

# The Effectiveness of Reducing State Anxiety by Digital Counseling Tool - Mind Collage

Yu-Jen Hsu <sup>\*</sup>, Ju-Ling Shih

<sup>a</sup> *Department of E-learning Design and Management,  
National University of Chiayi, Taiwan*

<sup>b</sup> *Department of Information and Learning Technology,  
National University of Tainan, Taiwan*

\*yuren925@gmail.com

**Abstract:** This research aims to investigate the effectiveness of digital counseling tool, Mind Collage, to reduce participants' state anxiety. Mind Collage is a digital tool designed based on expressive art therapy, Landscape Montage, to project users' inner self image onto the paintings they made. STAT-S inventory was used to compare the participants' change of state anxiety. From behavioral observations and interviews, the researcher found that Mind Collage can provide a relaxing space for the participants, and effectively reduce their state anxiety. At the same time, they highly trust the tool, and are more willing to reveal themselves on the digital system.

**Keywords:** Digital Counseling Tool, State Anxiety, Mind Collage

## 1. Introduction

In the modern society, human beings are living in a much faster pace, receiving more information, facing more challenges, and feeling more pressures. As a natural consequence, invisible anxieties exist deep inside each individual. From the counseling perspective, expressive art therapy is a way to restore emotions, and thus reduce anxiety.

In order to approach the individuals with ease, this study strive to seek a commonly used tool to do the work. Reviewing the nature and features of technology, from the 20<sup>th</sup> century on, Internet and information technology have brought about the formation of virtual world which intrigued thousands of young people to be its loyal citizens. The virtual environment has greatly influenced people's living and learning style since it has opened the possibility of linking people with others and their environment.

Counseling is a professional work that counselors aim to assist their clients to effectively deal with their problems with effective ways (Egan, 2007). It is based on assisting the clients' to develop into mentally healthy individuals who can work independently and self-guidedly. Traditional counseling model provides personal psychological assistance to the client face-to-face, but it often discourages some young people to seek for help due to the mental confrontation of revealing oneself to strangers. Therefore, many counseling groups have begun to provide Internet counseling services, and have led counseling into a new era.

Existing digital counseling tools are becoming more diverse. Many counseling groups have begun to provide Internet counseling services, but limited to mechanisms such as message boards, E-mail, online psychological tests, real-time chat, and so on. Related studies showed that the Internet has advantages such as anonymity, virtuality, convenience, escape, and so on. Therefore, web-counseling can provide clients a high degree of freedom and privacy so that they can directly express their feelings; at the same time, the counselors can create better counseling relationship with the client, and easily record and manage the process of treatment.

With the advantages of counseling in the digital forms, the purpose of this study is to use a self-developed digital counseling tool, Mind Collage, to reduce clients' anxiety. The development of Mind Collage integrated digital technology and counseling theories, with two special features. First, digital expression of mental images. Users project their mental images onto the pictures, which is a non-verbal communication medium. Second, mental images as treatment. As the users conduct the

painting, they enter a space where they face themselves, without external pressure or burden. They have little emotional confrontations, and enhance perceptions and awareness. Both features strengthen Mind Collage as the bridge to connect the users' inner self with the outside world.

## **2. Literature Review**

### *2.1 Anxiety*

Anxiety can be categorized as state anxiety and trait anxiety in terms of its nature (Spielberger, 1971). Trait anxiety refers to the anxiety that comes from inside of an individual. It is a long-lasting and fixed personality that no matter what circumstances the person is in, trait anxiety would stay. On the other hand, state anxiety refers the emotional responses when the individual faces certain situations, for example, work pressure; however, as long as the situation does not last, the anxiety disappears as well. Thus, state anxiety has temporary and transitional characteristics (Pintrich & Schunk, 2002).

Anxiety makes people feel tension and nervous. It comes from intangible and unobvious sources and threatens. It is a defensive emotion that helps people deal with the environment, and stay away from danger; at the same time, it transmit communicative message of acquiring help and protection. It stimulates the individual's willingness to take action, and do things better. Nevertheless, it influences the work of cognitive function. Pekrun (2000) pointed out that emotion has three major sources, namely genetic dispositions, physiological processes, and cognitive appraisals. The most commonly seen emotions seen in the psychological therapy include anger, sadness and distress, fear and anxiety, shame, as well as the pleasant emotions. Anxiety is generated from the uncertainty and fragile inner self, which make one feels repressed from self-expectation, afraid of rejection and failure. One would be influenced by the stereotype of the society, and experience anxiety through anger or sadness.

