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Cognitive and affective academic self-concepts: Which predicts vocational education students' career choice?

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ABSTRACT

Grounded in self-concept theory, this study examined the predictability of cognitive and affective academic self-concepts in relation to vocational education students' education and career choice outcomes in the Hong Kong HE setting in two studies (*N*s = 384 and 476). Structural equation modeling revealed that sense of competence (i.e., cognitive) is more related to competence/performance-based outcomes (i.e., operational capability and resilience at work in Study 1; and competition in Study 2). Liking of the vocation (i.e., affective) is more related to non-performance-based emotional-motivational outcomes (i.e., career intention in both studies and educational aspiration in Study 2) than is the cognitive component. These findings offer an empirical basis to guide vocational higher education institutes to effectively use educational resources to build a sustainable future workforce.

Introduction

The main feature of vocational and professional education and training (VPET) is its highly specialised contents in terms of vocational skills or professional knowledge in the curriculum specific to that field. Traditional education, by contrast, provides manifold pathways to unleash youth's talents and nurture human capital to support long-term social and economic development (Education Bureau, 2020). Although traditional higher education (HE) used to offer more generic and less trade-specific program contents, contemporary HE institutions offer vocation-oriented programs, blurring the boundary between VPET and the traditional mainstream. This is due to the increasing concern for graduates' employment upon completion, irrespective of course content and educational pathways provided by the HE institution. This concern is particularly salient at a difficult time such as the COVID-19 pandemic (Hong & Ma, 2020; Sigala, 2021). While many young graduates fail to launch their careers in the upended job market amidst the pandemic, some industries that have been devastated but are ready to revive from the hit have difficulty in attracting new graduates to join the profession (Choy, Cheng & Yu, 2021). In the hospitality industry in particular, over 20% of workforce shortage was recorded in Hong Kong, and front-line and operative level positions were found to be in the greatest demand (Oriental Daily, 2021). Lack of workers across various industries was further exacerbated by the recent emigration wave causing an enormous loss of experienced workers in Hong Kong (The Standard, 2021). Whereas HE continues to contribute significant supplies of workers, a mismatch between supply and demand of graduates to fill suitable jobs (Small, McPhail & Shaw, 2021; Suleman, 2018) can be a serious problem that may stifling economic recovery from the COVID-19 pandemic. For HE institutions, whether VPET or traditional, how their graduates make a career choice to fill the greatest societal demands is a significant concern to address.

In response to this concern, bourgeoning research has devoted to examining antecedents affecting graduates' career choice and employment decisions (Baum, Mooney, Robinson & Solnet, 2020; Hu, Hood & Creed, 2018; Jackson & Tomlinson, 2020; Jeon, 2019). Among various factors revealed in the literature, self-concept has been identified as a crucial one that plays a vital role for an individual's choice and success in life. As Marsh and Craven (2006) have highlighted, self-concept is "a hot variable that makes good things happen, facilitating the realization of full human potential in a range of settings" (p. 134). Hence in interventions for academic success, researchers have emphasized the importance of a dual approach to promoting both academic performance and academic self-concept in the specific subject domain and contextual setting (Marsh et al., 2018; Morony, Kleitman, Lee & Stankov, 2013). The same is likely to apply to VPET students. Hong Kong has a population of just over 7.48 million. Around 180,000 students enrolled in post-secondary education annually between 2012/13 and 2019/20. Of around 58,000 students enrolled in VPET programs (e.g., High Diploma, top-up degree and bachelor's degree programs provided by VPET providers) in 2019/20, the tourism and hospitality-related discipline (13%) was well received by VPET students, followed by design and creative (10%) and

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information technology (7%) (CSPE, 2020). However, although VPET contributes one fourth of the total workforce and supporting several pillar industries in Hong Kong such as tourism, design and creative, and information technology (PwC, 2021), the graduates' self-concepts in these industries are mostly untapped. Despite the important role of HE in supplying trained workforce, there has been little knowledge about how students' self-concepts are related to their education success and career aspirations.

In an educational context, a student's self-concept may be differentiated into a cognitive and an affective component (Arens, Yeung, Craven & Hasselhorn, 2011). The cognitive component is primarily a sense of competence (i.e., how good I am) whereas the affective component is an emotional-motivational response to the domain (i.e., how much I like it). A key question for HE is how these two components of self-concept make a difference in students' education and career choice outcomes. In two studies, we first examined whether these two related components are differentiable, and then tested whether these components would 'make good things happen' in a similar or a distinctively different way in HE settings. The findings have the potential of addressing a supply and demand mismatch and strengthening new graduates' employability by enhancing their career competencies that bring them a competitive edge (PwC, 2021).

Theoretical background

Self-concept is an overarching idea one holds about oneself in regards to various aspects such as behavior, abilities, emotion and attributes, which is shaped by one's experience and interpretation of one's external milieu (Shavelson, Hubner & Stanton, 1976). Self-concept comprises many interrelated sub-domains and is domain-specific and multidimensional (Kadir, Yeung & Diallo, 2017). A positive self-concept facilitates success in school work (Chen, Yeh, Hwang & Lin, 2013; Marsh et al., 2018), in social-emotional situations (Pekrun, Lichtenfeld, Marsh, Murayama & Goetz, 2017), and in everyday life (Eccles, 2009; Elliot & Dweck, 2005). Hence one's positive self-beliefs are essential for a range of desirable outcomes.

The cognitive and affective components of self-concept

Recent self-concept research has differentiated two components of self-concept (Arens et al., 2011). The cognitive component of self-concept refers to one's sense of competence (Arens et al., 2011; Kadir et al., 2017). For students in an educational program, it is about how competent they feel about their learning. For students in a specific vocational domain, it is about their sense of competence in that specific vocation. In studies in school children, cognitive self-concept was found to be more related to academic achievement (Arens et al., 2016; Arens, Bodkin-Andrews, Craven & Yeung, 2014) and shorter-term performance outcomes (Yeung, Craven & Ali, 2013, 2014) than was affective self-concept.

