

A Preliminary Study on Vocational Maturity and Career Choices of Female Industrial Design Students

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Abstract: In the past, product/industrial design (ID) has been regarded as a masculine and male-dominated profession, and females have not been active in the field in Taiwan and an international context. To date, there are more female than male students in class for ID programs in Taiwan and the ratio of females studying ID has reached to 61%. The authors have conducted a series of studies to investigate vocational maturity and career choices of female ID students in Taiwan and in an international context. This paper is to explore the content of vocational maturity and career choices of female ID students with twenty-five participants in Taiwan. The outcome includes female ID students' perception about the ID career/industry and self and influential factors of career choices. Based on the transcripts, the authors analyzed career development for each interviewee and detailed reasons and factors that influenced their choices. The next step will adopt a questionnaire to investigate vocational maturity and career choices of female ID students in Taiwan and in an international context. The outcome of a series of studies would help to educate and guide female ID talents for their employment and career planning.

Key words: *Vocational Maturity, Career Choices, Female Industrial Design, Design Education, Industrial Design*

1. Introduction

In the past, product/industrial design has been regarded as a masculine and male-dominated profession [1]. Because of the increase in women's purchasing power and intense competition in the market, the enterprises pay more attention to the female market. Female consumers are significant decision-makers in the market and are valued increasingly by corporations nowadays. When corporations launch their new products to satisfy female consumers' needs, both the female users' opinions and female designers' involvement are required during the process of product design and development. In the past decade, the number of females studying ID has increased dramatically and has reached to 61% in Taiwan [7]. However, a significant proportion of them still has been absent from design professions.

Women pursuit higher education is becoming more and more common today. They have to face career choices at their different stages of career development. For example, some female college students often face career choices of either “to work” or “to study in graduate school” after graduation. Jiang [3] defined "career choice" as a behavior of "make a decision" on critical moment in a career to find career goals which suit one's needs. Hsueh [8] claims that the factors of influencing career choices include gender, age, grade, family economy, socioeconomic status, school, working experience, learning experience, vocational maturity, career orientation, and so on. Mao [2] claims that vocational maturity not only is about a choice to one's career, but also includes personal attitude to make decisions, understanding the needs for the profession and the ability to plan ahead. Qin [6] proposes eight factors for vocational maturity, includes: 1) information application; 2) vocational attitudes; 3) vocational choices; 4) self-awareness; 5) vocational values; 6) vocational awareness; 7) individual adjustment; 8) qualification assessment.

The students' vocational maturity is interacted with career choices. Choosing an appropriate vocation has a great significance to the person. Students must have sufficient abilities to plan their career and to make choices during career at their different stages of career development; based on the majors students having chosen in a college, they can learn professional knowledge, skills and attitudes effectively, and then work in the related fields after graduation [4, 5]. It is worthy to explore vocational maturity and career choices of female ID students. The authors have conducted a series of studies to investigate vocational maturity and career choices of female ID students in Taiwan and in an international context. This paper is a preliminary study to explore the content of vocational maturity and career choices of female ID students in Taiwan. The authors would apply the Qin's concept to explore female ID students' vocational maturity. The findings are as the base to a follow-up questionnaire design and survey distributed to a large scale of participants in the future. It is significant to explore the influential factors in female ID students' career choices. The outcome of this study can help to educate and guide female ID talents for their employment and career planning.

2. Methodology

There is a limited amount of literature and studies about vocational maturity and career choices of female ID students so far. Therefore, the authors adopted an explorative approach to collect the data by structured interviews. The findings could be a basis for further designing a questionnaire survey in the future. The authors conducted structured interviews with twenty-five participants in Taiwan. The subject was selected by purposive and snowball sampling based on their educational background and current status. Thirteen ID college students are juniors/seniors from either the general university (six females) or the technology university (seven females). Their career choices cover three various types: to “study in graduate school,” “get a job,” “not decided yet.” Newly enrolled students “may not be familiar with the major or the school they study,” “may be dissatisfactory with the major,” “would like to transfer to another major or school.” Thus, freshmen and sophomores are not selected as participants due to their unstable career decisions. The other twelve participants are ID females who graduated less than two years, currently either being employed (six females) or studying in graduate schools (six females).

