

Browsing Collectable Items to Motivate Continued Engagement in Learning Systems

Alexis Chuck

Pomona College

alexis.chuck@pomona.edu

Caitlin Kelleher

Washington University in Saint Louis

ckelleher@cse.wustl.edu

ABSTRACT

Despite the ubiquitous presence of computers and technology, limited opportunities to learn computing skills result in only a small, homogenous segment of the population entering the field. Looking Glass is a programming environment designed to provide the opportunity for young learners to independently teach themselves computer programming. We hope to promote long-term engagement with Looking Glass by learning from the example of online services such as NeoPets and Webkinz. Young users spend hundreds of hours on these websites in the pursuit of new, desirable, and rare items to add to their collections. In Looking Glass, the corresponding collectables are 3D models of environments, characters, and props used to create an animated movie. We designed a system to employ users' natural acquisitiveness to motivate sustained interest in Looking Glass. We describe the results of an early formative study on an interface for browsing 3D models that supports this system.

Author Keywords

Alice, motivation, navigation, collections, tagging.

INTRODUCTION

Despite the ubiquitous presence of computers and technology; and the economic, intellectual, and social value of computer science skills in the modern world, only a small percentage of the population knows how to program. The inclusion of a computer science curriculum in public education is a long way away, currently, only the most privileged and affluent school districts offer such courses and only the most privileged and affluent families can afford to send their children elsewhere for instruction.

Not only are opportunities to learn computer science in an organized setting limited in this way, but certain groups, of which women are arguably the largest [Kelleher], are under-represented. Girls' interest in science and math decreases as they pass through middle and high school

[Kelleher]. This has been attributed to a multitude of factors ranging from plain disinterest to dislike of computing culture [Kelleher].

Looking Glass

Looking Glass is a programming environment designed for independent learners who do not have access to a class or mentor to introduce them to basic computer programming skills. It allows users, generally of middle school age, to create 3D animated stories by dragging and dropping code elements. The storytelling focus of Looking Glass makes it more appealing to groups that might otherwise be uninterested in programming and computers [Kelleher]. Keeping users engaged in Looking Glass over the long term is a goal of all work done on the project.

Currently Looking Glass offers a library of around 1,000 characters, objects, and environments for inclusion in "worlds", the term we use to describe the movie or game created by the user. In the existing system, users navigate through this collection in the "character gallery" (Figure 1). We use "character" as a general term to describe any item that may be included in a world – this includes everything from dragons to cowboys to bonsai trees.

The characters are organized within a fairly simple directory structure, with three being the average depth of a given node/item. Items and child directories (differentiated with a small folder icon) appear in a panel with a horizontal scrollbar. Location-based breadcrumb navigation is given along with a search box that treats entered text as a starts with/contains but does not start with filter on all contents of the current directory and its children (Figure 4).

EA has generously donated the Sims 2 assets, including all expansion packs, for use in future Looking Glass releases. This means that Looking Glass's character browsing abilities must be able to scale to accommodate a seemingly infinite supply of lamps, tables, pets, clothing, and more.

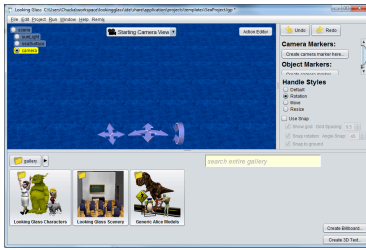


Figure 1: Original appearance of scene editor with character gallery appearing along the bottom.

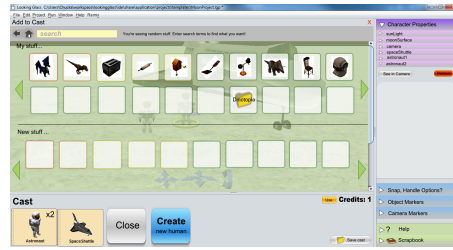


Figure 2: Mockup of transparent gallery and cast in place of character gallery.

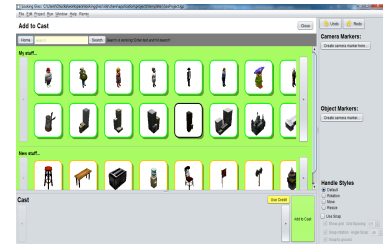


Figure 3: Working implementation.

We do not believe the current “character gallery” can expand to include so many items. User testing indicates many users are thrown off by the horizontal scrollbar. Additionally, the sheer amount of characters to look through provides a distraction for many users. The average Looking Glass user spends a little over 20% of his or her time on scene editing, with some spending as much as 60% of their time, as opposed to spending this time on programming [Kelleher]. With an exponential increase in characters on the horizon, we expect this percentage to increase if the system remains unchanged.

Finally, categorizing items remains a tricky business. The Sims 2 handles this by allowing users to browse items in one of three ways: by room (living room, kitchen, etc.), by function (surface, appliance, etc.), or by theme (art nouveau, gothic, etc.). Even within the subset of domestic items the Sims 2 covers, categories are an imperfect system, with the “miscellaneous” section catching items ranging from trash compactors to xyz. We expect any attempts on our part to categorize characters will involve arbitrary decisions and result in a confusing mess.