The affective component of self-concept refers to one's interest and positive affect to study or work (Kadir et al., 2017). While students' learning experiences are stemmed from a combination of positive affect and effort, positive affect tends to have more long-term effects on motivation and engagement (Kadir et al., 2017). In other words, students with a strong affective self-concept are more willing to devote time on, and attention to, a particular academic topic of interest and may ultimately reach higher achievement (Jansen, Lüdtke & Schroeders, 2016). By the same token, vocational interest is believed to be a powerful driving force of career choice (Hanna & Rounds, 2020). Interestingly, research on the process of career planning and employee selection has shown that students with similar interest profiles tend to select, or be selected in, a particular occupation even though interests may vary considerably across occupations (Nye, Perlus & Rounds, 2018).

The differential associations of cognitive and affective self-concepts with different outcomes have apparently important practical implications for educators. However, research studies to date have not clearly identified how the two components of self-concept are differentially associated with various education and career outcomes (e.g., career intention, educational aspirations, resilience, etc.). It is also unknown as to whether differences in the self-concept associations with various outcomes apply to vocational education students in HE settings, hence the rationale for the present investigation. Specifically, this paper investigates the relative contribution of the Cognitive and Affective self-concept components in predicting different education and career outcomes within a broader vocational HE context in Hong Kong. The investigated outcomes included competence/performance-based variables (i.e., operational capability, competition, and resilience at work) and non-competence/ performance-based ones (i.e., career intention and educational aspiration).

Essential education and career choice outcomes

Competence and performance are widely used variables to measure education outcomes (Tan, 2019; Grigg, Perera, McIlveen & Svetleff, 2018). Competence can be described as a range of general capability to perform something or a specific task (Holmes, Polman Tuin & Turner, 2021). While definitions of competence may vary depending on the nature of the domain and profession which continually evolves in response to macro and meso environment change (e.g., vocational training and teacher education), studies have suggested that competence integrates numerous components including skills, know-how, capability, knowledge, aptitude and attitude to complete a task and ultimately transform into actual performance within a specific domain (Halász & Michel, 2011; McConnell, 2001). Scholars have classified competence into three key areas: personal, academic, and career/occupational (Redding, 2016). For each area, commonly observed competences may be classified as: cognitive competence (i.e., know how), motivational competence (i.e., know why), and social-emotional competence (Kuijpers & Scheerens, 2006; Redding, 2014). For the purposes of the present investigation, we have chosen three respective competence outcomes – operational capability (cognitive), competition (motivational), and resilience at work (social-emotional) – as performance/competence-based outcomes.

For students, 'two important academic outcomes are: desire for further education and career aspirations' (Yeung & McInerney, 2005 p. 540). Educational and occupational aspirations are predominant motivational forces that channel an individual's effort toward goal achievement, which may sequentially affect performance (Widlund, Tuominen, Tapola & Korhonen, 2020). For the purposes of the present investigation, we have chosen these aspiration variables as non- performance/competence-based outcomes. Self-concept is known to expedite the realization of desired outcomes in various aspects (Marsh et al., 2018). For example, positive correlations have been found between self-concept and career intention (Atitsogbe, Moumoula, Rochat, Antonietti & Rossier, 2018), educational aspirations (Grigg et al., 2018; Olivier, Archambault, De Clercq & Galand, 2019), and resilience (Willis & Burnett, 2016). However, as more recent studies have shown that cognitive and affective components of self-concept are distinctively separable (Arens et al., 2011; Kadir et al., 2017), the question is whether these separate self-concepts (cognitive vs. affective) would facilitate these aspiration outcomes equally or differently. Notably, while cognitive self-concept (i.e., how good I am) is considerably correlated and shares a reciprocal relation with academic accomplishment (Marsh & Craven, 2006), the relation between affective self-concept (i.e., how much I like it) and academic accomplishment is not as clear, for example, in studies with Australian preschool and high school students (Arens et al., 2014, 2016; Seaton, Parker, Marsh, Craven & Yeung, 2014). On the basis of the limited empirical evidence so far, we may speculate that cognitive self-concept would be more related to performance/competence-based outcomes (whereas affective

self-concept would be more related to non-performance, motivational outcomes such as education and career aspirations).

Performance/Competence-based outcomes

Operational capability. There have been mixed views regarding the definition of core competencies that would influence students' employability (Kim, Park & Choi, 2017; Yao & Chen, 2014). While some studies suggested core competence as job-specific skills and knowledge that enable daily operations for a given position within a particular discipline (Hora, 2020; Suleman, 2018), other studies maintained that they are transferrable skills and knowledge (e.g., information and communication technology (ICT) and soft skills) that can be applied across a wide range of industries (Jiang & Alexakis, 2017; Yao & Chen, 2014). Notably, a recent study maintained that new competencies such as health/safety protocol, resilience, ICT skills and an ethical mindset should be embraced in vocational education curricula amid the COVID-19 shake-up (Sigala, 2021). In general, operational capability is imperative in enhancing students' employability. However, how students' self-concept may influence this competence-based outcome in HE has remained unclear.

Competition. Today's education and employment are both full of competition. Advocating a goal to be competitive in the modern world is an important construct for success in life. In achievement motivation research, a goal for competition and being a winner is known as a performance goal orientation (King, McInerney & Watkins, 2012; Pintrich, 2000), which is of particular relevance to students' success in an Asian context, such as the students from Hong Kong in the current research.

