

## THE RELATIONSHIP BETWEEN TAIWANESE DESIGN DEPARTMENT STUDENTS' LEARNING STYLE AND LEARNING FEATURE

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### ABSTRACT

The purpose of this study is to find out the relationship between Taiwan design department students' learning style and learning feature. Categorize students with Kolb's learning style inventory. Research in one sophomore design class of National Taipei University of technology with 29 students. Researcher participated in for 6 months to observe and record. Then use the in-depth interview method to talk with 10 students from 4 learning styles. Coding the interview data by the software Atlas .Ti (6.0) and extract the result. The answer is that, there were two over all phenomenons of features of design department student: 1. They tend to learn design by experience, observation and live with their style. 2. Because of there is no standard process or answers in every design course, grading student rely on teacher or judge's subjective opinion. The features of different learning style are that: 1. Converger students good at analyzing and arranging their mind with objectivity. They also tend to be confident and active. 2. Assimilator tend to have no their own opinion and unconfident. they prefer the design project with limitation, rules or concrete topic. 3. Accommodator are sensitive in the class, and prefer to do design project with their subjective and instinctive opinion. 4. Diverger prefer to think freely and emotional. The way they learn is spontaneous and brave to show themselves off.

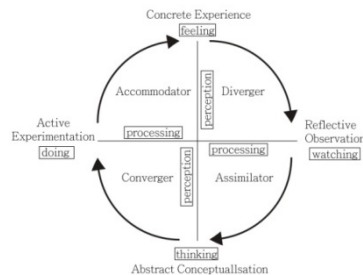
**KEYWORDS:** Learning Style, Learning Feature, Kolb's Learning Style, Adaptive Learning, Design Department Student

### INTRODUCTION

Today, Industrial design is one of the most popular academic subjects in China, Taiwan, Thailand and other Asia emerging countries. In Taiwan, the most important environment to teach and cultivate industrial designer is in college courses. Therefore, the purpose of this study focus on understanding the learning situation and learning feature of different type of learning style. The result will be as consideration for researcher and educator to cultivate and teach more competitive industrial designers. One of the features in learning design is that, there is no standard answer and process to learn. Design learning emphasize the accumulating of knowledge, skills and experience. Therefore we talk about the design learning based on constructive learning theory. Constructive learning theory emphasize that knowledge is based on the interaction of the experience and the objects. Kuo (2000) thought that the key of learning depends on whether the learner integrate the new knowledge and the old one.

Based on constructive learning theory, this study uses the Kolb's experiential learning theory to discuss the interaction between teaching, learning and learning styles. Kolb's Lsi (Learning styles inventory) is extended from he's Experiential Learning Theory. He said that there is no learning style better than another, the importance is how educator offer them appropriate aid and help at right time. Kolb define 2 aspects: perception and processing, and divided by 2 aspects to 4 learning style (Kolb, 1976). Kolb thought learning as continued processes. There are 4 steps including:

1. Concrete Experience, 2. Reflective Observation. 3. Abstract Conceptualization. 4. Active Experimentation. Kolb thought these 4 steps as a circle of learning and keep going, none stop. According to 2 aspects (perception and processing) and 4 learning steps (Concrete Experience, Reflective Observation, Abstract Conceptualization and Active Experimentation), brings out 4 learning styles, 1. Diverger, prefer to learn by observation and concrete experience. 2. Accommodator, prefer to learn by doing and concrete experience. 3. Converger, prefer to learn by doing and abstractive concepts. 4. Assimilator prefer to learn by observation and abstractive concepts. Show on figure 1



**Figure 1: Kolb's Learning Styles Inventory & Experiential Learning Theory Processes. (Kolb, 1976, 1984)**

Dr. Howard Gardner published 《Frames of Mind》 at 1983 said that there are 8 kinds of intelligences including linguistic intelligence, logical-mathematical intelligence, spatial intelligence, bodily-kinesthetic intelligence, musical intelligence, interpersonal intelligence, intrapersonal intelligence, and naturalist intelligence. And explain that everyone have different potential in these 8 intelligences. Because of design emphasize on the integration of student's professional knowledge and their own type of designing. Adaptive Education becomes more important for the design major students. Briefly, the purposes of this study are: 1. Understand the distinctive difference between Taiwanese design majors and other majors and the learning characteristics. 2. Find out the characteristics of different learning styles.

