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Investigation on psychological capital, work values, and career choice intention
心理資本、工作價值觀與職業選擇意向之研究

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Abstract: Psychological capital is a complex that constituted by multiple factors. It is a positive attitude the individual develops when facing task, achievement, and success under some certain circumstances. They also stress that the feature of an individual's strength and psychological competence is that it is measureable, developable, effectively-managed, and able to improve working performance efficaciously. As nearly all industries rely on design to enhance the value-added of their products or services, commercial design departments in universities have gained greater popularity. Students' decision concerning their future career is an issue worth further research, especially after they gain practical experience in the field of commercial design during an internship. This study thus conducts a questionnaire survey for data collection by distributing 300 questionnaires to university students who are majoring in commercial design in Taiwan and who have finished an off-campus internship, retrieving a total of 254 valid copies. After analyzing the data using structural equation modeling (SEM), the results show that psychological capital has a significantly positive effect on career values and career choice intention, while work values have significantly positive effects on career choice intention. These findings serve as references for the commercial design-related departments in higher education institutions. Moreover, career planning and guidance measures can help enhance students'

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understanding of future career challenges, thereby improving their competitiveness in career choice and development.

Keywords: Commercial design, psychological capital, work values, career choice intention.

摘要：心理資本是由多種因素構成的綜合體，個體在特定情境下，面對任務、績效與成功的一種正向態度，並強調個體的優勢以及心理能力，其特性是可測量、可開展與有效管理，並可有效提升工作表現。近年來臺灣地區的大學校院相繼設立商業設計相關科系，吸引有興趣的學生就讀，而現今任何產業也幾乎都需要設計來增加產品或服務的附加價值，因此商業設計相關科系愈來愈熱門，而學生在修習實習課程期間，與商業設計領域的產業實務接觸後，是否對自己的未來職場的就業領域有所考量是值得研究的議題。本研究以問卷調查法收集資料，對臺灣地區就讀商業設計相關科系的大學生，且已完成校外實習者發出 300 份問卷，有效問卷共 254 份，利用結構方程模式分析資料結果顯示：心理資本對工作價值觀有顯著正向影響。心理資本對職業選擇意向具有顯著正向影響。工作價值觀對職業選擇意向具有顯著正向影響。故本研究所建構的研究模式，可解釋及預測商業設計領域的學生在心理資本、工作價值觀與職業選擇意向的影響效果，並適時將研究結果提供給高等教育所屬之商業設計相關的科系參考，以期透過職涯規劃與輔導的措施，增強學生瞭解未來職場的挑戰性，進而提升學生在職業選擇與發展方面的競爭力。

關鍵詞：商業設計、心理資本、工作價值觀、職業選擇意向。

1. Introduction

The mission of higher education is to cultivate students who can think independently and creatively. During the transition from school education to career choice, university students tend to be influenced by various factors such as change in economic structure and political circumstances (Chigisheva, 2011). Today's current employers seek employees who have professional skills, teamwork spirit, and initiative traits, yet there is still a significant gap between the competent levels of graduates and workplace demands (Melnichuk, Osipova, and Kondrakhina, 2017). Such a gap gradually becomes an obstacle for

university students when they are job hunting. To narrow this gap, higher education institutions and enterprises should offer effective and efficient market training, in order to cultivate university graduates into well-prepared professionals (Prichinin, 2014).

According to a survey by the World Bank, there will be a demand gap in the global talent competition in the coming three decades, and the talents of design and creativity are expected to be in high demand. It is estimated that the demand for these talents will account for over 25% of the total talent demand around the world (Chou, 2012). Many universities in Taiwan in recent years have established a department related to commercial design, attracting students who are interested in related fields. In addition, nearly all industries intend to increase the value added of their products or services through design (Liu, 2011).

Commerce and design are the cores of industrial transformation and upgrade, and hence relevant governmental units have focused on promoting the industries of creativity and design. Commercial design talents are highly valued, and the number of commercial design graduates has increased greatly as a result. The commercial design field has unperceivably become a mainstay in the workplace, which has triggered a strong demand for study of commercial design and brought more design talents into the commercial design industry. Design education is now a very popular subject in higher education.

The majority of businesses in Taiwan are small- and medium-sized enterprises (SMEs). To meet these enterprises' demand for diverse talents and to narrow the gap between theory and practice in higher education, universities have begun to plan and promote career-oriented internship courses. The purposes are to integrate the resources of the universities and enterprises, promote industry-academia coordinated education, and create more opportunities for students to experience the workplace through internship programs. In this way, students are able to achieve learning-through-practice and practice-through-learning, put their theoretical knowledge into good use, and have an interactive experience through practical work. The win-win outcomes between teaching and practice can indeed develop the competencies of students. At the same time, the objective of practical education, which is a priority of technical and vocational schools, can be fulfilled in the combination of theory and practice (Ministry of Education, 2014).

With the advancement of the knowledge-based economy, creativity and innovation have become essential factors driving any economy. Because design has a significantly greater influence on the quality of life and perceived experience of consumers, an increasing number of enterprises have strived to improve the image of their products through design, so as to bring their products and services to a new level. In Taiwan, original equipment manufacturing (OEM) has gradually been replaced by original design manufacturing (ODM). Under such a changeable situation, all industries need design factors to increase their value-added; hence, it is predictable that design will become an increasingly popular major. In fact, many higher education institutions have established design-related departments within a short period of time, resulting in a soaring number of students. This phenomenon will influence the future career of commercial design students, as well as the potential development of the industry.

Previous literature has shown that the factors influencing the career choices of university students may be a result of the great gap between their expectations of the workplace and the actual workplace, which could diminish their professional commitment and sway their determination of entering relevant industries. Therefore, this study explores the psychological capital, work values, and career choice intention of university students majoring in commercial design and further offers suggestions on the training of industrial talents. Moreover, this study proposes effective measures that can help enterprises retain talents and promote the commercial design industry in Taiwan.

Universities in Taiwan in the past decade have cultivated a large number of design talents, but most of those students did not find jobs in their desired fields or failed to fulfill their career plans after graduation. As a result, they chose to work in other industries. In 2016, the GDP per capita in Taiwan hit US$22,540 (National Statistics Taiwan, 2017), yet according to statistics released by the Ministry of Education (2016) the average monthly income of design graduates is NT$29,000, the lowest among the 21 educational departments in Taiwan. The data suggest that the possible reason for this large salary gap is that there is no effective mechanism to regulate the admission of design students in recent years, which has resulted in an excessive number of design students and insufficient training for them. Consequently, the graduates have failed to meet the requirements of enterprises, and there is an imbalance between supply and

demand in talent training. According to a 2010 survey of university graduates, only 24% of design graduates worked for the same company in the three years following their graduation, implying that the employment stability of design graduates is low (Ministry of Education, 2016).

