

<p>ISEI 7</p> <p>7th International Conference on Ecological Informatics</p> <p>13 – 16 December 2010</p> <p>Ghent University Ghent, Belgium</p>	<p>Design Decisions for Virtual Characters in the DynaLearn Interactive Learning Environment.</p> <p>René Bühling¹, Michael Wißner¹, Markus Häring¹, Gregor Mehlmann¹, Elisabeth André¹</p>
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Session: Education and training in ecological informatics (Chairs: Prof. P. Salles (Brazil), P. Correa (Brazil) and B. Bredeweg (The Netherlands))

Timing: 15 December 2010, *Persconferentie Room*, 10h40-11h00 (Code ET 3)

Abstract

In this contribution we report on how we designed, created and evaluated a cast of virtual characters for the interactive learning environment "DynaLearn". Our goal was to create characters that enable learners to interact with the different parts of the software in an easy, intuitive, unobtrusive as well as motivating and engaging way. Furthermore, ecological topics like cause-effect relations in ecosystems covered by the software's learning contents were meant to be picked up by the character design for consistency and completeness. The outcome of our design phase in this context is a set of cartoonish humanized hamsters. By choosing animals in general, we connect the virtual characters and ecological topics so learners can interact with natural life forms on screen. When using the software features of teachable agents and adoptable pets, this reflection of the human-environmental interaction becomes even stronger. Hamsters do not only pick up the idea of virtual pets literally, but knowing about the danger of extinction of some hamster genera brings up the issue of humans' environmental responsibility again.

We decided to mix up the animal appearance with anthropomorphic characteristics, human behavior patterns and the ability to speak for smoothing their integration into the educational environment, to match their functional tasks in the learning process and to support the impression of intelligent characters. Consequently, the graphical style resulted in a non-realistic cartoon design which gives us the possibility to exaggerate animations and expressions without appearing implausible or absurd. These emphasized expressions in turn ease the graphical transmission of comprehensible educational and technical software feedback compared to realistic human animation which might be more discreet and therefore less intuitively understandable.

The DynaLearn workbench provides different use cases and events like help and feedback functionality whose content is communicated by the virtual characters. To avoid overloading a single character with different purposes and taking the risk of confusing the learner, a group of hamsters was built and the functional load divided among them. Different personalities and roles ease the identification of meaning for the learner and increase the dramaturgical aspects of the on-screen society which decreases monotony. By staging the group of virtual characters in the

form of a school yard scenario we approach the learner's real situation. This setup requires personalities of various characteristics, levels of competence, models of activity and social roles. The learner interacts with experienced adult hamsters that offer supporting help and feedback as well as student hamsters that can be trained, fed with knowledge and sent to challenges.

Creating graphical character designs that transmit different personality roles requires careful design decisions so that the characteristics of each character is reflected clearly in the visual form. Separate color sets and props (such as glasses) used in the character design were applied to categorize and group characters by their roles in the software as well as in the virtual community of hamsters. Each character's style of motion and the used gesture space were furthermore adapted according to the personality and characteristics to be expressed.

We conducted two studies among members of the target group in order to evaluate the design of our characters. The first study aimed solely on the graphical design of the characters and whether it subtly communicated the intended roles and personalities. The second study's goal was to evaluate the effect of the characters' functional and dialog behavior in the context of the software environment. It turned out that the intended suggestion of functionality, roles and graphical design matched the perception of the studies' participants very well.