Comparison of Middle School, High School and Community College Students' Wiki Activity in Globaloria-West Virginia (Pilot Year-Two)

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ABSTRACT
Constructionist-learning researchers have long emphasized the epistemological value of *programming games* for learning and cognition. This study reports student experiences in a program of game design and Web 2.0 learning offered to disadvantaged West Virginia middle, high school and community college students. Specifically, the poster presents findings on the extent of student use of the Wiki for project management, teamwork and self-presentation of game design attributes, comparing results across 13 school pilot locations. Also presented are students' self-reported recommendations for possible improvements to the wiki. Results indicate that some locations were more active in their wiki use; the poster addresses location-specific implementation context factors that may have played a role in the variant results.

Keywords
Constructionism, game design, wiki, computer-supported collaborative learning, digital literacy, Globaloria, Web 2.0, social media, serious games.

1. INTRODUCTION
In 2006, the World Wide Workshop Foundation established the *Globaloria* network and program to help close the digital literacy gaps that exist in the United States and worldwide. Globaloria seeks to empower young people in economically- disadvantaged and technologically- underserved communities to learn and create complex web content. To achieve this objective we have developed a technology platform and a curricular program that provides opportunities for young learners to engage in social and collaborative game design and construction using a network of open-source Web2.0 tools and resources --including a wiki.

In Pilot Year-2 (2008/2009 school year), our 5-year pilot project in the state of West Virginia has doubled in participation from Pilot Year-1, to include 24 educators and 291 students in 11 counties throughout West Virginia. Thirteen partner locations implemented the curriculum in Year-2 as an in-school game design course elective offered to students for credit and a grade during the regular school day.

This poster presents an overview of student wiki activity at each pilot location in Year 2. We also provide aligning results from the mid-program survey, featuring student feedback on using the wiki in their game design learning process. Overall, the findings indicate the extent of students' wiki use in Pilot Year-2, comparatively from location to location, as well as students' qualitative experiences engaging in this social media use.

2. LITERATURE REVIEW
To articulate the learning goals for Globaloria, we created a framework of learning objectives, which guides our applied program development and research. The objectives presented draw upon previous Constructionist literature on game design in workshop-based settings (e.g., Harel & Papert, 1991; Harel, 1988, 1989, 1991, 2002; Kafai, 1995, 2006; Wilensky, 2003; Klopfer, 2008; Seely Brown 2005, 2006), as well as findings from the organization's earlier pilot research, and "digital literacy" scholarship in several fields (e.g., Turkle, 1997; Barron, 2004; DiMaggio, Hargittai, Celeste, & Shafer, 2004; Eshet-Alkalai, 2004; Eshet and Aviram, 2006).

We propose that the 6 Contemporary Learning Abilities with Technology (6-CLAs) are required for effective learning in today's technology-driven landscape and world:

1. Invention, progression, and completion of an original project idea (educational game or simulation)
2. Project-based learning and project management (in wiki-based, networked environment)
3. Posting, publishing and distribution of digital media (designs, videos, graphics, notes, and games)
4. Social-based learning, participation, and exchange (ideas, process notes, code)
5. Information-based learning, research, purposeful search and exploration
6. Surfing and analyzing websites and web applications

Globaloria provides students opportunities to engage in innovative activities in school, to achieve these learning objectives. The overall program applies design-based research principles (e.g., Barab & Squire, 2004; Wang & Hannafin, 2005), towards defining, implementing, and iteratively improving Globaloria across time. Annually we report changes made to the innovation, and the learning outcomes with students, educators, and groups.

Program Implementation

Supports provided to each pilot location include a full dedicated wiki environment and curriculum for game design learning, in which students can learn from other students' public work posted online; in-person and virtual professional development training sessions for educators before and during the program's implementation; monthly expert Flash design trainings direct to students; and weekly virtual "office hours" for six hours/week, providing access via Skype and/or Webex with an industry Flash game design expert.

