A Study on Cultivation of Employability of Visual Communication Designers in Taiwan

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Abstract

This study aims at exploring, from a student s perspective, the cultivation of employability in visual communication designers in Taiwan. With regards to the methodology of the present study, first, a literature analysis is conducted to gather the demands for "employability" of various professional skills in visual communication designers. Second, through secondary data analysis, an investigation is aimed at graduates who have left

art-related departments for just one year, to analyze how helpful their academic study has been to their work, in an attempt to understand whether their academic training meets the industry's demands. Finally, an effort is made to integrate the results and offer suggestions on employability for visual communication designers. The demands for "employability" include the following: (1) Basic competence: the basic concepts and background knowledge required for a profession. (2) Professional competence: the ability of using professional software to perform a specific task required in the professional field. (3) Professional work attitudes: the occupational ethics required. In terms of the cultivation of employability, the following points are significant— (1) Basic skills: In response to basic skills, those surveyed find that helpful skills include "cultivating listening ability", "improving communication and public speaking skills" and "forming an international perspective;" whereas many feel there is room for improvement in terms of "improving reading ability", "enhancing mathematic and physical, logic, and analytical abilities", "recognizing the importance of history", "cultivating foreign language ability" and "fostering financial management ability." (2) Professional skills: As to the ability of using professional software, skills of using "computers and information technology", "computer-aided design software" and "Chinese and English word processing software" were among the list of helpful skills. This suggests that the training of these skills at school has generated positive results. Moreover, skills of applying "Web page design software," "multimedia software (Flash, After Effect, etc.)" and "professional application software (SPSS, accounting software)" have also been helpful (3) Professional attitudes: As to necessary professional attitudes and ethics, attitudes of "appreciating literature, art, music and drama", "cooperating with others", "getting along with people from different backgrounds", "understanding different philosophies, cultures and lifestyles", "multi-tasking", "fostering self-discipline" were found to be very helpful. This shows that the cultivation of these attitudes at school meets the demand of the industry. Finally, this study presents the relationship of required abilities between "the job market and the educational training system" with the aim of narrowing the gap between the training model at school and requirements of the industry.

Keywords: Visual Communication Design (VCD), Employability, Talent Cultivation, Design Education

1. Introduction

1.1. Research Motives

Visual communication design (VCD), a new term in the design industry, is a concept that defines boundaries between art and design, commerce and culture, and two-dimensional and three-dimensional, hence integrating art, functionality, media, tools and spatial dimensions (Lin, Pan-song, 2006). The design industry is a vital part in the development of a knowledge-based economy (Ding, Si-yong, 2001). And in a knowledge-based economic model, knowledge is a production element that is preserved among people and organizations. Kerka (1998) points out that cultivation of talents has to properly reach a standard level so that a country's economy can be globally competitive. When discussing an "in-depth aesthetic and knowledge-intense" design industry, the question of how to maximize efficiency and value with limited resources has become an important strategic plan for many countries around the world. Human resource management is therefore a key factor that can lead to success or failure in an industry.

While the Taiwanese government has been seeking to promote the cultural creative industry with great efforts, some problems have emerged in the VCD industry in Taiwan. For instance, due to frequent change in design staff, employers make little investment in training employees, leading to limited on- the— job training (Yang, Yu-fu, 1997; Yang, Mei-wei, 1997). The establishment of many design departments in colleges at present may be adequate for talent cultivation, but designers' practical experiences required by the industry, especially by the VCD industry (Chen, Jhao-yi, 2006), are greatly in demand. An annual report on the development of cultural creativity industry in 2005 indicated that 78.05% of interviewees believed the government should enhance people's designing ability. This suggests that there is still room to improve the "quality" of Taiwan's designers, which might be a great challenge.

As a result, designers play a vital role in the development of a knowledge- based economy, and how to cultivate VCDers' employability deserves great attention. Previous research on employability was mostly aimed at managers in the industry or professors in universities and was conducted using the Delphi method or questionnaires (Huang, Jin-nan, 1998; Yang, Mei-wei, 1998; Lai, Li- jun, 2003). Babbitt suggests that education is a preparation for life, that education is analogous to "production" (Huang, Jheng-jie, 1991), and therefore students are the products of school. Consequently, the present work adopts literature analysis to find out the VCDer's employability, followed by secondary data analysis to

investigate art graduates who have left school for just one year and to explore if their academic study has been helpful to their work, in an attempt to understand whether their academic training meets the industry's requirements. In the end suggestions are provided on the abilities required by cultivation of employability for VCDers.

1.2. Purpose

This study aims to understand the employability of VCDers in Taiwan by
    (1) Analyzing the employability of VCDers in Taiwan, and
    (2) Investigating how helpful the abilities cultivated by school are to the
        VCD industry.

2. Literature Analysis

2.1. Definition of VCD

Chong-hong Lin (1990) indicates that design areas generally fall into three categories: VCD, Environmental or Space Design (1990), and Product Design. Ji-wun Jhang (1994) goes a step further to point out that the main difference among these three areas is the procedure and method of implementation, but the three areas still have a common goal—which is to solve the problems of "object", "environment" and "information". Saguchi Shichirou (1990) categorizes VCD in three levels: two-dimensional design includes sign design, lettering, typography, editorial design, advertising design, photo design and illustration. Three-dimensional design includes pack design, exhibition design, display design and POP design (purchase of point design). Four-dimensional design includes commercial film, animation and stage design.

