville. In addition, we also consider what effect cheats have on the virtual community based on formal community discussion.

RESEARCH APPROACH

For our investigation of cheat sites, we drew from two sources, cheat sites available on the Internet and the archive of news articles in the Whyville Times. In July 2006 we entered the following search terms in Google, “Whyville cheat or cheats,” which resulted in a listing of 257 sites. We sampled a subset of 15% of these sites (38 in all) and ruled out sites that were scams (asking for people’s passwords in exchange for an advertised raised salary) and sites that only talked about cheating but did not offer answers or directions. Of the remaining sites, 13 were legitimate cheat sites. In a first step, we evaluated the identified cheat sites using the typology developed by Salen and Zimmerman [18]. Our goal was to establish to what extent the cheat sites developed for the educational MUVE by younger users emulated those developed for commercial MUVES and more adult players. In a second step, we developed a classification system that delineated the types of sites according to the quality and helpfulness of the cheats (from comprehensive to copies of other cheat sites) and the kinds of cheats listed for various games as they relate to the science in the games (from a listing of answers to more qualified descriptions and illustrations).

In addition, while studying the cheat sites, we discovered select sites that provided cultural advice and tips for participating on Whyville. In order to study how these cheat sites changed over time and how they provide insider strategies for participating in the social and cultural world of Whyville, we selected one of them to follow over eight months, visiting the site weekly and taking screenshots of the forums and pages to track its development over time.

We also searched in the archive of Whyville’s weekly, player-written newspaper, *The Whyville Times*, by using the *Times*’ search tool with the words “cheat,” “cheats,” and “cheating.” Overall we identified over 100 articles that discussed cheating in Whyville. We used these articles to evaluate the discussions surrounding cheating and to understand how some citizens feel the impact of cheating in Whyville. Articles for *The Whyville Times* are submitted by Whyvillians and selected for publication by the paper’s editor, an employee of the company that owns Whyville. So while, as the discussion below will demonstrate, published articles represent a wide variety of opinions on most subjects, we cannot assume that the articles selected for publication are perfectly representative of Whyvillians’

views because we do not know all the selection criteria that influence what is published in *The Whyville Times*.

FINDINGS

In the first section of our findings, we will report on the cheat sites created outside of Whyville, the second part will focus on a case study of a particularly active cheat site, and the third part describes discussions around cheats within Whyville community.

Content and Typologies of Cheat Sites

The large number, 257, of cheat sites about Whyville found on the Internet is a clear indication of Whyville’s popularity. When we applied Salen and Zimmerman’s [18] typology of cheats, we found that cheat sites for Whyville incorporated all of the types they identified. We have outlined their definitions in the table below and listed parallel types of cheats found on Whyville sites (see Tables 1 and 2).

Table 1: Salen and Zimmerman’s Typology of Cheat Sites

Cheats	Description
Easter eggs	Special secrets hidden in the game by designers
Cheat codes	Actual codes written up by the designers (providing immortality and other benefits)
Game guides and walkthroughs	Step-by-step instruction for finishing a game
Workarounds	‘Legal’ ways of working around game structures
True cheating	Really and truly breaking the official site rules (e.g. multi-sessioning)
Hacks	Intervention on the level of a computer code
Spoil-sport hacking	Intervening in a way that brings down the game and is not for the purpose of being involved in the games.

Based on the content of the cheat sites we analyzed, we created a typology of the types of sites based on the quality of the help or answers provided (see Table 3); we did not include scam sites in this typology, though there were certainly many. Although the sites varied in terms of the number of games for which they posted, differentiating them by the sheer number of games was not as relevant as by the quality of directions or solutions for completing games.

Of the 13 sites we studied, only 15% or two contained almost complete listings of all the games on Whyville and provided solutions and/or directions for how to complete these games. These sites also supplied cultural instructions for participating on the site, including which shops offered the best face parts, how to teleport to secret locations

unlisted on the normal Whyville map, and even a computer code to throw projectiles more quickly and thus get the best of your opponent(s). All other sites paled in comparison, but a small number of sites provided solutions for 4-10 games and included in their solutions some directions or illustrations (such as the diagram of the angles in a circle in Table 4) that facilitated completing games. At the lower level of quality were sites that only gave unexplained or incomplete answers to games, such as an ordered list of answers to the Great Balloon Race with no accompanying explanation, in this case altitudes between which to fly in order to reach a target. Unfortunately, without more explicit directions, such as how to navigate between altitude levels where the wind switches directions, this lower quality cheat is not very helpful. Finally in what we call the “Ultimate Cheat” are sites that are obvious copies of other Whyville cheat sites, noted by the identical language and punctuation in their solutions; these actually appeared to be cut and pasted websites!

