Zuzie: An Expression Tool Designed with Activity Programs

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Abstract: This paper takes a look at museum learning for children, discussing from an information design approach the design and development of tools used in this learning and case examples of new activities that employ these tools.

Key words: Museum Learning, Activity program design, Visual composition, Affordance

1. Introduction

New tools transform the activities of people, causing activities never before known to take shape. However, tools often end up not being used because the activities that employ the new tools do not properly take shape. It can be said that one of the reasons for this is because the users do not understand what the tools are or how to use them, even though the functions of the tools have been achieved. This statement is not limited to physical tools, but can also be said about tools within computing machines, or “application s.” Many studies have tried to solve this problem, such as Contextual Design [1], Scenario-based Design [2], Knowledge Interaction Design [3], and Activity-based Design [4].

We are currently focusing on learning through expressions at museums, conducting information design research on tools for expressions there. Approaching from the viewpoint that innovative tools lead to innovative activities in people [5], this study aims to design new tools and new activity programs in which ordinary people rather than professionals can enjoy expressions. Making these tools and activity programs our basic concept for designs, we set reflection, which are important cognitive experiences in human expression activities, as objectives of the study.

2. Activity program and Tool Design

Activities and tools are usually coupled in practices. First, in the design phase the “people” and “expressed works” that conceptualize are an external design element, while “activity programs” and “tools” are conceived and implemented. Next, in the practice phase “activity programs” and “tools” are provided as expression activities to museum visitors. The usage of both is thereupon generated by “people” (expression activity participants), and “expressed works” are created through that usage. The relationships are illustrated as a model in figure 1.

It is important to note in this model that in “activity program” and “tool” design, both share a complementary relationship. To wit, activity programs define the role of tools, while tools define the activity programs. One design this relationship generates is the design thought process in which “activity programs” formulated from activity design principles prompt the creation of “tool” functions and interface ideas, regulating the design and
stipulating its specifications. This paper defines this as “activity toolification”. Operating in the opposite direction is the design thought process in which “tool” design becomes the grounds of an argument from which “activity program” contents and procedures are formulated, or are regulated and stipulated. This paper defines this as “tool activitization”. One characteristic of approaches in information design is the fact that “activity programs” and “tools” assume a relationship that generates, regulates and stipulates each other’s designs. This then becomes the very grounds for the arguments that decide the designs of each.

3. Expression tool “Zuzie”

3.1 Expressing visual compositions with figure and ground

“Zuzie” is an expression tool that simultaneously allows composition and reflection by incorporating two processes of subjective painting and diagrammatic drawing in which explicit comparison can be made.

Visual composition is the act of placing each component on a flat, 2D surface. Paintings and diagrams are produced by this visual composition principle. In general, presentational mode of reading occurs in visual composition, but this mode of reading is not a fixed order, like linear mode of reading in text [6]. The intention of persons who express appeared in visual compositions, from which the reader extracts meaning and arrives at an interpretation. However, the intention of the expression and the interpretation of the reader may not necessarily match. This mismatching can be thought of as the emergent readings visual compositions provide. “Zuzie” actively uses these visual compositions and emergent readings in the learning process to conduct expressions.

According to this figure and ground concept, we designed “Zuzie” to be comprised of placeable expression materials as figures, and the remaining background as ground. In “Zuzie”, “figures” are referred to as “cards,” and “ground” as “sheets,” and are defined as follows. (See figure 2)

1. Card (Corresponds to “figure”): Internally possesses digital images with three components, “pictures”, “author’s portrait,” and “writing,” one of which is shown as a thumbnail.
2. Sheet (Corresponds to “ground”): Multiple cards can be placed on top of it. Multiple sheets can also be had. Same set of cards can be shared between sheets, but their positions are unique to each sheet.
3. Sheet work: A visual composition work produced by placing cards on top of a sheet.

3.2 Design for affordance

“Sheet selection tab” of sheets is designed for the GUI, as shown in Figure 2. Thumbnails of each composition are displayed within the frame of each of these tabs. What is important to this study is the act of affording persons who express to compose multiple sheet works, and have them perform expressions while being alluded to the works.
A feature that switch between multiple compositions of sheet works is designed, as shown in Figure 3. Further, we used animation to smoothly move the positions of same set of cards on sheet works being compared, designing an effect that visualizes change the cards compositions.

All cards contain a “author’s portrait” component, which we made viewable by double clicking on the card as illustrated in Figure 4, leading persons who express to find their relationships. The importance of making others aware that each work has a author (painter) is widely known in the art world. Tying sketch images with their author’s portraits aims to clearly convey the images were created with intention.

4. From practice to new designs

An expression activity named “Zuzie workshop” was held at The National Museum of Emerging Science and Innovation (Miraikan) in July 26th and 27th 2008. Thirty Y6 elementary school children divided into six groups enjoyed the composition works.

It can be said that this “expression activity program,” which was designed and implemented in this expression activity, sparked in cognitive experiences of the children that grasp the significance of self expressions and use
that to develop further expressions, and that “expression tools” also facilitate those experiences. Moreover, the
children in the activities performed expressions that far surpassed those the designers planned for the activity
programs and tools. The composition work “Sheet work 4: Faces” (Figure 5), which was the final work this
group created, is an example of this.

During their presentation, they explained there was an “order to collaboratively build ideas” in the roles of
themselves—the ones who were conducting expression activities—and they visualized this not with a sketch
card of “the stroke order of the kanji character for ‘end,’” but rather by placing cards of the authors’ faces (card
displays could be changed between sketches and author’s portrait).

This indicates that by reflecting upon their own activities, they were lead to the expression world that draws
the “authors” as a new expression motif. Moreover, it can be remarked that the “practice” that set up the program
and tools that implemented the designs showed an important and new expression activity. Here can be seen the
co-evolution of the practice phase and the design phase. Activity program and tool designs are causing here the
deepening of “expression activities” which are produced by practices in which people participate, and by
mutually influencing each other.

Figure 5. A composition work by a set of four sheet works entitled: “Human immigration”

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References
Press, 1998
[3] Nakakoji, Kumiyo and Yamaoto, Yasuhiro, Knowledge Interaction Design for Creative Knowledge Work,
Traveling, Journal of the Institute of Systems, Control and Information Engineers, Vol.50, No.1, pp.28-32 in
Japanese, ISCIE, 2006
Design, Addison-Wesley, 1987
251-277, Visible Language, 1985