Yong-fu Ciou (1990) is the first person in Taiwan who introduced the concept of VCD, suggesting VCD is aimed at delivering information or news. Later, Ji-wun Jhang (1993) indicates that the nature of VCD is a planned creation and that it integrates scientific and artist creations into our daily life. It is not limited to decorative purposes. More importantly, it conveys thoughts and feelings among people. In other words, it is a combination of "communication functionality" and "aesthetic form". Yu-fu Yang (1997) regards VCD as design aiming at "concept". Meanings are specifically generated by "representations" (images

or visual narratives), which on an abstract level, are conveyed by dots, lines, surfaces, volume, colors, brightness, and texture, and on a concrete level, can be described as a strategy of storytelling. Jun-hong Chen and Dong-min Yang (1998) suggest that VCD is a design for processing communication or expression of visual information. Ordinary people acquire 65%~70% of their perception through sight. VCD embraces fields such as humanities, social sciences, psychology, economics, marketing, aesthetics and art and combines the latest technology and information software and hardware. Therefore, it is an industry that requires intense brain work and the essence of its value is in aesthetics and creativity. Based on the evolution of the term VCD in Taiwan, Pan-song Lin (2006) indicates that when VCD became a new term, it symbolized a transcendence of boundaries between fine art and applied art, art and design, commerce and culture, and two-dimensional and three-dimensional. Moreover, it represents a design concept that integrates art, functionality, media, tools and spatial dimensions, and further displays the spirit of the times.

Therefore, in this study, VCD is regarded as a term which is named differently depending on time, place, language transformation or interpretation. It can be called "commercial design" or "graphic design", which mostly comes from English or Japanese. VCD is aimed at solving problems through design, so any communication design related to sight is within this scope (e.g. photography, printing, computer animation, illustration, advertising, etc.) It is applied to every aspect of life, but it emphasizes the effectiveness of "communication". VCD as discussed in this study is not limited to the different names mentioned above, but embraces any communication design of two, three and four dimensions that possesses "communication functionality" and "aesthetic form".

2.2 Discussion on the employability of VCDers

2.2.1 Discussion on the definition of competence

Competence must be defined according to the objective and structure of a curriculum, and set as a standard goal within a comprehensive educational plan. As a result, students and teachers can act accordingly, and the essence of education can be realized. Butler (1978) holds that competence is the knowledge, skills and values required to successfully complete each task in one's private or professional life. Jhen-rong Tian (2006) regards competence as an observable, behavioral action where an individual effectively performs a job, and properly

plays his role according to his work position and mission. Tian even roughly categorizes competence into generic competence and professional competence. The former signifies the common abilities required in the job market: "listening", "speaking", "reading", "writing", "counting", "making use of technology" and "problem solving". The latter refers to the professional knowledge and skills required to complete a task on a specific job and these requirements vary from job to job. Dai-wei Li (1983) argues that competence can be described as the use of one's cognitive, emotional and technical abilities to successfully complete a mission at a professional level. Jhih-hong Jheng (1995) considers competence as a set of behaviors related to the knowledge, skills and attitudes required to perform a job. Ding-hong Chen (2001) defines competence as the knowledge, technical skills and people skills that are displayed when one is required to perform a mission or job— a set of abilities needed in a specific task or profession. However, the definition and nature of competence can vary depending on the temporal background, social and cultural characteristics, and the potential of economic development of a country. (Lin, Mei-chun, 2007)

The Technological and Vocational Education division of the Ministry of Education (1996) categorizes the professional competence of students from vocational schools into technical (professional skills and knowledge) and humanistic (general skills and knowledge required by the profession) aspects. The technical aspect covers professional knowledge, skills and attitudes, whereas the humanistic aspect includes skills of collecting, analyzing and organizing information, interpersonal communication and expression skills, teamwork ability, mathematics skills, problem-solving skills, leadership skills, technology application skills, and life-long learning ability.

Stark, Lowther & Hagerty (1986) suggest that the quality and competence required of professionals consist of: (1) Conceptual competence: the basic knowledge required to execute a professional task (2) Technical competence: the basic technical skills required to execute a professional task (3) Background knowledge: comprehensive understanding in the larger social, economic and cultural contexts related to the profession (4) Communicative competence: the ability to communicate with others effectively through various signs (5) Integrative competence: the ability to integrate concepts, background knowledge, skills and communication for efficient decision-making on the job (6) Adaptive competence: the ability to adapt to the fast-changing technological society and the dynamic nature of the profession, and to apply the skills acquired in school to various situations on the job (7)Professional attitudes: the maintenance of compete- tiveness in the job market, professional identification, professional ethics, consideration for professional enhancement, and the motivation for

continual education.

Combining the different definitions mentioned above, this study suggests that competence is an individual's ability required by the job market and should be divided into three parts: basic conceptual competence, professional technical competence and professional attitudes at work.

2.2.2 Discussion on the employability of VCDers

Daniel H.Pink (2006, translated by Jha, Siou-jie) suggests that in the future, innovation and integrative skills will take precedence over the emphasis on logic, sequence, and mechanic efficiency in the information era. He proposes six vital concepts that are key to achieving success in the future era: (1) design in addition to functionality (2) stories in addition to viewpoints (3) integration, or symphony, in addition to professionalism (4) empathy in addition to logic (5) play in addition to work (6) meaning in addition to money. Artists, inventors, designers, skilled story tellers and open-minded professionals will be in demand in the future job market. Therefore, a VCDer is not only a doer but also a thinker, like someone who packages products, executes decisions, solves problems, catalyzes actions, offers explanations and acts as a product spokesperson (Deng, Cheng-lian, 1999). VCDers now face diversified challenges on the job, as they have to integrate knowledge from various fields and simplify people's complex and multifaceted demands, and then design a final product which caters to the needs of the consumers.

As a result, AIGA divides the known, required competence of graphic designers into 9 categories (Poggenpohl, 1993):

(1) Perception, Visual Organization, Aesthetics
Designers need to think about the visual form and how to organize the form visually for the purpose of communication. Visual forms make use of a visual language which includes dots, lines, surfaces, sizes, spaces, regions, textures and colors. They also create geometric, proportional and rhythmic concepts based on the designer's visual vocabulary.

(2) Visualization Techniques
Designers must be familiar with basic tools, skills, and the production process involved in creating images, drafts, and models. Designers should possess techniques and sensibility in the application of tools.

(3)   Design Theory

Design theory explores the basis of the forms and reasons of communication and serves as the foundation of all graphic design.

(4)   Graphic Design Subject

Designers need to learn related graphic design subjects, including: letterform, type and image, design system, symbol and identity, information design, diagrams, graphic and maps, publications and print design, book design, poster design, film and video graphics, computer graphics, package design, environment signage and graphics and exhibition and display design.