The profile of interviewees is as shown in Table 1. Twenty-five participants can be divided into six categories: 1) students decide to study in graduate schools (No. 01,03, 13, 18-19, 23); 2) students decide to get a job

Table1. Profile of Interviewees

No.	Category	Educational background			Current status
		University	Department	Grade	
01	Students decide to study in graduate school	NUU	ID ¹	senior	accepted as a graduate student
03		NUU	ID	junior	college student
13		CGU	ID	senior	college student
18		MCUT	ID	senior	accepted as a graduate student
19		THU	ID	senior	accepted as a graduate student
23		TNNUA	MA&D ²	senior	college student
04	Students decide to get a job	NUU	ID	junior	college student
05		NTUT	ID	senior	college student
21		CYUT	ID	senior	college student
14	Students haven't decided yet	CGU	ID	senior	college student
15		NYUST	ID	junior	college student
16		NYUST	ID	junior	college student
20		CYUT	ID	senior	college student
07	Graduates are studying in the graduate school now	NTUE	A&D ³	graduate	graduate student
08		NUU	ID	graduate	graduate student
09		THU	PD ⁴	graduate	graduate student
10		NUU	ID	graduate	graduate student
11		MCU	PD	graduate	graduate student
12		HFU	ID	graduate	graduate student
17	Graduates are working in the ID related jobs	NCKU	ID	graduate	industrial designer
24		DYU	ID	graduate	industrial designer
25		NHCUE	A&D	graduate	shoes designer
02	Graduates are working in the non-ID jobs	NUU	ID	graduate	sales staff
06		NTUE	A&D	graduate	space designer
22		NCKU	ID	graduate	international trade staff

¹Industrial Design; ²Material Arts & Design; ³Art & Design; ⁴Product Design

(No.04-05,21); 3) students haven't decided yet (No.14-16,20); 4) graduates are studying in graduate schools now (No.07-12); 5) graduates are working in the ID related jobs (No.17,24-25); 6) The graduates are working in the non-ID jobs (No.02,06,22). Due to participants from each category with slightly different backgrounds and current status, three versions of interview outlines and personal information forms are developed. After filling out the personal information form, each participant's interview was recorded and transcribed for later analysis.

3. Findings

3.1 Vocational Maturity of Female ID Students

The content of female ID students' vocational maturity includes the participants' perception of ID career/industry and about their own strengths/weaknesses on the professional competence, and frustrations during their study. At the end of this section, the authors will examine the overall situation of the female ID students based on Qin's [6] eight factors of vocational maturity.

3.1.1 The participants' perception of ID career/industry

The participants' perceptions of ID career can be broadly divided as follows: 1) Industrial designers always work overtime and have to exchange health with work which causes to poor quality of life. 2) Pay is low. 3) Designers in Taiwan are squeezed (e.g. responsible for the duty of two dimensional and three dimensional design) and do not receive well-respected as foreign designers. 4) In-house design departments within large companies have a large scale and well-developed system but the variety of the product category to design is less diverse than design houses. The employee' welfare is more promising, higher base pay, more regular duty hours in large companies than in design houses. However, if the schedule of front-end development is delayed, the time left to the designers of in-house design departments to complete design tasks is shrinking, which could cause designers very tired and high pressure. 5) Design houses are established on a small scale, thus designers in design houses usually have to work overtime and are unable to predict how many things need to be done. However, design projects in design houses are diversified which can expand designers' life experience and views. 6) Designers as SOHO (Small Office Home Office) have more autonomy on their own workload and the type of design projects than those who work in design houses, but the income of SOHO is less stable. 7) Many products designed by design houses are small stuff (e.g. little toys, products for soothing stress, etc.); however, high price and mass produced products, such as suitcases or massage chairs, are not taken seriously. 8) Some ID graduates become art designers. 9) The Taiwan government spends little funds and efforts to promote the development of design industry. For example, the Taiwan government advocates the cultural and creative industry ostensibly rather than essentially. 10) Taiwan has placed more focus on the technology industries; however, traditional industries are more competitive advantages and should be noticed seriously. 11) Many internal parts and mechanisms of Taiwan's electronics products are bought from abroad which is not a sustainable way for corporations to compete and innovate.

