

Applying Blended Learning with Creative Project-Based Learning: A Case Study of Wrapping Design Course for Vocational High School Students

¹Hua-Yun Hsieh, ²Shi-Jer Lou, ³Ru-Chu Shih

¹Sansin High School of Commerce and Home Economics, Kaohsiung, Taiwan

²Graduate Institute of Vocational and Technical education, National Pingtung University of Science and Technology, Taiwan

³National Pingtung University of Science and Technology, Department of Modern Languages, Taiwan

vincent@npust.edu.tw

Abstract: This study aims to investigate vocational high school students' learning effects and learning satisfaction toward the Wrapping Design course with a combination of blended learning and creative project-based learning. A total of 44 students from the Advertising and Design Course participated in this study and they were divided into 11 teams to conduct gift wrapping design activity. The blended learning in this study combined the traditional in-class instruction and a self-designed online learning platform for the students to discuss and share their ideas and related information. The learning process included teamwork, project-based learning, the inquiring-thinking-doing-evaluating, and the 12 creativity tactics. Data collected from the self-developed satisfaction survey questionnaire, online learning platform, classroom observation, learning portfolio, and finished products were analyzed. The findings of this study reveal that the ideal teaching model for applying blended learning with creative project-based learning should contain seven stages. Additionally, key factors such as the teacher's guidance, the practice of creativity teaching methods, teamwork, and online resources can influence learners' performance and learning effects. Finally, this blended learning approach not only can make up the shortcomings of the traditional in-class learning, but also enhance the learners' skills in independent learning, problem solving, and communication.

Keywords: blended learning, creative teaching, project-based learning, vocational high school students, wrapping design

Introduction

In the past years, creative and cultural industry has gradually become one of important global industries. In order to catch up this new trend, Taiwan government has been actively promoting cultural creative industry. However, a successful cultural creative industry heavily relies on high quality creative talents and the teaching mode and quality are the two fundamental factors for cultivating such talents (Lu & Lin, 2005). Thus, one of the best ways to educate students to possess problem solving skills is to design a student-centered environment connecting with various subjects. When students focus on solving problems, their learning motives increased (Brab & Landa, 1997; Zhi & Chuang, 2003). Lou, Chung, Dzan & Shih (2012) mentioned that if school can actually provide students hands-on experience and sense creativity, their creativity can be inspired. In today's increasingly competitive market, wrapping design plays an

important role in the enterprise development, and the demand for packaging design talent is also increasing. On the other hand, in terms of the design industry's talent needs, Lu and Lin (2005) pointed out that the design talents' design expertise is the most important factor, followed by the ability to solve problems, and teamwork, and professional and technical ability. Therefore, this study aims to (1) explore students' learning effectiveness and satisfaction; (2) develop the blended creative project-based teaching model; and (3) providing useful suggestions for the implementation of vocational high school packaging and design course.

Literature Review

With the vigorous development of information technology and the advents of various forms of digital learning tools, teaching methods need to be in response to different teaching environments or mixed medium of instruction. Blended learning integrates formal and informal learning, face-to-face and online learning, self-directed learning, and digital reference resources and connecting with group members (Lou et al, 2010; Shih, 2010; Shih; 2011; Shih; 2012; Rossett & Frazee, 2006). Past studies show that blended learning has the following characteristics: (1) pedagogical richness, (2) access to knowledge, (3) social interaction, (4) personal agency, (5) cost effectiveness, and (6) ease of reversion. From the above mentioned, blended learning not only integrates the benefits of face-to-face and online teaching environments, but also the teachers can identify the most suitable teaching mode in a blended learning environment (Osguthorpe & Graham, 2003; Kose, 2010).

Project-based learning (PBL) is a systematic teaching approach, which emphasizing on students learn knowledge and practical skills through exploring complex life issues and well-planned learning tasks (BIE, 2007). Through living and learning project to integrate different disciplines of curriculum and carefully arrange complex, and real tasks to design motivation enhancement and cognitive strategies to create a peer cooperative learning environment and conduct inquiry-based learning activities, so that the students can acquire problem-solving knowledge and skills (Li, Lou, Chu, & Liu, 2009). Through project-based learning, students will be able to find their own interests and thus to trigger their independent learning motivation (Nastu, 2009; Kose, 2010).