Online Communities

Brands such as NeoPets and WebKinz experience spectacular success attracting children to their sites and maintaining their interest for hundreds of hours. The design of the Looking Glass community will be informed by the successes of NeoPets and Webkinz.

NeoPets

In NeoPets, users care for virtual pets by acquiring virtual items such as food and accessories. An entire capitalist economy, complete with a stock exchange and user-run stores revolves around the exchange NeoPoints. Users can gain NeoPoints in a variety of ways, including buying and selling items, but the primary method of acquisition is through arcade-style games, many of which are sponsored.

The heavy branding present throughout the NeoPets website is one source of the company’s income, while the sales of reports on their users comprise the rest. Most NeoPets users are under 18 years old, 57% are female. NeoPets pulls in \$30 million in revenue, with 1 trillion page views since its creation [Grimes].

Webkinz

Entrance to the online Webkinz world can only be obtained via a code included with the purchase of a real-life plush toy, and from then on an annual membership fee is charged. The toy has virtual existence as a virtual pet on the Webkinz site, and, as in NeoPets, children can buy accessories with “KinzCash” for their pets and their pets’ rooms. KinzCash is earned by playing nominally educational games on the site. More credits, in much large dominations and exclusive items can be obtained with the real-life purchase of physical Webkinz products. About 3 million unique visitors came to the Webkinz site in 2010 [Black], with the average visit lasting 2 hours [Druin].

METHODS

Like the items NeoPets and Webkinz, Looking Glass’s characters are plentiful. The items, and the prestige, social status, and personal satisfaction that accompany acquiring them motivate users of NeoPets and Webkinz to invest hours on their respective websites, and spend, or convince parents to spend, real money on virtual goods. In the case of Looking Glass, we hope that the allure of new characters will be an effective incentive for continued participation in the community and continued improvement in programming skills.



Figure 4: Ways to acquire new characters.

An online Looking Glass community to support users is currently under development. The online community will be a space for sharing and collaborating on stories, the creation of competitive challenges, and serve as a rich source of help. The acquisition of new characters will be an important element of this community.

Figure 4 outlines the ways in which users can earn a new character, in the example, a dragon. There are two main paths:

1. The user directly earns the dragon by entering a challenge in which it is a reward or by remixing a world that it.
2. The user gets the chance to select a new character from a set of items. They get this chance by:
 - a. Practicing programming alone. A separate system, also under development, will evaluate users' skill level. Increases in skill will be rewarded.
 - b. Sharing worlds with the community.
 - c. Asking or answering question.
 - d. "Liking" other community members' worlds.
 - e. Leaving comments around the site.

The set may or may not contain the dragon.

In the second route, the set the user is offered is generated by taking in account the desirability of each character. Rather than wade through the thousands of items assigning desirability by hand, we will base frequency of a characters' appearance in sets on it popularity within the community. The more popular, the less likely it is to appear, encouraging the user enter challenges, remix worlds, or continue improving their skills and participating.

Figures 2 and 3 demonstrate how a new character browser was designed to handle the increased number of characters and a higher level of searching and sorting them. The new interface provides more room to see the options and is navigated more in the style of an Internet browser with a "home page" of all the characters (in the future, this page will have recommendations) and forward/backwards navigation. The user and the community tag characters. Tagging is used in search and to display related characters.

The new interface also includes space at all times for character recommendations. We hope we can tempt users with these recommendations, encouraging them to continue building their skills by suggesting characters that we know the user will have to work hard to get.

Formative Study

A formative study conducted in the lab tasked 5 undergraduate students unconnected with Looking Glass with creating a scene with at least 5 characters. The scene

was related to one of three themes: old west, classroom, and cabin in the woods.

All but one user used the selection of "related characters" to quickly select the other 4 once an initial character had been found either by looking through the selection on the "home page" or by search. The fifth searched for each item by specific terms.

The study revealed the need for a stronger concept of environments and perhaps a rethinking of how they relate to other objects. Currently, items such as whole buildings, rooms, and fences are treated much the same as every other character. Users expressed confusion regarding where to find them. They were also frustrated with how items like fences had to be placed by hand, – rather than with a tool like the line tool in an image-editing program. In particular, indoor scenes were problematic. There is no "wall" object, but users wanted to be able to draw these out.

FUTURE EVALUATION

There are several questions future evaluation will address:

- Do users spend more, less, or the same amount of time in the scene editor?
- Are users more or less satisfied with the characters they find?

When the online community is running, there will be even more questions to consider:

- Do users enter into more challenges?
- Do users remix more worlds?
- Do users share more worlds?
- And, most importantly, do users advance in programming skill level faster?

FUTURE WORK

Practical considerations of the mechanics behind characters and tagging must be resolved before big-picture work can continue. Many behind the scenes issues with new versions of Cheshire Cat/Croquet must also be resolved.

The existing working version of the interface runs only with existing Looking Glass characters. There is no interaction whatsoever with a database, which was under development during the course of the work outlined here.

In the longer run: trial inclusions of a small subset of the Sims 2 assets, systems for securing un-owned characters and attaching permission to us a character to specific users/accounts, and transfer of groups of characters between website and IDE are all tasks that must be completed.

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