(5)   Materials, Tools and Technology

Designers present their ideas in two or three dimension, so they must use different media and materials, such as films or printing, adopt different tools, such as computers, cameras or spray guns, and take advantage of different printing and filming techniques.

(6)   Blending Ideas and Production Techniques

Designers create the solutions for design problems. Part of this process involves how to complete a task skillfully. Designers also have to learn how to clearly express and transform thoughts and instructions, and receive and evaluate feedback.

(7)   Message and Content

Designers identify problems of communication, interpret their thoughts and display them again in images or text. As a result, the skills of thinking and creating images, styles and symbols are required. In addition, it is also important to have the competence of creating persuasive or information-communicative thoughts.

(8)   Methods, Planning and Management

Learning design methods is a way for designers to find solutions to problems. Design evaluation reflects the quality of design through an examination procedure. Design management differentiates design procedures, including the creativity, cost, schedule and quality of management.

(9)   History and Criticism

Visual culture encompasses all areas of arts and architecture, so understanding art in its historical and cultural context is important.

Designers must study art history to be inspired and understand the evolution of certain topics, forms and technology. Exploring certain ideas and the evolution of technology and art can help designers perceive past influences on the present. On the other hand, criticisms can help designers assess the functionality and aesthetics of their design.

Friedman believes that a designer should possess the following abilities: (1) skills to learn and lead: including the method of training and guidance, analytical ability, language ability as well as presentation skills ；(2) awareness of the human world: including human behavior and organization culture ；(3) understanding of artificial instruments: including product development, market research and process management ；(4) environmental concepts: from natural to man-made environments. In other words, a professional designer should have a deeper perception of life than most people in order to become a competent designer. (Ciou Zong-Cheng, 2003)

Based on the demand standards of the local VCD industry, He Sin-Jhu (1996) proposes that the six most essential abilities of designers include: creative thinking, styling ability, design presentation, aesthetic literacy, commentary ability as well as the analytical ability. Jheng Yuan-Jin (1997) suggests that when using visual communication as the design theme, a VCDer should be equipped with the following abilities: (1) analytical and planning abilities: product and graphic design companies should have the abilities to pitch, propose, and negotiate prices in addition to their professional design techniques (2) professional design abilities: in addition creativity, professional skills are required in order to comprehensively present the design project (3) design management abilities: design management has become an important topic for global design industries and design education; therefore, is one of the essential qualities a professional designer should possess (4) communication and presentation abilities: a designer should have superb presentation and demonstration abilities so clients can understand the design. Luh (2004) and Yang Min-Jhou (2002) both provide their opinions on the abilities that an undergraduate student from the department of design should possess based on the researches conducted by the industry and academic, respectively. They point out that the industry categorizes the qualities of a designer into character (attitude) and competence. Character features include: teamwork attitude, project quality, self-confidence, curiosity towards things, aesthetic sense, endurance, and stamina. Competence includes: richness and uniqueness of creativity, sensitivity and observation towards things, sketching skills for composing drafts, oral presentation ability, product analysis and planning ability,

ability to work independently and the ability to provide the most suitable design, color and quality for the product. Therefore a VCDer in a corporation should have diverse qualities in order to take part in product planning activities.

On the other hand, Jhang Bai-Yan (1991) further categorizes the abilities demanded by different levels of design jobs. The practical ability of college students as a middle level designer deviates significantly from that demanded by the industry. Such deviation originates from the fact that the students are uncertain about their self-position and unaware of their abilities, leading to an underestimated self evaluation of employability assessment. The research conducted by Chen Jun-Hong et al. (1995) indicates that the demand for senior level designers falls on those with the ability to assess the quality of projects and to plan and analyze designs. Demands for middle level designers include the abilities of creative thinking, stereo design, and product quality assessment. For entry level designers, those with the abilities of sketching, drawing and draft recognition as well as the computer graphic skills are more likely to be employed.

In conclusion, based on the proposed ideas from all researchers (Table 1), the employability of VCDers are categorized into three groups as below, which will also serve as the research components of this study:

(1)   Basic conceptual competence: This refers to the basic conceptual understanding and background knowledge required to execute a professional task. Basic conceptual competence include listening- "the ability to listen to others' opinions," "speaking-the ability to communication and present ideas," "reading—the ability to read and understand," "writing-the ability to analyze and plan," "calculation- the ability to assess budgets and negotiate prices," "technology application-technological awareness," "problem solving-the ability to lead and integrate," and understanding of broader historical and social contexts as they relate to specific designs.

(2)   Professional technical competence: This refers to the professional software skills required to execute a professional task, including 2-D graphics, multimedia, Chinese and English word processors, etc.

(3)   Professional work attitudes: This refers to the job ethics required to display professionalism in all areas of work, which includes but is not limited to teamwork ability, project quality, self-confidence, curiosity towards things, aesthetic sense, endurance and stamina.

Table 1. Table of Design Employability

Year	Scholar	Design Employability
1991	Jhang Bai-Yan	professional knowledge, practical skills, project quality assessment, creativity of design, design cost awareness, marketing and consumption psychology, language ability, project planning and analysis, computer skills, project presentation skills
1993	American Institutes of Graphic Arts (AIGA)	perception, visual organization, aesthetics, visualization techniques, design theory, graphic design subject, materials, tools and technology, blending ideas and production techniques, message and content, methods, planning and management, history and criticism
1994	Chen Jun-Hong	(1) Senior level：project quality assessment ability, design planning and analysis ability (2) Middle level：creative thinking ability, stereo design ability, and project quality assessment ability (3) Entry Level：draft sketching, drawing, and recognition abilities and computer graphic ability
1994	Department of Technological and Vocational Education	(1) professional knowledge (2) professional skills (3) professional attitude (4) information collection, analysis and organization ability (5) interpersonal communication ability (6) teamwork ability (7) mathematical skills (8) problem solving ability
1996	He Sin-Jhu	(1) creative thinking (2) styling ability (3) design presentation (4) aesthetic literacy (5) commentary ability (6) analytical ability
1997	Jheng Yuan-Jin	(1) analytical and planning ability (2) professional design ability (3) design management ability (4) communication and presentation ability
1997	Jhang Wun-Syong Syu Fong-Huo Lai Ming-Mao	(1)Students in school should focus primarily on the abilities of creativity, creative thinking and design methods. The abilities of secondary importance are computer-aided design ability, work ethics, presentation ability, styling ability, humanistic and artistic awareness, professional language ability, practical design experience.