## METHODS

### Research Sample and Interviewer

The sample of this study is sophomore furniture design class in Taiwan, National Taipei University of Technology (NTUT), total research for 6 months with 29 students. Through Kolb's learning style inventory to classify different learning styles, as a result, there are 7 convergers, 7 assimilators, 9 accommodators and 5 divergers. In order to understand for deeper feeling and difference between different learning styles, this study interview 10 students, including 3 convergers, 2 divergers, 2 assimilator and 3 accommodators. The average time of interview is 1 hour. Because of participating this class for a long time, researcher and the students are trust each other and willing to share the true feeling and opinions the researcher. It is one of the most important parts of this study.

### Research Method and Tools

Through participating and interviewing, the data of this study is qualitative mostly. Then use the qualitative data analyzing software coding, organizing and summarizing.

### Participant Observation

Lindemann (1924) says that there are two kinds of observers: 1. Objective observer: through interview or other non-participating observation. 2. Participant observer: through real participating to understand the group or culture of them.

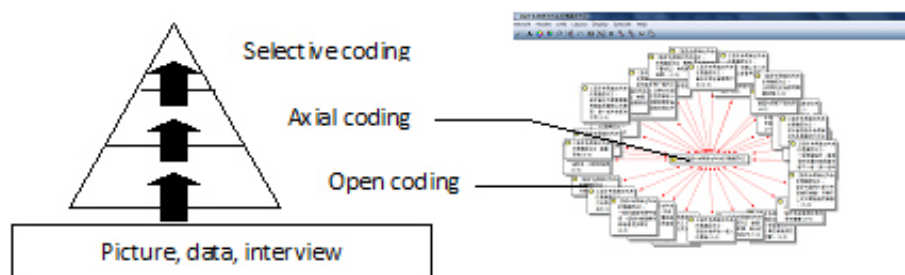
## Depth Interview

Depth interview is one of the most used methods in social studies to collect data. Focus on the interviewer's feeling, life experience and personal opinions from conversation. Thus, understand and explain the interviewer's mind and cognition (Lin, Yan and Chen, 2005). Through depth interview can understand the feeling or opinions between different learning style students.

## Coding

Grounded theory is mentioned in 《the Discovery of Grounded Theory》 wrote by Barney G. Glaser and Anselm L. Strauss published in 1967. Grounded theory is not a theory but a research method by logically analyze the data to find out and construct new theory. In a word, grounded theory focuses on "logic of generation ", not "logic of proof". (Chi and Lin, 2005)

This study code data with qualitatively analyzing software Atlas. Ti (6.0) through 3 steps including open coding, axial coding and selective coding. The processed showed in figure 2. Open coding is a process of apart, compare and survey the data. Axial coding is a process of integrating the open coding by connecting or interacting. Selective coding is a process of summarizing and proof the relationship. (Corbin, 1997)



**Figure 2: Grounded Theory Coding Process & Atlas. Ti (6.0) Coding Tree Diagram**

## RESULTS AND ANALYSIS

Through coding, organizing and summarizing the qualitative data, we understood the distinctive difference between Taiwanese design majors and other majors and the learning characteristics of students with different learning styles. The research objects are sophomore students majoring in industrial design, class of furniture design. As we were limited by time and manpower, other grades, learning condition and learning styles were not considered in the research.

