

The *Prism Effect*-based Creativity-Thinking Process:

With "Multi-Sensory," "Multi-Dimensional," and "Storytelling" Devices

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Abstract: Digital information society shows a variety of contents of cross-categorical digital media in their inner or outer forms and concepts of the artistic aspects. In order to cope with such a complicated, unexpected trend in digital media and its industry, a new approach in the design process needs to be developed and adjusted with the new equipment of the creativity-thinking process of "the Multi-Sensory Device (MSD)," "the Multi-Dimensional Device (MDD)," and "the Storytelling Device (SD)" in the *Prism Effect*-based Creativity-Thinking Process (PECTP). The PECTP is in principle designed to practically work with the four distinct techniques: 1) Physical Activity, 2) Linguistic Activity, 3) Visual Activity, and 4) Complex Activity. Consequently, this thesis notes that the nature of the cross-categorical design contents is necessarily non-directional since the creativity power inside the *Prism Effect* results in openness and diversity.

Keywords: *Prism Effect*, cross-categorical design contents, multi-sensory device, multi-dimensional device, storytelling device

1. Introduction

Digital media, unlike analog media, are fundamentally transforming art in that it changes the marketing system, the communication system, and even the mentality of art between performers and consumers, which relate to an appreciation of art operated in a passive and one-sided way. As noted by Won¹, this attitude is now changing to an advanced form of mutual involvement between performers and consumers to shift the focus of art more toward participation and performance in a time of critical media change. As information society advances, the integration of the media and communication technologies in

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¹ Won, Kyungah (2003), Creativity Education Based on Digital Media Environment, Korean Society of Basic Design & Art, Vol.4.No.2, pp. 108~109, S. Korea.

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which both have independently occupied and developed its own fields has brought about the birth of a newly conceptualized cultural industry. The integration of expressive media and communication develops into a comprehensive network of information and communication and brings forth a new concept in which art and culture produce valuable cultural contents with a development of digital technology. One thing to note is that this integration as an artistic medium intensively deals with the digital structure. Paul ²focuses particularly on the distinguishing features of the digital medium that constitute a distinct form of aesthetics that is interactive, participatory, dynamic, and customizable in its principal characteristic. This thesis, along with a suggestion of a multi-functional form of the digital platform by Paul , delves deep into the artist's creative ways of thinking in digital media with the aids of integrated devices, the *Prism Effect*, which I employ to expand the realms of the creativity thinking.

The *Prism Effect*-based Creativity Thinking Process (hereafter the PECTP) that consists of "the Multi-Sensory Device (hereafter the MSD)," "the Multi-Dimensional Device (hereafter the MDD)," and "the Storytelling Device (hereafter the SD)" is designed to exploit every opportunity produced by the application of the devices, as noted by Won, that includes those basic ways of creativity thinking with respect to emotion, space, and time.

2. Method

How do we deal with work creation? In order to create artworks, we usually use the following three-step process.

- 1) Step 1: Setting a Goal: Relevant Sources
- 2) Step 2: Solving a Problem
- 3) Step 3: Evaluation

Although strategies in sketching the whole picture people use may vary, but most of them are operated in a similar fashion in that they generally have Step 1 and Step 3. Consequently, the creative thinking in work creation gets necessarily involved in Step 2. Step 1 mainly functions to collect relevant data and information from our surroundings and utilize them as precious and valuable sources of creative work. In Step 1, we thus grasp the source of the creative power. Step 3 usually includes various contents as the product of the creative work process and also serves to evaluate the results of the work process which are used as criteria for one's creative abilities in work.

As shown in Fig. 1, Step 2, which I deliberately skipped over, is an important phase in implementing the creative thinking in work creation. In most cases, this step, so far as we know, reflects one's creative faculty and requires lots of techniques available to produce the creative work. Therefore, the critical debate in this thesis resides in Step 2 that is variously applied in the framework of the *Prism Effect* that I will discuss in the following sections.