1997	Jhang Wun-Syong Syu Fong-Huo Lai Ming-Mao	(2)Abilities to be enhanced by graduated students: The majority of the test subjects agreed that new designers should strengthen their communication and planning ability when entering the industry before working on their technical abilities, teamwork ability, professional ethics and their overall competence to complete a project.
2003	Friedman (Reference from Ciou Zong-Cheng)	(1) learning and leading skills (2) awareness of the human world (3) understanding of artificial instruments (4) environmental concepts
2004	Luh	Corporations believe that a designer's quality should be categorized into character (attitude) and ability.

Source：Compiled by the authors of the present study (2007)

3. Research method and tools

3.1. Research framework

The framework of this research is constructed based on the result of literature analysis which categorizes the employability of designers into three main aspects: Basic conceptual competence, professional technical competence, and professional attitudes. With the aim to assess the employability of VCDers, the present study will look at results from "Questionnaire for students of class 2004 graduated one year from university," and discuss whether the education training equips designers with adequate skills and competence to meet the industry's requirements.
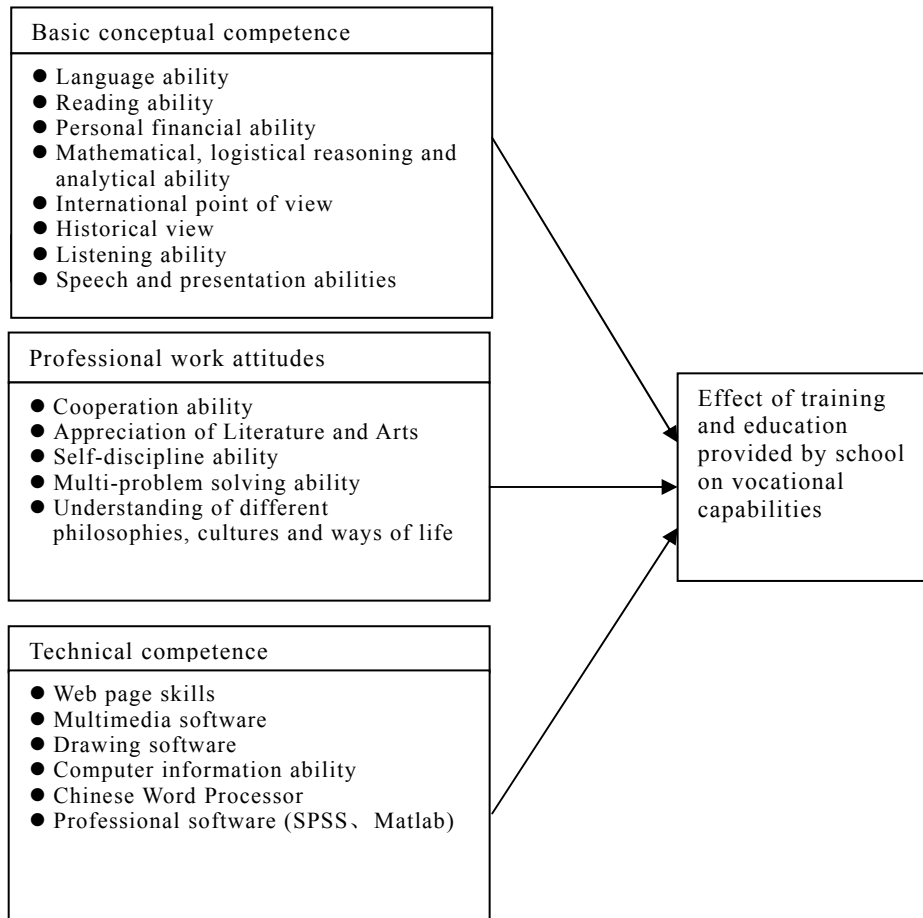
Basic conceptual competence

- Language ability
- Reading ability
- Personal financial ability
- Mathematical, logistical reasoning and analytical ability
- International point of view
- Historical view
- Listening ability
- Speech and presentation abilities

Professional work attitudes

- Cooperation ability
- Appreciation of Literature and Arts
- Self-discipline ability
- Multi-problem solving ability
- Understanding of different philosophies, cultures and ways of life

Technical competence

- Web page skills
- Multimedia software
- Drawing software
- Computer information ability
- Chinese Word Processor
- Professional software (SPSS、Matlab)

Effect of training and education provided by school on vocational capabilities

Figure 1. The Research Framework

3.2. Research method

The research is divided into two stages. The research method and steps for each stage are illustrated below:

3.2.1 First stage: Literature analysis

The literature analysis is a method that involves primarily the collection, identification and organization of literatures. Through the study of literature a method can be derived to understand the scientific facts. The publications and data relevant to the design industry were collected via Interlibrary Loan, International Academic Network, published books and journal abstracts and analyzed to obtain knowledge, job contents and operations of the design industry. International and domestic publications on the development and employability of the VCD industry were also collected and analyzed to outline the capability components of the VCDers- "basic competence", "professional competence" and "professional work attitudes". These components will be used as the theory and the foundation for establishing the practical employability for this research.

3.2.2 Second stage: Secondary source analysis

Secondary sources include information from different resources, data collected by other researchers, or documents of different formats. Such information sources range from government reports, industrial studies, document database, corporation records to books and journals from libraries, all of which provide a rather convenient and economic route to answer different questions. Secondary sources are endowed with a critical mission that is to analyze the data collected from the original studies in a brand new direction.