### The Overall Phenomenon

- The learning style of design majors favors feeling and experiencing things in life through observation, understanding and discovering problems around them. By combining the experience with professional knowledge, the experience becomes the foundation of design. We see that the learning style is diverse and liberal. Part of the coding detail is listed in Table 1.
- Subjective assessment, unlike the fixed answers and standard procedure of other majors, and objective grading criteria enable students to recognize their capability. As design majors' grading is decided upon the judge's subjective opinion, students fail to value their academic level and think that there is no positive relation between

giving and receiving in the learning process. Also, design ability is selective and inconsecutive. Part of the coding detail is listed in table 1.

**Table 1: Coding for the Difference of Learning Styles of Design Majors**

Selective-Coding□	Axial-Coding□	Open-Coding□
The difference of learning styles of design majors□	Learning in life□	1. → Everything we hear or see is a kind of learning and becomes a kind of foundation for designing. (Di.L:071-072)□
		2. Sometimes only emotionally expressive people can create more possibilities in design. (Ac.W:019-020)□
		3. One can design by observing the needs in daily life. (As.W:157-158)□
		4. Many things can inspire designing, including books, videos and the internet, even walking on the street. (Ac.T:041-041)□
	Learning through feeling an experiences□	1. In terms of learning design, experiencing is more useful than reading books. (Co.T:067-068)□
		2. It's hard to learn design from reading books, sometimes observing or understanding what is happening is more important. (Di.W:015-015)□
3. I like to have fun everywhere; it inspires me a lot by looking at different things. (Co.T:073-075)□		
Subjective Assessment□	No fixed answers or learning styles□	1. → A lot of answers in other majors are fixed, but for design, it is completely different. (Ac.W:035-036)□
		2. Comparing to other majors, design majors don't have to memorize a lot of things, and nothing is really fixed. (Ac.W:019-020)□
		3. There is no established criterion for grading in design majors, unlike other majors. (Co.W:109-110)□
	No positive relation between giving and receiving□	1. Sometimes we spend a lot of time on a design case, only to be terminated because the professor disapproves. (As.W:019-019)□
		2. If one really tried to study, even without complete understanding, one can get score by memorizing the answers, but for design students, spending a lot of time on designing does not guarantee the quality. (Co.W:70-73)□
	Not knowing whether one is competent or not□	1. The opinions of professors, judges and classmates make it hard for us to value our own competence. (Co.W:132-132)□
2. Other majors can probably evaluate themselves by assessing their usual performance, while design majors hardly feel this way. (As.W:021-022)□		

**Note:** (Code for interviewee: paragraph of the transcript)

### The Difference Characteristics of Different Learning Styles

Through the results obtained from participating in classes and in-depth interviews, we summarized the different learning characteristics of students with various learning styles. The coding and arrangement is listed in Table 2.

- **Converger:** During observation, we understood that convergers are good at rational analysis and sorting information. Through in-depth interview, we found that this type of student likes to organize their thoughts from an objective perspective and to initiate experiments. They are confident in their abilities and like to think of ways to overcome their shortcomings.
- **Diverger:** During the design learning process, the diverger's thinking mode is characterized by its extensiveness, independence and vividness. The learning process is more liberal, thus they dislike design cases with a lot of restrictions. Their design ability focuses on innovative ideas and sensual modeling. They are also not afraid to express themselves.
- **Assimilator:** This type of students lacks their own opinions during the learning process. They rarely take risks or think and carry out the design cases, as they rely too much on the opinions of professors and classmates that they lose their own focus, which causes them to be less confident on their ability. They prefer design cases with more restrictions and follow the steps and progress of the professor.

- **Accommodator:** This type of student is more sensitive to the class's overall operation and state and tends to provide suggestions and give opinions. They are intuitive, subjective, and confident and are prone to protect their own designs, but at the same time, they are willing to discuss and to improve their designs too.