² Christiane Paul (2003), *Digital Art*, Thames & Hudson world of art, pp.67, New York

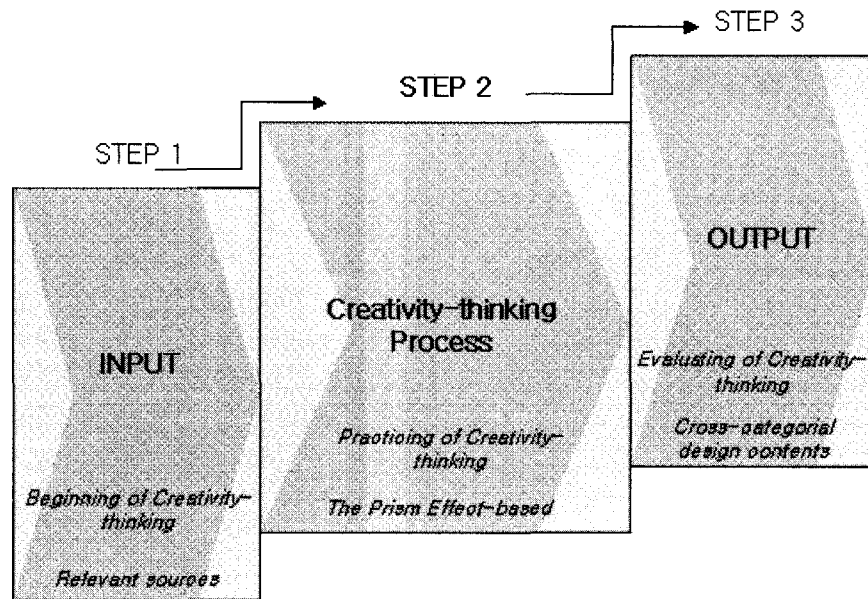


Fig. 1. The 3-step of Creativity-Thinking Process

The creative thinking processes through into the three steps; sources-*Input* as step of beginning of Creativity-thinking, *Creativity-thinking process* as step of practicing creative thinking, contents-*Output* as step of *evaluating Creativity-thinking*. The raw data in the first step gradually develops into the second step that focuses on the *Prism Effect*-based creativity-thinking process and, finally, projects the result of the cross-categorical digital media contents in third step. The creativity-thinking process of the *Prism Effect* radiate from the power source in both real and possible worlds around us.

At the first stage, we are all beginning creative thinker who are challenging ourselves to be armed with useful of information and stuffs to be powerful sources for creative problem solving. While collecting relevant data and information we begin to be creative thinker. Creative power for the creative process originates from our surroundings which we mentally and physically taste, smell, touch, and feel. As the very precious and valuable sources of information produce creative thinking, we open up our eyes to the world so that we grasp the source of the creative power from our surroundings and change to be creative attitude. The second step is where most creative thinking takes place. It is also the step that practices creativity-thinking and advances and develops in keeping with practice by offering the greatest potential for improving your creativity abilities focusing on that how do we develop creative ideas through *The Prism Effect*-based Creativity-thinking Process. Finally, the third step show outcomes of cross-categorical design contents which are possible and unexpected results of creative thinking.

The PECTP deals in principle with the following ideas that house the conceptual framework of the creative work of digital media. The basic conceptual methodology starts with an understanding of a creative thinking device in digital media and a characterization of the *Prism Effect*. Secondly, the spirit conceptualized within the framework becomes embodied through a three-staged program of the PECTP,

which suggests a systematically organized process of creative thinking. Finally, in order for the system to have productive efficiency in the educational field of art design, relevant techniques that deliver a gradual creative thinking process are suggested.

2.1. The *Prism Effect*-based Creativity-Thinking Process (PECTP)

2.1.1. The Basic Concepts of the PECTP

The PECTP is in principle designed to develop one's creative abilities in the field of design art through a multi-staged creative process of the *Prism Effect* that mainly utilizes the process as a device to draw creative thinking abilities. One way of accomplishing creative thinking abilities is to integrate the PECTP with the MSD, and the MDD, and the SK, which all function as an access to expressive creative abilities.

Each stage of the PECTP is organized with a relativity conception that does not restrict the realm of space and the shift of time, in contrast to the existing 2-D way of thinking in creative process. This creative thinking device which is manifested as a prism functions as dividing an information source into many different creative outputs.

1) Devices of the Creativity-Thinking

In the course of the creativity-thinking process, the MSD originates from the integration of all sensory systems we have and governs the emotional status related to digital life. The MDD is utilized to broaden the realm of the spatial thinking toward the artistic expressions. Finally, the SD is to develop the basic ideas and expressions through time-based storytelling methods. These devices mentioned above function to contribute the characteristics of media in analog-digital lives toward a great variety of expressive ways in creative thinking.

