

A Study of the learning performance of Collaborative Learning and Creative Thinking on a Design Sketching Course

Chien-Chih Ni

Hsuan Chuang University
48 Hsuan Chuang Road
Hsinchu City, Taiwan
+886-3-5302255#5618, nancyni1008@gmail.com

Abstract

This study aimed to explore the causes and influences in learning effectiveness regarding collaborative learning that includes teaching creative thinking for the design sketches of the “Portfolio portrait unit”. There are six weeks in total for this project, 52 students completed feedback evaluation forms, underwent learning assessment, and had an exhibition. After joining this collaborative learning project with creative thinking teaching combined with the design sketches of human figures, most of the students suggested the cognition, affection, and psychomotor domain were useful.

Keywords: collaborative learning, creative thinking, design sketches course

1. Introduction

Teaching research and higher education practices have been given great importance in recent years. It is worthy of exploring how teachers should focus on course design, teaching strategies, the effectiveness of student learning, and teaching effectiveness on educational sites to fit the learning context in the design field in universities. Ho stated that current university education in Taiwan is affected by economic factors, and that how to improve the effectiveness of students’ learning in specialized course with limited class hours is a challenge faced by teachers as well as an issue to be addressed by teachers [1]. Csikszentmihalyi and Wolfe believed that teachers are important gatekeepers for student creativity and play an important role in the process of developing the creativity of students [2]. To this end, teachers are indeed a critical link of higher education in improving the effectiveness of student learning and developing student creativity.

Sato Manabu, a Japanese educator, is of the view that classes exist for the purpose of realizing learning and that realization of the learning of every student must be the appeal for a class [3]. Therefore, further research on teachers should focus on the application of collaborative learning as the application mode of classroom teaching to assist students with incorporating the contents of creative thinking units and stimulating their creativity, in addition to improving their sketching abilities. The researcher imported teaching contents through several methods set out in the Williams’ Creative-Affective Teaching Model and applied collaborative learning in a design sketching class, in the expectation of understanding the impact of creative thinking through the teaching style of collaborative learning on the learning situation of the students in the fields of cognition, skills, and affection, etc. Additional methods were tried hereby

to improve the quality of teaching and share teaching experiences. Based on the aforesaid research motivation, the purpose of this research was to discuss whether the classroom context of collaborative learning could contribute to improving the learning performance of students in three aspects: cognition, skills, and affection, in a creative thinking unit during a design sketching class.

2. Literature Review

Collaborative Learning

Sato stated in his book *The Learning Revolution - The Revolution Originating From Education* that collaborative learning was first observed in the experimental school established by John Dewey at the University of Chicago in 1896 [3]. New education reformers led by Dewey promoted the reform of education by enabling children to learn from each other. In addition, Slavin advocated for collaborative learning and investigated its effect, stating that collaborative learning can be used to develop the diversified abilities of every child and allow them to make progress in learning [4]. Sato Manabu believed that collaborative learning challenges the extension and leaping of learning through dialogue among teachers, classmates, and students, and is able to contribute most efficiently in group work and discussion to implement extending and leaping learning [5].

Collaborative learning is a process of shared creation: two of more individuals interacting to create a shared understanding of a concept, discipline or area of practice that none had previously possessed or could have come to on their own. Collaborative learning activities can provide students with the opportunity to think for themselves, compare their thinking with others, conduct small research projects, investigate subject matter with fellow students, and to practice using higher level cognitive thinking skills [6]

Creative Thinking

Creativity is a trait that is peculiar to humans. Fromm put forward that creativity is the ability to note (or perceive) and respond [7]. Torrance found in his research that the correlation between creativity and intelligence is very low; that is, the child with the highest creativity may not have the highest intelligence [8]. Creative thinking ability is not peculiar to gifted and talented individuals; children of average intelligence may also have such potential. There is no absolute relation between creativity and intelligence [9]. Creativity can be correlated to imagination that goes beyond the range of perception to form a new and unique architecture by virtue of thoughts and

sensibility [10]. Mayesky stated that creativity is a kind of original thought [11]. Therefore, the teaching model by which teachers stimulate and foster students' creative actions through the course content and planned teaching activities is exactly the connotation of a creative thinking program. Such teaching has no fixed model to follow; instead, it is diversified, flexible, and suitable for individual differences. Every teacher can create his/her own teaching model according to his/her needs and actual conditions [12].

