

Article

Teaching Sustainable Employability: Examining the Factor Structure of the Perception of Career Development Inventory for Chinese College Students

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Abstract: The universalization of higher education and the uncertainty of the labor market in China has rendered the career development of college students increasingly important. However, previous constructs of career development and their measurements were mainly developed for psychological interventions based on Western culture, rather than educational practices in China. To investigate the career development of Chinese college students, this study examined a four-factor model of the Perception of Career Development Inventory for Chinese College Students. The four factors are self-seeking, competence enhancements, context exploration, and role matching. The present study confirmed the four-factor structure and provided evidence of satisfactory psychometric properties using a sample of Chinese college students ($N = 739$). Further validation and the investigation of educational effects need to be extended.

Keywords: career development; college students; higher education



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1. Introduction

The learning experience at college forms the foundation of a student's lifelong sustainable employability. Career development can be viewed as a lifelong process, presenting roles attainment and transitions [1,2]. Learning at college is one of the stages in an individual's career development process. Career development also refers to an individual situation that is affected by psychology, personal choices, education, opportunity, and other social factors [3,4]. The teaching of a HEI (Higher Education Institution) is an important contributor to the career development of college students. In the field of education, skills are incorporated into the conceptual framework of career development [5,6]. Lanpan proposed six career development skills, which include career exploration, person–environment fit, goal setting, readiness skills, self-regulated learning, and the consistent utilization of emotional and instrumental support [5]. The focus on the career development skills of students echoes the call for sustainable employability in the volatile labor market. The career development of students is essential for personal learning, psychological health, and overall wellbeing [7,8]. Additionally, an unsuccessful transition from education to work may increase social issues, such as NEET (Not in Education, Employment, or Training) and youth unemployment [9,10]. However, most previous studies of students' career development pay attention to personal psychological attributes and psychological interventions. The educational circumstance, structure, and institutions are seldom focused upon. In fact, career development is the result of the interaction between an individual's attributes and his/her social circumstance [11–14]. The expansion of higher education and the claims for accountability of HEIs make promoting the career development of students become one of the key goals of teaching. This research aims to examine the factor structure of the Perception of Career Development Inventory for Chinese College Students (PCDC) to assist with monitoring the teaching process through student surveys.

1.1. The Career Development Theory and Measurements

The widely used instruments for measuring the perception of career development of college students are mainly derived from the trait and factor theories, social cognitive theories, and social constructionist theories [14–16]. These instruments are normally based on theoretical constructs, such as vocational personality, career self-efficacy, and career adaptability. For example, Holland's theory, which belongs to trait and factor theories, offers vocational type assessments based on personality [17]. A RIASEC model from Holland aims to match students to the suitable vocational type according to their personality traits [18,19]. In terms of social cognitive theories, the construct of career self-efficacy demonstrates the influence of social experience on self-evaluation [20]. It is linked to a specific behavioral domain and attempts to explain how career feelings or behavior proceed via cognitive reflection on environmental feedback [21–23]. Based on the career construction theory, the construct of career adaptability denotes the psychological resource of individuals in confronting career issues [24]. Promoting career adaptability is the primary goal of career intervention in the life design paradigm of career construction theory, and the construct is observed to be significantly associated with a variety of individual difference characteristics, wellbeing indicators, and career outcomes [25,26]. These theory-based career constructs and measurements have been used not only in mechanism explanations, but also for evaluations and counseling in psychological interventions. However, these theories and measures do not directly relate to the individual's cognition of the educational process and circumstances. With the exception of intervention design, it is difficult to link the results of these measurements to educational practice and provide references for teachers and school administrators.

Measurements based on career development theories have been applied in different cultural contexts, including the Confucian culture sphere. The Confucian culture originates from China and influences countries in East Asia and even South Asia. Collectivism, rather than individualism, is one of the characteristics of the Confucian culture. College students with a Confucian cultural background may have different career characteristics compared with their counterparts from Western countries. The students from Asian collectivist cultural settings had more difficulties in career decision-making [27]. Additionally, their career attributes were more likely influenced by family or others rather than intrinsic features [28,29].