3.1.2 Participants' perception about their own strengths/weaknesses on the professional competence

That participants' perception about their own strengths and weaknesses on the professional competence represents their self-awareness. In terms of strengths on the professional competence, participants' answers are much dispersed. It means there are no strengths particularly prominent. Most participants believed that the two dimensional (2D) and three dimensional (3D) software operation is their weakness. The rest answers to weaknesses on the professional competence are dispersed. There are gaps between participants' perception about their own strengths/weaknesses on the professional competence and participants' claims about strengths/weaknesses of female students to study ID. For example, more than half of the participants thought "carefulness" is one of female ID students' strengths, but only the participant No.14 think "carefulness" is her strength. In terms of weaknesses, most participants thought "female's poor physical strength affecting design operation during the process" is a major weakness of female ID students. However, in the aspect of self-awareness, no participants mentioned that "poor physical strength" is their weakness. It shows that the participants maybe understand their own strengths/weaknesses clearly, but in terms of self-awareness, most participants lack confidence about themselves.

3.1.3 Participants' frustrations during their study or work

Half of nineteen student participants ever had the idea of suspending from school or major transferring. Among them, five of the thirteen college students felt unaccommodated during the learning process: some college students weren't used to the way of the teachers' instructions; some felt exhausted after majoring in design. When they faced the above frustration, it tends to come out the idea of suspending from school or major transferring in those students' mind. However, most of them found reasons to persuade themselves of continuing their studies. Five of six graduate students ever had the idea of suspending from school: some felt unsuited to the specific research area and theory-oriented courses; some claimed that they spent most of their time to help teachers doing chores and were unable to concentrate on their research. The above graduate students tend to feel waste of time in school comparing with their college's classmates working in the workplace. Under the pressure of time and money making, some graduate students came out with the idea of suspending from school.

In terms of the employed participants' idea of job changing, one of three participants who had working in ID related jobs has the idea of job changing into non-design jobs. The reasons behind the participant No.17's decision are: 1) Working in ID related jobs is tired; 2) ID related job is not well paid; 3) There are conflicts with the director and 4) There is economic pressure from her family. And the first two reasons are the participants' perception about ID related jobs. On the contrary, two of three participants who had working in non-design jobs are willing to job changing back to ID related jobs. The participant No.22 said, "I will get into the field of cultural and creative industries if I am going to work in ID related jobs again. However, this choice for the future will be evaluated carefully because of the lower paid within cultural and creative industries.

3.1.4 Overview of female ID students' vocational maturity

In term of female ID students' vocational maturity, six of Qin's [6] eight factors for vocational maturity are found in the in-depth interviews. There are information application, vocational attitudes, vocational choices, self-awareness, vocational awareness and qualification assessment. In regard to the other two factors, vocational values and individual adjustment, both are not found during the in-depth interviews and will be included in a questionnaire in a follow-up survey to be investigated.

Based on the interviews, due to penetration of Web usage, the majority of participants were informed of the ID career information through internet. For example, they inform the recruitment information through design website or Facebook, and some people gather relevant career information through newspapers and magazines. But fewer people put this information to do methodical collation and preservation. It means that the participants' level of information application is insufficient. About vocational attitudes, the majority of respondents attach importance to their own interest in the process of choose occupations. But vocational environment and salary conditions also affect the mentalities and ideas of participants. When some participants faced the choice of the future direction, their heart is clear and firm. Because they sufficiently definite their own interest, so they are less susceptible to external influences. However, some participants are influenced by factors such as family or employment environment, and then they choose the work which they think fit but not necessarily their favorite. About self-awareness, the majority of participants are aware of their own strengths and weaknesses. But in terms of

self-affirmation, not the most of people have confidence on their ability. Most of the participants' level of vocational awareness is enough. They get the vocational information by Internet, part-time jobs, internships or relatives and friends, etc. Because of the closed school climate and fewer resources of school, some participants' level of vocational awareness is lower. In terms of qualification assessment, the majority of participants can't find their own direction in a short time when they face the career choice. They try to do the jobs as they see fit, and to find the answers tentatively in the process. The parts of vocational values and individual adjustment can't be learned from the results of the interviews. We should strengthening and clarifying a few points in the follow-up questionnaire survey. To clarify the participants on the likes and dislikes of the ID field, to understand the subjects ID career evaluation, and the participants will focusing on their own subjective conditions, external and objective conditions, or to strike a balance between this two when they facing the career choices.

3.2 Career Choices of Female ID Students

The findings about female ID students' career choices can be divided into two parts: one is the influencing factors of choose to study in the ID department. Another one is the influencing factors of career choices after graduation.

