

A Web2.0 Imitation (Copy a Painting) Learning Project of Art Education via e-Learning in Taiwan

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Abstract— In this study, we develop a WEB2.0 imitation learning system to assist the students in imitation learning, and apply blended learning in teaching. We combine imitation learning and traditional classroom teaching and receive better learning effects. Applying practical theory in art teaching is not an easy task. Therefore, we hope to understand the student's imitation learning process through this imitation learning system. The teachers can add some short-term tasks to the imitation learning process to allow the students to more easily understand the concept of drawing and enhance the effectiveness of elementary school art teaching through "Learning by Doing".

Keywords— WEB2.0, Imitation Learning, Art Teaching

I. INTRODUCTION

Imitation learning or Copy Painting learning is an art teaching method, which is to study someone's work, understand the creative mentality of the author, and finally recreate the work in one's own way. The historical background, the creator's style characteristic, the motive for creation and the creator's inner thoughts of the imitated work can be understood through imitation learning. The drawing skill, formation, composition, colour, material selection and presentation techniques of the imitated work can also be understood through imitation learning, and it is also helpful for future creations.

In the elementary school phase, art teaching mainly focuses on imitation. However, due to the great amount of students, teachers often cannot focus on each student and understand his/her imitation learning process, and can only approximately care about the learning result of the student. Therefore, it is a major difficulty to understand and record a student's imitation learning process in elementary school art teaching.

Along with the improving information technology, drawing can no longer be only processed on paper or fabric, applying computer graphics has already become the common method of art creation. Computer graphics can present the various strokes, textures, and colours of traditional drawings. Applying computer graphics in art teaching has been broadly accepted by the public and most teachers, and is even being used.

In this study, we attempt to develop a WEB2.0 imitation learning system to assist the students in imitation learning, and

apply blended learning in teaching. We combine imitation learning and traditional classroom teaching and expect to receive better learning effects. Applying practical theory in art teaching is not an easy task. Therefore, we hope to understand the student's imitation learning process through this imitation learning system. The teachers can add some short-term tasks to the imitation learning process to allow the students to more easily understand the concept of drawing and enhance the effectiveness of elementary school art teaching through "Learning by Doing".

II. LITERATURE REVIEW

A. Imitation Learning

Imitation learning is a significant method of art education. Numerous expression techniques exist in painting; for a beginner, it is difficult to learn painting only by painting still life (sketch and hand painting). Even though one can make it, he or she must spend much time and effort. Imitation takes much shorter time to learn the techniques accumulated by predecessors. Some regard that practicing painting still life more can replace or cancel imitation learning; in fact, this notion is not correct. Chinese traditional artists had already proposed the concept of imitation in the ancient time. In the old days, Chinese did not have the skills of printing and duplication, therefore imitation was not only a way of art teaching but also a very important method for painters to pass on and carry on predecessors' techniques. The practice of copying masterpieces has been one of the cornerstones of traditional art education for a long time [1]. There are some research point that the benefits of spatial ability that were found on copying would extend to a task where students need to rely on their visual memory to recreate a painting [2]. Up to now, imitation is still an integral course to painting learning.

The main method of imitation learning is to learn predecessors' expression technique, detail treatment, and creation concept etc. Some technique application, shaping treatment, composition method, and colour matching of art learning be learned through imitation learning. However, we need to note that it is possible that imitation learning can make us learn the good parts and also the bad parts. It is not necessarily that everyone's works are perfect. Hence, when we imitate predecessors' works, first we have to choose better

works to imitate. Nevertheless, one piece of work is not necessarily perfect in each aspect; for instance, the technique is good but the colouring is bad. In this situation, we need to consider carefully about how to make the selection and only absorb the good parts.

The merits of each style can be understood through imitating excellent works of these styles. Each piece of work has its own shape, expression, technique, feeling and understanding, and therefore we can constantly improve our observation method, comprehension method, and expression technique during imitation to enhance our aesthetic conception. People can trace the artist's working sequence, colours and mediums, surfaces and tools, as he creates a new painting [3].