Resilience at work. Resilience could be viewed as a context-oriented process in which one manages stress and engage in change adaptations to manage it (Brewer et al., 2019). It has been defined as a capability or a competency by some researchers (e.g., Ledesma, 2014; Pidgeon, Ford & Klaassen, 2013; Sigala, 2021) and training program providers (e.g., Forbes Human Resources Council, 2021; Noble & McGrath, 2015) although some may argue that one's emotion and affect also contribute to resilience (e.g., Freitas & Downey, 1998). Essentially, HE institutions have a crucial role to play in developing students' academic and workplace resilience in preparation of their university-to-workplace transition (Hancock & Walsh, 2016). Evidence shows that resilience development involves strengthening competence beliefs, psychological wellbeing, and optimism (Johnson, 2008). Importantly, wellbeing is not only amount to one's happiness; strengthening one's positive functioning is equally important (Dillon, Craven, Kaur & Yeung, 2020). Advocates of academic resilience and buoyancy (Martin & Marsh, 2016) maintain that academic resilience equips students with capabilities to overcome difficulties, bounce back and flourish from hardship and mishap. A study conducted in Australia showed that skills and capabilities that are relevant to resilience are elements of student success in their school lives and future endeavours (Holdsworth, Turner & Scott-Young, 2018). However, a recent study concluded that occupational interest counterbalances workplace adversities and unfavorable job features in the tourism industry (Choy & Kamoche, 2021). Hence it may be affective self-concept that is a stronger driver of resilience than is cognitive self-concept about competence in certain skills. In sum, whether cognitive or affective self-concept would have a stronger contribution to resilience is yet to be revealed.

Non-performance-based outcomes

Educational aspiration. Educational aspiration can be defined as students' future academic goal(s) and desire(s) (Widlund et al., 2020). Extant studies have revealed a strong association between students' interest, educational intentions (Grigg et al., 2018), and academic achievement in a specific domain (Jansen et al., 2016). It will be worth exploring whether the same applies to vocational education students in HE.

Career intention. Career intention is defined as students' vision for their future occupational and professional life (Widlund et al., 2020). A systematic review conducted by Akosah-Twumasi, Emeto, Lindsay, Tsey and Malau-Aduli (2018) found that student career intention and choice are influenced by intrinsic motivation such as interest in the specific career. However, cultural characteristics and contextual differences may have impacts on an individual's career choice in specific professions. For example, a study in Mainland China maintained that undergraduate students' intention to pursue a tourism career remained at less than 20% (Wu, Morrison, Yang, Zhou & Cong, 2014). Another study found that students were reluctant to join the tourism industry due to various negative perceptions (e.g., heavy workload, low pay, and lack of career prospect) (Baum et al., 2020). To HE program developers and tourism industry leaders, it is of significant value to understand whether cognitive or affective self-concept would drive the intention of HE tourism graduates to join the tourism workforce and maintain a sustainable supply of new staff.

The present investigation

In two studies, the ultimate goal of the present study is to examine the predictability of cognitive and affective academic self-concepts in relation to vocational education students' education and career choice outcomes in the Hong Kong HE setting. The investigation aims to answer three research questions (RQs) below, which are illustrated in the proposed research framework presented in Fig. 1.

RQ1. Do tourism students clearly differentiate cognitive and affective self-concepts related to tourism?

RQ2. What is the relationship between cognitive/affective self-concept, vocational education students' performance-based outcomes (i.e., operation, resilience, competition) and non-performance-based (emotional-motivational) outcomes (i.e., educational aspiration)?

RQ3. What is the relationship between cognitive/affective self-concept and vocational education students' career intention?

Study 1

Participants

For Study 1, students studying in a tourism and hospitality subdegree and undergraduate program in five VPET HE institutions in Hong Kong were invited to complete a survey. A total of 384 completed surveys were collected (72% females; age ranging from 20 to over 50), from a population sample of 7718 tourism and hospitality students (CSPE, 2020).

Material and procedure

Following university ethics procedures, we had gained informed consent from all participants before they responded to the self-administered survey. A pilot test was conducted to fine-tune the instrument prior to the current main study. All survey items were measured by a six-point Likert scale: ranging from 1 (Disagree strongly) to 6 (Agree strongly). Data collection was conducted online (paper copies were provided only if requested). A link to the survey was provided and a spreadsheet of the data was generated for analysis. The survey comprised of 16 items covered the following constructs: cognitive self-concept, affective self-concept, operational capability, resilience at work, and career intention, with three to four items measuring each of the five factors (see Section A of Appendix). The survey also collected respondents' demographic data such as gender, age and curriculum domain. For both Studies 1 and 2, the items were designed to suit the respective vocational discipline of the target participants.

Cognitive and Affective self-concepts. Three items for each construct were adapted from Arens et al. (2011) and Yeung, Craven & Kaur (2012)