The Multi-Sensory Device (MSD)

The MSD relates to the senses that integrate all sensory systems into the multiplex system that governs and opens one's emotional status. The digital emotion in a digital media period is a feeling that can be achieved by exploring the interrelationship of space and sound with the integrated medium between audio and video. Many experimental attempts in digital art may be accounted for by an analysis of the MSD equipped with digital emotion. The MSD plays a crucial role in understanding their complicity of digital media since the appearance of experimental digital art is no longer grounded by a single-minded sensory system which conveys its artistic expressive. Therefore, the MSD functions to open the gates of all sensory systems to utilize the digital emotion as a creative thinking device. The creativity thinking thus begins from the recognition of the digital emotion, which is integrated into all sensory systems available, in digital media and, therefore, becomes a preliminary criterion in observing objects.

The Multi-Dimensional Device (MDD)

The MDD notes a relative concept in an artistic way of thinking that experiences a relatively free movement of space and time out of a restricted realm of the 2-D way of thinking. This enlarged idea enables us to pursue plenty of expressiveness in ways of thinking in both inside and outside qualities. The approach with a multiple creative thinking becomes an important basis in understanding the media form and the concept of various expressions produced by the digital media environments. This device has an effect of improving creative abilities with multi dimensions to spatial time, the relation between space and time, 3-D form, and 4-D expressiveness.

The Storytelling Device (SD)

The SD is a way of developing one's way of creative thinking and expressiveness through the form of narrative. The narrative that changes in a digital period with various contents such as movies, animation, games, and music is an important attribute in digital media. Most ideas rely on our experience that is in general full of a variety of stories. In order to utilize the experience, we need a device to resolve the unorganized narrative by employing a specially designed way of creativity thinking. I note with Douglass³ that the SD serves as a creativity thinking that includes the characteristics of emotion and the concept of time and space and enhances the creative faculty of digital contents with the aid of a training that enables us to express and develop the idea of narrative.

2) The Prism Effect

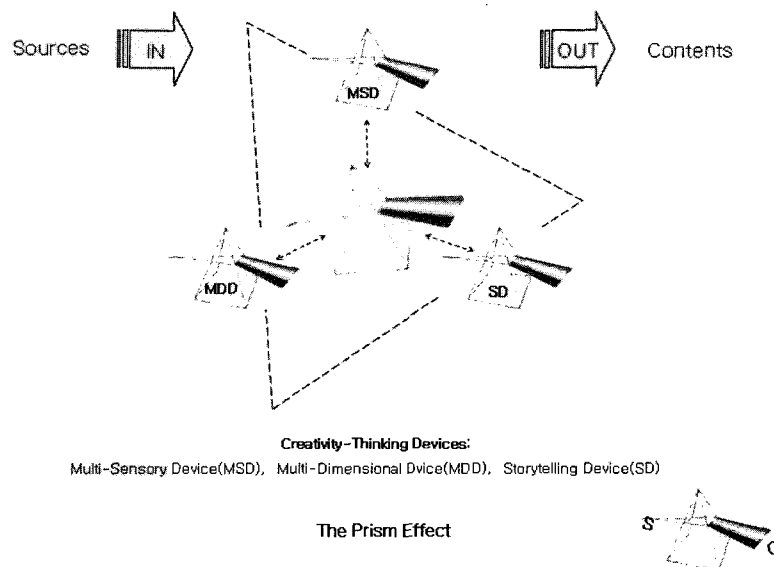


Fig. 2. The Prism Effect

³ Douglass, John S. and Glenn P. Hardnden (1996), *The Art of Technique: An Aesthetic Approach to Film and Video Production*, Allyn and Bacon, pp. 20~29, MA, USA

The outcome of work creation needs to be unexpected so as to include a variety of contents in number, size, and nature. The key role of the prism of the system as shown in Fig. 1 is to absorb an analog information source and divide it into many different pieces that are transformed digital contents. The *Prism Effect* then functions to diverge onto the target of the digital information life with the amalgamation of multi-sensory, multi-dimensional, and storytelling devices that are manifested themselves in the images of the prisms. Those three prisms interact with each other and function to constitute one single device to perform the comprehensive creative thinking.