Expressive art therapy can reduce the anxiety that is generated from the first encounter of counseling. Expressive art therapy also helps the participants to establish relationships with the counselors, and be submerged in the counseling process. Since mental image projection create a psychological safe distance of the participant and the issue, the participants can reveal their subconscious feelings and thoughts from the project and make it a part of their self-perception.

Ellis (1998) thought emotion is the result of complex interaction of human behavior responses and perceptions; therefore, emotion is a kind of cognitive perception. There are three levels of emotion expression guidance (Greenberg, 2006). The first level is Dialogue Level which refers to the process of using simply language with experience-focused questions to guide the clients to express their emotions. Most traditional counseling stay in this level. The second level is Processes-oriented Level in which counselors direct the client's emotional focus onto a specific experience or behavior, and increase his awareness to the aroused emotions. The last level is Stimulate Level which is to create a new experience through activities for the client to generate new emotions.

From this point of view, the participants' emotion responses monitored in this research involve those of process-oriented level and stimulation level. Therefore, the aim of this research is to use a digital tool to guide them through specific emotions, and even through the activities to create more peaceful emotions.

### *2.2 Expressive Art Therapy*

Art activities can provide a concrete and non-verbal medium for people to deliver their subconscious thoughts and to raise their awareness. It can be the drive for people to make therapeutic changes (Dalley, 1984). Because that we are very isolated, inhuman, and over-intellectualized that it is rather important to increase the connection with their inner selves (Moreno, 1975). Therefore, non-verbal counseling methods such as art therapy are used more in the counseling arena in the non-verbal domain. Expressive art therapy is a medium of expression, which can present visual image from sub-consciousness. In this way, people can display outside their hidden thoughts and affections. thinks that the expressive art therapy emphasizes players' creative process. This treatment assumed that the individual's inner reality of can be presented by creation. Therefore, the expression of the creative process makes the players experience expanding human experiences, self-balancing, whole life, and increasing self-awareness, and get feelings from inner world.

Expressive art therapy is a medium of expression, which can present visual image from sub-consciousness. In this way, people can display outside their hidden thoughts and affections. Egan (2007) thinks that the expressive art therapy emphasizes players' creative process. This treatment assumed that the individual's inner reality of can be presented by creation. Therefore, the expression of the creative process makes the players experience expanding human experiences, self-balancing, whole life, and increasing self-awareness, and get feelings from inner world. As Withrow (2004) said, art therapy can more effectively reached the therapeutic goals than dialogue because it provides experiences exceeding language. Expressive art therapy allows the clients to recover from their negative emotions through images, and reached the deeper self.

Expressive art therapy is a medium of expression, which requires the individual to present his visual images from the sub-consciousness (Malchiodi, 2007). Landscape montage technique, also called landscape composition, was proposed by Mr. Nakai in 1969. It is one of the methods of expressive art therapies. There are 12 landscape objects, such as river, mountain, farmland, road, house, tree, people, flower, animal, stone, bridge, and sun. Each one of them has its counseling implications. (1) River: unconscious life progress, the flow of energy. (2) Mountain: focus, direction. (3) Farmland: integration of the picture. (4) Road: the shape, form, type, and so on. (5) House: personal perceptions and feelings of the environment. (6) Tree: process of self-growth. (7) People: sensitivity, maturity, flexibility. (8) Flower: vitality, hope, and life which means the subjects' implicit sense of life and affection. (9) Animal: The outside ways getting energy and life. The performance of inside energy and drives from individual's sub-consciousness. (10) Stone: awareness of self-enhancement and protection. (11) Bridge: contact and communication. (12) Sun: vitality or strength.

### **3. Digital Counseling Tool System Description**

Mind Collage was built with Unity 3D game engine. Adobe PhotoShop was used to create and generate various graphic styles for the users to use. From the previous counseling experiences, Landscape Montage drawing is difficult to people with lower painting skills. They would worry about whether they can complete the picture as the counselor hoped. Since this research wanted to solve this problem, the digital system was designed to use easy-to-manipulate techniques. The features include, 1) there is graphical user interface (GUI) to increase user friendliness; 2) objects are provided to minimize users' worriness to painting fright; 3) drag-and-drop is enabled to allow minimal manipulation complexity; 4) expert knowledge database analysis to allow users to receive instant feedbacks.