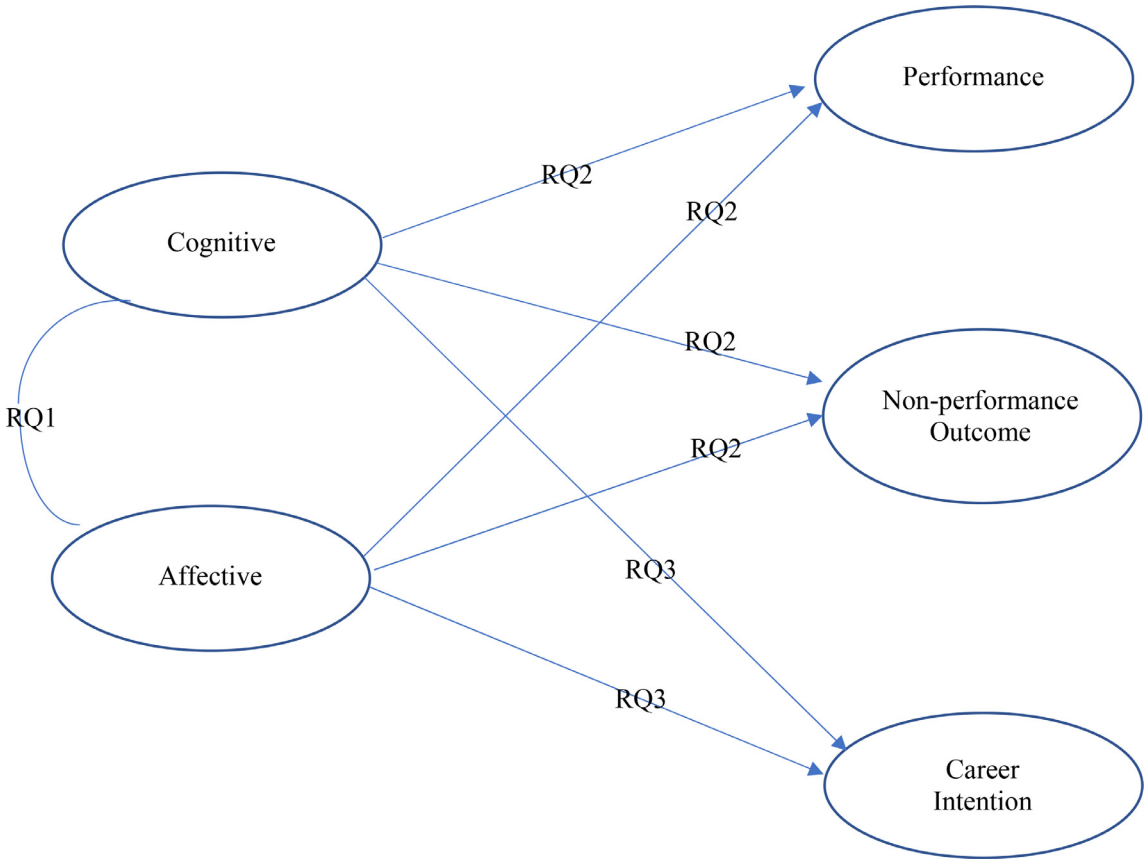

Fig. 1. RQs relating cognitive and affective self-concepts to outcomes.

to measure students' academic cognitive and affective self-concepts for Study 1.

Operational capability. Students' operational capability in ICT and conceptual knowledge in tourism and hospitality was measured by three items adapted from Atstaja & Dambe (2013) and Tsai, Goh, Huffman & Wu (2006), Oktadiana & Chon (2017) in Study 1.

Resilience at work. Students' capability to cope with stress, adversity and difficult situations was measured by four items adapted from Martin & Marsh (2016).

Career Intention. This was measured by three items adapted from Yeung, Kadir, Kuppan & Foong (2011) with modification to measure students' inclination towards being a tourism and hospitality industry practitioner.

Data analysis

Both studies applied the same approach to data analysis, CFA and SEM were used to test similar hypotheses and to answer the respective RQs. Preliminary analysis included descriptive statistics and reliability analysis. Using the statistical package of Mplus (Muthén & Muthén, 2015), confirmation factor analysis (CFA) and structural equation modeling (SEM) were conducted. For both Studies 1 and 2, we first tested a 5-factor CFA model to examine the factor structure of two self-concepts and three outcomes. Finally, a path model was tested with the two self-concepts predicting three outcomes (respectively in Studies 1 and 2).

Model fit was accessed by the comparative fit index (CFI) Tucker-Lewis index (TLI), and the root mean square error of approximation (RMSEA). The chi-square test statistics are also reported. In general, the values of TLI and CFI equal to or larger than 0.90 are considered an acceptable fit (Byrne, 2012). The value of RMSEA ranging between 0.05 and 0.08 is generally accepted as a close fit to a fair fit (Bowen & Guo, 2012). Factor loadings and latent factor correlations were inspected. Factor loadings show the relations of each underlying construct (i.e., each of the constructs to be measured) with each of the observed variables (i.e., the survey items). The latent factor correlations show the associations of the latent constructs, which should be clearly smaller than 1 so as to be differentiated from each other.

Results and discussion: study 1

Model 1.1 was a CFA model testing the structure of a 5-factor model (Table 1), which resulted in an acceptable fit (CFI = 0.926, TLI = 0.905, RMSEA = 0.080, χ^2 = 323.875(94 *df*). As can be seen in Study 1 of Table 2, all the factor loadings were good (all> 0.50). The latent factor correlations were all positive and statistically significant, indicating that they were positively associated with each other. However, the largest correlation was 0.785 between Cognitive self-concept and Resilience, well below 0.90, indicating that all the constructs were clearly differentiable from each other. The alpha reliability estimates were all good (ranging from 0.73 to 0.90; Table 2 Study 1). The mean scores were all above the mid-point on a 1–6 response scale, indicated that the students were positive in these six constructs.

Model 1.2 (Table 1) testing the paths from Cognitive and Affective self-concepts to three outcome variables (Operation, Resilience, and Career Intent) was equivalent to Model 1.1 with an acceptable fit (CFI = 0.926, TLI = 0.905, RMSEA = 0.080, χ^2 = 323.875(94 *df*). Fig. 2 summarizes the path estimates for Study 1. The paths from Cognitive self-concept to Operation and Resilience were statistically significant (βs = 0.725 and 0.661, respectively), but the path to Career Intention was not significant (β = 0.011). The paths from Affective self-concept to Career Intention and Resilience were statistically significant (β = 0.624, and 0.194, respectively), but the path to Operation was not significant (β = 0.034).

Table 1
Models.

Study 1. Hospitality and Tourism, $N = 384$	χ^2	*df*	CFI	TLI	RMSEA
Model 1.1 16 items form 5 factors	323.875	94	.926	.905	.080
Model 1.2. Paths from 2 self-concepts to 3 outcomes	323.875	94	.926	.905	.080
Study 2. Design, IT, Music, $N = 476$	χ^2	*df*	CFI	TLI	RMSEA
Model 2.1. 16 items form 5 factors	232.798	94	.951	.938	.056
Model 2.2. Paths from 2 self-concepts to 3 outcomes	232.798	94	.951	.938	.056