One thing to note is that each creative thinking device interacts with the other, so they communicate with and react to one another and often performing various exercises together to produce an infinite set of digital contents, which are, in many cases, unpredictable. The integration of the *Prism Effect*, which is the process of combining with information sources of all types in a well-staged system, also has an effect of producing pedagogical techniques and practice in the course of the work creation.

2.1.2. Techniques of Creativity-Thinking

As shown in Fig. 2, I propose four distinct types, or techniques, which are categorized as two aspects, a basic emotional aspect and an advanced technical aspect, according to the features of the contents of activities that take place in the course of inducing the factors of creative thinking. These techniques are in principle designed to interact with the core concepts of the PECTP that functions as devices to stimulate and inspire each activity. I believe that these efforts would change an attitude toward one's perception of things. Those techniques I present would also be effective tools for enhancing the creative faculty and, furthermore, the exercises employed would contribute to maximum adaptability of the PECTP.

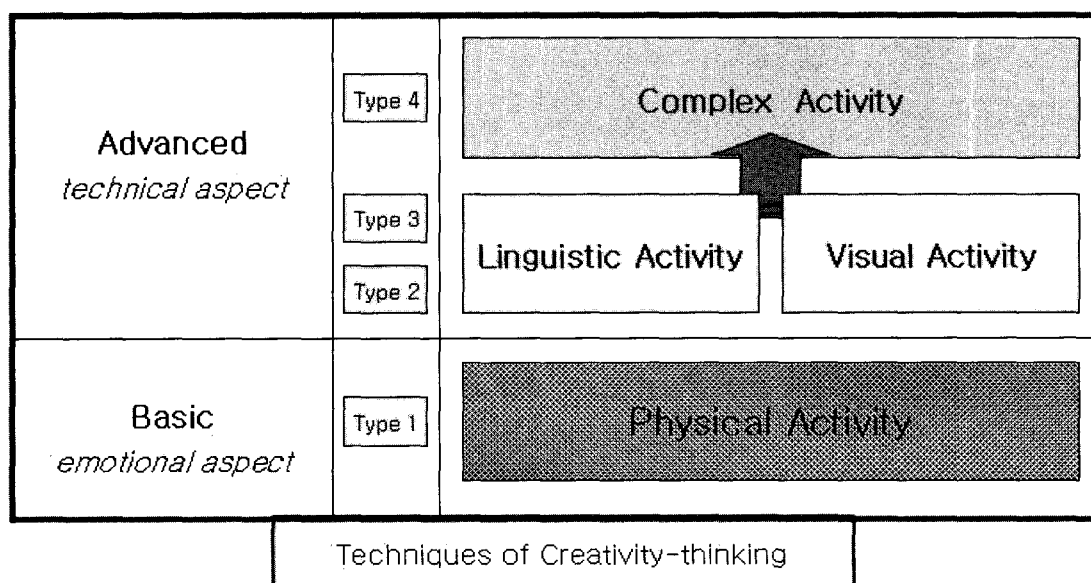


Fig. 3. Techniques of Creativity-thinking

1) Type 1: Technique with Physical Activity

Type 1 requires the input source to experience the PECTP first hand, which activates devices such as the MDD and the MSD except for the SD since it involves physical activity like "play," as Edwards⁴ notes, that relates to one's body in the real world rather than one's mind in someone's imagination. People are therefore asked to observe, touch, smell, taste, hear, etc. each other as well as surroundings to unlock all of their senses. This type of physical activity, as also noted by Elkins⁵, has an effect of meticulously observing and describing things that serve to connect to the creative ideas by recording subtle changes in the targeted objects. Physical activity can help not only relieve stress on the subject, but also deal effectively with problems by encouraging the energetic, active interaction with the related things. Healthy and positive environments induced by physical activity give rise to sound and positive feedback which strengthens the participation for the creativity-thinking process. This physical interaction helps broaden one's horizons and the creative realm of the targeted objects⁶.