Furthermore, there is limited evidence supporting the cross-culture validity of these instruments. Rounds and Tracy [30] examined Holland's RIASEC models and measures in 18 countries and found that cross-culture structural equivalence was not supported. Yang et al. [31] also found similar results in the Chinese population. Hampton [32] concluded that the structure of the original version of the Career Decision Self-Efficacy Scale-Short Form could not be applied to the Chinese college students. Although the internal consistency and factor structure of the Career Adapt-Abilities Scale had been confirmed in Chinese college students, the value of factor loadings was different from the international version, and the cross-culture structural equivalence was not examined [33].

In addition to theoretical-based measurements, there are assessments of students' career/work readiness in the field of educational evaluation. These assessments are mainly employed according to accountability standards [34,35]. Career-related attitudes and activities were included [36]. The definition and measurement of a student's career/work readiness of students are contentious. Some studies use career maturity, career decision-making difficulty, and other theoretical constructs to define and measure career/work readiness [37,38]. There are also endeavors to develop career/work readiness scales based on qualitative studies [39] or generate indicators according to existing datasets [36]. However, these scales and indicators are designed within Western cultural contexts. The cross-culture validity of these instruments still needs to be confirmed.

The cross-cultural differences in career development and the issues of cultural validity in measurements increase the need for indigenous exploration. Since these theories and measurements are constructed in the context of white, middle-class Western culture [40],

they may have limited explanatory power in the Confucian cultures. As Fan and Leong [41] claimed in a Special Issue on career development research in the context of China, the shortage of indigenous theoretical modes and measurements was a challenge for career development research in Chinese societies. It is necessary to develop a measure of career development for Chinese students due to both theoretical and educational practice demands.

1.2. The Career Development Practice of Higher Education in China

In the 1990s, the practice of career development for college students was officially initiated by the government in China. The marketization in the economic system shifted the arrangement of college graduates from state allocation to self-directed job hunting. Career development practices featuring employment centers and employment guidance curricula (or lectures) were formed in HEIs to prepare college students for incoming market competition. Career development services in HEIs were promoted in the national policies released by the State Council and the Ministry of Education. It was also legitimated as a fundamental duty of HEIs in the Higher Education Law since 1998.

However, the career development practices of HEIs are often isolated from the teaching system in China. The employment center mainly serves students who are in their final year by providing job fairs and recruitment information. Additionally, the employment guidance curriculum is designed in the form of general education courses that are not directly connected to the students' learning areas and potential careers. While the teaching system is usually organized based on disciplines, academic knowledge is at the core of teaching, which generates a gap between learning and the real world of work. Although the employment center gives annual feedback on the employment rate to the teaching system, the causes of the employment rate are often complicated. Thus, employment results of students would hardly trigger teaching reforms.

Considering the institutional, historical, and cultural basis of higher education in China, monitoring and analyzing the career development process of students may comprise the teaching transformation implications for HEIs. Compared to America, the UK, Japan, and other developed countries, institutionalized career development practices are scarce at the K-12 level in China. For example, the majority of students choose their study area under the limited experience of his/her social network, rather than professional career guidance services or curricula. HEI may be the most accessible public institution providing career development services for the youth. As enrollment in higher education has been dramatically expanded, the mounting supply of college graduates has resulted in fierce competition and tension in the labor market [42,43]. Since the imperial examination system—which was used for selecting political elites—lasted for more than 1000 years in traditional China, there is pervasive cognition that learning and examination are open paths to upward social mobility. Currently, college graduates experience multiple highly selective examinations that take place from K-12 to higher education. However, some of them may not be able to find decent employment. The increased disappointment of students and their parents due to this situation may threaten the development of HEIs. In the era of mass higher education, the career development of graduates and related teaching practices from HEIs are essential for student recruitment.

Hence, this study focuses on the college students' perception of career development in China. The measurement of this perception can provide students to voice their opinions and to help improve teaching practices.

1.3. The Present Study

The author's previous study proposed a four-dimension conceptual framework with respect to the college students' perception of career development in China [44]. The four dimensions included self-seeking, competence enhancement, context exploration, and role matching. They were constructed via the qualitative approach. Self-seeking refers to the process in which college students formulate their career preferences based on their personal career experiences. Competency enhancement refers to the process by which college

students improve their employment competitiveness by actively engaging in learning activities and using educational resources on campus. Career exploration refers to the process by which college students form job perceptions of a certain range of positions by exploring the world of work. Role matching refers to the college students' vision of their future position in society and their actions in relation to that vision. The conceptual framework presented how students made sense of career development and how their learning experiences were connected to career development.