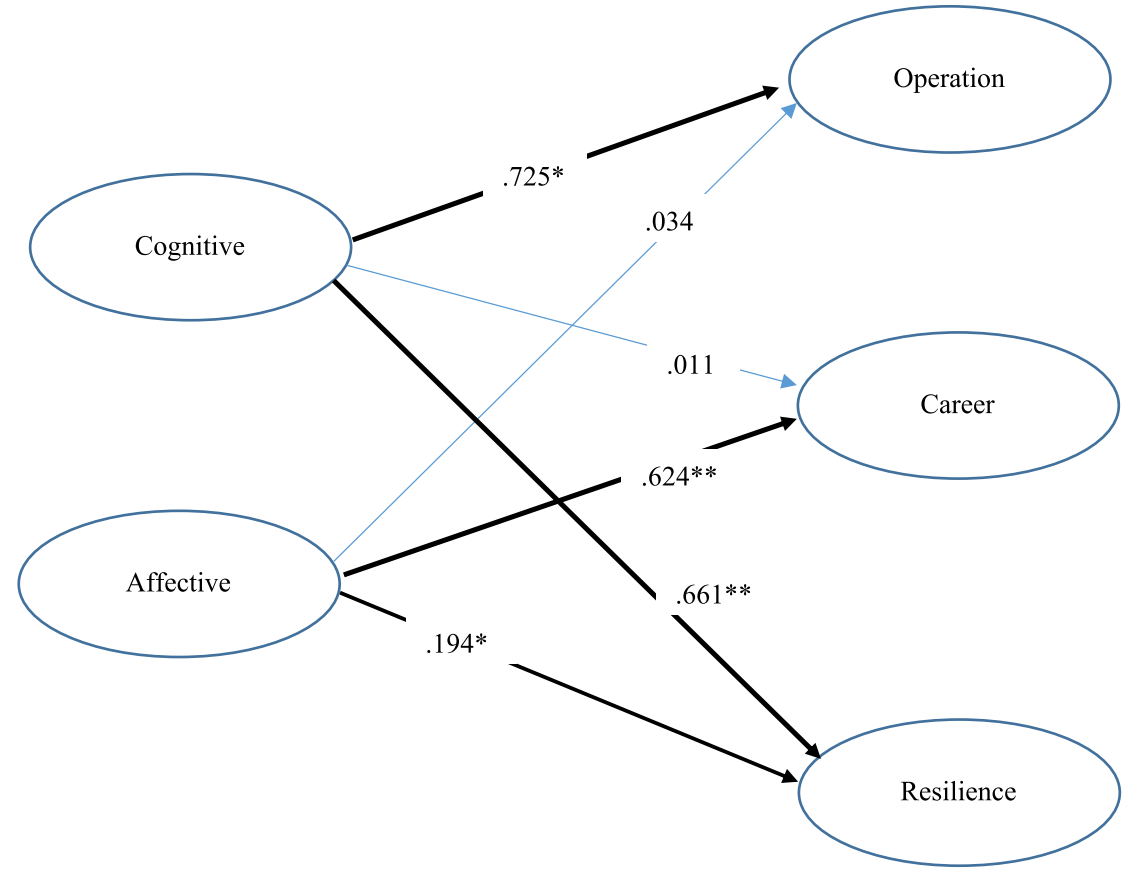

Fig. 2. Paths Study 1
* $p < .05$. ** $p < .001$.

RQ1. Differentiation of cognitive and affective self-concepts. CFA results showed that cognitive and affective self-concepts can be clearly differentiated. They correlated at 0.636, far lower than a perfect correlation of 1.000.

RQ2. Relationships of cognitive/affective self-concepts with outcomes. Results from Study 1 suggested that Cognitive self-concept is more strongly associated with competence/performance outcomes than is Affective self-concept (*r*s = 0.747 vs. 0.495 [Table 2] and βs = 0.725 vs. 0.034 for Operation [Fig. 2]; *r*s = 0.785 vs. 0.615 [Table 2] and β = 0.661 vs. 0.194 for Resilience [Fig. 2]). That is, for the tourism and hospitality students in Study 1, their sense of competence is positively related to their operational skills as well as their resilience in the workplace, whereas their intrinsic interest in tourism and hospitality may have less association with the vocational competence and skills.

RQ3. Relationship between cognitive/affective self-concepts and career intention. Results showed that Affective self-concept is more strongly associated with career intention than is Cognitive self-concept (β = 0.624 vs. 0.011; Fig. 2). That is, students' intrinsic interest in tourism and hospitality is closely related to their career choice whereas a high sense of competence may have a weaker contribution to one's intention to enter the industry. The key finding here is that for students to choose tourism and hospitality as their career, their intrinsic interest matters more than their sense of competence in tourism and hospitality tasks.

Study 2

Participants

For Study 2, students studying in various vocational education programs (ICT, design, music) in a large HE institution in Hong Kong were surveyed. A total of 476 completed surveys were collected (80% females; age ranging from 18 to over 30), from 9722 students undertaking design and creative and IT-related VPET programs in HE (CSPE, 2020).

Table 2
CFA Solutions.

Study 1	Cognitive	Affective	Operation	Career	Resilience
Alpha	0.78	0.90	0.76	0.73	0.87
Mean	4.29	4.24	4.17	4.06	3.88
SD	(0.92)	(0.97)	(0.88)	(0.80)	(1.04)
Item 1	0.780**	0.824**	0.764**	0.913**	0.744**
Item 2	0.698**	0.888**	0.694**	0.654**	0.550**
Item 3	0.733**	0.888**	0.723**	0.921**	0.633**
Item 4	–	–	–	–	0.622**
Factor Correlations					
Cognitive	–				
Affective	0.636**	–			
Operation	0.747**	0.495**	–		
Career	0.408**	0.631**	0.426**	–	
Resilience	0.785**	0.615**	0.684**	0.500**	–
Study 2	Cognitive	Affective	Competition	Career	Education
Alpha	0.76	0.83	0.79	0.76	0.75
Mean	3.13	3.89	3.56	5.03	4.64
SD	(0.94)	(1.03)	(1.00)	(0.82)	(0.88)
Item 1	0.734**	0.849*	0.596**	0.682**	0.694**
Item 2	0.675**	0.706**	0.708**	0.761**	0.740**
Item 3	0.735**	0.811**	0.805**	0.810**	0.794**
Item 4	–	–	0.660**	–	–
Factor Correlations					
Cognitive	–				
Affective	0.393**	–			
Competition	0.646**	0.417**	–		
Career	0.001	0.251**	0.302**	–	
Education	0.347**	0.417**	0.519**	0.583**	–

** $p < .001$.

Material and procedure

Study 2 followed the procedure of Study 1, including ethics procedures and pilot testing. However, data collection was conducted by distributing and collecting paper copies of the survey. All survey items used a six-point Likert scale: ranging from 1 (Disagree strongly) to 6 (Agree strongly). For study 2, the survey consisted of 16 items with three to four items testing each of five constructs: Cognitive self-concept, Affective self-concept, Competition, Career Intent, and Educational Aspiration (see Section B of Appendix).