Table 2: Typology of Whyville Cheat Sites

Cheats	Whyville Cheat Sites
Easter eggs	Unlisted spaces within the game, e.g., Jupiter, Disco Room, the Newspaper
Cheat codes	Indirect parallels in Whyville: - “teleport Jupiter” to get to Jupiter, - “ earmuffs now on” to listen to people whispering online
Game guides and walkthroughs	Most common on cheat sites: - How to play through a game, - Answers to games - Illustrations for games - E.g. House of Illusions: walking through all rooms without looking at anything
Workarounds	- Setting up another account to get more clams - Selling or buying others’ extra accounts
True cheating	Stealing others’ accounts through scams that ask for usernames and passwords
Hacks	Codes that deposit many clams in account (now expired – we were unable to test these)
Spoil-sport hacking	Stealing others’ accounts by hacking into the system (rumors of this happening but unstudied by the authors)

Interestingly enough, during our investigation we found an independent evaluation of cheat sites compiled by a Whyville player. As part of his own cheat site, this player had assembled a page of 38 other cheat sites and rated them

with one to five stars, sometimes with comments about which sites were scams. In general our typology agreed with his; we agreed on which sites were scams, his one-two star ratings roughly correlated with our “minimal” ranking, his three star ratings with our “developed” rankings, and of course we thoroughly agreed on his only four and five star ratings which matched with our two “comprehensive” sites. Our only area of disagreement was in our category of “ultimate cheat,” probably explained in that he did not appear to be looking for cheat sites that copied other cheat sites. His only five star rated cheat site also happened to be the site we chose for continued study.

Table 3: Types of Content in Cheat Sites.

Types of sites	Description
Comprehensive: 15%	Near complete listing of help for games, Solutions for harder levels of games, Research outside of Whyville, Insider instructions for how to play games, Explicit and full directions for games, Illustrations, Cultural tips, Non-essential (aesthetic) cheats
Developed: 23%	Solutions for harder levels of games <i>or</i> Research outside of Whyville, Basic directions for playing games, One or more illustrations
Minimal: 31%	Unexplained answers to games, No solutions to harder levels of games
Ultimate Cheat: 31%	Completely copies other sites without referencing the source

Generating Cultural Knowledge: A Case Study

We examined in detail Gamesite2.net (a pseudonym for the site), one of the more comprehensive sites (see Table 2) that contained Easter eggs, cheat codes, game guides and walkthroughs, and workarounds as described above. In October 2006 the site itself noted that it had on average 200 visitors a day in addition to 34 registered users. By March 2007 it had grown to 134 registered users. Gamesite2.net began in mid-2004 and, according to the history posted on the site, went through several versions until in mid-2006 it started regaining popularity. The site owner and designer, a 14 year-old young man, and his three administrators, posted new messages on the home page of the site roughly four times a month, not including numerous responses to messages on the forums. On the home page, the site designer wrote regular updates about “our” progress in

developing/researching new cheats for new games or versions of games in addition to cheats or hints about things that were not game-related (in other words not related to a game that would be rewarded with clams). Other Whyville players posted comments about cheats they had figured out in a game, pleas for more or better cheats, and praises for the help offered on the site. While the site designer and his site administrators officially managed and posted the cheats, the activity of gathering and synthesizing the cheats was a collaborative effort, and the leaders gave credit to those who had assisted with various parts of researching and developing the cheats.

The appearance of a new salary-raising game on Whyville during the time we tracked the site provided an opportunity to study the collaborative development of a new cheat. When the new game, called the Spitzer Spectrometer (see Figure 1), appeared on Whyville and the site designer was out of town (he posted his absence on vacation to the forum), the drive to find a cheat only gained momentum.