The connotation of creative thinking programs in the research is dominated by Williams' Creative Thinking and Affective Model. Williams put forward that teachers should, through the contents of a course, apply creative thinking strategies and teaching models that enhance students' creative actions to stimulate the cognition and affection of students and achieve the expected teaching objectives [13, 14]. When teachers are able to understand, be familiar with, and properly apply the 18 teaching methods put forward by Williams, the teaching process will certainly be lively and interesting [14, 15]. Williams also put forward eight important processes for developing the creative thinking abilities of students; four of them, including fluent thinking, flexible thinking, original thinking, and elaborative thinking, are mental processes that are related to the development of students' divergent thinking and fall within the field of cognition. In addition, quality of curiosity, quality of adventure, quality of challenge, and quality of imagination are related to the attitude, value, appreciation, motivation, and other characteristics of students. Such characteristics contribute to the connection among students and knowledge, facts, and information, etc., to generate meaningful learning. Such process training helps students give consideration to both logic and sensibility and enables them to speculate, assume, deliberate, and validate matters that are sensitive and curious to them [14, 16].

3. Research Methodology and Course Plan

This study adopted the qualitative research method to investigate the learning performance of students enrolled in a design sketching course of H University through participant observation and completion of student learning feedback forms. The researcher was the main collection tool used to collect descriptive information, pay attention to the process and result, and analyze information by inductive means. The main point in attention was significance, while insight, discovery, and interpretation were concerned in qualitative research other than assumption test. The collection and analysis techniques were mainly conducted in a qualitative way but could also be supplemented with numbers [17, 18].

3.1 Participant Observation

Participant observation refers to research conducted by the researcher observing interactions with people on site through long-term integration into the life and experience of people in a community [19]. Guba and Lincoln stated that participant observation, as an information collection method, is based on direct experience and incidents that have actually happened [20]. Behaviors can be recorded by the observer who can understand the context with his/her own knowledge through his/her observations, to avoid the prejudice incurred

due to the changes caused by distance, memory, and emotional reactions. Participant observation enhances the ability of the researcher to understand complex environments and allows the researcher to immediately collect information. However, participant observation also has its limits, most importantly, the dual-role played by the observer. When he/she acts as a participant, his role as an observer is undermined naturally. To this end, in this research, in addition to the researcher himself/herself, a co-observer was placed in class to maintain the objectivity of the observation records. The researcher and the co-observer directly participated in and observed in-class mutual learning and discussions among students enrolled in a design sketching class of a university's fashion design department and recorded interactions among students to understand the consistency of the observed information.

3.2 Research Process and Data Processing

During the research, the researcher acted as both a teacher and an observer. As the teacher of the basic sketch course of this class knew the students well, and actually observed in class, which was quite favorable for the research. However, the researcher often reminded herself that her subjective interpretation should be based on objective evidence and should be validated with the observation records kept by the co-observer due to the impact of personal experience, knowledge background, and familiarity with the environment.

- Study Period: from March 16, 2015 to April 28, 2015; 6 weeks in total; 3 hours per week; 18 hours in total.
- Research Subjects: A total of 52 students enrolled in a design sketching class of H University in 2015.