An internship is an important part of students' exploration in their career development. With a positive internship experience, students are able to make a better career development plan for themselves (Chen and Chen, 2011). An internship is also a simulation process for university students to explore career choices and is one of the ways for a university to help students build positive work values. As an internship is most likely the first workplace experience for students, they exhibit different learning behaviors versus their traditional classroom learning behaviors. Moreover, most enterprises or internship institutions regard students as part-time workers in the laborer-employer relationship during an internship, and thus students feel a gap between work values and self-cognition or even lack a sense of belonging. This in turn affects their intention to continue to stay in the internship institution or industry after the internship.

Taiwan's technical and vocational education system attaches equal importance to theory and practice and targets to equip students with the understanding of careers and enterprises, as well as the basic knowledge and skills of management. Done successfully, students are then able to quickly enter the workforce or continue their study to acquire advanced professional knowledge and skills. Therefore, the effectiveness of an internship and the factors that influence its effectiveness are two issues worthy of discussion. This study delves into the effects of an internship in the field of commercial design on university students' psychological capital, work values, and career choice intention. We further validate the findings in order to offer academic and practical value, supplement existing studies, and provide references to future studies.

2. Review of literature

2.1 Commercial design

Design factors are widely applied in present-day society to add value to all types of commerce, leading to the existence of commercial design. For

enterprises, commercial design involves the expertise and design creativity of commercial designers, who provide creative designs according to the images and products of enterprises and who help serve as a convenient channel for those enterprises to achieve success (Lin, 1986). The present innovative design thinking requires comprehensiveness, and novelty commercialization needs protection. The increasing innovation of commercial design in Taiwan's commodity market has brought benefits to the development result of organizational commercialization little by little (Chou, Yang and Chiu, 2016). Being highly adaptable and adjustable to the market, commercial design meets consumers' needs according to the market and focuses on marketing segmentation. From the perspectives of consumer psychology and marketing strategy, commercial design is one of the tools that help shape and target customers. Therefore, commercial designers have become important members of an enterprise, and there is a close and essential relationship between the two.

Aside from satisfying consumers' needs as well as changing consumers' behaviors and marketing modes of products, commercial design creates values for the products and marketing through overall planning and design (Zheng, 2011). Commercial design serves product users, is dominated by commercial practicability, and is market-oriented with profits as the ultimate objective (Wu, 2011). Hence, the success of commercial design is determined by the degree of visual sense and emotional experience perceived by consumers. Apart from supporting commercial marketing, commercial design still needs to meet public aesthetic views; it should be a design for the public. A good commercial design should meet at least three criteria: customer acceptance, market acceptance, and peer acceptance. A commercial design that meets these three criteria is definitely a suitable one (Meng, 2010). It is obvious that commercial design is an integration of ideas, planning, and making of products and creates various meaningful effects through the degree of persuasion and added value of design factors. Therefore, it is upmost necessary for commercial design students to undergo an effective internship program before entering the workplace.

2.2 Psychological capital

Psychological capital is a positive psychological energy of an individual and a form of intangible capital that has been highly profiled by scholars in recent

years. Psychological capital can be efficiently increased through particular procedures of development and training, which accordingly become important capital of the organization (Avey *et al*., 2011; Baron, Franklin, and Hmieleski, 2016). Psychological capital refers to some personal traits that influence individual productivity, such as self-view or self-esteem, which directs personal motivation and attitude towards work (Jiang and Miao, 2010). Some empirical studies have shown that psychological capital can increase work values, career satisfaction, and workplace well-being (Luthans and Youssef, 2007). Luthans *et al*. (2005) are the first to define psychological capital: it is a core factor of positive mentality and is consistent with the normal mental state of positive organizational behaviors; it exceeds labor capital and social capital and brings competitive advantages through investment and development. Luthans *et al*. (2006) clarify the definition of psychological capital as being confident to shoulder responsibility and making the necessary efforts to complete challenging tasks. Table1 shows the relevance theory of psychological capital.

The earliest concept of psychological capital appears in the literature of economic studies, science of investments, and sociology. The economists Goldsmith, Veum and Darity (1996) believe that psychological capital is the major source of creating organizational value, which is very essential to any organization. It not only can bring competitive advantages to the organization, but also can boost sustainable development.

Hosen, Stern, and Libraty (2003) point out that psychological capital is a constant, stable inner basic concept the individual has gained through the path of learning. Luthans *et al*. (2005) initially define psychological capital as a positive psychological core factor and a mental state that meets the standards of positive organization behavior. It surpasses human capital and social capital while acquiring competitive advantages through engagement and development. Subsequently, Luthans *et al*. (2006) clearly redefine psychological capital as being able to take responsibilities and make the necessary efforts to complete challenging assignments. To succeed, other ways will be adopted to unswervingly reach the goal as the occasion requires. Those with pyschological capital possess positive attribution for both present and future success that they will store, and even surmount the original state to accomplish success when troubled by adversity and thorny problems.

Table 1
The relevance theory of psychological capital

Author	Theoretical foundations
Seligman and Csikszetmihalyi (2000)	Based on positive psychology: positive psychology breaks the traditional ideas and practices, placing importance on the characteristics of personal optimism, positive emotions, positive significance, and intrinsic motivation. No matter what kind of circumstances a person is in, favorable or unfavorable, he/she would still have the desire for pursuing cheerfulness and happiness or be capable of developing potential, realizing the demand for self-fulfillment.
Luthans (2003)	Based on positive organization behavior: the goal is to fulfill the advantage strength of enhancing performance and to implement the study and application of mental capacity based on positive, measureable, developable, and effective management.
Luthans, Luthans and Luthans (2004)	Transcend traditional capitalism: it is a kind of intrinsic psychological resource of individuality beyond human capital and social capital whose substance comprises self-efficacy, hope, optimism, and resilience. As people are convertible subjects who are capable of organizing values, there is no need for them to claim psychological capital from the outside world. Unlike human capital and social capital, it does not require high cost to purchase or educational training to be executed for long periods of time.
Luthans and Youssef (2004)	Four major dimension theory: psychological capital is composed of the four aspects of self-efficacy, hope, optimism, and resilience, whose representational construct conforms thoroughly to the standards of positive organization behavior (unique, measurable, development, and impactful on performance). In addition, the four major aspects exhibit solid theoretical basis.
Luthans, Youssef and Avolio (2007b)	Theory of integration: the assertion of psychological capital is to spare no effort in completing challenging tasks with strong confidence (self-efficacy), develop positive attribution (optimism) for both the present and the future, uphold willpower and attain an ideal target through practical strategies if necessary (hope), and go back to normal as soon as possible and keep moving forward to achieve success when confronted by failures (self-resilience).