In the first level of the game, players had 120 seconds to match five elements to their spectra by dragging an element to either the Bunsen burner (for a solid element) or what appears to be a gas discharge lamp (for a gaseous element,) at which time the element’s spectrum appears below the picture of the spectrum that one needs to match. At the second level, a spectrum of two elements was pictured with the added task of finding the two elements that matched. Figure 1 displays the successful matching of the spectra of two elements to the picture.

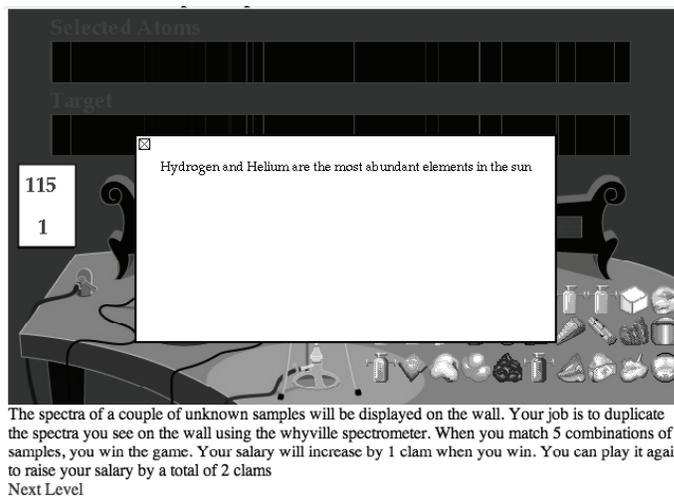


Figure 1. Spitzer Spectrometer, Level 2.

Although the Spitzer Spectrometer is a basic matching game, the time limit of 120 seconds was overwhelming not only for one of the authors who was previously familiar with spectroscopy but apparently also for many other players who posted urgent requests for the cheat site to finish the cheat. An analysis of the forum posts indicates

that the Spectrometer game was first mentioned on the site on 13 August. The site owner reported:

This new game (Spitzer Spectrometer) is so hard for us to figure out. We have read up on Spectroscopy on the internet and found nothing on it! Now since we can't figure the game out we need your help to give us the answers so we can give them to every one else. We will give the first person who responds to us with the correct answers **2000 clams!** If you give it to use in the nexted 48 hours (2 days) it will be **3000 clams**, but after that it will be 2000.

A few days later, with still no success, the site owner went on vacation (he posted this news to the site), and a grass-roots effort to figure out the game began in earnest. As one visitor wrote:

We gotta get some answers quick! I am going to form a group of people to work different solutions out for spitzer spectrometer. All we are doing is in our spare time, we will experiment with the game and see what we can do with it. Especially level 2. Level 2 is nothing but trouble for everyone. So i hope to get answers as soon as possible. Remember everyone reading, if you have answers SUBMITT them. It will benefit us all...

Soon after, one Whyville player posted screenshots of all the spectra of the elements to a separate website and noted it on the forum. Another cheat site owner picked up on her posting and added it to his site. Finally, when the site designer returned from vacation, he put her cheat on the main cheat page with full credit and told the community about this on the home page. The cheat itself would be classified as a "guide" on our typology (see Table 1). It changed the game strategy from trial and error to a more systematic and less time-consuming search by providing a reference table of the spectra of all the elements.

Fascinatingly, a couple of months after the Spitzer Spectrometer cheat was developed, Whyville simplified the game by taking out half of the elements available for spectra, claiming that it was too difficult for people to complete. This puts an interesting light on the potential role of the cheat developed by the participants of Gamesite2.net. It would seem that with learning as a publicly acknowledged goal on Whyville, the site designers encouraged greater learning in the more difficult version of the game, which generated collaborative problem-solving efforts in the cheat site community.

Beyond providing cheats, the site was not neutral about what was appropriate behavior on the forum. The owner closely watched forum postings for inappropriate material and advertising of other sites: "every one who swears a lot, spams, or cusses... will be banned." Looking through the forum, one can see many times when messages or parts of them have been locked or erased by the owner. In addition, other forum participants pointed out things that they thought rude about some comments left on the site. For instance, when one user complained that there were not enough cheats or that the site did not help him enough,

another user replied that the site owner did a lot of work on others' behalf and they should all be grateful for the help he provided. While the site recognized that scams occurred, it did not support them and purposefully tried to distance itself from that practice.