Expert Knowledge Base refers to the database to generate counseling feedbacks. It is the brain of the system which was built with the Sequence of the 12 elements for Landscape Montage, Definitions of the elements' placements, and Content Experts' Interpretations.

During the process of working on Mind Collage, the participants were asked to draw a landscape following counselor's step-by-step instruction. (Figure 1). Users can choose their own picture frame and background. The sequence and definition of the 12 elements of Landscape Montage were defined according to Akira Kaito's book (2010) Landscape Montage: A Pictorial Psychological Therapy. Our digital counseling game modifies such a method and allows users to perform it on a platform. On the game menu, clients place 12 objects onto the canvas. They place the visual images by simply drag-and-drop the pictorial icons in the zoom-in/zoom-out mode in the virtual environment. The completed landscape can not be changed or modified after they complete the project. The 12 Landscape Montage elements were grouped into three clusters, including background group, center group, and foreground group. Then the system would generate automatic counseling responses according to the definitions of the kinds, styles, sizes, quantity, and placements as the user finishes the game. These steps will constitute the picture that can sufficiently represent users' inner thoughts and feelings. In this way, we can help players to fine their hidden selves and diagnose the situations they are in.

When the client finishes the picture, the counselor discusses with the client, and gives suggestions to the client in aspects of the sense of integration, richness, uniqueness, spatial depth, and so forth; and at the end, concludes the feedbacks with the interpretations of individual meanings (Figure 2).



Figure 1. Mind Collage Interface and Product Example



Figure 2. Counseling feedbacks of the system

#### 4. Methods

This research invited twelve adults randomly chosen, 2 males and 10 females, aged 25 to 40 years old, to participate the experiment. Pretest and posttest of participants' state anxiety were conducted for comparison to understand the effectiveness of expressive art therapy. Instant feedbacks to the participants' Mind Collage final product were given. Desktop recordings were done for the analysis of participants' inner image projections. The experiment process is as Figure 3.

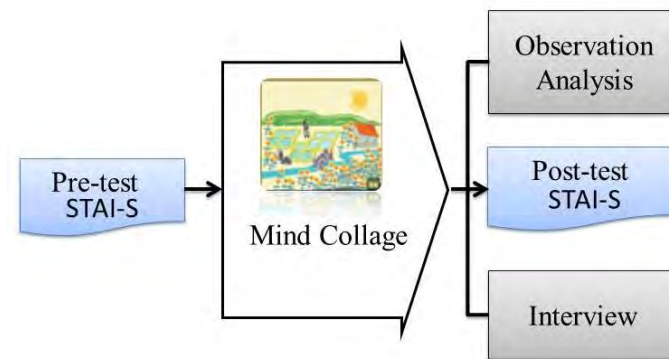


Figure 3. Experiment Process Flowchart

In order to investigate whether expressive art theory based digital counseling tool can allow the participants to calm their minds, be more peaceful, relaxed, and obtained positive action goals. In order to know the effects, the research tool used in this research is State-Trait Anxiety Inventory (STAI) proposed by Spielberger (1983). The inventory is appropriate for measuring the anxiety levels of teenagers to adults. The inventory involves two parts, State Anxiety and Trait Anxiety, with total of 20 questions. This research only uses state anxiety for measurement. State anxiety refers to the temporarily emotional state, which includes nervous, anxious, autonomous nerve system excitements, and conscious perceptions. Therefore, state anxiety would be different according to time and context. Questions in the inventory are mostly about current emotional feelings and self-perceptions. For example, I now feel peaceful; I feel I am confident; I am always alerted; etc. The point of Mind Collage is to allow participants to place their focus on making the pictures, and during this time, to calm down, lower down the defense, forget about the pressures from the outside world, look into their inner selves, and reduce state anxiety.

The scale uses four-point Likert with 4 points for strongly disagree, 3 points for disagree, 2 points for agree, and 1 point for strongly agree. The lowest score is 20, and highest score is 80. The lower the scores represent that the participants have more anxiety. The inventory has a retest reliability of 0.737 with Cronbach's  $\alpha$  of 0.898.