Positive psychological capital mainly contains four aspects: self-efficacy, hope, optimism, and resilience (Luthans *et al*., 2007a, 2007b). The relevant definitions are described as follows. Bandura (1986) first proposes self-efficacy, stating that self-efficacy is a positive emotional experience whose determination is affected by past performance, assessment of the event, verbal persuasion, and emotional state. On the other hand, deems that self-efficacy signifies an individual's ability for evaluating whether or not he/she is capable of completing a particular thing or task in light of th past experience earned after having gone through several successes or failures aiming at a certain thing or task. In other words, it is the belief that the individual has realized how to decide whether or not he/she can fulfill a particular thing based on his/her own success-failure experience and how to inspire motivation, to mobilize cognition resources, and to apply necessary actions in a specific situation so as to smoothly accomplish a certain task.

Snyder (2002) defines hope as a sort of cognition that encompasses way-power or pathway and willpower or agency. Pathway refers to an individual's conviction that he/she is able to produce an effective process for reaching a goal; willpower refers to the individual's faith in activating his/her own competence, which assists in moving forward to the goal. This means that the individual forms a kind of positive motivation based on the experience produced by the cause and way of success.

As to the aspect of optimism, Avey *et al*. (2011) mention that since optimism is not only a sort of positive attitude of life, but also a permanent personality trait, optimists mostly develop positive thinking about the future. The good feelings commonly fostered by optimists will often last for a long time, and optimists are always able to create positive effects on everything they do. Though they would also think of bad things, which may result in isolation as well, the condition will not last long, nor will it influence their lives. Thus, we can say that the way an individual interprets a positive or negative event will determine him/her to be an optimistic or pessimistic person.

In the early period of one's life, resilience is often known as invulnerability, stress resistance, and adaptive behavior. However, as some scholars regard resilience as a personal capability while others tend to regard it as a process, or rather an outcome, it is difficult to give a precise common definition. Owing to

resilience being a complicated phenomenon, it is impossible to explain it with a single indicator. Therefore, resilience generally indicates an unexpected capability or behavioral result an individual can perform when he/she is in a dilemma or under crisis-ridden pressure.

Formed by psychological elements of a higher level including self-efficacy, hope, optimism, and resilience, psychological capital is a positive mental state of an individual. Its features involve the following actions: to believe you have the ability at fulfilling challenging assignments; to advance forward to the goal with great perseverance and if necessary reset the path of attaining the goal in order to succeed; to nourish positive attribution for present and future success; to persevere and regain one's self when confronted by failures or trapped by untoward circumstances and to even go beyond the barriers to achieve success (Luthans, Youssef and Avolio, 2015).

Vink, Ouweneel, and Le (2011) find that there is a significant relationship among work resources, psychological capital, and work commitment. According to the findings of Avey *et al*. (2009), employees' psychological capital could predict positive emotions and then influence their attitude and behavior. Avey *et al*. (2010) also argue that employees' psychological capital could predict their attitude towards work and behavior. Toor and Ofori (2010) note that the psychological capital of police officers has positive mediating effects between their superiors' psychological capital and their own job performances, thus improving their job performances (Walumbwa *et al*., 2010). As for corporate managers, group psychological capital has a significant effect on group performance and personal behavior (Walumbwa *et al.*, 2011). Nguyen and Nguyen (2012) also note that psychological capital has a positive effect on work performance and the quality of work life (QWL). A person who has richer psychological capital expects to encounter wonderful things (optimism) in his/her work, with the belief in creating success on his/her own (self-efficacy and hope). He/she is not easily affected by frustrations (resilience) and is always willing to offer help to others (Avey *et al.*, 2011). The relevant literature also indicates that psychological capital has a positive impact on organizational citizenship behavior (Avey *et al*., 2011; Jung and Yoon, 2015).

In accordance with the best knowledge of the researchers, almost no research exists that involves the relevant studies of students and the

psychological capital of practical training. Employees will likely exhibit better job performance if they can feel a positive sense of happiness (emotional ability) in the workplace. At the same time, both delightful mood and emotion regulation also improve job satisfaction of the employees. As a result, we can learn from the perspectives cited above that employees who tend to develop higher positive psychological capital will be able to manifest higher job satisfaction and promote steady development of the organization (Liu, Chen and Liao, 2015). Based on the above literature, most previous studies have treated work commitment, attitude towards work, and work performance as their variables, but seldom discussed the relationship among psychological capital, work values, and career choice intention. Moreover, there are scant studies on commercial design, and there is limited literature on the factors affecting students' choices of commercial design programs and the job competencies they should prepare for before graduation. Therefore, the mechanism that influences students' psychological capital, work values, and career choice intention is an issue worthy of discussion.

2.3 Work values

There is a relationship between work values and behavior. Work values represent personal intention and work tendency. As permanent faith and standards, they influence personal attitude and work satisfaction and support or guide people in their career choice, demission, and work performance (Brown, 2002). Chung, Chi, and Chen (2008) suggest that work values are personal faith in work persistence and reflect personal demand and a person's preferred work type and environment. Moreover, work values can guide a person's work behavior and serve as a direction of personal pursuit of work objectives and a standard for career choice. Work values influence a person's intention of joining, staying in, and devoting efforts to an organization.

From the perspective of personal career choice, work value is a worker's evaluation of the value of his work, work experience, or work outcomes (Robbins, 2004). According to the career development master Super (1970), a person might play several roles in his/her life, but work is the most important role; hence, a person's life development is career-oriented. He proposes the concept of work value and suggests that work value is an objective related to work, a necessity for inner needs, as well as the work feature or attribute a

person pursues in an activity; it could form an internal momentum system, supporting or guiding personal career choice or becoming a work orientation. An enterprise that possesses due core value, together with sustainable competitiveness and outstanding performance, can be considered as a prominent business that is capable of aiding employees' learning and growing (Liou and Tsai, 2016). Thus, work values can influence a person's perspectives and attitudes toward work and guide his/her work behaviors and performances.

Psychologists are opposed to defining work value specifically, but generally agree that work value is a basic structure based on personal preference for different features in work. Ginzberg *et al.* (1951) present that work value is a structure of internal support and current behavioral guidance. From the perspectives of work needs and work satisfaction, Kalleberg (1977) defines work value as the degree to which a person expects approval of and respect toward his/her work, as well as the reflection of the consistency between the conditions and management a person expects from the workplace and his/her requirements. Possessed by individuals, psychological capital is a resource that can help people meet their job requirements. It is easier for a person to get involved with the job when he/she is capable of conserving existing resources while replenishing new ones in a timely fashion (Bergeron *et al*, 2013). Kinnane and Gaubinger (1963) confirm in their study that there is a close relationship between life value and work value.