The secondary source analysis is used in the current study to analyze the perception of students, who graduated one year from arts related departments, towards the training and education they received on vocational capabilities from school. The secondary source for the study undertaken was the "Questionnaire for students of class 2004 graduated one year from university" conducted by the Higher Education Evaluation & Accreditation Council of Taiwan. Questions regarding the abilities required for each component were selected for the questionnaire whose content validities were further evaluated in expert meetings.

Table 2.   The questionnaire of talent cultivation provided by school for undergraduate students of class 2004 who graduated one year from School of Arts

Field	Major ability	Students of class 2004 who graduated one year from School of Arts Questionnaire
Basic conceptual competence	Basic concept abilities	● Was school helpful for the development of foreign languages? ● Was school helpful for the development of reading skills? ● Was school helpful for the development of personal financial ability? ● Was school helpful for the development of mathematical, logical and analytical ability? ● Was school helpful for the development of global perspective? ● Was school helpful for the development of ability to understand the importance of history? ● Was school helpful for the development of listening ability? ● Was school helpful for the development of speaking and presentation abilities?

Professional technical competence	Professional software utilization	● How much does the data management ability help you in getting a job or starting your own business?
		● How much does the ability to utilize computer software help you in getting a job or starting your own business?
		  ■ Chinese and English word processors
		  ■ Web page skills
		  ■ Multimedia software
		  ■ Drawing software
		  ■ Professional software (such as: Accounting and Engineering)

Professional work attitudes	Work attitude ethics	● Was school helpful for the development of your team work ability? ● Was school helpful for the development of your ability to work with people from different background? ● Was school helpful for the development of appreciation of literature, art, music, and theatre? ● Was school helpful for the development of self-discipline ability? ● Was school helpful for the development of ability to solve multiple problems simultaneously? ● Was school helpful for the development of ability to understand different philosophical, cultural and living experiences?

3.3. Research tools and examination

3.3.1 The scoring method of the questionnaire

The research tool of the current study, questionnaire, utilized the Likert scale. The scoring method categorizes the skill assessment levels into "very helpful", "quite helpful", "slightly helpful", and "not helpful". Each individual selects the most representative option based on him /her experience and perception. Each option is given a score of 4, 3, 2, or 1 for statistical calculation of which the result will analyze the importance of each professional ability.

3.3.2 The reliability of the questionnaire

The survey of "The questionnaire of talent cultivation provided by school for undergraduate students of class 2004 who graduated one year from art schools" is composed of 20 questions. Before factor analysis was conducted, students with arts related degrees were selected. The KMO value and Bartlett's test of sphericity were used to test the adequacy of the questionnaire. Based on Kaiser's argument (1974), the factor analysis should not be conducted if the KMO value is lower than 0.5. The mediocre value of KMO should be at least 0.6 before the factor analysis is to be considered. It is shown in Table 4 that the KMO value of this study was 0.875 which is greater than 0.5 and the Chi-square of the Bartlett's test of sphericity was 16564.260 (p≦0.001) which is significant, indicating that the questionnaire is adequate for factor analysis. The factor loading is calculated using primary component analysis based on the number of factors determined at the beginning of the study. Factor rotation is then performed to obtain factors of "basic conceptual competence", "professional technical competence", and "professional work attitudes". It can be shown in Table 5 and 6 that the Eigen value of each component is greater than 1 and that the total variance is greater than 50% (59.13%) demonstrating sufficient representability. From the point of reliability value, the Cronbach's α is 0.879 for the "basic skill abilities" factor, 0.842 for the "professional technique abilities" and 0.816 for the "professional work attitudes" factor, generating a total Conrbach's α of 0.884. The α value of each component is greater than 0.7 and therefore the consistency of the questionnaire is within the acceptable range (Hinkin, 1998).

Table 3. **The KMO summary for the questionnaire of talent cultivation provided by school for undergraduate students of class 2004 who graduated one year from art schools**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.875
Bartlett's Test of Sphericity	Approx. Chi-Square	16564.260
	df	190
	Sig.	0.000

Table 4. **The factor analysis summary for the questionnaire of talent cultivation provided by school for undergraduate students, of class 2004, who graduated one year from art schools**

Component	Eigenvalue	Variance Proportion	Cumulative Variance
Component 1: Basic conceptual competence	7.04	35.20%	35.20%
Component 2: Professional technical competence	3.04	15.21%	50.41%
Component 3: Professional work attitudes	1.75	8.73%	59.13%

Table 5. **The summary of factor loading and α value for the questionnaire of talent cultivation provided by school for undergraduate students, of class 2004, who graduated one year from art schools**

Component	Major ability	Question	Component			α
			1	2	3	
		Was school helpful for the development of foreign languages?	0.82			
		Was school helpful for the development of reading skills?	0.74			
		Was school helpful for the development of personal financial ability?	0.71			
		Was school helpful for the development of mathematical, logical and analytical ability?	0.67			
		Was school helpful for the development of global perspective?	0.63			

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		Was school helpful for the development of ability to understand the importance of history?	0.62	
		Was school helpful for the development of listening ability?	0.60	
		Was school helpful for the development of speaking and presentation abilities?	0.53	
Professional technical competence	Professional software utilization	How much did the capacity to utilize the web page software help you in getting a job or starting your own business?	0.80	
		How much did the capacity to utilize multimedia software help you in getting a job or starting your own business?	0.79	
		How much did the capacity to utilize computer graphic software help you in getting a job or starting your own business?	0.74	0.842
		How much did the capacity to utilize computer data management software help you in getting a job or starting your own business?	0.64	
		How much did the capacity to utilize Chinese and English word processing software help you in getting a job or starting up your own business?	0.63	
		How much did the capacity to utilize professional software, (SPSS, Matlab), help you in getting a job or starting your own business?	0.55	
Professional work attitudes	Work attitude ethics	Was school helpful for the development of your team work ability?	0.86	
		Was school helpful for the development of your ability to work with people from different background?	0.80	
		Was school helpful for the development of appreciation of literature, art, music, and theatre?	0.79	0.816
		Was school helpful for the development of self-discipline ability?	0.79	
		Was school helpful for the development of ability to solve multiple problems simultaneously?	0.51	
		Was school helpful for the development of ability to understand different philosophical, cultural and living experiences?	0.50	

3.3.3 The validity of the questionnaire

The validity of this study focuses on the content validity which refers to the extent to which a measurement reflects the domain of content or the appropriateness of the samples collected and whether or not the test content can represent the intended behavior level. The content validity of the current study was confirmed by expert review. A total of 5 review experts were recruited from relevant fields to examine and adjust the items of professional ability upon the completion of the questionnaire.