3.2.1 The influencing factors of studying ID in the university

Integrate the reasons of choosing the ID department by 25 participants, and collect influencing factors of choose to study in the ID department. That can be summarized as follows: 1) Personal factors - "their interests" (No.02-06,08-13,15-25), and "test scores"(No.01,08,10-11,14); 2) Family background -"family economic status" (No.01-02,17), "parents' education level"(No.23), "parents' occupation"(No.11,23), "family's expectations" (No.07,11,14), and "influence of families' interest"(No.12-13,17,23-24); 3) Learning process - "influence of classmates"(No.23), "school teachers"(No.05,10,20), and "developing time of department"(No.23); 4) Social factors-"influence of information (newspapers, magazines, Internet)"(No.17); 5) Professional factors of ID - "course content of ID"(No.04, 24), "the courses of design department is more flexible than mechanical and engineering department"(No.05), "ID's way out would be more widely"(No.16).

Among the influencing factors which the participants choose to study of the ID related departments. The proportion of "their interest" is the highest and second highest are the "test scores" and "families' interest." The analysis results show that when doing the choice of university departments, although the majority of people would consider their own interests, but sometimes the test scores are the main factors that cause the final results. In the case of small monasteries, families' interest influence career choice should not be underestimated.

3.2.2 The influencing factors of career choice after graduation from university

Compared with the above factors, the influencing factors of career choice after graduating from university has a wider range, and the reasons are more complex. Participants has experienced 3-4 years of ID education, they have a better understanding of the connotation of ID, but also change their view of the ID industry. Some people decided to study in graduate school, some people decided to get a job. Behind the seemingly simple choice, in fact, it implied many reasons.

Integrate the influencing factors of career choice after graduating from university, that can be summarized as follows: 1) Personal factors-“their interests”(No.02-03,15,17,21), “professional competence”(No.05,11,13,24-25), “self-concept”(No.06,24), “part-time or internship experience”(No.18,22); 2) Family background-“parental occupation”(No.21), “family’s expectations”(No.03,08-09, 16);3) Learning process-“curriculum planning”(No.02), “school teachers”(No.05,19), “school resources”(No.07), “school reputation”(No.10), “would like to know more people through university-industry cooperation”(No.01);4) Social factors-“job-market conditions”(No.22), “ability requirements of interdisciplinary job-market”(No.12,15), “job-market salaries”(No.07,10), “academic requirements of job-market”(No.23), “planning to go abroad(to expand the international perspective)”(No.20,22,24) ; 5) Professional factors of ID-“university period focused on implementation, to pursue graduate studies in order to enrich the theory”(No.01,08,10,19), “think design is very hard”(No.04,22).

In the influencing factors of career choice after graduating from university, "their interests," "professional competence", "family’s expectations", "university period focused on implementation, to pursue graduate studies in order to enrich the theory", the four factors have high influence degree.

3.2.3 Overview of female ID students’ career choices

Compare the influencing factors of choose to study in the ID department with the influencing factors of career choice after graduating from university, the shared factors of above are: 1) Personal factors-“their interests”; 2) Family background- “parental occupation”, “family’s expectations”; 3) Learning process- “school teachers”.

Text analysis results can be found that "their interests" is the greatest influence factor of female ID students. Female students choose university departments according to their own interests. The meaning of "their interests" at this stage of selecting university departments are mostly interested on the ID's professional learning content. They have in common the following points: like drawing, like DIY, unlike reading ... etc. Although they don't necessarily understand the course contents of the ID department, but they would think like drawing or like DIY is suitable for studying at department of ID. In the stage of career choice after graduation, "their interests" refers not simply interested in ID professional learning contents. Female students have experienced 3-4 years of education, they may be found that they don't suitable studying at the department of ID, and they might found more suitable for their courses or field. For example, among the participants who mentioned herself has more interested in marketing courses, after graduation, she choose to engage in the marketing industry, rather than the ID industry. Although the same factors like "their interests" that influence career choice, but their meanings are different.

Family background-“parental occupation” and “family expectations” also affect the female students' career choices of the two stages, it shows the importance of the family members. At home, parents are the closest persons of children, under the environment of the Influenced by what they constantly hear and see, the children are likely to be influence by parental occupations. If the parents are engaged in the ID industry, the probability of the children choose the ID department and industry will be higher. When make a decision about choosing the university department and doing the choice after graduating from university, the families often play important roles. Sometimes children are at a loss in the life choice, at this time, family’s expectations will become the key to making a decision. But sometimes the children’s personal wishes contrary to family’s expectations which caused

the children make the choices against their ambitions. And there is a similar case of interview participants.

