New Active Tools for Supporting Narrative Structures

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Abstract: Constructing stories is a type of playing that involves mobilizing the storyteller’s imagination and finding original ways to convey narrative intentions. When a child invents a story, there is a natural interaction with the local environment and the use of various means of expression. We adopted a user-centered approach to design POGO, a playful environment which utilizes the child’s physical environment and sensory modalities. Pogo is a system of active tools that enable children to create stories by connecting physical and virtual environments. By providing children with the possibility of capturing and manipulating images and various media, and combining them in sequential form, Pogo triggered new strategies in the construction of narrative logic, time and space, in the construction of the episodes and in the visual narration.

Keywords: Active tools; Invisible computing; Narrative structures; Ubiquitous games; User-centered approach

1. Introduction

Constructing stories is a type of playing that involves mobilizing the storyteller’s imagination and finding original ways to convey narrative intentions. When a child invents a story, there is a natural interaction with the local environment. The activity involves implementing various means of expression. Whether in class or out, the object is to invent a story based on observations of the seasons, develop a comic situation involving two people or to touch an object collected during an outing. Through storytelling children learn to express themselves and make sense of the external world. As Bruner [1] points out, developing narrative skills is for children the privileged and primary way to enter in the culture.

New technological tools are being marketed to help children invent stories. However, these tools impose structured interactions that limit both spontaneity and interaction with the environment. We used a user-centered approach to design a new environment. It is playful, educational, and utilizes the child’s normal physical environment and sensory patterns [2, 3]. The first step in this approach consisted of investigating the use of existing storytelling aids for six-to-eight year old children, and observing how these aids provided support for the children’s imagination. The second step involved investigating how children used the physical media in their interactions, and finding the best way of using new and appropriate tools to support storytelling. This was the basis for the design of an environment called POGO. The aim was to produce a virtual story environment and help children to utilize their many modes of expression. In the end, we evaluated the impact of this new environment on storytelling, and in particular on their narrative structures, taking into account the oral components of the story, the visual characteristics and their segmentation in terms of time, logic and space.

1.1. Information technology in storytelling

Computer mediated tools are increasingly present to support children narrative experience. However, few environments satisfy user expectations in the areas of spontaneity, stimulating imagination and interaction with the environment. In particular, these tools hobble narrative structures with rigid constraints in terms of characters and the flow of the story [4].
We examined some of these environments, particularly CD-ROMs available on the market. We tried to understand the reasons for their very limited acceptance. Our first observation is that children rapidly lose interest in these types of systems, which sometimes lack the aspect of 'playing a game'. Our second observation was that the children cannot really construct stories. In reference to the theoretical framework of Vygotsky [5] concerning the laws of creativity and imagination in games and in narration, we observe that these systems significantly limit user creativity. They do not allow the child to use his prior experience. Choices are limited (characters, objects, scenery, etc.). The same is true of the animation possibilities (movements and actions of characters, etc.). There is no possibility of introducing new experiences into their predefined narrative environments. The child has the possibility of selecting and/or combining pre-established background modules, and is given a range of predefined behavior patterns for the characters. Sensory modes are also limited to the visual and auditory features built into each system. For example, the child can arrange parts of the background, and can add music or select a pre-established sound track (preprogrammed, coordinated sounds and movements, such as characters hitting each other, mocking one another, etc.). The result is a deeply entrenched channeling of the child's imagination, which soon engenders frustration and aggravation with the stereotyped limitations of the characters. This type of experience does not stimulate the child's imagination: the limited range of possible actions restricts the child to moving the character from one place to another (even with this feature, problems are encountered: a child who wants to make a phantom fly, places this character in the sky; since the top of the screen is not designed for this purpose, the display shifts and the phantom ends up down at the screen level where it started). These systems do not encourage children to use their own experience to develop new stories. In general, the only possible stories are those that exist in the program. There is no support for personal expression. For instance, the child cannot draw his own characters and use them as parts of the narrative. In addition, these systems are not designed so that groups of children can produce stories together, and therefore they do not engender social interactions between children.

By confronting the child with a restricted space in front of a screen and by inhibiting social interactions, they make it impossible to produce collaborative and co-located story construction. Even the possibility of sharing the finished story with others is seriously limited. As shown by Mandryk and Inkpen [6], this type of game eliminates the social features of traditional open-ended games. In short, this type of tool neither stimulates the imagination nor does it enable the child to develop the narrative skills that are essential at this age.

The work done by various researchers in recent years [7,8] witnesses a growing interest in the possibility offered by new technologies to enrich story building activities. Several research projects are attempting to build technologies that encourage children's creativity in open-ended ways and peer collaboration.

The Kid story project aims to encourage spontaneous children collaboration. Technologies are based on single display groupware, which implies that several children interact with a single display using multiple input devices [9]. Using Kidpad, a 2D drawing tool, children build stories by moving between different parts of a drawing, by creating links and zooming between pictures and scenes, therefore allowing the development of non linear structured stories. A second tool called Klump, based on an amorphous 3D object, can be used by two or more children at the same time and is intended to be an improvisational tool to help generate ideas in the early stages of story development.

As Kid story, the Narrative toys project at the Interactive Institute in Malmö aims to develop toy concepts that support collaborative narrative. The aim of the project is to develop innovative toy concepts using physical objects augmented with digital media. The authors intend to develop a series of toy prototypes which view play as a space for 'narrative processing'.

StoryMat [10] is a tool to encourage collaborative storytelling through children fantasy play. It includes a soft play mat with appliqued objects such as houses and roads and provides a play space for children to tell their own stories. The story told by a child is recorded and then compared with other stories told by children previously. One of the past stories sharing a similar pattern with the present one can be