Data Processing:

- (1) The researcher and the co-observer participated and observed during the research period and kept observation records in each class. References were made to such records in the process of the research. For example, T-01 referred to week one of the class records kept by the teacher, while C-02 referred to week two of the class records kept by the co-observer.
- (2) The researcher numbered the collected feedback form information in the sequence of 01, 02, 03..., and organized the information for analysis and references were made to such information. For example, S1 referred to the information provided by the first student in the feedback form.

3.3 Course Design and Planning

In terms of the course design, the researcher expected students with poor performance to restore their learning ability and students with excellent performance to challenge their learning opportunities at higher levels. This was achieved through the classroom context of collaborative learning and contents of the creative thinking program titled "Portfolio Portrait" designed independently by the researcher to stimulate more creative ideas and challenge the original mode of thinking. Based on the concept, in the design of the unit contents, the teacher presented open questioning and an open mindset in which the students could learn from each other. The learning environment valued questioning and discussion to achieve the presentation of works of opening up self-creation from "draw what I see" to "draw what I think". In respect of the design of the unit contents, three development stages were set (Table 1).

3.4 Course Procedure

The research was conducted over six weeks, during which time the teacher and the co-observer observed and recorded in class simultaneously. Records of learning context of the “Portfolio Portrait” course unit are:

Week 1-Teaching process of the teacher :

- (1) The teacher implemented heterogeneous random groupings with four students per group.
- (2) Unit contents and scoring principles were explained.
- (3) Williams: study creative people and processes: appreciation of the works of Giuseppe Arcimboldo.
- (4) The teacher raised questions through creative questioning skills and Williams’ attributes and analogies: what are the sketch expression concepts of the four items, i.e., corn, pepper, mushroom, and lotus seedpod?
- (5)The teacher demonstrated on the blackboard. The teacher toured among students and observed interactions among students.

Week 1- Learning situation of students:

- (1) Students were seated accordingly after random grouping.
- (2) Appreciation of works.
- (3) Group members discussed the questions raised by the teacher regarding the four items and answered the questions (cognition field).
- (4) Group members observed and raised questions (cognition and skill fields). Group members practiced the four items (skill, affection, cognition).

Table 1. “Portfolio Portrait” unit and its objectives

Stages	Course connotation	Course objectives
Stage 1 Fluent thinking Flexible thinking	Art appreciation and aesthetic experience	1. Know about and appreciate the works of Giuseppe Arcimboldo (1527--1593), an Italian painter during the Renaissance. 2. Discuss and analyze the composition principles and content presentation of the artist’s works in groups.
Stage 2 Elaborative thinking	Sketching techniques	Expression of physical structures in techniques (sphere, rectangular prism, cylinder, cone, others), tactile impression of materials (rough, smooth, particles, texture, holes, openings, etc.), color gradation.
Stage 3 Original thinking	Individual creative design	1. Divergent thinking is an efficient way of creation 2. Discuss and brainstorm design ideas and concepts in groups

4. Discussion

A discussion was held on whether the classroom context of collaborative learning would contribute to improving the learning performance of the students in the three aspects of cognition, skills, and affection, in the creative thinking unit of the design sketching class. Set out below are the analysis and

discussions through participant observation of the teacher and the co-observer and the completion of feedback forms by the students.

4.1 Difficulties Faced by Students in terms of Creative Forms

The researcher found from previous experience in teaching the design sketching course that all students were able to draw the items they saw on paper by applying sketching skills after finishing a preparatory basic sketch course; however, the students faced difficulties in reorganizing and designing the items they saw through thinking to form the subject of a portrait. In the research, it was found that the students lacked creative imagination on how to convert and reorganize the 12 visible items into a portrait. Therefore, it was found in the process of observing the discussions among the students in groups that the students were prone to directly using items, such as peppers representing eyebrows, peppers representing lips, oranges representing eyes, and bowls representing ears, but they were at their wit’s end in converting and applying certain items, such as lilies, sunflowers, and lotus seedpods. Set out below are some typical statements made by students regarding such difficulties:

- I think it is hard to form a portrait using such items. Eyes, nose, mouth and ears can be represented with one item respectively, so how to incorporate other items? (S10)

In respect of the difficulties faced by the students in converting the items, after the researcher asked questions about the items through the questioning skills of Williams’ creative teaching and led students in a discussion, the students gradually began to discuss and express their ideas, and the learning behaviors of the students observed in class began to change:

- The teacher first asked questions to lead the students to think and discuss in groups the structure of the five sense organs on a portrait, potential applications and change patterns, the purpose of sketching, and how to apply these items in the design sketching course. Every student attempted to suggest ideas in the group. [T-04]

4.2 Positive Effects of Collaborative Learning on Creative Development

In respect of students’ limited intuitiveness, the groups expressed their ideas through dialogue and sharing in class, which was helpful for students to break through their limits on thinking and accept and absorb other classmates’ ideas to inspire creative thinking. Most students felt they received help from classmates to varying degrees during the process from the imagination to the completion of works; different views, ideas and styles were brainstormed through discussion and sharing, which was the reason for the successful completion of works. Set out below are some typical statements made by the students regarding collaborative learning:

- My classmates expressed their ideas during discussion. This theme design was very helpful; therefore, I came up with more ideas. (S-27)

The researcher also found during observations in class that, after the run-in period, the interactions and discussions among group members in class increased; relatively passive students started to take the initiative to hold discussions with other members in the same group, and thus the composition was accelerated.

- Students from the groups viewed each other’s

compositions and discussed and provided suggestions for modification. Students sought help from the teacher by show of hands only when problems remained unsolved after discussion. So far in observation, mutual trust and an atmosphere of mutual learning among students have been already formed. [T-05]

4.3 Positive Effects of Classroom Context of Collaborative Learning on the Improvement of Skills and Affection

It was found through information analysis that the classroom context of collaborative learning contributed to the improvement of sketching skills and the learning affection of the students to some extent. Among students in the same group, there were differences in prerequisite sketching abilities. Students with poor abilities could not only directly ask and learn but also observe the painting techniques of members in the same group at close range, thereby absorbing the painting techniques of classmates to improve their own skills.

- We discussed with each other when I encountered something that I had not practiced before. Classmates in the same group told me how to paint a specific part. (S26)

In the process of the unit, the classroom context had extraordinary effects on inspiring the quality of adventure, quality of challenge, and quality of imagination of the students. The students needed to adjust their mindset during discussion and needed to be willing to accept the criticism of classmates and control their emotions to avoid quarrels, and they needed to be comfortable to provide advice and assistance to classmates in the same group.

- We almost quarreled with each other during discussions, but we were rational, identified the problem, and made improvements. I learned how to get along with people during this process. (S5)

The classroom context of collaborative learning helped the students improve their sketching abilities through mutual learning, enabled group members to learn to share and accept others' advice in inter-group interactions, and helped the students' learning in respect of their affection to some extent.

5. Conclusion

The purpose of the research was to understand the learning situation of students in a creative thinking program based on a "Portfolio Portrait" unit from a design sketching course through the classroom context of collaborative learning, as well as the positive effects of the improvement of creativity in the design sketching course and the three fields of cognition, skills, and affection. The conclusion of the research was proposed based on the above purpose and information analysis results.

The teacher and the co-observer found that a positive progression of trust, consultation, affirmation, brainstorming, independent creation, and finally the independent completion of works was generated in the learning behaviors of the students through the classroom context of collaborative learning.

Most students though they made improvements in the fields of creative thinking, sketching abilities, and affection after the creative thinking program unit through the classroom context of collaborative learning. The classroom context of collaborative learning allowed the students to be comfortable to

discuss and share, inspire more imaginations, accept criticism, face up to their shortcomings, think out of the box, be willing to take risks to change, support each other and learn from each other, appreciate others' merits, be patient, be proactive to assist others, and challenge the concepts of self-help and helping others.

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