Creative teaching refers to teachers can adopt diverse, active, and rich content to stimulate students intrinsic learning interest to cultivate their attitude of willing to learn and thus to enhance their learning ability (Wu, 2002). In this study, creative teaching was integrated with blended creative project learning, and its teaching process included Chen's (1990) ATDE (Asking-Thinking-Doing-Evaluation) create thinking teaching model, Lin's (2004) creative teaching model, and the 12 "creative tactics." expect to allow students willing to think and learn, and to further enhance its ability to create and creative thinking teaching strategies.

To summarize the above-mentioned literature review, this study aims to apply blended creative project-based learning to the Wrapping Design course of a vocational high school. During the teaching process, creative teaching, project-based teamwork learning, and strategies for blended learning and digital learning system will be merged into the curriculum to further enhance students' performance and

creativity to achieve the teaching goals.

Research Method

Case study, observation, and questionnaire survey were administered in this study. The seven phrases, including preparation, situation observation and raising questions, guiding discussion and confirming questions, generating creative proposal, implementing creative proposal, outcome presentation, and evaluation from the blended creative project-based learning model were introduced to the teaching sessions. The implementation of the study included blended teaching combining digital learning and traditional in-class instruction, teamwork and situated guidance project-based learning, ATDE, and the 12 creative tactics.

Participants

A total of 44 students enrolled in the Wrapping Design course from a vocational high school in southern Taiwan were divided into 11 teams and participated in this study. The teaching experiment lasted for 12 weeks.

Research Instruments

The research instruments contained the Learning Effectiveness Checklist, the Learning Satisfaction Survey Questionnaire, Student's Learning Observation Record, and the Online Learning Platform. The

1. Learning Effectiveness Checklist: design creativity, box structure, and visual perception were evaluated.
2. Learning Satisfaction Survey Questionnaire: it contains four domains, including teaching and course arrangement, online learning platform, learning attitude, and learning fulfillment. A total of 27 questions in a five point Likert scale and 3 open-ended questions in the questionnaire.
3. Student's Learning Observation Record: includes in-class observation and learning platform observation.
4. Online Learning Platform: contains course information, discussion forum, message board, blogs, bulletin board, downloads, and small group discussion areas, etc. Figure 1 shows the entry page of the online learning platform.