During the process of imitation learning, we have to clearly understand the purpose of learning; we do not just emphasize on whether the imitation is close to the original one. Imitation learning asks us to read and study predecessors' works conscientiously, realize painters' exquisite artistic conception profoundly, and comprehend how they paint shapes using lines and planes. In imitating predecessors' works, we should simultaneously learn and understand how to paint shapes according to our own understanding in order to achieve the optimization of shapes.

B. E-Learning

E-Learning is first proposed by Jay Cross in the U.S. in 1999. "E" refers to "electronic". In 2001, American Society of Training and Education (ASTD) defined e-learning as the delivery of teaching content or learning experience through electronic technologies including computer training, compact disk and a variety of internet application [4]. The more detailed definition is "e-learning is learners' learning process by applying digital media including internet, corporate internet, computer, satellite radio, audio tape, video tape, interactive TV and compact disk etc. Its application scope includes web-based learning, computerized learning, virtual classroom and digital collaboration." [5]. Therefore, "e-learning" includes all the above-mentioned electronic learning, and its scope is digitalized learning activities partly or totally delivered by the internet."

In the beginning stage of the development of e-learning, it was mainly the long-distance course structured by the medium of text. With the advancement of technology, e-learning was transformed to use computer and internet as the communication media. The characteristics of computer and internet make the participation without limitation possible. Anyone can perform learning activity on the internet through the way of e-learning. If learners have a computer and internet environment, then they can learn things on line anytime for 24 hours. With the assistance of computer, learners are able to satisfy their individualized learning needs depending on their learning status through the help of learning content planning and information technology. In addition, the teaching materials of e-learning will have real-time update, and the teaching materials are more interactive than they were before. The most important is that the cost of e-learning is much lower, and it is a great help for learners in remote areas.

In the age of maturely developed information technology, e-learning has increasingly become one of the common teaching modes. The features of openness and immediacy allow learners to control the learning progress and quality easily. The characteristics of low cost and being interactive let learners learn more at least and independently, and go beyond learning by books or face-to-face learning which are difficult, boring and limited in many ways.

C. Blended Learning

Blended learning is defined in many ways. Among these definitions, Graham, Allen and Ure (2003) generalized the most common three definitions including blending different teaching media, blending different teaching strategies, and blending different teaching environments [6].

Scholars held that using blended learning can change the learning method -- change the P2P learning mode providing lots of resources for students to focusing the center of learning on the learners themselves, thus enhancing the flexible application of time and space. The points of blended learning are providing learners with more time and enlarging learners' space by which they can use less time to achieve better learning effectiveness.

More and more researches found out that using blended learning -- replacing parts of classroom teaching by the learning resources and discussion activities on the internet -- could improve the learning effectiveness, reduce the spending of students and the schools, and allow a higher level of flexibility in time for the students who couldn't often come to school. For those students who couldn't learn by themselves, blended learning was able to assist them to actively manage their learning progress and lives and also let them avoid choosing from totally on-line course and totally classroom course.

D. WEB2.0

The term "Web2.0" first emerged in a CEO group discussion of O'Reilly Media, Inc. in the U.S. In Oct. 2004, this publisher held the first "Web2.0 Conference" and held the second "Web2.0 Conference" in Oct. 2005 and since then "Web2.0" had become the most popular term in the internet industry.

O'Reilly Media, Inc. in the U.S. proposed the following characteristics of Web 2.0. A service provider: It is not providing package software but providing service. Service and package software are different in that there is no finished product for service, and if it is not constantly improved then it will be out of date soon. Therefore, the service of Web2.0 is always β version. For instance, Windows and Office are package software rather than Web2.0. However, the continuing service of the internet -- MSN -- has the characteristics of Web2.0.

The database of Web2.0 can restore large amount of data and provide added value. As a consequence, the service of Web2.0 is one type of "Data Inside" which collects usable data and processes them to serve the users. The CEO of O'Reilly's media Company pointed that the important

principle of Web2.0 is: The more users, the better the service [7].