4. Data Analysis and Discussion

A single sample t-test was used in this study to examine the expected value of 2.5 in order to understand the self-perception of students towards the vocational capability training and education for VCDers provided by the school. For the statistical data please refer to Table 7. The result of analysis is discussed below:

4.1. Basic conceptual competence

It was shown in Table 7 that the average value of the single sample t-test was 2.65, $t(3128) = 9.81$, $p < .05$ for the question of "Was school helpful for the development of listening ability?", which meets the criteria of "quite helpful". In addition, the sample average of 2.65 is higher than 2.5 indicating that the school was quite helpful in developing the listening ability of students. Therefore the students considered school quite helpful in the development of listening ability required for the VCD industry, which verifies Tian Jhen-Rong's theory (2006) on the learning ability categorized as the one of basic abilities.

For the question of "Was school helpful for the development of speaking and presentation abilities?", the average value of the single sample t-test was 2.63, $t(3128) = 8.073$, $p < .05$, which meets the criteria of "quite helpful". In addition, the sample average of 2.63 is higher than 2.5 indicating that the school was quite helpful in strengthen the speech and presentation abilities of students. Therefore the students considered school quite helpful in enhancing the speech and presentation abilities required for the VCD industry. The researches conducted by Jhen Yuan-Jin, He Sin-Jhu (1996), Luh (2004), Yang Min-Jhou (2002), Liou Ruei-Cih (2004), and Tian Jhen-Rong (2006) all pointed out that the most important evaluation item for selecting designers was the "communication ability".

For the question of "Was school helpful for the development of global perspective?", the average value of the single sample t-test was 2.54, t(3120) = 2.221, p < .05, which meets the criteria of "quite helpful". In additional, the sample average of 2.54 is higher than 2.5 indicating that the school was quite helpful in developing the global perspective of students. Therefore the students considered school quite helpful in the development of global perspective required for the VCD industry. According to the result from Syu Yan, Jhang Wun-Jhih, and Yang Geng-Sian's research (2007), the department managers, design directors, and senior designers of a corporation tend to look heavily on the language ability of the new designer compared with the owner of the design company. This phenomenon reveals that the design department from a corporation may pay greater attention to internationalization as well as the demand for product design that targets global markets and therefore stresses more on the language ability.

For the question of "Was school helpful for the development of reading skills?", the average value of the single sample t-test was 2.35, t(3128)=-9.762, p<.05, which fails to meet the criteria of "quite helpful". In addition, the sample average of 2.35 is lower than 2.5 indicating that the school was not quite helpful in terms of strengthening the reading ability of students. The students felt that there is room for improvement in their academic training when it comes to enhancing the reading ability required for the VCD industry. It was suggested that the schools should design more classes in literature studies given that the quality of reading will help enhance the thinking ability as well as the presentation of creativity. Since the scope of the VCD industry is extremely broad and that the designers should possess the T-type personality in order to have an in-depth understanding of the design profession as well as a comprehensive knowledge of multiple disciplines, reading is considered a fast way to achieve both. Liou Ruei-Chi (2004) also mentions that reading is one of the many ways to understand knowledge of other fields and that reading of diverse subjects can inspire different elements which are critical for designing a superior project.

For the question of "Was school helpful for the development of mathematical, logical and analytical ability?", the average value of the single sample t-test was 2.22, t(3115) = -17.564, p < .05, which fails to meet the criteria of "quite helpful." In addition, the sample average of 2.22 is lower than 2.5 indicating that the school was not quite helpful in terms of building the mathematical, logical and analytical abilities of students. Therefore the students felt that there is room for improvement when it comes to enhancing students' mathematical, logical and analytical abilities required for the VCD industry. The job content of a VCDer is more than just design and artistic drawings and that the designers of higher levels should have

more logical ability and the abilities of design planning and analysis (Jheng Yuan-Jin, 1997; Jhang Bai-Yan, 1991; Ciou Zong-Cheng, 2003). It is shown in Lai Li-Jun's research (2003) that both design experts and the industry emphasize on the importance of the "cost concept" due to the fact that price has always been a major communication issue between the client and the designer when working on a design project (Jhang Tian-Jun, 2002). Such situation may be caused by the understanding or lack of understanding of figures on the part of the visual designers.

For the question "Was school helpful for the development of ability to understand the importance of history?", the average value of the single sample t-test was 2.16, $t(3128) = -22.264$, $p < .05$, which fails to meet the criteria of "quite helpful". In addition, the sample average of 2.16 is lower than 2.5 indicating that the school was not quite helpful in terms of improving students' ability to understand the importance of history. Therefore the students felt that there is room for improvement in terms of developing the ability to understand the importance of history for the VCD industry. Hence it is clear that the history education provided by schools was below expectation. However the AIGA suggests that a graphic designer should possess abilities of understanding history and criticism. The study conducted by Lai Li-Jun (2003) points out that both design experts and the industry stress the importance of "social sciences" since a VCDer has to look for the root of a culture from its history to inspire the concept of creation.

For the question of "Was school helpful for the development of foreign languages?", the average value of the single sample t-test was 2.13, $t(3128) = -22.54$, $p < .05$, which fails to meet the criteria of "quite helpful." In addition, the sample average of 2.13 is lower than 2.5 indicating that school was not quite helpful in terms of developing language ability of students. Therefore the students felt that the schools need to provide more training and education for the language ability required by the VCD industry.