The Mind Collage was done in a small room which had only the researcher and one participant and no external interferences. Every participant had 40 minutes of time. During the process, behavior observations were conducted to document participants' digital counseling process in order to find out

the factors of participants' emotional changes. After the experiment, focus group interviews were made with the participants to know their use experiences, feelings, counseling effectiveness, and motivation changes. During the process, the researcher would place a mirror behind the participants which would reflect the actions of the computer desktops. In the front, there was a camcorder which recorded the participants' facial expressions. The setup is to conduct synchronous observations, document the working process. The experiment setup is as Figure 4.

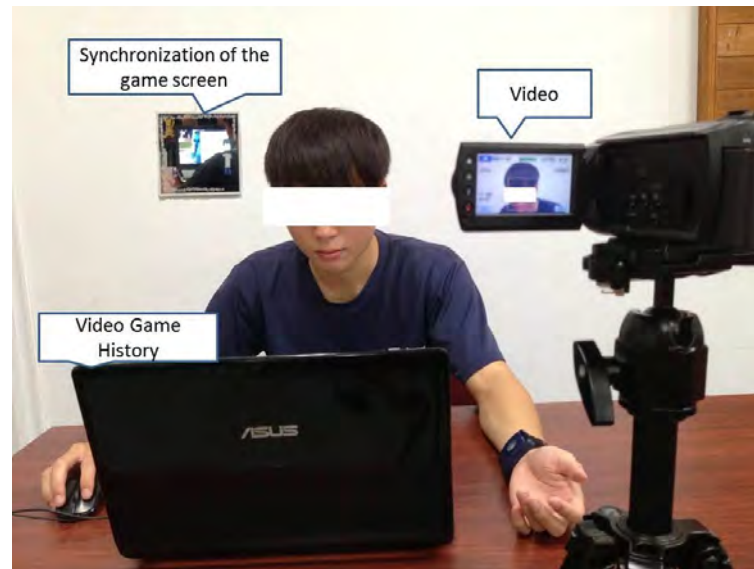


Figure 4. Experiment set up

## 5. Results

The occurrence and intensity of state anxiety is related to individual's subjective perception to the stimulation, and changes as the situation change. As the stimulation of state anxiety disappears, state anxiety would return to normal. STAT-S inventory shows the results of individual's responses to the certain environmental condition, and whether they feel safe, nervous, or anxious. The score of state anxiety of all twelve participants have risen after using Mind Collage (Table 1). All the posttests are higher than the pretests (Figure 5). It shows that this digital counseling tool has positive influence on the participants' state anxiety that their feeling of anxiety is reduced.

To further investigate the results, the participants can be categorized into two major types: those with obvious variation of state anxiety (Variation > 5) and those of stable variation of state anxiety (Variation < 5). Type I include 7 participants: W01, W02, W05, W06, W07, W08, W10; Type II include 5 participants: M01, W03, M02, W04, W09.

Table 1: STAI-S data

Subjects	Number	Gender	Pretest	Posttest	Variation	Variation
01	M01	M	58	59	Rise	+1
02	W01	F	49	65	Rise	+16
03	W02	F	57	66	Rise	+9
04	W03	F	68	72	Rise	+4
05	M02	M	60	61	Rise	+1
06	W04	F	74	76	Rise	+2
07	W05	F	45	56	Rise	+11
08	W06	F	56	71	Rise	+15
09	W07	F	65	73	Rise	+8
10	W08	F	56	67	Rise	+11
11	W09	F	69	70	Rise	+1
12	W10	F	43	50	Rise	+7