Allowing users to participate unconsciously: It trusts the participants and reflects their feedbacks on the development. It analyzes participant's behavior in using the services and provides them with services they want and easy-to-use environment such as the services of editorial review and customer review provided by Amazon.com.

Collecting knowledge and reusing it: It stores all of the participants' information in the database and reuses it. The amount of internet users rockets rapidly, and more users participate in it themselves. Besides, one characteristic of Web2.0 is to put information on websites and use it effectively.

Understanding "Long Tail": It fully understands "Long Tail" of the internet, and sets the contribution level of product, service and information etc. as the vertical axis and sets the types of product, service and information etc. as the horizontal axis. It is very critical to frame strategies for enterprises or individuals. However, it is difficult to for "Long Tail" to appear without reaching a certain level of scale.

Not limited by the operation system: On any operation system, Web2.0 can be used in no matter it is Windows, Linux, Mac etc. It can provide services on multi-device such as PC, mobile phone or PDA etc.

Abundant and easy-to-use: It uses techniques such as Open Source of Ajax, Java etc. to provide services by the easy-to-reuse form. The point lies in that it is able to produce services in a simple way by low cost for everyone to use.

III.METHODS

In this study, we developed a Web2.0 on-line imitation learning system to help art education at elementary school. The system design and research framework is as bellow.

A. Structure and Design of the System

The analysis and design of the on-line imitation learning system combined techniques such as imitation learning, instruction theory, on-line teaching, and Web2.0 to construct a highly interactive on-line imitation learning system. The overall system was developed based on the methods of needs survey and literature analysis which provided the references for the steps of system analysis, system design and system development. After the system was finished developing, a system review was conducted to evaluate the appropriateness of the system and further the conclusion and report of this study were completed.

To fill the ideas of Web2.0, this study used Web to design the on-line imitation learning system and used XML as the basic data format, and utilized AJAX and Cloud Computing technology to design the system. The system is shown in the following figure 1: what learners see is a simple drawing board and they can start the on-line art learning using the tools. By using the tools, students use a learning collaborative model to do the imitation learning as figure 2.



Figure 1. Interface of on-line imitation learning system



Figure 2. Collaborative learning model of on-line imitation learning system

In addition, predecessors' works could be viewed to understand their techniques such as shaping, composition and colouring etc., moreover, they could be played repeatedly and viewed stopping at a certain frame to understand all techniques they used profoundly. Also, teachers are able to investigate the details and features when learners conduct imitation learning and strengthen these parts in teaching.

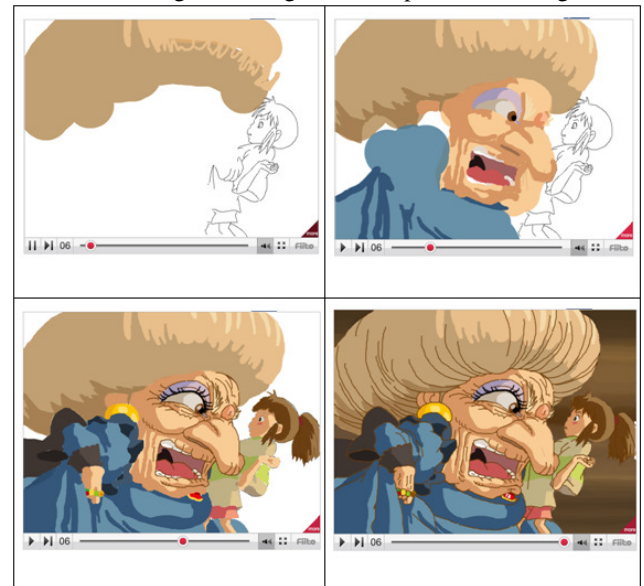


Figure 3. Painting processes

Besides, experts' works could be cited to do re-painting and obtain the understanding of techniques such as composition and colouring etc.