For the question of "Was school helpful for the development of personal financial ability?", the average value of the single sample t-test was 2.11, $t(3112) = -22.15$, $p < .05$, which fails to meet the criteria of "quite helpful." In addition, the sample average of 2.11 is lower than 2.5 indicating that the school was not quite helpful in developing the personal financing ability of students.

4.2. Professional technical competence

For the question of "How much did the capacity to utilize computer data management

software help you in getting a job or starting your own business?", the average value of the single sample t-test was 2.92, t(3128) = 26.779, p < .05, which meets the criteria of "quite helpful". Furthermore the sample average of 2.92 is higher than 2.5 indicating that being capable of utilizing computer data management software was quite helpful in getting a job or starting your own business. Therefore the students considered school quite helpful in developing students' computer and information technology abilities. Furthermore Lai Li-Jun's study (2003) indicates that both design experts and the industry emphasize the importance of "integration of image and text" and "ability to utilize information". Hence it is clear that school was quite helpful in terms of providing training and education to enhance the computer and information technology abilities of students.

For the question of "How much did the capacity to utilize computer graphic software help you in getting a job or starting your own business?", the average value of the single sample t-test was 3.08, t(1610) = 19.749, p < .05, which meets the criteria of "quite helpful". Furthermore the sample average of 3.08 is higher than 2.5 indicating that the being capable of utilizing computer graphic software was quite helpful in getting a job or starting your own business. Therefore the students considered the education received in university as quite helpful in developing the professional abilities demanded by the VCD industry. The ultimate reason may be that the designers are more familiar with computer software as an aiding tool for project design and proposal. These aiding tools can effectively enhance the efficiency of product designing; however, they can also cause new designers to neglect the conventional hand drawing techniques. Syu Yan, Jhang Wun-Jhih, and Yang Geng-Sian's research (2007) demonstrate that computer aided designs can speed up the integration of R&D product and its color simulation effect and speed are superior to the conventional graphic software. This question coincides with Liou Ruei-Cih's interview result (2004) which states that the proficiency in professional software will increase the opportunity for employment. The experts and the companies interviewed in Lai Li-Jun's study (2003) point out that the Illustrator and Photoshop software were also the ones utilized by the VCD industry.

For the question of "How much did the capacity to utilize Chinese and English word processing software help you in getting a job or starting up your own business?", the average value of the single sample t-test was 2.74, t(1610) = 9.882, p < .05, which meets the criteria of "quite helpful". Furthermore the sample average of 2.74 is higher than 2.5 indicating that the Chinese and English word processing capacity was quite helpful in getting a job or starting your own business. Therefore the students considered the education received in university was quite helpful for the development of Chinese and English word processing

capacity.

For the question of "How much did the capacity to utilize the web page software help you in getting a job or starting your own business?", the average value of the single sample t-test was 2.48, $t(1610) = -0.691$, $p < .05$, which fails to meet the criteria of "quite helpful". Furthermore the sample average of 2.48 is lower than 2.5 indicating that the capacity to utilize web page software was not quite helpful in getting a job or starting your own business. Therefore the students felt that there is room for improvement in terms of schools providing training and education for developing the capacity to utilize web page software utilization. The ultimate reason may be that the early VCD departments were developed based on graphic design and commercial design thus most trainings were emphasized on graphic and visual aspects. Additionally the computer web page skills involve program design which relies heavily on mathematics and logical reasoning. As a result the learning response received from students was below expectation.

In response to the question "How is it helpful for you to find a job or create a business with computer multimedia software (Flash, After Effect)?" the sample average is 2.43, $t(1610) = -2.643$, $p < .05$, which doesn't reach the level of "very helpful." The sample average 2.43 is lower than 2.5, so respondents do not believe computer multimedia software are "very helpful." This corresponds to research done by Xu Yan, Zhang Wen-Zhi and Yang Geng-Xian (2007), which indicate that many university departments have provided courses related to computer-assisted design and changed hand-drawing courses into optional courses. Many new designers, as a result, are not equipped with sufficient draft-drawing ability, which is an economic and fast communicational channel in the process, and which affects how ideas are developed. This is a basic professional skill that designers should acquire. It is suggested that a balance be reached between computer software application and hand-drawing in curriculum.

As for the question "How is it helpful for you to find a job or create a business with computer professional application software (accounting, Matlab, SPSS)?" the sample average is 1.77, $t(1603) = -28.207$, $p < .05$, which doesn't reach the level of "very helpful." The sample average 1.77 is lower than 2.5, so respondents do not believe computer professional application software is "very helpful." Students think there is room for improvement in courses related to computer professional application software (accounting, Matlab, SPSS).

4.3. Professional Attitudes

According to Table 7, regarding the question "How is it helpful for you to understand different philosophy, culture and lifestyle in school?" the sample average is 2.66, $t(3121) = 9.954$, $p < .05$, which is regarded as "very helpful." The sample average 2.66 is higher than 2.5, so respondents believe in the field of understanding different philosophy, culture, and lifestyle, university courses are very helpful in the VCD field.

In respect of the question "How is it helpful for you to learn to appreciate literature, arts, music and theater in school?" respondents think it "very helpful" as the sample average 3.23 is higher than 2.5. This is also in correspondence to research conducted by Xu Yan, Zhang Wen-Zhi and Yang Geng-Xian (2007), Luh (2004), Yang Min-Zhou (2002), Lai Li-Jun (2003), and He Xin-Zhu (1996). The research, experts, researchers and practitioners all emphasize the importance of aesthetics in the field of VCD.

As for the question "How is it helpful for you to learn to cooperate with others at school?" the sample average is 3.07, $t(3128) = 39.943$, $p < .05$, which is regarded as "very helpful." The sample average 2.66 is higher than 2.5, so respondents believe in the field of cooperating with others, university courses are very helpful in VCD area. To graduate, every student is required to cooperate with others to participate in large-scale exhibitions in the very last year at school, and cooperation is common in daily training. Xu Yan, Zhang Wen-Zhi and Yang Geng-Xian (2007) also point out designers should be optimistic, enthusiastic, spontaneous, and willing to cooperate and learn.