This study defines work value as personal emphasis on and preference for work, as a representative of personal faith and attitude tendency that are reflected in work behaviors for the fulfillment of work objectives. Therefore, we further define work value as the work conditions or outcomes that one emphasizes at work. In other words, it is the faith and degree of a person's emphasis on or preference for work features. It can satisfy the demands of different levels and guide personal behaviors. In consideration of the influence of social change and culture, this study explores the work values of commercial design students in internships.

2.4 Career choice intention

Career choice refers to the decision-making attitude or behavior of university graduates concerning work before entering the job market. It is also

called career development tendency, which is derived from career choice. It is defined as the decision-making attitude of a person who seeks preferred work after a long time of search and trials, as well as the accumulation of rich experiences in self-development, learning, family, and work (Chang, 2000). Holland (1985) states that personal career choice is the extension of personal traits and that the process of career choice reflects personal traits; therefore, a higher level of goodness-of-fit between personal traits and career environment leads to stronger work satisfaction and lower turnover. Career choice is the combination of self-recognition, education, and the evaluation of external factors, as well as a reaction to critical career decisions (Fouad *et al.*, 2006). Herr and Cramer (1992) point out that university students are in a key stage of career development and must face many critical decisions related to future development, such as job hunting, forming life values, and marriage. According to a survey on university students' demands for career life, many of them entered university with a vague idea about their future careers. This highlights their need for guidance and assistance from the university (Luzzo, 1991). It has also been found that university students are still unable to define their future career direction or encounter difficulties in career choice. This demonstrates that helping students realize their personal traits and interests is an important issue in future career choice (Betz, 1994).

According to Farmer (1995), though the effect of gender on career choice has decreased due to the societal changes and efforts made by schools, it still exists. Sharf (1997) offers the idea that interest has become the most important factor in career choice. In a study on career intention of graduates, Chen (2000) finds that an internship experience or part-time job affects one's career choice; 48.3% of the students confirm a positive effect, while only 5.7% regard it as negative. Monica (2002) mentions that there is a significant relationship between the stability of youns' career choice and the careers of their parents; in particular, the jobs and social status of family members have a strong influence on a youth's career choice; in terms of career choice, most of them share a similar view with their parents. Therefore, parents influence the career choice of their children who are in adolescence.

Schein (1996) is the first to propose the concept of career choice intention. In a study that lasted from 1978 to 1990, he generalizes personal career choice

intention into the following types: (1) technical/functional competence; (2) general managerial competence; (3) security/stability; (4) entrepreneurial creativity; (5) autonomy/ independence. He argues that career choice intention appears in the early stage of personal development and guides and controls the values of positive thinking throughout life. As this factor determines personal career choice, he proposes five factors that influence career choice intention: (1) technical intention; (2) managerial intention; (3) security/stability intention; (4) creativity intention; and (5) autonomy/independence intention. Our study treats these five factors as the basis of the research on university students' career choice intention.

According to the relevant literature of the past, the reasons that influence undergraduate students' career choice may be those produced by the significant gap between their cognition of the actual situation of the workplace and the expectations they have before they start working. This factor leads to a drop in professional commitment and shatters the thought of entering related industries in the upcoming future. Hence, this study probes into the effect upon psychological capital, job values, and career choice intention during the period of internship of students who are majoring in commercial design and to raise appropriate suggestions in order to draw back the focus on industrial talent training as well as to avoid the outflow/shortage of talents caused by students' backing out from industries related to their own expertise. The negative phenomenon like this may invisibly lead to a wastage of educational and industrial resources, which has become the primary issue both that schools and the capital/management are currently facing. For this reason, it is expected that the effective policies proposed by this study can help enterprises retain persons with the proper ability and can enhance the market of commercial design in Taiwan.

3. Methods

Based on the literature review, this study utilizes university commercial design undergraduates in Taiwan as the subjects and explores the model of relationships among psychological capital, work values, and career choice intention. Figure 1 illustrates the research structure.

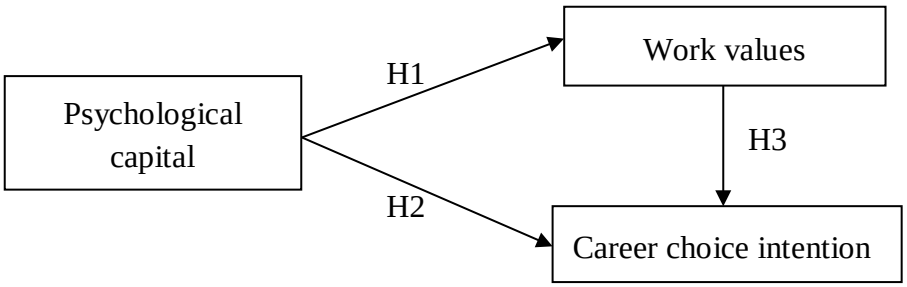

Figure 1
Research structure

3.1 Hypotheses

We derive the hypotheses of this study from the theories in the literature review and validate them in the data analysis. According to the research purposes, literature review, and research structure, we propose the following hypotheses concerning the relationships among the variables and conduct an empirical study.

H1: Psychological capital has a significant positive effect on work values.

H2: Psychological capital has a significant positive effect on career choice intention.

H3: Work values have a significant positive effect on career choice intention.

3.2 Participants and data collection

This study investigates commercial design students who had completed their internships and probes into the relationships among their psychological capital, work values, and career choice intention during the internship. The subjects were commercial design undergraduates in Taiwan and day-time commercial design undergraduates who were enrolled in the first semester/fall of 2016. A total of 300 questionnaires were distributed, and 270 samples were retrieved, for a return rate of 90%. After coding, there are 254 valid samples, with a valid return rate of 84.6%.

3.3 Research tools

The questionnaire, which is the measurement tool of this study, consists of

four parts: basic information, psychological capital, work values, and career choice intention. We designed it based on previous literature and adopted it from the Scale of University Students' Psychological Capital, as developed by Yu, Chen, and Tang (2012). The measurement is based on the Likert's 4-point scale, ranging from 1 (strongly disagree) to 4 (strongly agree). The scores are summed, whereby a higher score indicates higher psychological capital.

The work values questionnaire is designed based on research purposes and adopted from previous literature. In the scale, we divide the concept of work values into two parts, objective value and tool value, and then subdivide this into six dimensions: self-growth orientation, self-achievement orientation, dignity orientation, social interaction orientation, organizational safety and economy orientation, and leisure health and transportation orientation. The measurement is based on the Likert's 5-point scale.

We finally comprise the scale of career choice intention of five dimensions based on the five types of career choice intentions proposed by Schein (1996): (1) technical intention; (2) managerial intention; (3) safety and stability intention; (4) creativity intention; and (5) autonomy/independence intention. The measurement is based on the Likert's 5-point scale.

