

# **Creative Thinking for Designing an Educational Tool**

Assoc.Prof.Dr. Oguzhan Ozcan  
Department of Interactive Media Design  
Yildiz Technical University, Istanbul  
[oozcan@yildiz.edu.tr](mailto:oozcan@yildiz.edu.tr)

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This paper examines an education model for design students who are involved with developing an electronical educational tool. In the paper after examining the results of two different design studios comparatively, it is discussed which teaching model is more effective. To do this, students projects were analysed comparatively one by one, then the results came out were evaluated. It is also given examples of students' projects in the paper. This subject is examined by means of visual communication design rather than educational sciences.

## **1. Introduction:**

One of the most important points in interactive media design education is having students make exercises in order to get them to be more creative when designing electronical tools which will serve to different fields.

One of the most important subjects is designing an electronical educational tool. As we know changes in conditions of world have supplied countries to take care of education much more than they used to do in the past. In order to have fast and effective results, when short, middle, and long term education programs are applied, all facilities of technology are used. As it is also known that another important cause for the use of technology in education is making education more effective.

However technology is used effectively, unless the educational tool is designed in an easy teaching way, attractively, and practically, it will be impossible to be functional enough. Because of this, it is important to use a pedagogical language and to supply rich visual and audible materials. But what is more important is the need of creative ideas which the designer produces intelligently when designing the educational tool and its content.

With the scope of above aim, answers of the following questions should be found:

In order to produce creative ideas

- for what kind of a design content should students of design produce?
- Which user groups should the students take up?

In order to find answers to the research questions mentioned above, a series of design studios at Yildiz Technical University, Interactive Media Design Education undergraduate programme between years 2000-2002 were held. This paper analyses these design studios.

## **2. Content Specifications for Creative Thinking**

Tools which are to be used for education vary according to the subject, user groups, and targets. But by means of electronical design, it is possible to classify contents into two groups:

### **a. Presentation of information (Passive Educational Tools)**

In this section of education, students access texts, image and sound which are prepared in a pedagogical knowledge. These presentations have no basic difference than a normal course- book, video or audible records. The only difference is that student makes backward and forward interaction and access and jumps to any point at video, audio, and texts more easily. The information is easily reached on-line. We can address these kinds of educational tools as passive tools. Passive tools are designed thinking in a way that the student has no idea about the subject.

### **b. Cross-examination of Knowledge (Active Educational Tools)**

In this section, the level of student's knowledge is determined and if there are any deficiencies, those will be compensated. We can talk about five kinds of examinations in terms of design: choosing, comparing, grouping, and reflection-in-action. Examples such as finding the right or wrong answer can be given for choosing, comparing the small and the big, finding shapes that fit each other can be given for comparing, classifying data which are similar or opposed to each other can be given for grouping, catching a moving shape, holding and exterminating it can be given for reflection-in-action. Especially learning by computer-game is a typical "reflection-in-action" method.

In order to understand which of the above education periods is useful to produce more creative ideas, two design studios were held.

In the first studio, students designed educational tools for groups from different ages. These designs are thought for students from preschool, primary school, and high school.

At first, students aimed to develop tools for a whole course such as Chemistry or Mathematics. It was seen in the following time period that because fixation, collection, and organization of the contents took most of students' time, they couldn't spend enough time on the design of tools. This situation prevented the designs to be creative enough. Because of spending much time on details of contents, they could not get concentrated enough on the entire tool and its aesthetics fiction.

To solve this problem, students were wanted to fix out the need for types of presentations instead of spending time on the contents of the courses and to propose solutions for one of these types of presentations.

For example it was emphasized that it would be more useful to search how a formula about chemistry could be taught easily and effectively instead of organizing the whole content of the course throughout one term. As a result, students were supplied to be intensive on the organization of data and the aesthetics fiction of the subject's part. As students spent more time on creative thinking, they had chance to produce much more creative solutions.

However the contents became narrower. The designs couldn't exceed more than any interface design created for any data. In other words, they had no plus use for design students to study on education specifically.

Starting out from this reality, a second design studio, in which another group of students were wanted to design tools that would supply testing of knowledge, was held. This time, students produced different scenarios for cross-examination of knowledge. They searched how an effective visual, audible expression method should be for the functions choosing, comparing, grouping, and reflection-in-action.

One of the most important examples of these tool designs is the cross-examination tool named "Knowledge Map":

To define the user experience we could say the followings:

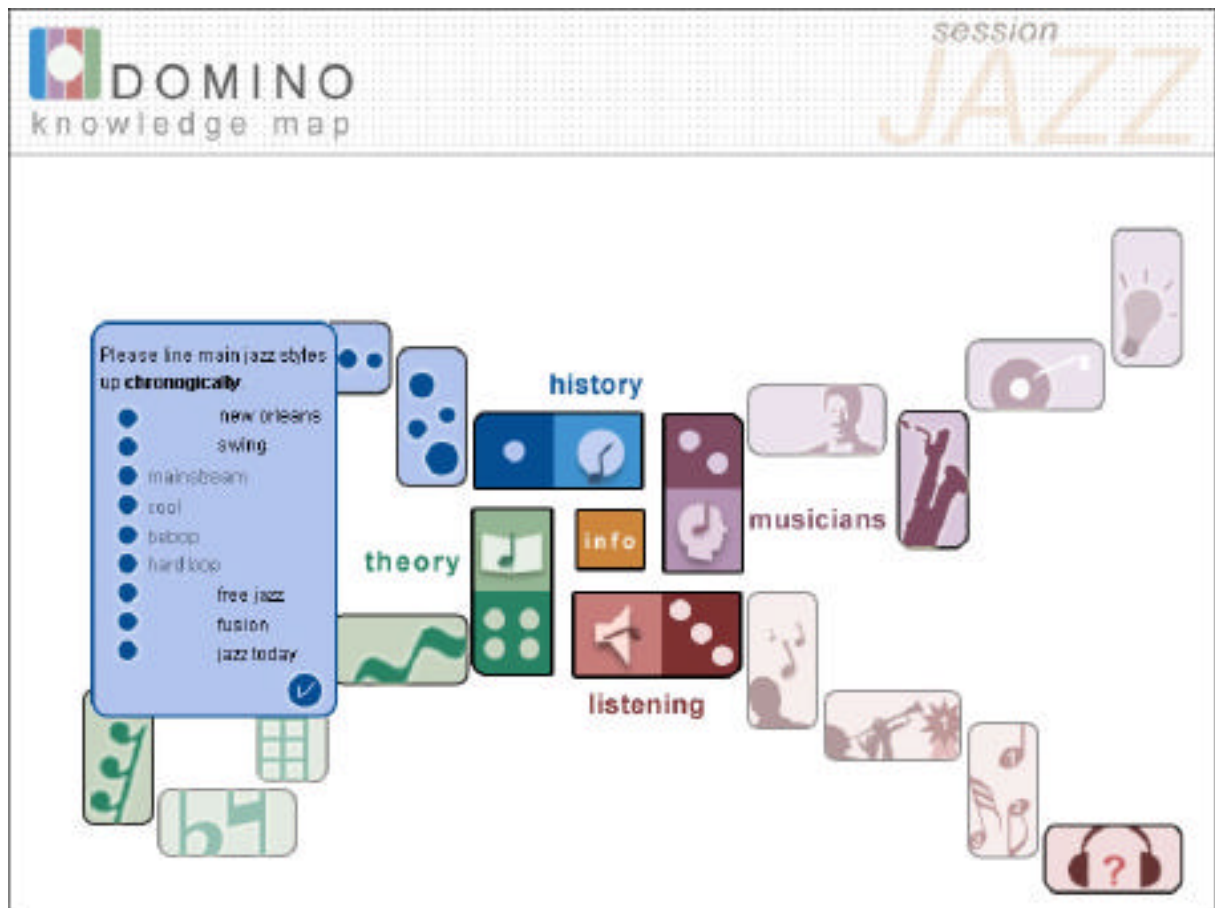
First the user reaches the "Quick Chart" which will give out the basic hints about the course or the subject, by the help of this tool. The look and feel of the interface has been influenced by the game Domino. The information flow of the Chart resembles the game.

Every Domino tile is a part of the subject and has a question about that particular subject.

At the beginning the user starts with a nine-tile Domino quiz.

Every tile when clicked on pops up a multiple answer type question window.

If the user gives out the right answer then the tile becomes a strong color and a new tile appears. If the user gives wrong answer then the tool guides the user to learn the subject by giving out Internet links on the subject and the tiles color turns dim



The user goes to the link to find out class notes about the subject supported with images and texts. We assume the user to get a hold of the concepts and when confident he gets back to the dimmed tile to click and continue the quiz. The knowledge map this time asks a new question on the same issue and assesses the users compatibility on the particular subject.

The system is designed and developed on the game concept, hopping to come out with a learning tool that is more fun and unconventional compared to the already available ones, and this, we hope is going to make the tool more popular.

At the end of a Domino session, the user will both asses himself and by look of the finished session will gain a quick chart that has images, short guides and terminological information about the course made of Domino tiles carrying this information.

As a conclusion, we have a learning tool that is both funs to use, as being time independent, more flexible and graphically pleasing. To mention a few words on the graphical interface, which completes the concept, we believe that heavy images competes with the information and some how creates perceptual conflict while learning. This fact has led us to design a light interface almost minimalist. The interface has been designed monochrome using the colors white as background and hues of blue.

The coding has been done using Lingo script for Macromedia Director. The project can be download from following link:

<http://www.siyah.net/koray/domino/domino.htm>

In this second design studio, students searched with which electronical tools could users response and which tools could present the truth of response in which ways. Consequently, students studied on cross-examination of knowledge rather than organization of it and on the kind of interaction mechanism in which such a cross-examination method could be applied.

### **Conculusion:**

As we mentioned at first, in this paper we aimed to find out which kind of contents should design students be dealt with in order to develop creative ideas for educational tools. In this scope, we can observe an exact difference between active and passive educational tools. Design student behaves as a web designer when creating passive tools, but he/she behaves as an industrial product designer when creating an active one. To express more clearly, design of active educational tools aren't taken up as a two dimensional site design. In virtual environment, sometimes third dimensional sometimes two dimensional design but like a physical tool just as a mobile phone, a car, an electrical broom, is created. This situation helps students to develop rich and experimental interactive design ideas. Here, user groups come out as an important factor in determining the shape of the tools. But we cannot say that this situation makes any differences in students' creativity. Properties of different groups of ages probably supply creative ideas to develop differently, but we observe that the richness and quality of interactive design can be the same for every group of age.

Consequently, we have the opinion that the difference between a passive and an active tool is more effective than groups of ages in development of creative ideas in educational tools.

In addition, design of active educational tools can be helpful to produce creative ideas to have an effective education. New tools and usage of new tools can cause new method developments. In this paper we analyzed what kind of an educational tool should be designed in order to strengthen creativity of design students; we hope that the active education tools and their similarities will be references to develop education methods. We think that the interaction between a designer and an educator can become more effective then.