Math Edutainment Game for Girls Grades 1-6

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Purpose

The purpose of this project is to create an engaging and educational game for girls in elementary school. This web-based math edutainment game will feature a comprehensive plot, a diverse, all-female cast of characters, and seven different mini-games. Through a feedback system, a stereotype-free presentation of science in the real world, and rewarding game play, this project will help girls develop crucial math skills, find greater confidence in their abilities, and pursue their interests with higher-level math, science, and technology classes.

Background

Many girls shy away from taking advanced STEM classes. Research done by the Girls, Math & Science Partnership states that boys still outperform girls in primary science, math, and technology classes. Girls are severely under enrolled in Advanced Placement Computer Science and Physics classes, and middle school boys typically have better performances and confidence in their abilities than girls in math and the core sciences.

Several suggestions have been made to try and correct this problem. These include making math more personal and rewarding, giving girls the feeling of control over their cognitive abilities, creating a "New Science Girl" archetype to break the "math is for geeks" stereotype, encouraging girls to explore what they can do with math and science, giving specific feedback, providing strong female role models, presenting a non-stereotyped look at math, and providing spatial skills training. Specific suggestions for implementation for edutainment games include strategy-based game play, social interactions, diverse and interesting characters, narrative plots, non-stereotyped creativity, and appropriate challenge level.
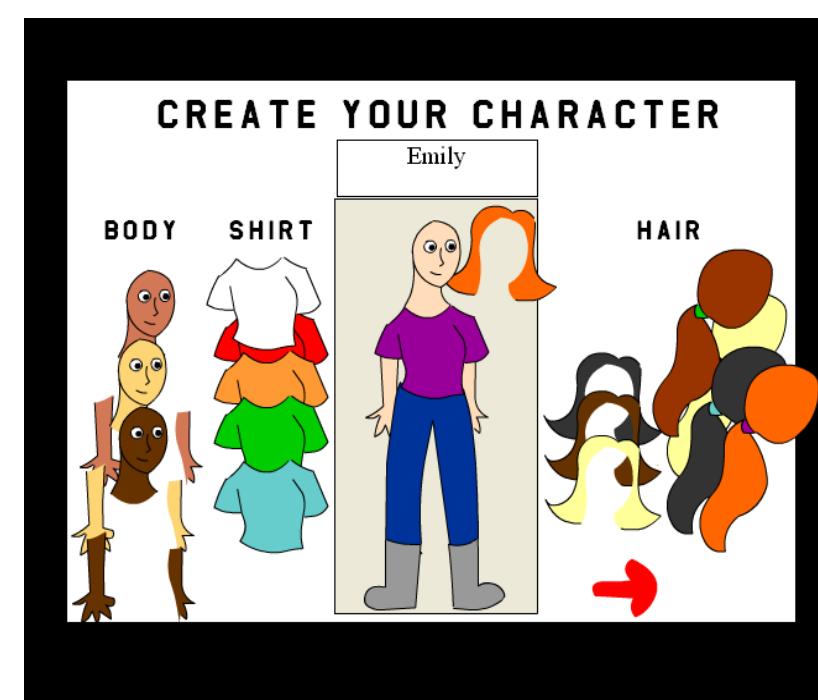

Figure 1.1 Character customization

Procedures and Methods

To create this project, I will use Adobe Flash MX and ActionScript 2.0 to create an interactive, web-based m edutainment game. There will be seven mini-games that will focus on basic math skills, word problems, logic, spatial skills, patterns, simple cryptography, and awareness of female scientists and careers in math, science, and technology. This game will be driven by a comprehensive plot based on a fictional space station and will allow players to customize their own character. Through a dynamic plot and a score tracking system, the player will be given constructive feedback and the ability to see how their math abilities are evolving.

I intend to test this project by making it available to Fairfax County elementary schools using my TJHSST web site and asking the students to take surveys on their attitudes towards math before and after they play the game.

At this point in the school year, I have completed four of the seven games (with the fifth in debugging mode), character customization, character interactions, score tracking, initial menus, and a fourth of the content of the study notebook.