2) Type 2: Technique with Linguistic Activity

Type 2 orders the input source to undergo the PECTP, but, this time, only such devices as the MDD and the SD will be activated since it involves linguistic activity like "utterance" and "writing" that are technically embodied in the "storytelling." This linguistic activity involves the relatively free movement of events, images, and feelings, which are not physical in nature, so it is easily augmented in the process of creativity thinking. As noted by Weiland (2001) and Won (2004), augmentation of a story is an important strategy that enables us to have the creative, positive interpretation of the subject in digital media and facilitate communication and participation between play and emotion. Linguistic activity also deals with writing as a device for communication, which is often used to develop creative thinking in work creation. Not only a well-prepared story but also an improvisational story would be very valuable to cut across any barriers to successful creativity thinking. One thing to note is that this activity becomes useful for the story in writing to project creative images of thinking.

3) Type 3: Technique with Visual Activity

Type 3 asks the input source to go through part of the PECTP, in which the MDD and the MSD are activated to motivate the visual images of various events, imagery, feelings, etc., which are neither a physical state nor written materials in any case. Therefore, this visual activity enjoys a maximum flexibility in visualizing and symbolizing images in the process of creativity thinking⁷.

⁴ Edwards, David D. (1979), *How to be more creative*, Occasional Productions, pp93, CA, USA.

⁵ Elkins, James (1996), *The Object Stares Back: on the nature of seeing*, A Harvest Book Harcourt, Inc., pp17~18, NY, USA.

⁶ Won, Kyungah (2004), *A Study on the Exercises-centered Creativity Program Courses Based on Digital Media Environment*, Korean Society of Basic Design & Art, Vol.5.No.1, pp. 101~102, S. Korea.

⁷ Won, Kyungah (2004), *Methodology of Creativity Development on Fundamental Design Education*, Korean Society of Basic Design & Art, Vol.5.No.3, pp. 274~275, S. Korea.

4) Type 4: Technique with Complex Activity

Type 4 is either combined activity of linguistic and visual activities or transformational activity that transforms visual activity into linguistic activity, or vice versa. Combined activity encourages various events, imagery, and feelings, etc. in the mixed form of linguistic and visual activities, which brings out plenty of expressiveness in creativity thinking. Sometimes, the result of combined activity becomes too complex so that one can no longer tell the difference between them⁸.

Transformational activity is another form of complex activity that relates to linguistic and visual activities that affect each other in the direction of application. For example, if the input source undergoes linguistic activity and visual activity in sequence and produces a creative story and a creative image in turn, then, transformational activity functions to reverse the direction, from visual activity to linguistic activity, resulting in a reversed output from a creative image to a creative story. As people's experience grow with this type of activity, the range of creativity thinking would be as maximally augmented as possible.

One thing to note is that the number of the techniques above is not fixed in practice since for a complex exercise more than one activity is needed in the pursuit of the best solution of creative work. Otherwise, one activity would be enough.

2.1.3. Creativity-Thinking in Practice

As shown in Table 1, each four types of techniques are focusing on their own activities based on observation, experiences, participation, play, visualization, storytelling, writing, combination and transfer in creative thinking practice

Table 1. Activity

Aspects	Types of Techniques	Activities
Basic Emotional Aspect	Physical Activity	Experiences, Observation, Participation, Play
	Visual Activity	Visualization
Advanced Technical Aspect	Linguistic Activity	Storytelling, Writing
	Complex Activity	Combination, Transfer

Among them, the activities of observation and experiences as the basic emotional aspect are grounded for the advanced technical aspect in creativity-thinking techniques. The action of observation is to watch and study someone or something with attentions in order to discover something. This method is powerful tool for improving accurate description of the things, and thus may develop artistic expression. The observation allows an ability of finding powerful connection to ideas by recording any changes of things as time passed and by having your point-of-view to be diverse. The experience in all of the senses is the basis of all activity.

⁸ Won, Kyungah (2004), Methodology of Creativity Development on Fundamental Design Education, Korean Society of Basic Design & Art, Vol.5.No.3, pp. 274~275, S. Korea.

The method of experience can unlock all of your senses and expand your creativity. The idea of participation as creativity-thinking techniques supports your commitment to have more energetic creative attitude and creative thinking. The creativity-thinking exercises are planned for you participate in creative process in the way of feedback to art working. Use play to generate new idea. You don't need to learn how to play. Play makes body and mind to be relaxing and lets you free.