B. Research Framework

The major purpose of this study was to investigate the effects of "on-line imitation learning" on the "learning effectiveness" of art teaching in elementary schools. Based on this conceptual investigation, the research process and framework of this study was built as the following figure shows. It was divided into 3 major stages; the 1st stage included a pre-test, sampling and categorization, and the next stage was conducting experiments. In this stage we use blended learning model to do the imitation learning. The last stage included a post-test and a teaching opinions survey.

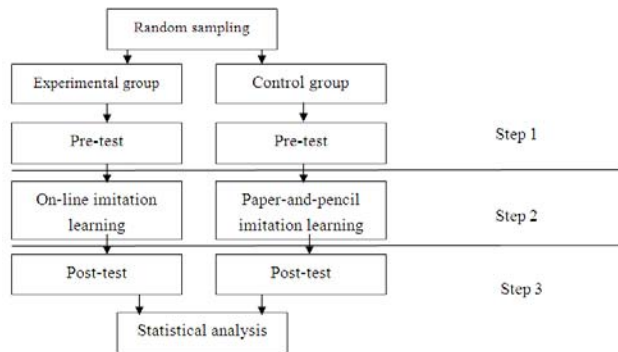


Figure 4. Research framework

C. Instruction Content

For the design of the experimental teaching material, this study conducted an in-depth investigation on imitation learning and from the studying process it was discovered that the main content of imitation learning included technique application, shape treatment, composition method, and colour matching, and therefore the design of teaching material included the following: shaping imitation, composition method imitation, technique application analysis and colour matching imitation.

Besides, learners could not repeat watching and imitating and cite some features (such as composition method and shaping treatment) in traditional imitation learning; aiming at the characteristics of traditional imitation learning, this study proposed a "recording function" by which the whole painting process would be recorded completely. In addition, this study proposed a "citation function" which can allow learners to cite parts of paintings such as citing the composition method or shaping and assisting them in doing imitation learning step by step.

D. Experimental Study

This study considered the skills of using computer and related software, and therefore the subjects were mainly students of the 5th and 6th grade of elementary schools. The samples were from the students of one elementary school in northern Taiwan; according to their grades of art in the class, they were divided into 3 groups (high 25%, middle 75%~25%,

low 25%), and 8 students were randomly selected from these 3 groups (4 males and 4 females), finally these 24 students in each class were in the control group (samples of traditional paper-and-pencil painting). Then, using the same method, 24 students in each class were selected as the samples of the experimental group (blended computer imitation learning) to be the tested subjects of the system.

In order to investigate the effect of the on-line imitation learning on the learning effectiveness of art teaching, this study used quasi-experimental design [8]. This study used nonequivalent-control group design to evaluate the learning effectiveness. In this study we use Rouse Scale [9] include variation of shape, variation of mass, variation of line, texture, detail, depth, tension, symbolism, balance, inity, dominance, craftsmanship, thickness of line, gradation of colour, symmetry, spontaneity, rhythm, transparency, originality, abstraction to identify the art products of elementary school children. Finally this study surveyed students' opinions in the experimental group by the researcher's self-made "On-line imitation learning questionnaire" and conducted the analysis after the experimental courses were completed. This study used one-way ANCOVA to conduct the analysis, and related variables were explained as follows:

1) **Independent variable** : The independent variable of this study was experimental treatment (accepted the instruction of blended on-line imitation learning/accepted the instruction of traditional classroom).

2) **Dependent variable** : The dependent variable in this study was examinee's score in art achievement test (post-test).

3) **Variance control** : The covariance of this study was examinee's score of art achievement test (pre-test)

4) **Teaching Material and Time** : According to the selected teaching material, the system was developed, and the teaching process was compiled into a teaching plan to be the basis for the practical teaching. In each class, teachers used 4 courses to deliver the content and experiment the teaching.

5) **Data Analysis and Processing** : In order to compare and analyze whether the difference of learning effectiveness of the students of these 2 groups was significant, this study therefore conducted a pre-test and post-test on the experimental and control groups, and then analyzed the data to see whether the difference was significant.