Besides cheats for science games, the site also provided cultural tips and insider knowledge about Whyville. These included how to access unlisted social spaces (teleporting), how to act and talk on Whyville, where to shop for face parts, how to avoid being hacked, and information about what kinds of people hang out in which locations on Whyville. The site even included non-salary raising cheats such as how to make your Scion (virtual car on Whyville) invisible, answers to *The Whyville Times* weekly crossword, and a simple computer code that makes throwing projectiles faster. As a final sort of cultural knowledge about Whyville, the site also allows its members to list their face-part stores, in essence providing both free advertising (in Whyville one has to pay for advertising) and a short list of where to get cool fashions.

Contestations and Effects of Cheating in Whyville

Cheat sites about Whyville, like the one we presented above, are not a hidden phenomenon; in fact, they are openly discussed in *The Whyville Times* newspaper that constitutes a community forum (see Figure 2). Just as in the commercial gaming world [8], cheating is a hotly debated topic in Whyville and the newspaper articles largely criticize the practice of using cheat sites to increase salaries illegitimately: "when just one person uses cheats it could affect our whole town" [10]. Yet the conversation goes beyond simple condemnation of using cheats, though many of the writers espouse that view.

Our search of the archive identified over 100 articles that mentioned cheats in *The Whyville Times* from 2000-2005. Roughly 10% of them were explicit warnings against scams, reporting on the many imaginative ways Whyvillians have tried to procure others' passwords with the promise of raising their salaries, giving them makeovers, and even claiming to be site designers. Another 30% more generally condemned cheating in salary-raising games, i.e., using cheats found on cheat sites. Others (20%) discussed cheating in the Smart Cars races where instead of going around the track in a traditional race, some players would immediately turn their cars around and cross the finish line, thus triggering a win. These particular articles constituted a long, multi-year discussion about whether this was a valid way to win at Smart Cars. Some utterly denounced the practice while others, including the *Times* editor considered it a rather clever method. Still further, another 10% of the articles concerned cheating in dating relationships, some of them asking whether it was cheating if one had one boyfriend in the 'real' world and a different one in Whyville. Another 20% concerned issues with ballot stuffing, creating multiple accounts in order to have more votes for oneself in elections for Whyville senator or prom king/queen. And a final 10% described and rebuked other

forms of cheating on Whyville, including the provocative “stealing from Grandma” referenced in the title of this paper.

THE WHYVILLE TIMES

www.whyville.net

Apr 17, 2004

Weekly Issue

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Scam Alert!

Hi, ok well I have this GREAT new software. I can get any hair that I want for free! I bought the Cd and it has tons of cheats where if you get taped I can get it off for you! It's so cool. So if you want me to get you free stuff, just give me a shout and tell me! I also need your password because it won't let me send stuff. Sorry L later!



FudgyFeud
Guest Writer

Ps. I can't send the face parts, I don't know why
This is a ridiculous ymail I got sent by some fool who wanted to hack me. Their story is something I have never heard of before, and I thought the rest of Whyville ought to know about this.

Please don't be pathetic and fall for this obvious scam; no one can really get a CD from the store to stop you from getting taped or from getting any face part you like. When you get taped, it is a punishment – Whyville does not want you to get out of the punishment by buying a specialized CD out of your own money!

Your (slow) reporter,
FudgyFeud

Figure 2. Excerpts of a *Whyville Times* article on cheating.

Stealing from Grandma: Condemnations of Cheating

By far the predominant view of cheating in the articles is that cheating is bad, lazy, dishonest, and unfair. In addition they claim that it hurts Whyville and goes against the “Whyville Way,” a philosophy that values learning, mutual support, and positively contributing to the community. Many of the arguments are based on the idea that such practices are wrong in real life and therefore are also wrong in virtual life, as in the following quotes from two articles:

On Whyville you have to earn your things and earn a living, just like in real life [25]

In real life would you take things from your Grandma and sell them to people at the mall? [16]

Both of these articles espouse the view that morals in ‘real’ life should apply to virtual life. The second article refers to Grandma’s, the place on Whyville where new players can go to receive donated face parts. According to oSTEPHo [16], experienced players were going to Grandma’s, accepting rather than donating parts, and selling them at the Trading Post for a profit. Therefore, they benefited from others’ well-meaning donations and “stole” from Grandma’s and newbies.