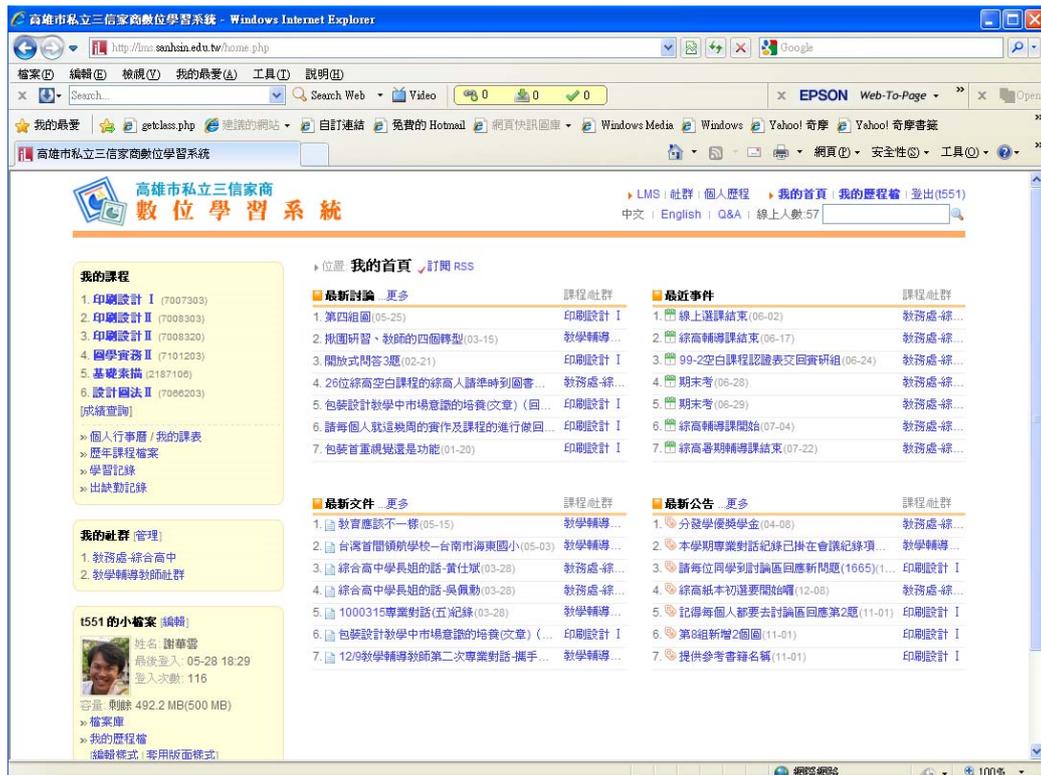


Fig. 1 The entry page of the online learning platform

Data Analysis

All quantitative data collected from the survey questionnaires were analyzed by SPSS 12.0 descriptive statistics, t-test, and One-way ANOVA.

Results and Discussions

The following section depicts the top three students' works, the three teachers' assessments on the top three products of the students work, and the analysis of students' responses to the survey.

1. The descriptions of the top three student s' works

Table 1 shows the descriptions of the top three students' works. After the completion of the works, the three teachers' assessed and scored all the 11 teams' works. Finally, Teams 5, 3, and 10 ranked the top three prizes.

Table 1 The descriptions of the top three students' works

Team	Name of Work	Description	Photo
Team 3	Candy Box	This box is designed for candy. It also can be used for cookies and chocolate. The special feature of this box is a bear with two arms holding up the box. The inner box is a 3 layer design. The color of the box is light yellow.	
Team 5	Canned Food Box	This box is designed for canned food. The inner box is a 2 layer design. The color of the box uses red and purple colors to represent luck and joy.	
Team 10	Cake Box	This box is designed for rectangle-shaped honey cake. The major box contains 4 small boxes. Each box is a 2 layer design. The four boxes represents the four seasons decorated with the seasonal flowers.	

2. The three teachers' assessments on the students' works

Table 2 The Statistical results of the three raters' scores

N	Kendall's W (a)	Chi Square	df	Sig.
3	.964	28.911	10	.001

Table 2 shows the three teachers' scores on the students' works obtained a .963 of Kendall ω coefficient correlation, chi-square=28.894, $p=.001<.05$, indicating the three teachers' scores are significantly related and consistent. That is, Team 5 ranked top one, followed by Team 3 and Team 10.

3. Analysis of students' responses to the survey questionnaire

Tables 3 to 6 show the statistical results of the four domains of the students' responses to the survey.

Table 3 Statistical results of the teaching and course arrangement domain

Item	Statement	Mean	SD	t value	Sig.
a1	In the beginning, the situated guidance and description can enhance my learning motivation.	3.93	.73	8.49	.000
a2	The teaching materials and samples can help me learn faster and easily.	3.98	.72	8.63	.000
a3	The instructor's guidance and assistance can help me stay on the right track for learning.	4.29	.60	13.75	.000
a4	The course design and assignments are appropriate.	3.66	.82	5.11	.000
a5	Teamwork can help carry out the project smoothly.	4.09	.92	7.67	.000
a6	Creative thinking approach and strategies can help me solve problems.	3.92	.75	7.86	.000
a7	I have learned a lot from observing other teams' works and presentations.	4.00	.707	9.06	.000
a8	The teaching methods enable me to think critically.	3.93	.69	8.66	.000
a9	The teaching methods enable me to learn actively and aggressively.	3.63	.73	5.53	.000
a10	I am satisfied with this course.	3.64	.81	5.21	.000

Test value=3

According to Table 3, a1 to a10 are the questions from the teaching and curriculum domain, which obtained means greater than 3 with $p=.000<.01$. Particularly Item a3 “The instructor’s guidance and assistance can help me stay on the right track for learning” obtained the highest mean of 4.29 and item a9 “The teaching methods enable me to learn actively and aggressively” obtained the lowest mean of 3.63. These results suggest that the instructor’s proper guidance and assistance to students are necessary and helpful to the students’ learning. Meanwhile, it could be because this typed blended creative teaching is new to the students, which was contrary to the traditional in-class instruction, the students need more time to get used to and adjusted to this new type of instruction.