Cognitive and Affective self-concepts. Three items for each self-concept construct were adapted from Arens et al. (2011) and Yeung et al. (2012) to measure students' academic cognitive and affective self-concepts.

Competition. Four items were adapted from Yeung & McInerney (2005) to measure students' tendency to achieve performance goal aggressively in Study 2.

Career Intention. Students' long-term career aspiration and goal in their respective vocational domain was measured by three items adapted from Yeung & McInerney (2005) in Study 2.

Educational Aspiration. Four items were adapted from Yeung & McInerney (2005) to measure students' aspiration to further studies after graduation in Study 2.

Data analysis

The same approach as in Study 1 was used for data analysis. The results are reported in a similar way.

Results and discussion: Study 2

Model 2.1 was a CFA model testing the structure of a 5-factor model (Table 1). The model result showed an acceptable fit of the proposed model with the data (CFI = 0.951, TLI = 0.938, RMSEA = 0.056, χ^2 = 232.798(94 *df*). As can be seen in Table 2 Study 2, all the factor loadings were good (all> 0.50). The latent factor correlations were all positive and statistically significant, indicating that they were positively associated with each other. The largest correlation was 0.646 between Cognitive self-concept and Competition, indicating that all the constructs were clearly differentiable from each other.

The alpha reliability estimates were all good (ranging from 0.76 to 0.83; Table 2 Study 2). The mean scores were mostly above the mid-point on a 1–6 response scale, except for Cognitive self-concept, indicating that the vocational education students in the HE institution did not have a very strong sense of competence.

RQ1. Differentiation of cognitive and affective self-concepts. CFA results showed that cognitive and affective self-concepts can be clearly differentiated. They correlated at 0.393, far lower than a perfect correlation of 1.000 and lower than the correlation found in Study 1.

RQ2. Relationships of cognitive/affective self-concepts with outcomes. Model 2.2 testing the paths from Cognitive and Affective self-concepts to three outcome variables (Competition, Career Intention, and Educational Aspiration) resulted in an acceptable fit, which was equivalent to Model 2.1 (CFI = 0.951, TLI = 0.938, RMSEA = 0.056, χ^2 = 232.798(94 *df*). Fig. 2 summarizes the path estimates for Study 2. The paths from Cognitive self-concept to Competition and Educational Aspiration were statistically significant (β = 0.571 and 0.217, respectively), but the path to Career was negative and not significant (β = −0.115). The paths from Affective self-concept to all three outcomes were statistically significant (β = 0.193, 0.296 and 0.332), respectively.

These results showed that Cognitive self-concept is more strongly associated with the performance-based outcome of Competition (r = 0.646, Table 2; β = 0.571, Fig. 3) than is Affective self-concept (r = 0.417; β = 0.193). That is, for the HE students in vocation-oriented programs, those who are higher in their sense of competence tend to compete to be a winner. From the results, it is clear that Affective self-concept is more strongly associated with non-performance-based outcomes (r = 0.251, Table 2; β = 0.296, Fig. 3 for Career Intention; r = 0.417, Table 2; β = 0.332 for Education Aspiration, Fig. 2) than is cognitive self-concept (rs = 0.001 and 0.347, Table 2; βs = .−0.115, and 0.217, Fig. 3, respectively). That is, students' intrinsic interest in coursework is more salient in guiding their choices after completion of study.

RQ3. Relationship between cognitive/affective self-concepts and career intention. A key question of the present investigation was whether cognitive and affective self-concepts contribute differently to a HE student's career choice in other vocational education programs. Affective self-concept was found to be a stronger predictor of career intention (β = 0.296) whereas the role of cognitive self-concept (β = −0.115) seemed negligible for career intention. The key finding here is that for students to choose a career relevant to their vocational training, their intrinsic interest matters more than their sense of competence.

General discussion

The present research examined vocational education students' cognitive and affective academic self-concepts in relation to their education and career outcomes in different professions and educational settings. Results in two studies across the two samples in HE settings demonstrated consistently that (1) cognitive and affective academic self-concepts are clearly differentiated by HE students, (2) cognitive self-concept is more strongly associated with competence/performance-based outcomes, (3) affective self-concept is more strongly associated with non-competence outcomes, and (4) affective self-concept is a stronger predictor of career intention. Specifically, cognitive self-concept (how good I am) is more strongly associated with operational capability and resilience (both competence-based) in the workplace in Study 1, and with an orientation for competition (also a performance-based outcome) in Study 2. By contrast, affective self-concept (how much I like it) is more strongly associated with career intention in both studies, and also education aspiration in Study 2 (non-competence/performance outcome).