3.4 Statistical procedure

This study uses SPSS 21.0 and AMOS 20.0 for analysis. In addition to the basic multi-variable statistical analysis, we employ structural equation modeling (SEM) to determine the fittest model of this study and to validate the significance of the effects of the variables in the research structure. The relationships among the three variables, namely, psychological capital, work values, and career choice intention, are tested to validate this study's hypotheses.

3.5 Sample analysis

Among the commercial design undergraduate respondents, 206 are females (81.10%); 147 are in the age group of 21 (57.87%); 102 study in a public university of science and technology (40.16%); 150 engage in 161-320 hours of internship (59.06%); and 191 work in a fixed position during the internship (75.2%). Table 2 lists the data.

Table 2
Basic demographic variables

		Frequency	Percentage (%)	Cumulative percentage (%)
Gender	Male	48	18.90	18.90
	Female	206	81.10	100.00
Type of college	Public university	40	15.75	15.75
	Private university	28	11.02	26.77
	Public university of science and technology	102	40.16	66.93
	Private university of science and technology	84	33.07	100.00
Internship	Less than 160 hours	59	23.23	23.23
	161~320 hours	150	59.06	82.28
	321-640 hours	14	5.51	87.80
	6-month internship	3	1.18	88.98
	1-year internship	5	1.97	90.94
	Others	23	9.06	100.00
Type of position	Rotatory	48	18.90	18.90
	Fixed	191	75.20	94.09
	Others	15	5.91	100.00

4. Results

4.1 Confirmatory factor analysis and goodness-of-fit analysis

4.1.1 Reliability analysis

This study adopts confirmatory factor analysis (CFA) to evaluate the reliability, validity, and factor structure of the scales. Moreover, we use Cronbach's α to measure the consistency among the variables in the same dimension. As shown in Tables 4, 6, and 8, Cronbach's α of each dimension of the questionnaire ranges from 0.674 to 0.894. This is consistent with the standard threshold proposed by Nunnally (1978) whereby Cronbach's α should not be higher than 0.6. Therefore, the internal consistency of this questionnaire is high. We adopt composite reliability (CR) of potential variables to measure the internal consistency of all dimensions, and a higher CR indicates a higher level of internal consistency of the indices. All potential variables of this study have a higher CR than 0.60, which is the minimum threshold suggested by Fornell and Larcker (1981), suggesting high internal quality of the research model.

4.1.2 Validity analysis

This study employs the maximum likelihood estimation (MLE) of CFA to test the fitness of the dimension measurement model, in order to determine whether the dimensions have adequate convergent validity and discriminant validity, as discussed below.

Analysis of convergent validity

This study refers to the norms of convergent validity analysis proposed by Anderson and Gerbing (1988), the evaluation standards of CFA proposed by Bagozzi and Yi (1988), and the suggested data for the goodness-of-fit by Gefen, Straub and Boudreau (2000) for evaluation. The four evaluation norms are summarized as follows: (1) Goodness of Fit Index (GFI), Normed Fit Index (NFI), and Comparative Fit Index (CFI) should be higher than 0.9, and Root Mean Square Residual (RMSR) should be lower than 0.05; (2) the factor load of all indices is significant; (3) all dimensions' CR is higher than 0.7; and (4) the Average Variance Extracted (AVE) is higher than 0.5. We use AMOS 20.0 in the analysis of the items of all dimensions and take the estimation parameters of MLE to calculate the dimensions' CR and AVE.

(1) Psychological capital

In the measurement model of psychological capital, RMR= 0.019, which is lower than 0.05; GFI, NFI, and CFI are respectively 0.921, 0.897, and 0.93, all of which are higher than 0.8, indicating that the factor load of all indices is significant. CR is respectively 0.709, 0.779, 0.708, and 0.826, and AVE is 0.449, 0.541, 0.448, and 0.613. CR and AVE are both higher than 0.7 and 0.4, respectively, as shown in Table 3. According to Fornell and Larcker (1981), if AVE is lower than 0.5 but the dimension's CR is higher than 0.6, then the dimension still has convergent validity. Based on data analysis, convergent validity is acceptable.

(2) Work values

In the measurement model of work values, RMR= 0.04, which is lower than 0.05; GFI, NFI, and CFI are respectively 0.866, 0.886, and 0.923, all of which are higher than 0.8, indicating that the factor load of all indices is significant. CR is respectively 0.875, 0.827, 0.815, 0.899, 0.745, and 0.817, and AVE is 0.700, 0.616, 0.595, 0.748, 0.494, and 0.599. CR and AVE are higher than 0.7 and 0.4,

Table 3
Discriminant validity analysis of psychological capital and the correlation coefficients of variables

Dimension	Self-efficacy	Hope	Recovery from frustration	Optimism	CR	AVE
					Composite Reliability	Average Variance Extracted
Self-efficacy	**0.670**				0.709	0.449
Hope	**.551****	**0.736**			0.779	0.541
Recovery from frustration	**.605****	**.530****	**0.669**		0.708	0.448
Optimism	**.550****	**.623****	**.648****	**0.783**	0.826	0.613
Cornbach's α	0.709	0.773	0.718	0.826		

The diagonal value is the square root of AVE; CR is composite reliability; AVE is average variance extracted; the lower triangle is the Pearson correlation.

respectively, as shown in Table 4. Based on the data analysis, convergent validity of the work values is acceptable.

(3) Career choice intention

In the measurement model of career choice intention, RMR= 0.03, which is lower than 0.05; GFI, NFI, and CFI are respectively 0.952, 0.931, and 0.958, all of which are higher than 0.8, indicating that the factor load of all indicators is significant. CR is respectively 0.763, 0.674, and 0.760, and AVE is 0.519, 0.411, and 0.514. CR and AVE are higher than 0.7 and 0.4, respectively, as is shown in Table 5. Based on the data analysis, the convergent validity of career choice intention is acceptable.

Analysis of discriminant validity

This study adopts two criteria proposed by Gaski and Nevin (1985) for testing discriminant validity: (1) the coefficient of correlation between two dimensions is lower than 1; and (2) given the coefficient of correlation between two dimensions is lower than Cronbach's α reliability coefficient, there is discriminant validity between the two dimensions. Following Fornell and Larcker (1981), this study proposes a third criterion: (3) given the coefficient of correlation between two dimensions is lower than the square root of AVE, there is discriminant validity between the two dimensions. We employ SPSS

Table 4
Discriminant validity analysis of work values and the correlation coefficients of variables

Dimension	Growth	Achievement	Dignity	Interaction	Security	Health	CR	AVE
							Composite Reliability	Average Variance Extracted
Growth	**0.837**						0.875	0.700
Achievement	**.586****	**0.785**					0.827	0.616
Dignity	**.551****	**.714****	**0.771**				0.815	0.595
Interaction	**.465****	**.557****	**.561****	**0.865**			0.899	0.748
Security	**.349****	**.544****	**.658****	**.572****	**0.703**		0.745	0.494
Health	**.344****	**.451****	**.489****	**.520****	**.567****	**0.774**	0.817	0.599
Cornbach's α	0.869	0.822	0.812	0.894	0.755	0.811		

The diagonal value is the square root of AVE; CR is composite reliability; AVE is average variance extracted; the lower triangle is Pearson correlation.