As shown in Table 2-1~2-4, here are samples of exercises can be used to expand creativity-thinking. They are based on the activities of observation, experiences, participation, play, storytelling, writing, visualization, combination and transfer. They are basically designed for improving and expanding creativity-thinking of "multi-sensory," "multi-dimensional," and "storytelling" by changing and training an attitude on our perception of things. As those techniques are effective tool for enhancing the creative ability, various creativity- thinking exercises are designed for learning and exploit them.

Table 2-1. Exercises

Types of Techniques	Activities	Exercises
Physical Activity	Experiences, Observation	Exercise 1: Exploring things
		Exercise 2: Physical exercise and Imagination
		Exercise 3: Taking picture of close-up natures
		Exercise 4: Daily works
	Participation, Play	Exercise 1: Show and Tell
		Exercise 2: Imagination by senses
Exercise 3: 10 objects story		

Table 2-2. Exercises

Types of Techniques	Activities	Exercises
Visual Activity	Visualization	Exercise 1: Imagination and collage
		Exercise 2: Creating on shoe box frame
		Exercise 3: Making map of journey
		Exercise 4: Making book of the day

Table 2-3. Exercises

Types of Techniques	Activities	Exercises
Linguistic Activity	Storytelling, Writing	Exercise 1: Box story My story
		Exercise 2: Dream Imagery
		Exercise 3: Visiting Art Gallery
		Exercise 4: Storytelling with Soundtrack
		Exercise 5: Interviewing
		Exercise 6: Imagination with Images

Table 2-4. Exercises

Types of Techniques	Activities	Exercises
Complex Activity	Combination, Transfer	Exercise 1: Frame Drawing
		Exercise 2: Guess with movie scene
		Exercise 3: Transfer visualization to writing
		Exercise 4: Image Reading
		Exercise 5: 5min. in camera

2.1.4. Example of Creative Process in PECTP

- 1) *Exercise:* Exploring things
- 2) *Types of Technique:* Physical Activity
- 3) *Activity:* Experiences & Observation
- 4) *Processing of exercise:*

Step1: Collecting data in Idea Box

For this step, participants are require to explore various ways of understanding and communicating with surroundings for finding relevant sources of ideas and broadening their areas of information to induce creativity. These sources are valuable material for developing their own ideas into the developing of theme. It is recommended that participants spend a lot of time in activities such as traveling, watching movies, reading novels, meeting friends, etc. to open up their eyes to the world so that they grasp the source of the creative power from their surroundings. The various experiences they may undergo are very precious and valuable sources of information that produce creative thinking and reflects one's subjectiveness.



Fig. 4. Sample of Idea Box

Step 2: Transformation & Choosing a Theme

It is not easy to draw tangible, applicable ideas from the raw and unrefined information that is simply accumulated by the first step. Step 2 activates an operation called "Transformation" which transforms the raw material of information into entities with a novel interpretation and re-expresses them in one's own words. How do we give an appropriate direction to our imagination so that it integrates our collected raw information into the interpretation. In order to solve the problem, we may have to keep asking ourselves the following questions: "What about...," "What if...," "What else...," and then again, "What else...," which all make us use our imagination on things. The following steps show how to approach a new interpretation of things.

1) Analysis: Things that are specifically analyzed turn into useful findings that provide important clues which speed up and strengthen our power of association in the process of creativity. In order to optimize the process of analysis, there should exist at least three steps: i) sort the collected material so as to be efficiently analyzed and prepare a work sheet for further systematic analysis, ii) list and place in order known facts of the things, and, deliberately, give little attention to the newly collected material when working on the creative process, and iii) start thinking up all possible ideas using association, combination, chain-thinking, word puzzling, drawing, or storytelling.

2) Development: Information filtered through the activities of various imaginative tools gets narrowed down into a few ideas that are in one sense novel and innovative. And one of these, finally, becomes a solid idea which can be used to delve into a theme

Step 3: Theme Development & Theme Presentation

Step 3 notes that all the activities related to the process of Theme Development are based on the concept of *multi-dimensional*, which utilizes non-static art forms for the theme presentation. Use of non-static art forms changes methods of creative thinking by literally and figuratively taking participants to another dimension. As shown fig.5, theme presentation as an art form needs to be non-static so as to give maximum variety to its expressiveness. Examples include installations, performances, case studies, mixed-media, quizzes, games, etc., in which participants perform without any limitations in time, space, expression or medium. Performers must be equipped with relevant motives to express their intentions in the non-static art form. The following figures show various types of non-static art in student presentations.