Table 4 Statistical results of the online learning platform domain

Item	Statement	Mean	SD	t value	Sig.
b1	I like to share ideas on the platform or discussion forum.	3.66	.68	6.43	.000
b2	Through online learning platform, my learning interest is enhanced.	3.66	.64	6.78	.000
b3	Interacting with others in the discussion forum can inspire my creative thinking.	3.84	.64	8.65	.000
b4	Through online learning platform, I like to explore more issues and topics.	3.75	.58	8.64	.000
b5	Online learning platform can assist our team learning.	3.72	.85	5.71	.000
b6	I am satisfied with learning through online learning platform.	3.89	.69	8.53	.000

Test value=3

According to Table 4, b1 to b6 are the questions from the online learning platform domain, which obtained means ranging from 3.66 to 3.89 ($p=.000<.01$), indicating the students are satisfied with learning through the online learning platform. Although the mean scores of the 6 items are close, showing that the students are moderately satisfied with the platform. In the future, more effective and interesting teaching approaches and materials can be added to the online learning platform to increase the students’ satisfaction if use.

Table 5 Statistical results of the students' learning attitude domain

Item	Statement	Mean	SD	t value	Sig.
c1	I can communicate well with my team members and work harmoniously.	4.18	.87	9.01	.000
c2	I can actively participate in small group discussions and knowledge sharing.	4.27	.54	15.52	.000
c3	I always actively seek for teacher or classmates help while designing wrapping box.	3.89	.69	8.53	.000
c4	I am willing to spend more time and efforts to collect and analyze data and work in order to solve encountered problems.	3.86	.73	7.80	.000
c5	I am more serious and diligent in learning this course than other courses.	3.77	.83	6.17	.000

Test value=3

According to Table 5, c1 to c5 are the questions from the students' learning attitude domain, obtained means ranging from 3.77 to 4.27 ($p=.000<.01$), indicating the students possess positive and active learning attitude toward this blended creative learning. Particularly, item c2 "I can actively participate in small group discussions and knowledge sharing" obtained a high mean of 4.27, indicating the students were able to actively participate in the group discussions and sharing knowledge.

Table 6 Statistical results of the students' learning fulfillment domain

Item	Statement	Mean	SD	t value	Sig.
d1	Combining traditional in-class instruction with blended learning and online learning platform can increase my understanding to wrapping design practice.	4.00	.75	8.88	.000
d2	This blended creative project-based learning can help groups design and produce their works nicely.	3.84	.68	8.20	.000
d3	Through teamwork to complete the task brought to me the sense of fulfillment.	3.82	.79	6.91	.000
d4	I will be very capable and confident about collecting wrapping design related information in the future. °	4.00	.68	9.73	.000
d5	I will be able to analyze and solve wrapping design related	3.82	.62	8.75	.000

	problems in the future.				
d6	I am very confident in creative design practice after taking this class.	3.98	.59	10.98	000

Test value=3

According to Table 6, d1 to d6 are the questions from students' learning fulfillment domain, obtained means ranging from 3.82 to 4.00 ($p=.000<.01$), indicating the students possess high fulfillment toward this blended creative learning. Particularly, items d1 "Combining traditional in-class instruction with blended learning and online learning platform can increase my understanding to wrapping design practice" and d4 "I will be very capable and confident about collecting wrapping design related information in the future" obtained the highest mean score of 4.00, revealing that the students feel confident and capable about doing wrapping design through this blended creative project-based learning.

To conclude, all the students possess positive and active learning attitude toward this blended creative project-based learning. Through the online learning platform, the students were able to discuss and share ideas and knowledge with others, which enabled the students become more confident and capable in making wrapping design.

Conclusion and Suggestions

The findings of the study show that the students are satisfied with this new learning approach for wrapping design course through blended learning. The students not only can access and obtain various resources in-class instruction but also from online learning platform. Also, project-based learning provides the students teamwork opportunity to stimulate creativity and design ideas as well as to solve problems. Through the online learning platform, the students became more independent and confident. Additionally, the students' learning motivation is enhanced through this blended creative project-based learning. Finally, the creative teaching approach brings different aspects to the wrapping design course and makes the course more joyful and effective.

The following are the suggestions for improving the wrapping design course. First of all, group member's teamwork should be emphasized and balanced, and their feedback and comments should be fully discussed and responded in order to run the course effectively. Second, the students' drawing ability should be reinforced before the class. If the teacher can provide at least two to three weeks for drawing, the teaching would be more effective. Finally, the blended creative project-based teaching and the online learning platform can be applied to various instructions of subjects to enrich the teaching content and enhance the students' creativity.

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