In addition to “stealing from Grandma,” we discovered seemingly innumerable other types of cheating on Whyville that we could not have imagined on our own. Some of the more interesting cheats included obtaining passwords by offering “makeovers,” copying face parts (a designer/copyright issue), and creatively coordinating cussing. For this latter cheat, GrriesYEA [9] vividly described three citizens standing next to each other, saying,

Person 1: Bu
Person 2: tt
Person 3: head

He goes on to denounce this and other forms of cussing, consisting of creative spellings of bad words, that try to get around the censorship word filter on Whyville. But not all Whyvillians consider cheating as completely negative.

Nuanced Views of Cheating: Confessions of a Site Designer

Though not the majority, many writers saw intellectual and creative elements in cheating practices on Whyville. For instance the *Times* editor wrote comments on several of the Smart Cars articles questioning whether turning around the car to go backwards across the finish line rather than around the entire race track was really cheating. Instead, the editor posed the view, agreed with by a few *Times* writers, that this could be considered a clever solution. Other writers pointed out that multiple accounts used by the same individual should be allowed one vote each *if* the accounts represent active citizens on Whyville. Finally, regarding more traditional salary-raising cheats, some writers pointed out how those cheats could be useful in getting people to the next step of their participation in Whyville:

And how many of you got help earning your salary, whether from a friend or by using a cheat site? [13]

Some of us are unable to complete the games, and it is tough finding help (there is a cheat site but its name will not be released) [15]

Indeed, one of the authors witnessed a site designer publicly confessing to having used a cheat during a community discussion at the Greek Theater, the live public forum in Whyville. So even the game designers use cheats once in awhile!

Effects of Cheating on the Whyville Community

The large number of articles devoted to discussing cheating, roughly one every three weeks, demonstrate that citizens are aware of cheating in Whyville. What are some of the effects of cheating on this virtual community? Beyond just the existence of the debate of cheats on Whyville, one of the most evident effects is disillusionment about elections and leaders on Whyville. The issue of ballot stuffing and bribing voters comes up almost every Senate election, to the point that some Whyvillians formed a committee to try to dissolve elections. In fact, one Senate campaigner purposely cheated in an election just to bring the issue to the forefront:

I wanted to prove that everyone who gets lots of votes is a cheater. And that even though the accounts behind it might not be obvious, a majority of the accounts are from the same select few people. [17]

Her “secret experiment” certainly worked to publicize the view that ballot stuffing is a frequent enterprise on Whyville (though notably she was “caught” so perhaps it is not as easy to do as she thought). In addition, with the availability of cheats to raise one’s salary, one of the qualifications for being a citizen-leader on Whyville,

namely a “ymail helper,” is called into question. Several writers doubted whether ymail helpers were truly qualified to help newbies since they may not have actually played the games to earn a salary. While these issues may or may not be as prevalent as some citizens think, the cynicism in the public forum of Whyville is apparent in by far the majority of the articles we read.

DISCUSSION

Our examination of cheat sites in Whyville, an informal free MUVE for tweens, took inspiration from what researchers had observed in large-scale online games. Our analyses indicate that the Whyville cheat sites are as sophisticated in the number of different cheat types as those for commercial games. The cheats cover the whole gamut: from helping players to make more clams to cheating players out of their clams. We could also gather from the large number of writings in *The Whyville Times* that cheating is not a secret but its controversy is openly discussed in the community. Like their commercial counterparts, Whyville.net provides home to a community of players whose engagement reaches far beyond the original game. Thus for tweens, joining Whyville is in many ways a stepping stone into a larger game community and allows them to practice the many forms of participation found present in commercial games.