Theme presentation should permit no explanation nor give any clues about the contents of the theme to the audience. The audience is then encouraged to participate in the communication process with the performer by directly experiencing the presentation of the non-static art form.

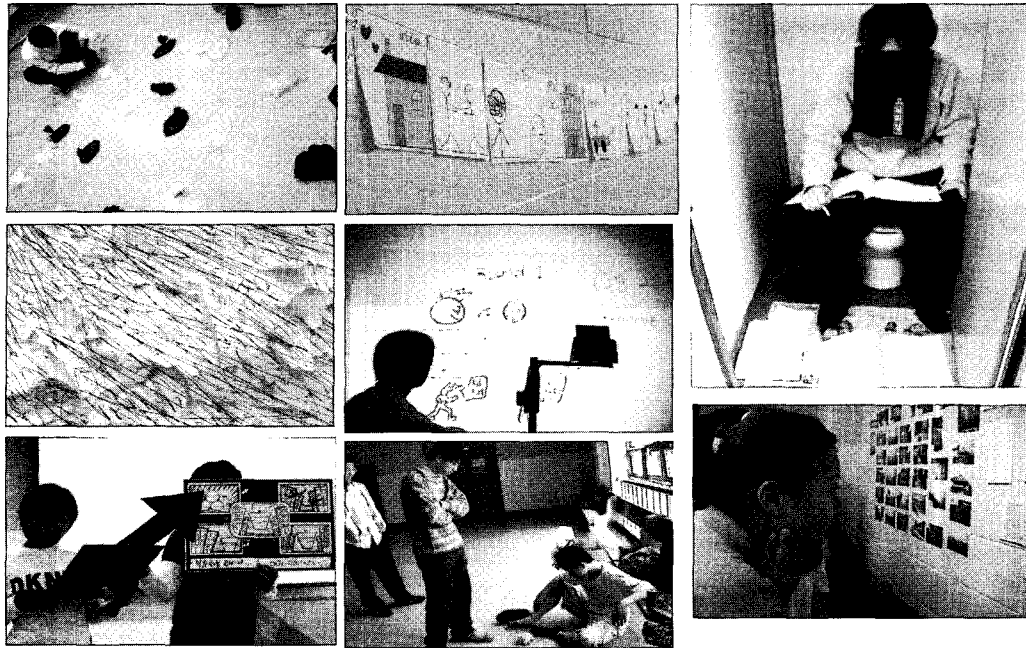


Fig. 5.Example of Theme Presentation

3. Results and Findings

This paper mainly deals with three steps in which the raw data in the first step gradually develops into the second step that focuses on the *Prism Effect*-based creativity thinking process and, finally, projects the result of the cross-categorical design contents. The creativity thinking process of the *Prism Effect* radiates from the power source of design in both real and possible words around us. The *Prism Effect* then functions to diverge onto the target of the digital information life with the amalgamation of "multi-sensory," "multi-dimensional," and "storytelling" devices that are manifested themselves in the images of the prisms. Those three prisms interact with each other and function to constitute one single device to perform the comprehensive creative thinking.

In order for the PECTP to work efficiently, well-organized techniques for solving problems and highly structured exercises for evaluating the effects of the process are needed. Techniques for augmenting creative thinking are in principle based on the PECTP and exercises for applying those techniques are designed.

4. Conclusions

So far, we have noted that the integration of expressive media and communication develops into a comprehensive network of information and communication that serve as a new concept in which art and culture produce valuable cultural contents with a development of digital technology. We have also discussed the effects of the PECTP to handle a variety of cross-categorical contents in digital media. One thing to note is that the nature of the cross-categorical design contents is necessarily non-directional since the creativity power inside the *Prism Effect* results in openness and diversity. The PECTP deals in

principle with the following ideas that house the conceptual framework of the creative work of digital media. The basic conceptual methodology starts with an understanding of a creative thinking device in digital media and a characterization of the *Prism Effect*. Secondly, the spirit conceptualized within the framework becomes embodied through a three-staged program of the PECTP, which suggests a systematically organized process of creative thinking. Finally, in order for the system to have productive efficiency in the educational field of art design, relevant techniques and practices that deliver a gradual creative thinking process are suggested

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