Table 5
Discriminant validity analysis of career choice intention and the correlation coefficients of variables

Dimension	Managerial Intention	Stability Intention	Creativity Intention	CR	AVE
				Composite Reliability	Average Variance Extracted
Managerial Intention	**0.720**			0.763	0.519
Stability Intention	**.249****	**0.641**		0.674	0.411
Creativity Intention	**.773****	**.242****	**0.717**	0.760	0.514
Cronbach's α	0.772	0.674	0.753		

The diagonal value is the square root of AVE; CR is composite reliability; AVE is average variance extracted; the lower triangle is Pearson correlation.

21.0 and AMOS 20.0 for the matrix analysis of correlation coefficients of the variables. As shown in Table 3, Table 4, and Table 5, all of the criteria are met, indicating that the discriminant validity of the dimensions is good.

4.1.3 Structural equation model analysis

To further test the relationships among the dimensions in the theoretical structure, this study conducts SEM-based analysis on all the samples in order to validate the proposed conceptual structure. As for the procedure of the SEM-based analysis, this study conducts two-stage SEM-based analysis according to the suggestions of Anderson and Gerbing (1988) and Williams and Hazer (1986): (1) in the first stage, we employ CFA and Cronbach's α coefficient analysis on the dimensions and their items; a stable measurement model is developed according to the analysis of convergent validity, discriminant validity, and reliability; (2) in the second stage, we reduce the measurement items into a few measure indices and adopt the structure model to validate the hypotheses of this study.

In the measurement models of psychological capital, work values, and career choice intention, we take the scores of the items of all dimensions as the indices for the measurement of the theoretical model. After clarifying the overall theoretical models between the dimensions and items, we construct the overall model AMOS analysis. The results of the analysis are explained in two parts: the evaluation of theoretical model and the validation of the hypothesis relationship.

I. Evaluation of the theoretical model

As for the evaluation of the models' goodness-of-fit, this study focuses on two aspects according to the views of Bagozzi and Yi (1988): (1) Preliminary Fit Criteria; and (2) Overall Model Fit.

(1) Preliminary Fit Criteria

The preliminary fit criteria include three criteria for testing: (1) the error variable should not be negative; (2) the standardized factor load should not be lower than 0.50 or higher than 0.95 and should be significant; and (3) the standard error should not be too high. Table 6 shows the results of measuring the overall theoretical model. The error variance of the theoretical model is not negative. The standardized factor loading of "stability intention" is 0.304, which

Table 6
Measurement approach of overall theoretical model

Variable	Estimation Parameters of MLE		Composite Reliability (CR)	Average Variance Extracted (AVE)
	Factor Load (λ_x)	Measurement Error (δ)		
Psychological capital			0.850	0.586
Recovery from frustration	0.775	0.399		
Hope	0.754	0.431		
Self-efficacy	0.741	0.451		
Optimism	0.792	0.373		
Work values			0.873	0.537
Growth	0.648	0.580		
Achievement	0.810	0.344		
Dignity	0.847	0.283		
Interaction	0.723	0.477		
Security	0.723	0.477		
Health	0.617	0.619		
Career choice intention			0.756	0.544
Managerial intention	0.883	0.220		
Stability intention	0.304	0.908		
Creativity intention	0.872	0.240		

is the only loading slightly lower than 0.50, but still acceptable. The other standardized factor loadings are higher than 0.5, but do not exceed 0.95, and all reach the level of significance. No high standard errors are observed in the data; thus, the goodness of fit of this research model is acceptable.

(2) Overall model fit

We adopt overall model fit to assess the fit between the overall model and the data. According to the suggestions of Hair, Black, Babin, Anderson and Tatham (2006), this study chooses three indices to evaluate the fit: (1) Absolute Fit Measures; (2) Incremental Fit Measures; and (3) Parsimonious Fit Measures.

The meaning of the three types is as follows: (1) Absolute Fit Measure is

used to ensure that the overall model can predict co-variance or the degree of relevant matrix, and its measuring indicators include Chi-square value, GFI, root mean square residual (RMSR), root mean square error of approximation (RMSEA), and adjusted goodness of fix index (AGFI). As shown in Table 7, the absolute fit measure indicators of the overall theoretical model of this study are χ^2=172.627; d.f.= 62; χ^2/d.f.= 2.784; GFI=0.906; RMR=0.029; RMSEA=0.084; and AGFI=0.861. Except that RMSEA is slightly higher than the criterion, the other indicators meet the corresponding criteria. (2) Incremental Fit Measure compares the developed theoretical model with a null model, and its measuring indicators include normed fit index (NFI) and comparative fit index (CFI). As shown in Table 7, the incremental fit measure indices of the overall theoretical model of this study are NFI=0.897 and CFI=0.931, both of which are acceptable. (3) Parsimonious fit measure adjusts fit measure and compares the models with different numbers of estimated coefficients to determine the fit for each estimated coefficient. Its measuring indicators include parsimony normed fit index (PNFI) and parsimony goodness of fit index (PGFI). The parsimony fit measure indices of the overall theoretical model of this study are PNFI= 0.713 and PGFI= 0.617, both of which are acceptable (> 0.500). According to these indices, the overall model fit of this study's theoretical model is acceptable.

Table 7
Evaluation indices for the overall model goodness-of-fit

Goodness-of-fit index	Criteria	Evaluation result	Model goodness-of-fit
MLχ^2	Smaller is better	172.627 (P=0.000)	Yes
DF (degrees of freedom)	Larger is better	62	
Normed Chi-sqr (χ^2/DF)	1<χ^2/DF<3	2.784	Yes
GFI	>0.9	0.906	Yes
AGFI	>0.9	0.861	Acceptable
RMSEA	<0.08	0.084	Acceptable
RMR	<0.08	0.029	Yes
NFI	>0.9	0.897	Acceptable
TLI (NNFI)	>0.9	0.913	Yes
CFI	>0.9	0.931	Yes

II. Validation of hypothetical relationship

We validate the research hypotheses so as to analyze the relationships among psychological capital, work values, and career choice intention. After conducting the test with the regression coefficients of overall path analysis, the results suggest that all of the three hypotheses are supported, with the p value above the significant level of 0.05. The path coefficients of the theoretical structure model and the validation of the research hypotheses are in Table 8 and Figure 2.