Learning process-“school teachers” is also an importance influencing factor. Teacher is important knowledge and information sources of students during the period of studying in school. Therefore, the teacher's words and even a suggestion will cause important influence in the student's mind. In this study, when the student faced the choice of university departments, because of the teacher's recommendation, the students decided to study at department of ID. When they faced with the choice after graduation, the teacher's recommendations may be influential to their decisions to get a job or to study in graduate school. So the influence of school teachers must not be underestimated.

Although among the influencing factors of choose to study in department of ID, "their interest" has the highest proportion. However, the researcher found that when participants chose university departments, even if they don't necessarily understand the course of the ID department, but they think that like drawing and DIY, even the reason such as doesn't like reading which certify she is suitable for studying ID department. In fact, the industrial designer should have the widely ability. Therefore, the ID students need to learn different subjects, this isn't like the participants who had imagined that simple. Experienced 3-4 years study, many participants found that design is hard, and also found that her own certain courses or skills are not very good. Therefore, they feel afraid and worried, their career choices has also been a change.

4. Conclusions

Only twenty-five female ID students are interviewed in this preliminary study, so the findings are not the final conclusions and can't be analogized to all the female ID students. The findings are as the base to a follow-up questionnaire design and survey distributed to a large scale of participants in the future. Based on the findings about vocational maturity and career choices, female ID students' obstacles and the factors of obstruction can be categorized as follows:

First, the conditions of ID job market force the female ID students to switch to non-ID jobs. The students' vocational maturity is interacted with career choices. Some students contact with the industry by being a part-time worker or interning in the design company. Others know the current situation in the industry by teachers, friends and family's telling. In this process, they will know how to work a project, and industrial environment in the design industry. Some people are more insistent on ID because of this. Of course, some people stay away from the design anymore. In the job market, because the ID job market is low starting salary, heavy workload, long working time and the uncertain off work time, people is easy want to change jobs. And coupled with the training and attention on ID designer in Taiwan's job market are inadequate. The designers always need to do all the processes of the work why they naturally will not stay long in this stressful environment. And the stereotype of female not only influences female's working opportunity, but also limiting the development of female on the workplace. For example: we generally believe female designers are not familiar with the operation of the mechanical structure, therefore they always been allocated the design project with less mechanical structural design.

Next, students found that they don't interested in ID learning content in university: According to this study, if

students found they don't interested in ID learning content in university, it will become an obstruction of career development. The possible factors are as follows: 1) The students had no understanding of the ID learning content in the beginning, and misunderstanding just like drawing or making model is suitable for studying ID department; 2) The students found that there are other departments more suited to their interested in the schooling of university; 3) Because the children's personal wishes of contrary to the family expectations, caused the children make the choices which is against their ambitions; 4) The students got into the ID department because of their teachers' suggestion. But they didn't understand what learning content is of ID department. And realize they were not suited to studying ID after the university schooling.

Finally, the weakness of female studying ID department: They need to produce a model and face of large-scale equipment in the ID courses. And they need to work long hours; it results in a big loading on physical strength. Female will more difficult because of their poor physical strength. Generally believed that the female's weak is mechanical structure, electronic, and physics. Because of female influenced by the general public, they is easy question their own ability to work and self-confidence. Then come out the myth what isn't conducive to the work.

Make recommendations based on the results of this study. In the matter of ID industry, should strengthen the training and attach much importance to designers, and don't limit the development of female designers in the ID field. In the matter of design education, should let the public sufficiently understand the connotation of ID department. And, in the process of university education as soon as possible to understand whether the students interested in the field of ID. Thus providing counseling or school change / department transfer information. For female designers, once influence by the social, and questioned their ability, it is easy to produce the confusion which is not conducive to their job. Therefore, should strengthen the degree of self-awareness, and make the best play to their strengths. In addition, interviewees are obtained by convenience sampling and snowball sampling, and therefore can't be evenly distributed in North, Central, and South regions. And if the interview participants are strangers or familiar people, they may affect the impartiality of the interviews and the degree of depth of text analysis. The above problems may cause the deviation of the results. Comprehensive analysis of the literatures and the interview results, found that the vocational maturity structures are not all to be summarized in the interview results. Therefore, the follow-up questionnaire in the future will also include in second-hand information of literatures and the first-hand information of the interview results. And use clarification to strengthen in the inadequacies of in-depth interviews.

5. Acknowledgement

This study was partly supported by the National Science Council of the Republic of China Government, under Grant No NSC100-2410-H-239-012-MY2.

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