IV. RESULTS AND DISCUSSION

The results of the statistical analysis of this study were divided into two parts for discussion including Cronbach's α reliability test of "Learning Style Inventory" and the effect of imitation learning on students' art achievement test. They are explained as follows:

This study used Cronbach's α to test the reliability of "Learning Style Inventory". Cronbach's α of the questionnaire used in this study was all above 0.7 as the following table shows, above the value 0.7 suggested by

Nunnally (1978), and hence the reliability of the inventory in this study was acceptable [10].

TABLE 1. CRONBACH'S A OF THE QUESTIONNAIRE

Dimension	People	Cronbach's α
Learning situation	24	0.8121
System Design	22	0.8322
Instruction Content	23	0.8411
Collaborative learning model	24	0.7774

Before conducting the ANCOVA analysis, this study first conducted a test of homogeneity within regression coefficient and obtained that $F = .311$ ($P > .05$) which did not reach the significant level and showed that it could not reject the hypothesis of homogeneity and it met the basic assumption of ANCOVA, and hence this study started to conduct the ANCOVA analysis. After removing the effect of the pre-test score on the art learning achievement test (post-test), this study tested the effect of experiment treatment on the art learning achievement test (post-test). The results indicated that the teaching effectiveness of different experiment treatments was significantly different ($F = 3.624$, $P < .05$), showing that the art learning achievement of the experimental group and control group was significantly different after these experiments were conducted. In other words, elementary school students' art learning achievement was enhanced by the assistance of the on-line imitation learning system developed in this study.

The post-test score of the experimental group before adjustment was 88.98, 86.01 after adjustment; the post-test score of the control group before adjustment was 82.12, 81.728 after adjustment. The results showed that the learning effectiveness of the experimental group was better than that of the control group after removing the amount of explanation.

After making a comprehensive review on the results, it was obtained that the on-line imitation learning system had a positive effect on elementary school students' art learning. The findings in this study were described as follows:

The effect on achievement: The scores of scholastic test obtained in the experiment showed that experimental group's learning effectiveness was higher than that of the control group; i.e. the experimental group's learning effectiveness was better than that of the control group with the assistance of the on-line imitation learning system.

Attitude survey: The attitude survey of the experimental group students after accepting the teaching showed that 90% of these students were willing to use it although the operation and content design of the system were not perfect.

REFERENCES

- [1] Shiff, R., "The Original, the Imitation, the Copy, and the Spontaneous Classic: Theory and Painting in Nineteenth- Century France," *Yale French Studies*, LXVI, pp. 27-54. 1984.
- [2] (2010) The Copy a painting in a Museum website. [Online]. Available: <http://www.explore-drawing-and-painting.com/copy-painting-in-museum.html>.
- [3] J. Sheppard, *How to Paint Like the Old Masters*. U.S. :Watson-Guption Publications Inc., 1983.
- [4] (2007) The ASTD website. [Online]. Available: <http://www.astd.org>.
- [5] Zou, J. P., "ELearning Method 134 Lecture: blended learning model for Basic Blue," *e-Learning Method*, retrieval in 2005 [Online]. Unavailable:http://elearning.uline.net/guestbook/dir_show.asp?file=1010&mana=0&page=6&area=1, 2003.
- [6] Graham, C. R., Allen, S., and Ure, D., "Blended Learning Environments: A Review of the Research Literature", Unpublished manuscript, UT: Provo.
- [7] Zhonghua D., Ling L., "An Exploratory Discuss of New Ways for Competitive Intelligence on WEB2.0," *Integration and Innovation Orient to E-Society*, vol. 2, pp. 597-604, 2007.
- [8] Kuo, S. Y., *Psychological and Educational Testing*, Taipei: JinHua, 1985.
- [9] Lewis, H. P., & Mussen, P. H., "The development of an instrument for evaluating children's artistic creativity," *Studies in Art Education*, vol. 10(3), pp. 25-48. 1969.
- [10] Nunnally, J. C. *Psychometric theory*. New York: McGraw-Hill., 1978.