An example of one location, TTC's Wiki homepage screenshot follows.

Figure 1. Wiki Homepage Screenshot, TTC

Students create accounts and manage profile and projects pages for their personal and team work. Student profile info is aggregated on a User Gallery page (screenshot as follows).
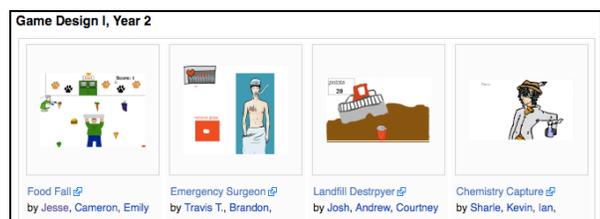
Figure 2. User Gallery Screenshot

Student Game Projects

Final games are aggregated on locations' Game Gallery page.

Figure 3. Game Gallery Screenshot example, TTC location

3. RESULTS

Wiki Use

Wiki use metrics present a track record of specific behavioral actions of students as they learn to design games. We counted wiki activity at the individual student level, by month. Editing content on a wiki page and saving the page is counted as 1 "edit." Uploads refer to file attachments and saves to the wiki. The table that follows presents descriptive data for two of thirteen exemplary pilot locations – one high school (TTC) and one middle school (SSMS).

Table 1. Wiki Use Metrics for 2 Exemplary Pilot Locations

Pilot Location	TTC	SSMS
Total # Students	23	14
Average # months a given student participated	5.7	9.0
Average # students in any given active month	13.60	13.80
Total file uploads, all students	*887*	*1129*
MEAN (adjusted) file uploads per any given student, across school-year	65.2	81.8
MEAN (adjusted) file uploads per student, in any given month	6.7	9.0
Total site edits, all students	*2770*	*2649*
MEAN (adjusted) site edits per any given student, across school-year	203.7	192.0
MEAN (adjusted) site edits per student in any given month	21.0	21.0

It appears that wiki use fluctuates across the school year -- with more activity occurring at the beginning, when students set up profiles, and at the end, when they share files for publishing – and less while they work on game design in Flash. A small number of the new Year 2 schools appear to have used the wiki significantly less frequently than the others, likely partially due to their educators' own learning curve as first-year participants.

Mid-Survey Feedback

To encapsulate student feedback on their learning experience in Globaloria, we conducted a mid-program survey (N=199; 62% response rate). On Question 11, we asked, "How could the course Wiki be improved to help you present your game design elements, and work in teams with other students?"

Many students answered "I don't know" to this question, or left it blank. However, results do indicate some agreement among respondents– particularly, in the areas of the quality of tutorials, the social networking capabilities offered on the Wiki, and the layout / navigation of the site. Responses were categorized as follows.

Table 2. Categorized Responses to Mid-Survey Question 11

How could the course Wiki be improved to help you present your game design elements, and work in teams with other students?	N[1]	% respondents (199)
Offer more tutorials / be more effective	39	20%
Offer more social capabilities / friending / synchronous communication options	11	6%
Better design / layout / navigation	10	5%
More access to experts	3	2%
Make it easier to get game feedback from peers	3	2%
Allow us to communicate with other schools	3	2%
Reorganize / update curriculum	3	2%
Make teamwork easier	2	1%
Provide previous game examples	1	1%
Let us do more group projects	1	1%
Let us present our work better	1	1%
Better Teachertube graphics	1	1%
More activities besides games	1	1%
More automatic / updating features	1	1%

[1] Each individual's question response is assigned to all relevant categories in which it fits (often more than 1)

4. Conclusion

Several improvements will be applied at the interface level on the Globaloria master wiki for Year 3, taking into account student feedback. Additionally, for educators' professional development,

we will share ways to optimize their integration of the wiki into the curriculum for students' project management, file sharing, and presentation of work -- as one of a suite of 21st Century Skills activities they engage in with their students.