MINECRAFT PlayScape:

Exploring Child Interactions Within and Between Virtual & Real Nature-inspired Environments

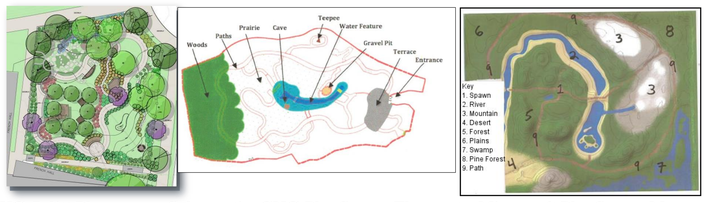
N. Maltbie , C. Maltbie, V. Carr, E. Daniels, D. Maltbie

(Acknowledgements to: A. Maltbie, I. Shalash, B. Maltbie for their "Admin" Support and the UC College of Education, Criminal Justice, and Human Services Instructional Research and Technology Grant for funding support.

Objective: To investigate effects of children's engagement with, and attitudes toward, nature given opportunities to interact (build, explore and play) with designed virtual nature spaces using the video game, *Minecraft*, and two physical nature playscapes on University of Cincinnati's campus in Clifton, OH (Arlitt) and on Cincinnati Nature Center in Milford, OH (CNC).

Background

- Participants are developmentally in middle to late childhood.
- Achievement becomes increasingly important; development of self-competence is critical for positive socio-emotional growth.
- A sense of industry emerges within focused activities of interest.
- Minecraft supports children's industry and self-competence as children find resources to transform into creative items while seeking those which will help them survive.
- In our especially designed Minecraft PlayScape, focus is on elements inherent to nature with an emphasis on similarities to designed Arlitt and CNC PlayScape environments built for children's play. Both environments offer opportunities to build confidence and competence, supporting children's development.



UC Arlitt Playscape Schematic, CNC PlayScape Elements, Minecraft PlayScape Map

Methodology

- Observation & focus group data from the in-person meetings
- Serialized data of interactions on server and log in-off times.
- Data creates picture of individual & collaborative experiences.
- Decisions made during design of the Minecraft PlayScape:

1) Custom world designed using "World Painter" software to resemble the UC and CNC PlayScape environment; with a wall build around Minecraft PlayScape to mimic fence;
2) Custom protected "Spawn" area; always daytime.
3) Each player had 21x21 block protected space to build homes
4) "Resource rich" design for easy materials access; no "Nether" or "End" region allowed
5) No free chat due to age differences in players, custom phrases ("quick chat") created for players-player and player-Administrator (Admin) communication; Admins could open up private "free chat" for user help
6) Players didn't "die", message said they "went home to rest"; players only lost experience when they "went home to rest"

Description of the Study

Seventeen children, between the ages of 7 and 12 years, and their parents participated in the study.

- 06/08/14 -- Orientation at UC; given *Minecraft* accounts

- 06/27/14 – Went to UC Arlitt PlayScape







- 07/28/14 – Went to the CNC PlayScape

- 8/10/14 -- all met once again on UC's campus
- Discussed children's experiences and their parent's reactions to study after interacting with the virtual and real environments

Connecting the Real and Virtual Environments - Activities

- At a mansion, called the "Rich Estate", created on the project's Minecraft server, the kids hunted for their personal chests with numbers inside that were brought to the Arlitt PlayScape.
- A drawing was held at UC PlayScape and the winners got Minecraft posters.
- Then, a physical chest hunt was done at the PlayScape and each child found a physical wooden chest that held a number This number gave them a virtual gift in Minecraft.
- Three weeks later, an area was created for each child to create an art project in a 10x10 space in Minecraft.
- At the CNC PlayScape, each child described their art project and was given a small Minecraft miniature.

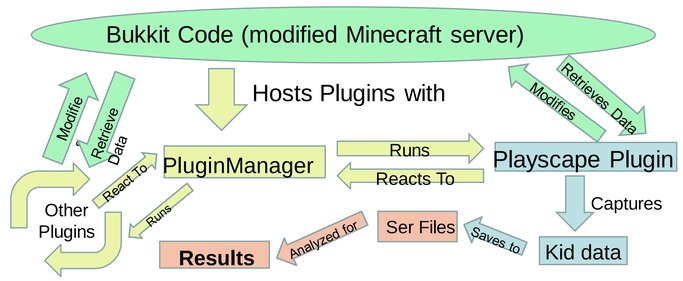


3 images of player's houses in Minecraft PlayScape


Two of the Minecraft Art Projects

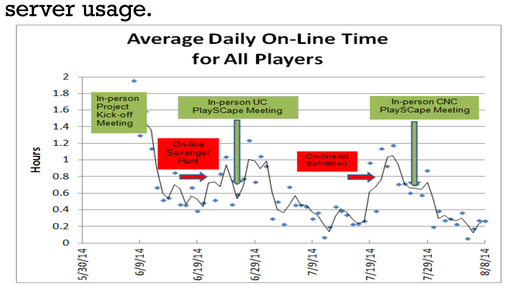
Below, children share printouts of their Art Projects at the CNC PlayScape.


Flow Diagram Showing Interactions of Minecraft Code and Custom Java Class Files



Initial Results

- Collected 100+ megabytes of serialized data using Java-based class files describing events
- Graph below indicates how prescribed actual events (virtual treasure hunt on Minecraft, physical meeting at UC PlayScape, virtual Art Exhibition, and physical meeting at CNC PlayScape) affected participants on-line server usage.



- Parents & players to continue the study until April 2015
  "We did what we did on Minecraft at PlayScape … built a furnace." (10-12 year old Player)
  "We liked playing with each other in person. … physical playscape more fun than Minecraft." (Majority opinion of players)
  "Now, my child is able to identify jewels and metals." (Parent of 7-9 year old Player)