

A Computer System Aiming to Stimulate Creativity for Narrative

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ABSTRACT

The goal of our research is to develop a computer system based on the concept of pictures-and-attributed-notes (PAN) aiming to stimulate creativity and imagination when users create a story. We have conducted an experiment and used the *Conceptual, Operational, Perceptual and Evaluation* (COPE) coding system to analyze the process of creating a story with the aid of computer system. The preliminary results revealed that the computer system based on PAN can stimulate user's creativity during the process of story creation.

Author Keywords

Creativity, Cognition, Computer-aided system, Narrative

ACM Classification Keywords

H.1.2. Information interfaces and presentation (e.g., HCI): user/machine Systems — human information processing.

H.5.2. Information interfaces and presentation (e.g., HCI): user interfaces — training, help and documentation.

General Terms: Human Factors

INTRODUCTION INTRODUCTION

A good storyteller usually needs good inspiration during the story construction process. McKim [3] proposed seeing-imaging-drawing as a framework of visual thinking, which explained that visual thinking can stimulate creativity. Therefore, it is crucial to provide visual objects to enhance creativity. Rabiger [4] proposed a method to systematize the stimulating materials, called CLOSAT CARD. The storytellers write down their interpretation of a picture through six attribute elements: *character, location, object, situation, act* and *theme*. These cards are collected regularly and used when they need inspiration for writing a story. It is a helpful method to collect, store up, review and classify our imagination when we see a picture. Liu [2] reassembled a shape to provide different shapes for users, so their creativity can be stimulated through seeing more variables. This study tries to use Liu's method to reproduce more elements. But it is difficult for computer to automatically generate pictures and texts. Therefore, we propose to develop a computer-aided storytelling system, named PAN (Pictures-Attributed-

Notes), aiming to stimulate users' imagination by providing pictures and attributed notes in the form of CLOSAT. In view of the preceding research purpose, the major research issue to be addressed here is as follows: How does a user create a story with the PAN system? To understand more details of the creation process, we used content analysis by adopting the *Conceptual, Operational, Perceptual and Evaluation* (COPE) coding system [1] and adapted sub-categories for narrative creation. By analyzing the creation process, we can contribute to the understanding of how to stimulate creativity in the creation of a story.

IMPLEMENTING THE PAN SYSTEM

The PAN system has been designed based on the Genex framework, proposed by Shneiderman [5]. The interactions between the user and the system are depicted in Fig.1. The user interface of the system consists of three main panels: *idea exploring*, *data buffer*, and *story writing area*. The goal of the idea exploring panel is showing data and giving the user stimulations when s/he is exploring. When s/he finds an interesting data item, s/he can put it into the data buffer panel for subsequent use. The user reads and generates new ideas in both two panels. Then s/he begins to arrange data, organize his/her thinking, elaborate and write down the story in the story writing panel. When developing a story, the user may go back to the idea exploring panel if s/he needs a new idea or to the data buffer panel for recalling her previous thinking. The relationship of the three panels becomes a loop through user's activity. Fig.2 shows a snapshot of the user interface of the PAN system. Since we want participants to focus on exploring data in the beginning, the idea exploring panel is maximized when a new session starts.

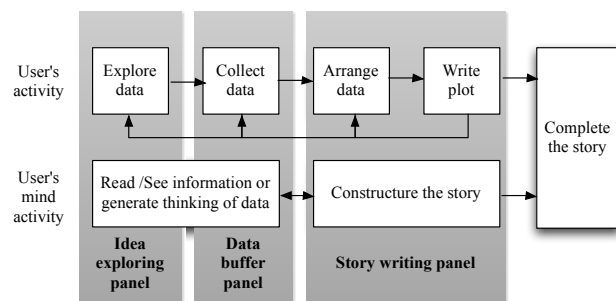


Fig.1. The interaction between the system and the user.



Fig.2. A snapshot of the user interface.

EXPERIMENTS

The initial sample consisted of only one participant, whose background is communication. The system showed 50 picture cards and the related attributed notes. The participant was asked to write a tale in about an hour. Immediately after the participant finished the task, she was asked to do protocol analysis.

RESULTS

The participant spent around one hour to create a story and used 18 pictures she picked up for the story. Then we used the COPE coding system to analyze the user's protocol data as shown in Table 1. The operational field occurred most often among all the fields because the participant explore and see the picture/text cards often to complete her story.