In Table 8 the hypothesis for the psychological capital and work value has a value of 0.591 ($p < 0.05$), indicating a significant level. In other words, psychological capital has a significant positive effect on work values, meaning it enhances the relationship between students' internship and their work values. Thus, H1 is supported.

The hypothesis for psychological capital and career choice intention has a value of 0.219 ($p<0.05$), indicating a significant level. In other words, psychological capital has a significant positive effect on career choice intention, meaning it enhances the relationship between students' internship and their career choice intention. Thus, H2 is supported.

The hypothesis for work values and career choice intention has a value of 0.502 ($p<0.05$), indicating a significant level. In other words, work values have a significant positive effect on career choice intention, meaning they enhance the relationship between students' internship and their career choice intention. Thus, H3 is supported.

Table 8
Path coefficients of theoretical structure model and hypothesis validation

Path	Path Coefficient	t value	R^2	Corresponding Hypotheses	Results of Testing
Psychological Capital → Work Values	0.591	8.094***	0.350	H1	Supported
Psychological Capital → Career Choice Intention	0.219	2.717**	0.441	H2	Supported
Work Values → Career Choice Intention	0.502	7.171***		H3	Supported

Note: *P<.05; ** P<.01; *** P<.001.

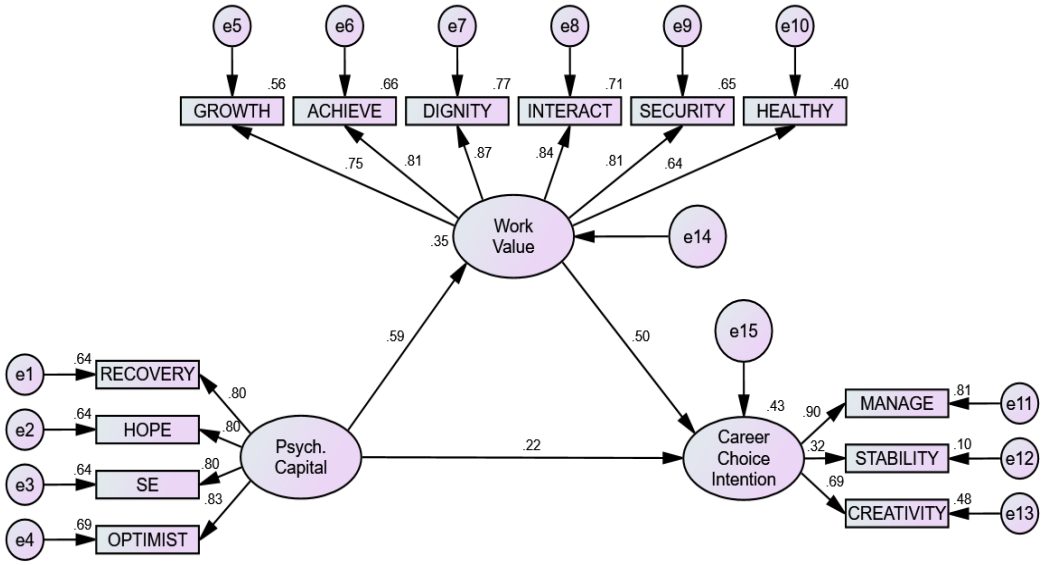

Figure 2
Linear structural model

III. Mediation effect

In related studies about indirect effects, bootstrapping exhibits more statistical power than the causal path analysis and the product of coefficients method (MacKinnon *et al.*, 2004; Williams and MacKinnon, 2008). Bootstrapping is a repetitive statistical sampling method that returns obtained samples back to a study population. Hayes (2009) suggested that the sampling process should be repeated at least 1,000 times, with more accurate results if it is repeated 5,000 times. This present study thus conducts 5,000 repeated samplings and obtains standard errors and confidence intervals for the total, direct, and indirect effects. Table 9 lists the results of the mediation analysis of indirect effects: The indirect effect of PC→WV→CCI is 0.493, and the standard error is 0.116. The Z value is 4.25 > 1.96, and both bias-corrected and percentile confidence intervals do not contain 0. The results indicate the presence of indirect effects. By contrast, the direct effect is 0.364, the Z value is 1.748 < 1.96, and both bias-corrected and percentile confidence intervals contain 0. The results denote that the direct effect does not exist, and thus the mediating effect could be inferred to exhibit complete mediation.

Table 9
Non-standardized mediating effect

Relationship	Point estimate	Product of coefficients		Bootstrapping 5000 times 95% CI			
				Bias-corrected		Percentile	
		SE	Z	Lower	Upper	Lower	Upper
Total Effects							
PC→CCI	0.857	0.171	5.012	0.512	1.182	0.512	1.182
Indirect Effects							
PC→WV→CCI	0.493	0.116	4.250	0.302	0.768	0.302	0.768
Direct Effects							
PC→CCI	0.364	0.204	1.784	-0.069	0.734	-0.069	0.734

PC: Psych. Capital, WV: Work Value, CCI: Career Choice Intention

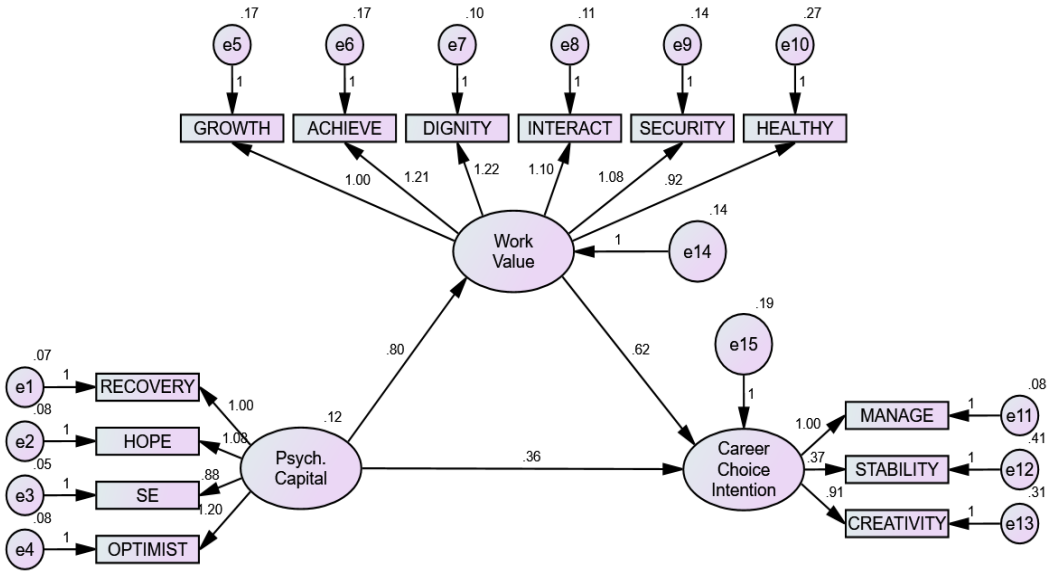

Figure 3
Schematic of the non-standardized mediating effect

5. Discussion and conclusion

In terms of the overall research structure, the fit indices of the hypothesis model suggest that the model exhibits goodness of fit. Moreover, the p values of the relevant path coefficients among the variables reach a significant level, indicating that the three hypotheses are supported by the empirical study.