A major implication of the findings across the two studies is that for students who choose tourism and hospitality as their career, their

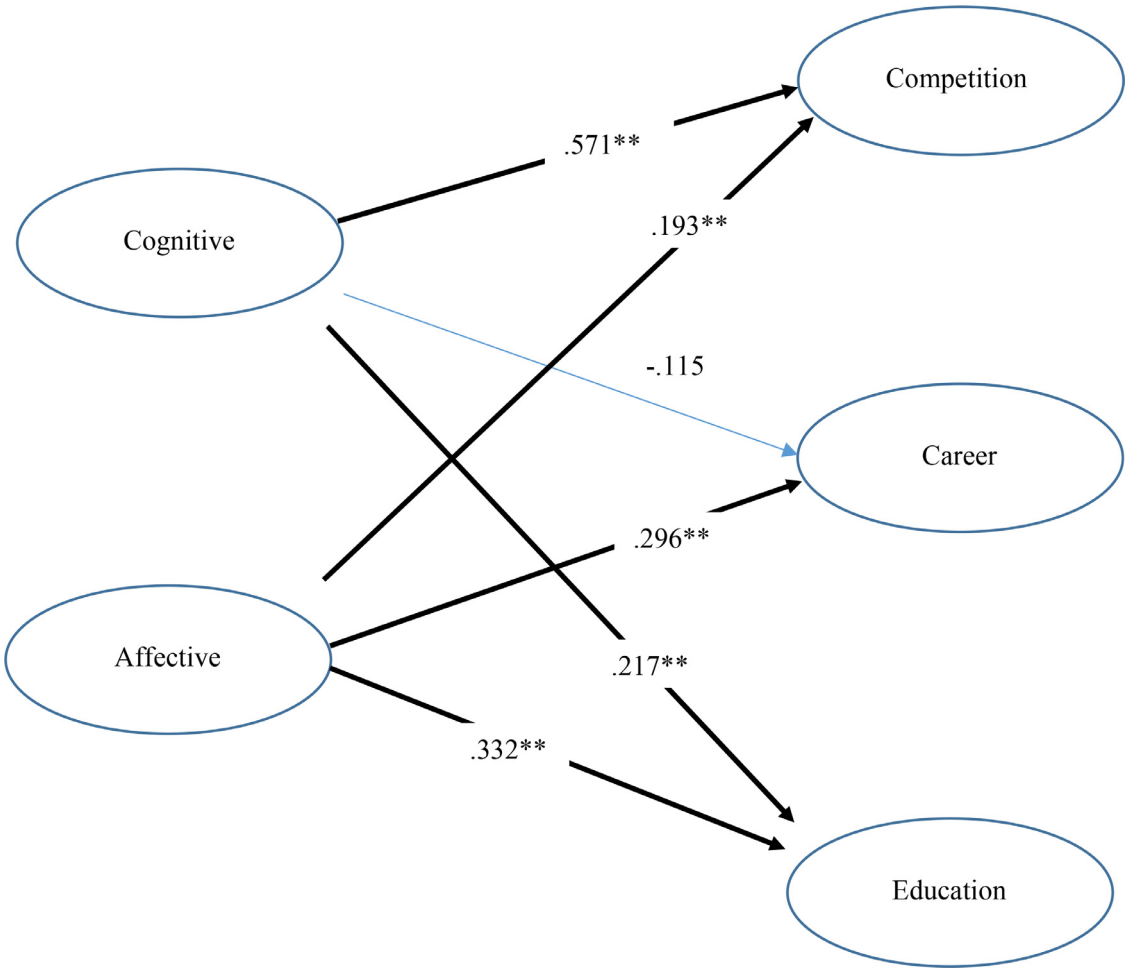

Fig. 3. Paths Study 2
* $p < .05$. ** $p < .001$.

intrinsic interest matters more than their sense of competence in tourism and hospitality tasks. Similarly, for other VPET students who choose a career relevant to their vocational training (Study 2), their intrinsic interest also matters more than their sense of competence.

Overall, the finding that vocational students' sense of competence (i.e., cognitive self-concept) is positively related to competence-based outcomes (i.e., operational capability; resilience and competition) is in accordance with extant research showing positive effects of cognitive self-concept on performance outcomes (Yeung et al., 2013, 2014). By contrast, also supporting previous studies (Akosah-Twumasi et al., 2018; Atitsogbe et al., 2018; Hanna & Rounds, 2020), our findings underscore the close association between students' affective self-concept (i.e., intrinsic interest) toward a specific discipline and choice of career in that discipline.

The two studies with samples from two different levels of vocational education attest to the differential predictability (Arens et al., 2016; Yeung et al., 2014). Evidence shows that whereas both cognitive and affective self-concepts may both contribute to career or learning outcomes (as can be seen in the positive correlations of both cognitive and affective self-concepts with outcome variables in Table 2), these two sources of self-beliefs may function differently in their contribution to the outcomes. Notably, cognitive self-concept (i.e., a sense of competence) is more salient for competence/performance-based outcomes (such as operational capability) whereas affective self-concept (i.e., interest in and liking of the discipline), which is of a more emotional-motivational nature, is more salient for non-performance career and learning outcomes (such as career intention and education aspiration). In this regard, an interesting finding is the significance of affective self-concept which shows a relatively stronger association than cognitive self-concept with career choice and educational aspirations relevant to the specific discipline in which the vocational students engage. Hence, further to supporting previous research showing a significant relationship between self-concepts and educational aspirations (Arens et al., 2016, 2014; Grigg et al., 2018; Olivier et al., 2019), our research has delineated the relatively stronger impact of affective self-concept on longer-term decision making such as career and educational choices.

Despite the strong support for the differential predictions showing the stronger contribution of cognitive self-concept to competence/performance-based outcomes, and of affective self-concept to emotional-motivational outcomes, for most of the outcomes included in the present study, both cognitive and affective components did have respectively significant contribution to a significant extent. Ultimately, the two self-concept components are positively correlated (r = 0.639 and 0.393, respectively in Studies 1 and 2), which means that an individual who feels a sense of competence tends also to like the discipline, and vice versa. For the tourism and hospitality students in Study 1, although cognitive self-concept is more strongly associated with resilience in the workplace (β = 0.661), affective self-concept also has significant contribution (β = 0.194). For vocational students in Study 2, although cognitive self-concept is more strongly associated with competition (β = 0.571), affective self-concept also has significant contribution (β = 0.193), although not as strong. Hence, it is the relative

strengths of contribution of the two components of self-concept that differ, not necessarily implying that a strong cognitive self-concept will be sufficient to benefit these performance/competence-based outcomes.