Conceptual	Operational	Perceptual	Evaluation
94	127	42	71

Table 1. Numbers of actions in each category.

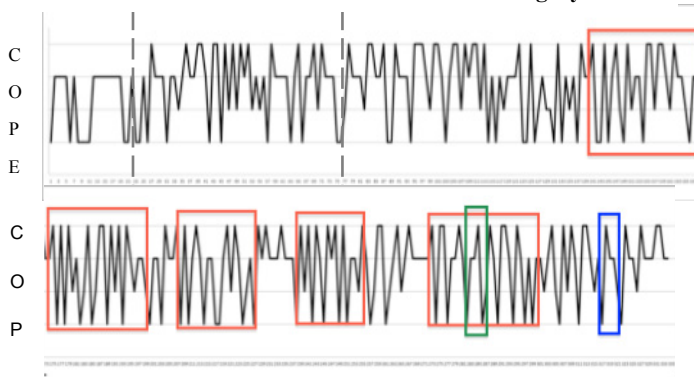


Fig. 3. Action sequence pattern in the story creating process.

Fig. 3 shows typical action sequences in the story creating process of the participant. The dotted lines divide it into 3 sessions: 1) finding what kind of elements to use, 2) viewing the elements, and 3) starting to write a story. The red rectangles in Fig. 3 are shocks composed of conceptual and

evaluation actions. They occurred when the participant tried to find ideas to develop her story. During the process, she repeatedly produced thinking (C), evaluated it (E), and sometimes explored pictures (O) to generate new ideas. Following we are going to elaborate the two patterns of the creation process of the participant.

Evaluation-Conceptual-Operational (ECO) Pattern

There are many ECO patterns (blue rectangle as a representation) in the process. When the participant evaluated a picture (E) and decided to use it ($E \rightarrow C$), she usually dragged it directly to the story writing area, or wrote new sentences for the story ($E \rightarrow C \rightarrow O$). Another similar pattern with different actions happened when the participant evaluated her thinking (E), decided to use it ($E \rightarrow C$), and then searched pictures to find a picture represent this thinking, or revised her story ($E \rightarrow C \rightarrow O$).

Operational-Conceptual-Evaluation (OCE) Pattern

The OCE pattern is also common in the creating process as shown in the green rectangle in Fig. 3. The participant explored her thinking (O), decided to use it or produced a new idea ($O \rightarrow C$), and then appraised how to use it ($O \rightarrow C \rightarrow E$). When she was revising her story (O), she may recall her memory ($O \rightarrow C$) and then evaluated it ($O \rightarrow C \rightarrow E$). Another serial actions of OCE pattern are when the participant saw a picture (O) and decided to use it ($O \rightarrow C$), she would evaluate the idea of the picture ($O \rightarrow C \rightarrow E$).

The OCE pattern can mix with the ECO pattern becomes OCECO pattern. Because after the evaluation, sometimes the participant might choose another thinking as her element ($O \rightarrow C \rightarrow E \rightarrow C$) and then revised her story or searched pictures for using ($O \rightarrow C \rightarrow E \rightarrow C \rightarrow O$).

DISCUSSION

In our research, we have designed a system based on the pictures-and-attributed-notes (PAN) framework and observed the story creating process. After analyzing the creating process by COPE, we found that the process could be divided into 3 sessions and discovered the ECO and OCE patterns. In general, the preliminary experiment allows us to observe that the participant diverged and converged her thinking with our system. This matched the design goal of the system based on PAN.

REFERENCES

1. Chen, S.C., *Analysis of the use of computer media by expert and novice designers*. The International Journal of Design Computing, 2002. 3.
2. Liu, Y.-T., *Creativity or novelty?: Cognitive-computational versus social-cultural*. Design Studies, 2000. 21(3): p. 261-276.
3. McKim, R.H., *Experiences in Visual Thinking*1980: Brooks/Cole Publishing Company.
4. Rabiger, M., *Developing story ideas*2000, Boston, Mass. : Focal Press.
5. Shneiderman, B., *Creating creativity: user interfaces for supporting innovation*. ACM Trans. Comput.-Hum. Interact., 2000. 7(1): p. 114-138.