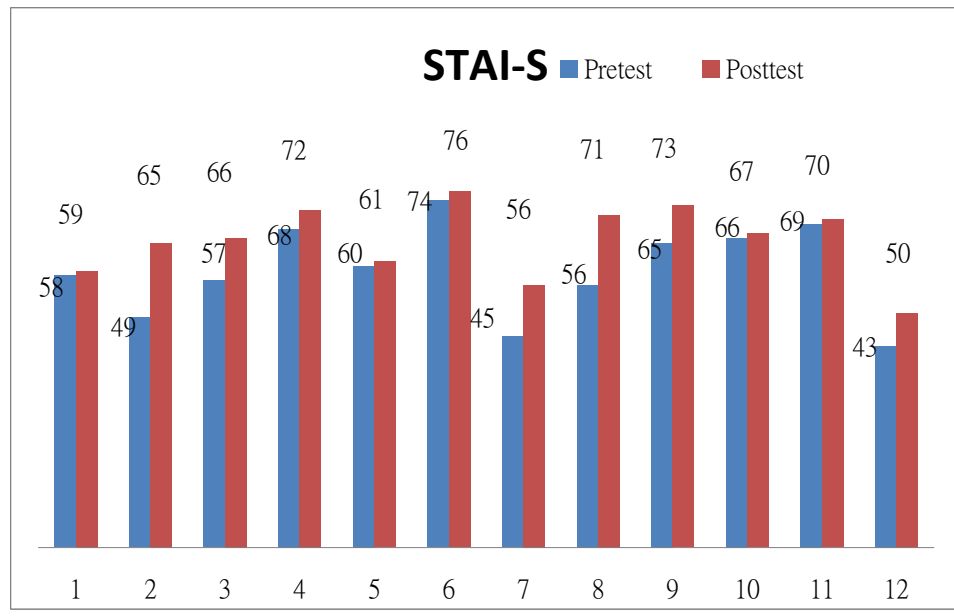


Figure 5. Graph of STAI-S Results

#### Type I: Obvious variation of state anxiety

A typical example of Type I is W02. The complete picture made by W02 in Mind Collage is as Figure 6. Her pretest score of STAT-S is 49 points, and posttest score is 65 points. It shows that Mind Collage has obvious effectiveness to reduce the participants' state anxiety. From behavior observations, W02 held her chin during the whole process and was immersed in thinking. When she encountered the river placement, she moved her eyes around the canvas and showed uncertainty. As she was placing mountain, she asked whether she can try again, can turn the object around, or can move the object forward or backward. As she is placing the field, she leaned forward; and when it came with the tree step, she was focused and seemed very determined. When she was dealing with the people and bridge, she showed smiles. Overall speaking, she was indulged in the process, and felt pleasant for this activity.

Other participants had similar experiences. They all felt more peaceful after doing Mind Collage, that completing the picture is to project their inner mind without consciously aware of emotional changes. They felt more satisfied (W06), calmer (W01), felt joy instead of cranky (W02), relaxed (W05) (W04) (W06) (W09), comfortable (W07) (W08), etc. Other than that, they felt that they understand themselves more than before (W02), can now see themselves from the other aspects (W08), and feel surprised to the results (W10). It shows that Mind Collage has spoken for itself about having the functions of visualizing self-images and creates emotional changes.



Figure 6. Mind Collage complete diagram of W02



Figure 7. Mind Collage complete diagram of M02

#### Type II: Stable variation of State anxiety

A typical example of Type II is M02. The complete picture made by M02 in Mind Collage is as Figure 7. His pretest score of STAT-S is 60 points, and posttest score is 61 points. From behavior

observations, M02 had been immersed in the activity showing not much facial expression changes. He was much focused, and was indulged in thinking. From the whole process, he chose to block the objects or move them to outside of the frame he found the results to be inappropriate, especially during the steps of mountain and road placements. In the tree placement step, he pondered on the positions and number of trees; and when he moved the house, he showed slight movement of his mouth; as he finished placing the stones, he took a deep breath; last, he pouted on bridge construction and moved his body slightly during the sun placement. When he reviewed the system feedbacks, he held his chin and sunk into deep thoughts. He said after the Mind Collage activity that he completed the analysis in the natural and fun atmosphere, and he felt calm and relaxed without burden (M02).

Although the participants in Type II have not shown big variations in state anxiety, they expressed highly trust to the digital counseling tool, and acknowledged Mind Collage to stimulate positive emotions, and lead to fair adjustments. Other participants also gave positive feedbacks during interviews. W03 expressed that exploring oneself through playing and doing activities is innovative and interesting. Her mind stayed in the pictures she composed and wanted to do more (W03). W04 said she saw the system feedbacks as self-reminders to make her better (W04). The system had gained trust from the users. Also, W01 used Mind Collage as self-examiner for psychological status (W01), so as W03. W05 stated that Mind Collage gave her something for self-reflection, and would encourage her to do or think more for the future (W05). Mind Collage can bring to the users so many functions that show it to have made a big leap to digital counseling.