The clearest prediction of affective self-concept is for the career intention outcome, which is significant in Study 1 ($\beta = 0.624$), compared to the nonsignificant contribution of cognitive self-concept ($\beta = 0.011$), and in Study 2 ($\beta = 0.296$), compared to the nonsignificant contribution of cognitive self-concept ($\beta = -0.115$). This implies that building a strong sense of competence in the vocational education courses does not guarantee that the students will choose it as their career. Instead, the extent to which they like the career matters more. This is an important finding for vocational education planners and policy makers. In addition, other longer-term outcomes, such as education aspiration ($\beta = 0.332$ vs. 0.217) in Study 2, favouring affective self-concept, also reinforce the salience of an individual's liking of the discipline in making a personal choice over a sense of competence.

Implications

The most noteworthy set of results in the current study is the influential impact of vocational interest (i.e., affective self-concept) on career choice. Positive occupational attitude and interest is notably a powerful force of career choice that can overcome structural problems in industry and workplace adversities (Choy & Kamoche, 2021). Our findings demonstrate the importance of facilitating students' vocational interest for making a favourable initial occupational choice. Given the general impression of superiority of traditional education in the current educational system, vocation-oriented education is comparatively less preferred and students in vocational education tend to have a sense of inferiority (The Education University of Hong Kong, 2017). The inferior perception and image can greatly influence one's training and career choice (Duemmler, Caprani & Felder, 2020). To rectify the misconception about inferiority of vocational-oriented education in HE setting, strengthened policy and financial support are recommended by embedding applied education in different levels of the education system and establishing a recognizable educational pathway for VPET comparable with the pathways in tradition education. Vocational HE institutes and policymakers need also to consider how to improve occupational identity of practical-based professions and the image of vocational education by promoting social recognition of vocational practitioners' contribution to society. Besides, more motivational elements should be introduced in vocational education program to enhance students' interest (affective) and thinking skills (cognitive) to strengthen the respective professions in various domains. Apart from internship experiences, which is regarded as a powerful force to provoke and prompt students' career choice propensity (Kim, Jung & Wang, 2016), job shadowing in an organization and taster programs offered by educational institutions can arouse both students' education and career interest and competence. Actual experiences can rectify students' biased perceptions and strengthen their understanding of the profession they choose to engage in (Buzzeo & Cifci, 2017; Skovhus & Thomsen, 2020). Vocational HE institutions may offer taster programs to provide secondary school students a chance to experience campus life and with the subjects taught at the institution. Job shadowing can provide students opportunities to observe and learn about daily responsibilities and required competencies of a specific profession from an experienced person who actually does the job.

Notably, our finding of a strong relationship between sense of competence (i.e., cognitive) and performance/competence-based outcomes (e.g., operational capability, resilience) warrants attention. Given that the recent pandemic has accelerated the integration of new technologies into various industries including innovations such as digital distribution, e-wallet, touchless elevator, QR code menu and artificial intelligence (Gursoy & Chi, 2020), developing a cutting-edge curriculum by incorporate more topics about applications of technologies into the workplace is likely to become increasingly prevalent (Sigala, 2021). A mastery of such competence may become crucial in future endeavours to perform well in a range of careers. Moreover, the present findings indicating that a positive sense of competence being closely tied with resilience point to the benefit of building students' skills and capabilities to endure hardship, adversities and stress to meet the academic, job, and personal life demands. It is also remarkable that a sense of competence (i.e., cognitive self-concept) is a crucial determinant of performance/competence-based outcomes, as illustrated in both of our studies.

Strengths, limitations and future research

A strength of our investigation is the convergent findings of two studies with two different vocational student samples to examine the relative predictability of cognitive and affective academic self-concepts in relation to students' education and career choice outcomes in the vocational HE setting in Hong Kong. The findings illustrate not only the importance of self-concept that "makes good things happen" (Marsh & Craven, 2006, p. 134), but also how the cognitive and affective components of self-concept differentially make different good things happen. However, this investigation also has some limitations that need to be acknowledged. First, this research was based on purposive sampling which relies on the researchers' judgement of appropriateness. Hence, the sample may not fully represent the wider population of vocational education students. Second, although we tested differential 'predictions', due to the cross-sectional nature of the data, the findings should not be taken as demonstration of causal relations of self-concepts with the range of educational and vocational outcomes. In fact, the causal relations could be opposite, or reciprocal, which can only be examined with longitudinal data. Third, our study tested the role of self-concepts among higher education students undertaking selected vocational specialities, which may not be generalised to other domains. Future research could focus on comparing different professions and specialisations in the same industry or pan-industry comparisons. A future line of enquiry would also be to investigate whether our findings in Hong Kong, which is now part of China, hold true in Mainland China or other countries by replicating the findings for generalization.

Conclusion

This article sought to advance the understanding of the differential associations of two components of self-concept (cognitive and affective) with a range of education and career outcomes. In two studies with higher education students in Hong Kong studying vocational courses, the analyses found that students' sense of competence (i.e., cognitive self-concept) is more related to performance-related outcomes (operational capability, work resilience, competition). In contrast, the extent to which one likes the vocation (i.e., affective self-concept) is more strongly related to emotional-motivational outcomes (intent to join the career in both studies, and educational aspiration in study 2). These results have not only supported the "twofold multidimensionality" of self-concept (Arens et al., 2011), but also the differential predictions across two distinct educational streams and across various vocational domains. The findings suggest that vocational educators can design interventions to target the cognitive component of self-concept to achieve positive gains in vocational performance, or to target the affective component of self-concept to achieve positive gains in emotional-motivational outcomes such as making educational and career choices. The differential strengths of promotion of the two distinct self-concept components have the potential to contribute to the optimal development of the individual vocational students and the sustained growth of productivity in the workforce.

Declaration of Competing Interest

None.

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Ethics declarations

There is no conflict of interest that we are aware of.

Data availability

With consideration taken to the anonymity of the respondents, full data and material are not made public.

Code availability

Not applicable

Geolocation information

The research was conducted in Hong Kong.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.ijedro.2022.100123.

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