**Table 2: Coding for the Learning Characteristics of Different Learning Styles**

Selective Coding	Axial Coding	Open Coding
Converger	The spirit to initiate experiment	1. Vinyl is like a thin pipe that can be shaped by using my home stove. As it won't be burnt, simply bend it with hand after heating it for a while. (Co.T:117-119) 2. I combined a flashlight with a fishing rod borrowed from my uncle, and I discovered it made an interesting lamp. (Co.S:110-111)
	Confidence	1. I felt that not everybody can get into the realm of design, or I should say that not everyone has the courage to study this. (Co.T:035-035 ) 2. If we have conflicting opinions, we would listen to our professor, but sometimes I stick with my own ideas. Other people's thought are their thoughts, and it doesn't represent the quality of my work. (Co.T:140-142)
	Reaching for better	1. Sometimes my ideas are not bad, but it may be the same as others. I just hope to make something that impresses others. (Co.W: 032-033) 2. When I see others with exceptional briefing skills, I would modify mine to make it better. (Co.T: 052-053)
Diverger	A vivid and liberal thinking mode	1. I think too much, often times it is an irrelevant and outlandish feeling. (Di.W:165-166) 2. I often think of a story for my product during the design process. (Di.L: 119-190) 3. My ideas come from a lot of places. It may be from movies, books or just life in general. (Di.L:102-103 )
	Spontaneous	1. I often let myself go consciously. I may have a lot of things to do, but I let myself watch two movies, not wanting to do anything else. (Di.L:050-051) 2. I don't like design cases with many design restrictions, it limits the procedures and thinking. (Di.L:131-135)
	Eager to express	1. I wish our university could invite more judges or teachers from the outside, because I believe that people from different backgrounds can give more advice, and on the other hand, I can prove my ability. (Di.L:033-034)
Assimilator	Lack personal opinion	1. I will try to satisfy others suggestions and modify it until the professor is pleased. (As.H: 139-140) 2. Sometimes I think I am not an opinionated person, I listen to whatever was being said. (As.W: 045-047)
	Prefers design with more restrictions	1. I quite like to follow the professor's progress. (As.W: 087-087) 2. When the goal and limitations are set, it is easier to implement the idea. Imagining is hard. (As.W:140-141)
Accommodator	Subjective	1. I will defend my ideas when we are divided in groups. (Ac.T:125-126) 2. I listen to the advice after discussing with the professor, but sometimes I still stand by my original ideas. (Ac.L:137-141) 3. Even though I will defend my own ideas, but if my classmates offer better suggestions, then I will modify or rethink my concept. (Ac.t:129-130)
	Sensitive, intuitive feeling	1. When doing designs related to cultural phenomenon, I will visit the place to see how it feels. (Ac.T:057-058) 2. I quite enjoy visits, because I can learn directly and experience some things first hand. (Ac.L:130-130)

**Note:** (Code for interviewee: paragraph of the transcript)

## CONCLUSIONS

The purposes of this study are: 1. Understand the distinctive difference between Taiwanese design majors and other majors and the learning characteristics. 2. Find out the characteristics of different learning styles, the result show below:

Difference of learning styles of design majors: 1. The learning style of design majors favors feeling and

experiencing things in life through observation, understanding and discovering problems around them. 2. Subjective assessment, unlike the fixed answers and standard procedure of other majors, and objective grading criteria enable students to recognize their capability. Characteristics of different learning styles: 1. Convergents are good at rational analysis and sorting information. They are confident in their abilities and like to think of ways to overcome their shortcomings. 2. Diverger's thinking mode is characterized by its extensiveness, independence and vividness. They dislike design cases with a lot of restrictions. Their design ability focuses on innovative ideas and sensual modeling. They are also not afraid to express themselves. 3. Assimilators rarely take risks or think and carry out the design cases, as they rely too much on the opinions of professors and classmates that they lose their own focus, which causes them to be less confident on their ability. 4. Accommodators are intuitive, subjective, and confident and are prone to protect their own designs.

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