## **6. Conclusion**

The goal of digital counseling is to assist the participants to deal with emotional issues. Since the digital tools can allow the users to immerse in the environment, be relaxed, release the sub-consciousness, and explore the true personality, their emotions can be relieved in the meanwhile. Therefore, the participants of this research stated that they were relaxed, felt interesting, and thought the tool is innovative (W03)(W04)(W07). Also, the participants both said that they can be more focused on the counseling process. The interactions between the participants and the system was quite smooth, especially the background music helps them to be relaxed (W03). Since the interactions with the digital technology was safe and full of trust, they can easily recognize with the system feedbacks about mental analysis (W10). W02 thought the system feedbacks can guide her to positive thinking, and she felt that the system was very professional (W02). As the positive counseling relationships can be established, they had less emotional connections between each other, and can focus on the counseling goals and tasks. The participants generally felt they were more in control of the counseling process, and were surprised at the freedom they have, and felt empowered. They had more equal relationship with the counselors, and can deal with their emotions they hardly touch. These were the advantages they would not have in the traditional face-to-face counseling sessions.

In the research, the participants also gave suggestions to the future improvement of the system. They thought the design of the graphics and paintings can be more delicate (W03), and can be satisfied with the need of revealing one's inner self in some way. One can seriously face to self alone (W06). Also, for those who are not good at painting, using graphical representations to reach the goal is a nice way (W07). It saves time (W08), but hoped the graphics in each category can be increased to suffice more preferences.

In the future, the development of digital counseling tool can be more truly project one's mental images, create a channel for the integration of inner mind and outside world. More importantly, expressive art therapy has the functions to reduce one's emotions by reaching to the inner mind due to its ability of privacy. Their emotions can be completely accepted by the digital tool, and can calm down their negative emotions during the process. It is of great importance to find that digital counseling tool can have such functions that it can be used for everyone to create a daily happiness through various kinds of expressive art therapy techniques.

## **Acknowledgements**

This study is supported in part by the National Science Council of the Republic of China, under contract numbers NSC101-2511-S-024-009-MY3.

## References

- Dalley, T. (1984). *Art as therapy: An introduction to the use of art as a therapeutic technique*. London: Tavistock.
- Egan, G. (2007). *The skilled helper: A problem-management and opportunity-development approach to helping* (8th). Belmont: Thomson.
- Ellis, A. (1998). *Rational emotive behavior therapy: A therapist's guide*. San Luis Obispo, CA : Impact .
- Greenberg, L.S. (2006) Emotion-focused therapy: a synopsis. *Journal of Contemporary Psychotherapy*, 2, 87-93.
- Malchiodi, C. A. (2007). *Handbook of Art Therapy*. NY: The Guilford Press.
- Moreno, J. L. & Moreno, Z. T. (1975). *Psychodrama third volume: Action therapy and principles of practice*. New York: Beacon House. °
- Pekrun, R. (2000). *A social-cognitive, control-value theory of achievement emotions: Developing motivation and motivating development*. In J. Heckhausen (Ed.), *Motivational psychology of human development* (pp. 143-163). Oxford, England: Elsevier
- Pintrich, P. R., & Schunk, D. H. (2002). *Motivation in education: Theory ,research, and applications* (2nd ed.). Upper Saddle River, NJ: Prentice Hall.
- Riley, S. (1999). Brief therapy: an adolescent invention. *Art Therapy: Journal of the American Art Therapy Association*, 16(2), 83-86.
- Spielberger, C. D. (1983). *Manual for the state-trait anxiety inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Spielberger, C. D., Richard, L., Gorsuch, & Lushene, R. E. (1971). *STAT Manual: for the State-Trait Anxiety Inventory*, Consulting Psychologists Press.
- Wang, C. H., & Fei, Y.C. (2006). Single Session Counseling Model for Clients with Anxious Mood, *Guidance Quarterly*, 42(1), 1-11.
- Withrow, R. L. (2004). The Use of Color in Art Therapy. *Journal of Humanistic, Counseling Education and development*, 43(1), 33-40.
- Wright, J. (2002). Online counseling: Learning from writing therapy. *British Journal of Guidance & Counseling*, 30, 285-298.