According to the analysis of the correlation between psychological capital and work values of students in an internship, the richness of psychological capital has a positive influence on students' internship work values. The reason is that psychological capital is a lasting, relatively stable inner framework of mind that the individual has gained through involvement and experiential attempts of learning approaches. From the results of this research we learn that students in the field of commercial design not only can adequately present positive psychological traits towards the four composition factors of psychological capital (self-efficacy, hope, resilience, and optimism), but also can develop a strong sense of identity for the career values in the field of their profession during the process of practical training. Thus, the study arrives at the following conclusions: In the aspect of psychological capital, we infer that if students in the field of commercial design who undertake an internship can foster a good mental state as well as display confidence and diligence when facing assignments during the learning process of practical training, then their personal work attitudes and gratification toward the internship will be realized, and the students will consequently obtain strong career values.

As for the aspect of probing into the relationship between students' psychological capital of their internship and career choice intention, the results of the empirical study show that "the hypothesis of psychological capital of undergraduate students who are majoring in commercial design has a positive impact on job objective" achieves support after having conducted research hypothesis testing. Hence, the study comes to the following conclusions: The higher the degree of psychological capital of undergraduate students who are majoring in commercial design is, the stronger the degree of career choice intention the students will develop for the professional field they are studying.

In terms of the effect of work values on career choice intention, the

empirical results reveals that the work values of commercial design students in their internship have a positive effect on their career choice intention. For university students, the main purpose for undertaking an internship is to apply their knowledge from school into practice. It is also a stage where they explore their future career development. The work values discussed herein are the value orientation that the students show in a specific job during their internship, as well as an expression of the significance of work, the norms of work, moral ethics, and behavioral norms. According to the investigation results, the students showed positive signs in self-growth, self-realization, dignity, social interaction, security, and leisure health. Nevertheless, when it comes to career choice intention, most of the students hoped that their work could reflect their professionalism in their future career and they expected a stable career life. As seen in the findings, work values and practice in a professional field in the internship are very important. Hence, this study concludes that if commercial design students develop strong work values in their internship, then they tend to choose a job related to commercial design in their future career path.

According to the empirical results, the students' psychological capital and work values in the internship influence their future career choice intention. This study infers that students tend to put forth concrete efforts in an internship with the hope of not only integrating theory with practice, but also expecting to acquire different skills and more professionalism in the internship. Moreover, their goal is to gain approval from supervisors and colleagues, achieve self-growth and self-realization, and then stay in the field of commercial design as a future career choice.

Based on the above results, this study proposes suggestions for the practical application of students' knowledge in internship programs and future studies. This study finds that psychological capital and work values have great influence on the future career choice intention of commercial design students. In recent years, commercial design has become a critical link in industrial transformation and upgrade, and commercial design talents are highly valued, thus imperceptibly making commercial design a core of survival at the workplace. This study hopes that the findings herein will trigger a trend in the career choice of commercial design, which can help cultivate new designers and bring new demand into the field. Socially, it is hoped that university students will develop

positive psychological capital and work values throughout their study and training of commercial design, and then they will be able to start their career in a relevant field after graduation so as to avoid any waste of educational resources.

The findings also provide suggestions to higher education institutions on fulfilling the objective of talent cultivation. The results further serve as reference to academic institutions in commercial design for decision-making on future development and talent training. Finally, our findings can assist commercial design-related departments in higher education institutions in their implementation of career planning and guidance measures, in order to help students understand the challenges in the future workplace and enhance their competitiveness in career choice and development.

6. Limitations and future research

The limitations of this study include research content, research subject, and research method. Please refer to the detailed explanations as below. For the research content, although this study mainly explores psychological capital, work values, and occupational choice intent of students' off-campus internship, there are still many other possible factors that could affect the practical training practiced by college students. This research only embodies the three elements of psychological capital, work values, and occupational choice intent into the conceptual framework, and other potential variables that the study has failed to consider should be regarded as the limitation of research content.

For the research subject, this study utilizes students who have already finished their internship and are still completing their majors related to commercial design as the sample objects, yet there still exist many others who have not completed their internship. Those who are excluded from the research object and scope of this study should be regarded as the limitation of research subject.

Finally, for the research method, this study only adopts survey techniques to carry out quantitative research owing to the restrictions of manpower, material, and financial resources. As a result, results are likely to be driven by both subject and object causes of the research respondents; for example, their personal cognition and background as well as the content of survey questionnaire may

also appear to be inconsistent with the actual condition due to social expectation disconfirmation. Since it is not under the researcher's control for whether or not the answers are given with total honesty, a certain degree of divergence of interpretation would still occur, which inevitably becomes the limitation of the research method.

Suggestions to future studies contain research object, research method, and research variable, and we list the explanations below in sequence. In the aspect of research object, since the objects of this study are limited to the consideration of manpower and material resources, students whose majors are related to commercial design are the only ones that are taken as the objects of this research. Consequently, it is advised that future studies extend the range to other departments of a university/college for verifying the inferences of this research model. Furthermore, in order to facilitate the applied sampling method, this study fails to take the dissimilar representativeness of the sample size of commercial design departments from different schools into account, which leads to a disparity in sample proportion and a bias of difference test. Future studies should pay closer attention to this.

As to the research method, this research principally applies survey techniques so that the commercial design undergraduates who have already finished their internship are allowed to appraise their psychological capital work values and career choice intent; these belong to cross sectional quantitative research methods. It is advised that future studies adopt research methods such as longitudinal research or a combination of qualitative and quantitative research to explore further the cause of variables' divergences among the interns for the purpose of making up the restriction and deficiency of qualitative research.

Finally, for the research variables, as psychological capital is a new issue, there exist other attributes that may influence the topic - for instance, gratitude, aspect of forgiveness, or emotional capital - and other research variables relevant to psychological behaviors apart from self-efficacy, hope, optimism, and resilience. It is suggested that future studies take these items into consideration to increase the value and contribution of the findings.

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