For the most part our discussion so far has concentrated on the players and their benefits from cheating. A less common perspective is that of the designers of Whyville cheat sites. We found that the cheat sites reveal a great deal about their designers. All are invested to varying degrees in Whyville, in promoting others' success on Whyville, and in displaying their knowledge of Whyville. In general they view the object of the ‘game’ as getting a salary to buy face parts and participate in the larger Whyvillian culture. In fact, they value the morals of Whyville as displayed in qualifiers to the cheats regarding the chat test, asking viewers to read carefully and understand the principles behind the questions. Still further, they have taken the time to learn the inside secrets of Whyville. In addition, the designers often do substantial research to develop their sites and learn how to complete science games. This includes technological research (web development, html, short codes) and scientific research (illustrations of spectra, theories about spinning fast). Even those cheat sites that we titled as “minimal” or “ultimate cheat” that are largely if not completely copies of other cheat sites show some investment on identifying oneself as a Whyvillian and a helper to others interested in Whyville.

If anything, the presence of this large number of cheat sites can be seen as a simple measure of community participation. These players in Whyville are interested in finding out about short cuts and pointers to provide to an audience. Thus there is an incentive for designers to create, and even copy, these sites. Beyond purely altruistic motives we suspect that hosting a site as a designer but also knowing about good sites as a player might just constitute what

Consalvo [5] had in mind when she coined the term “gaming capital.” As in many other games, knowing shortcuts represents some form of insider knowledge and thus positions users and designers of cheat sites as legitimate participants of the Whyville community. Indeed some knowledge on Whyville, specifically teleporting (the only rite of passage to chat rooms such as Jupiter, Mars, or Saturn), is solely passed on through word of mouth [7] or on cheat sites. In this case, accessing the hints page on GameSite2.net would avail a new player of rich knowledge on how to navigate Whyville, constituting a type of game capital not easily found on Whyville without someone's help.

In addition, the presence of what might be considered frivolous cheats, cheats that do not help players with more obvious goals of earning more clams, point to what Julian Kuecklich [14] speaks of as the aesthetic value of cheats. As Kuecklich notes, some cheats can constitute “a playfulness on the part of the players that goes beyond the game itself and transforms the object of consumption into a creative medium.” The constant efforts of participants of GameSite2.net to find sneaky ways to work around putting on seat belts in Scions or some Whyvillians' impressively coordinated efforts to get around the security system in order to cuss indicates a social and creative value in cheats that goes beyond purely logistic motives.

Our analysis also revealed some interesting aspects about the instructional design of the science games themselves and the associated learning. When science games only require simple answers such as in the Alien Rescue Game where a set of answers takes away all of the thinking about spatial relations between the Sun and the Earth, one might wonder how much there really is to learn aside from finding the right number. Similarly, when some science games such as the House of Illusions just have the player walk around and look at different illusions, what in particular can be learned here without any further explanation or transformation possible? In an interesting turn, the cheats reveal how much there is to explore and experiment within a game. They also suggest that educational science games should be designed in such a way that they might require more research, and Whyville sponsored sites should be developed that encourage kids to draw in research from other sites (texts, websites, experts) and contribute to the knowledge of the larger community. Having other forms of recognition besides a high salary could assist in this, for instance sponsoring marks of status by knowledge or theory development.

In commercial games there are financial issues at stake that place the discussion about cheats in a more economic framework. When, for example, gamers are paid to play certain characters because their possessions can be sold on eBay to other players [21] or when players purchase bots to accumulate possessions for their avatars, the gaming capital acquired through short cuts has tangible monetary equivalents [4]. As Kuecklich [14] argues, “Insofar as the

characters themselves become a commodity in MMORPGs, cheats that address this commodification can be said to possess critical potential.” While Whyville has not entered this real/virtual economy exchange in the same way as virtual worlds such as *Lineage* or *Second Life* and no Whyvillian avatars are up for sale on eBay, cheats may facilitate the trading of avatars. Since avatars come complete with a salary, cheats can help a player quickly build a salary (though this still takes time – we’ve tried it!) and then trade that avatar for clams at the Trading Post. We ourselves have witnessed the advertising of avatars for sale at the Trading Post in Whyville and wonder to what degree the players who are selling the avatars used cheats to build those salaries. Further, in November 2006 formal real-to-virtual monetary exchange entered Whyville when the company started offering clams, Whyville’s currency, for sale in terms of dollars. It will be interesting to see in which ways the typology and nature of the cheat sites we have investigated will change within this new economic landscape that now provides incentives for bypassing both ‘hard work’ and cheats by simply buying clams.

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