As to the question "How is it helpful for you to learn to get along with others with different backgrounds in school?" the sample average is 2.99, $t(3128) = 32.678$, $p < .05$, which is regarded as "very helpful". The sample average 2.99 is higher than 2.5, so respondents believe in the field of getting along with others with different backgrounds, university courses are very helpful in VCD area.

As to the question "How is it helpful for you to learn to handle multiple problems in school?" the sample average is 2.83, $t(3128) = 20.518$, $p < .05$, which is regarded as "very helpful." The sample average 2.83 is higher than 2.5, so respondents believe in the field of handling multiple problems, university courses are very helpful in VCD area.

As to the question "How is it helpful for you to learn self-discipline in school?" the sample average is 2.79, $t(3128) = 18.634$, $p < .05$, which is regarded as "very helpful." The sample average 2.79 is higher than 2.5, so respondents believe in the field of learning self-discipline, university courses are very helpful in VCD area. The most distinct

characteristic of a designer is "self-discipline."

Table 6. The questionnaire of employability based on single sample t-test to Class 2004 after one year of graduation

Area	Major Ability	Question	n	t	df	M	S.D	Order
Basic Skills	Basic Concepts	How is it helpful for you to learn to listen at school?	3129	**9.81	3128	2.65	0.867	1
		How is it helpful for you to learn to speech and express yourself at school?	3129	**8.073	3128	2.63	0.901	2
		How is it helpful for you to have an international perspective at school?	3121	**2.221	3120	2.54	0.945	3
		How is it helpful for you to improve your reading skills at school?	3129	**-9.762	3128	2.35	0.846	4
		How is it helpful for you to improve math, logical thinking and analytical skills at school?	3116	**-17.564	3115	2.22	0.896	5
		How is it helpful for you to understand history at school?	3129	**-22.264	3128	2.16	0.85	6
		How is it helpful for you to learn foreign languages at school?	3129	**-22.54	3128	2.13	0.908	7
		How is it helpful for you to learn financial management at school?	3113	**-22.15	3112	2.11	0.989	8
Professional Skills	Professional Software	How is it helpful for you to find a job or create a business with computer information ability?	1611	**32.871	1,610	3.19	0.852	1
		How is it helpful for you to find a job or create a business with computer graphics skills?	1611	**19.749	1,610	3.08	1.17	2

		How is it helpful for you to find a job or create a business with word processing skills in Chinese and English?	1611	**9.882	1,610	2.74	0.97	3
		How is it helpful for you to find a job or create a business with Web software skills?	1611	**-0.691	1,610	2.48	1.11	4
		How is it helpful for you to find a job or create a business with computer multimedia software (Flash, After Effect)?	1611	**-2.643	1,610	2.43	1.11	5
		How is it helpful for you to find a job or create a business with computer professional application software (accounting, Matlab, SPSS)?	1603	**-28.207	1,602	1.77	1.03	6
Professional Attitude	Professional Ethics	How is it helpful for you to learn to appreciate literature, arts, music and theater at school?	3129	**51.054	3128	3.23	0.801	1
		How is it helpful for you to learn to cooperate with others at school?	3129	**39.943	3128	3.07	0.793	2
		How is it helpful for you to learn to get along with others with different backgrounds at school?	3129	**32.678	3128	2.99	0.835	3
		How is it helpful for you to learn to handle multiple problems at school?	3129	**20.518	3128	2.83	0.899	4
		How is it helpful for you to learn self-discipline at school?	3129	**18.634	3128	2.79	0.882	5
		How is it helpful for you to understand different philosophy, culture and lifestyle at school?	3121	**9.954	3120	2.66	0.894	6

5. Conclusions and Suggestions

Through literature analysis and secondary data analysis, this research aims to explore the needs and the effects of the employability in employees in the VCD field in Taiwan and to analyze the impressions arts-related graduates who have left school for just a year ago have on their skills developed by universities. Suggestions derived from the integration of the research results are provided as a reference to the needs of the employability in employees in the visual communication field. The results are as follows:

5.1. Basic Competence

With regards to basic competence, items which reach above the level of "fairly helpful" are development of listening ability, improvement of speaking and expression ability and cultivation of a global perspective. Other items that still need improvement are enhancement of reading ability, improvement of logical and reasoning ability, understanding of the importance of history, cultivation of foreign languages and development of personal financial managing skills. It can be concluded that universities emphasize teaching listening and speaking skills in terms of development and cultivation of employment competency.

5.2. Professional Competence

In the application of professional software in this category, items that reach above the level of "fairly helpful" are the abilities of using computers and information technology, computer graphic software and word processors for Chinese and English. It is acknowledged that universities have had positive effects on the education of professional skills. However, web design software, multimedia software (Flash and After Effect, etc.) and professional computer applications (SPSS and other accounting software) do not reach the level of "fairly helpful". This is because the industry also requires high programming and planning abilities along with utilization of software. These abilities are related to mathematic logic. Yet, logical and reasoning ability is not very helpful in the previous category. Therefore, it is important and urgent for universities to address the issue of how to enhance the ability of visual communication employees.

5.3. Professional Work Attitudes

With respect to work attitude and ethics, items that reach above the level of "fairly helpful" are the ability to comprehend and appreciate literature, art, music and opera, developments of collaborating with other people and getting along with people from different backgrounds and understanding of different kinds of philosophy, cultures and lifestyles. At the same time, the development of multitasking ability and self-discipline is fairly helpful. It can be concluded that universities have had positive effects on the education of professional work attitudes.

In accordance with the research results above, the study offers a match of ability requirements between the job market and educational system to minimize the ability discrepancies. With the communication system between the job market and the educational system, students can learn what the industry demands of them and cultivate the necessary skills accordingly. They can further perform various skills on their job or change to other positions. Educators also need to learn the demands of the industry in order to design suitable training programs and assessment criteria for evaluating students' performance. Through collaboration with employers, educators can provide practical courses to give helpful job advice and information on career planning. The system can not only serve as a good communication tool but minimize the discrepancy between the requirements of the job market and educational system, and optimize efficiency in the use of human resources.

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