The goal of this study is to provide evidence for the factorial validity of the PCDC. The author expects that the PCDC shows a four-factor structure, and the scales to measure the four factors show adequate reliability. The measurement of the perception of career development for Chinese college students is hypothesized to have a four-factor structure.

2. Method

2.1. Participants

This study recruited a convenience sample of participants. In total, the participants were a group of 739 college students (450 female and 289 male). The mean age of the participants was 22. The sample included 43.17% undergraduate students (mean age = 19), 45.47% postgraduate students in a master's program (mean age = 24), and 11.37% postgraduate students in a doctorate program (mean age = 27). Moreover, 60.8% of participants perceived their family background to be on average (lower than middle class); 14.3% perceived their family background as poor, 13.5% as middle class; 1.6% perceived their family background as affluent; and 9.7% did not want to report their family background.

2.2. Materials

A Perception of Career Development Inventory for Chinese College Students (PCDC) was developed. The inventory comprised 4 dimensions: self-seeking (e.g., "I know my work-related strengths."), competence enhancement (e.g., "Our courses emphasize the ability to solve practical problems."), context exploration (e.g., "I know the trend of the career I intend to pursue in the future."), and role matching (e.g., "I know work will be an important part of my future life."). The initial item pools were mainly generated by qualitative interviews with Chinese college students [44]. This study also referred to survey items on college students' learning and development and theories on career development.

This step resulted in 34 items. A six-point Likert-type of scale was used, and the scale ranged from "strongly disagree" (or "strongly inconsistent") to "strongly agree" (or "strongly consistent"). The items were reviewed by one education scholar to confirm the content validity. This study conducted a pilot survey to refine the expression of the items. Three undergraduate students (two male and one female) completed the items. Additionally, cognitive interviews were then conducted on the paraphrasing of items, grading of the scale, and response to the questions [45]. Subsequently, the items were refined or dropped, resulting in 29 items.

2.3. Procedure

The questionnaire of study was created and distributed by using an online platform. The questionnaire included the background information and the PCDC. In addition, two sets of reverse-code items were included in the questionnaire to identify the response quality. The respondents followed a link to the online questionnaire with informed consent.

2.4. Data Analysis

SPSS Version 22 and Mplus Version 8.1 were used to analyze the data. Six responses with missing data were deleted. Additionally, 53 responses were identified as invalid following 3 standards: (a) completion time was far shorter than average; (b) the same response was given to more than 20 consecutive items; or (c) the same or similar response was given to the reverse-code items. The remaining 680 questionnaires were analyzed using the following steps.

First, the sample was randomly divided into two groups (340 in Group 1 and 340 in Group 2). The independent-samples *t*-test demonstrated that there were no gender differences between Group 1 and Group 2. Second, an Exploratory Factor Analysis (EFA) was conducted to test the tentative factor structure using data from Group 1. The robust Maximum Likelihood Estimator (MLR) and oblique rotation with the geomin method were used to identify the latent constructs. The epsilon value for the geomin rotation was 0.001 with three factors. With four and five factors, it was 0.01. Items were evaluated and selected via multiple EFA. Third, while the dimensionality was confirmed via EFA, Confirmatory Factor Analysis (CFA) and Exploratory Structural Equation Modeling (ESEM) were conducted to ensure the factor structure using data from Group 2. In addition, Cronbach's alpha was tested before the CFA and after the validation of the instrument.

3. Results

3.1. EFA

To investigate the dimensionality of items, the EFA was conducted with the pool of 29 items using data from Group 1. Before the EFA, the skewness and kurtosis scores were calculated for all 29 items. Skewness ranged from -1.93 to -0.30 , and kurtosis ranged from -0.06 to 4.91 . Both the skewness and kurtosis scores were acceptable, as the absolute value of skewness and kurtosis was less than 2 and 7, respectively, indicating that the data were normally distributed [46]. Furthermore, the data were deemed suitable for factor analysis since (a) the correlation matrix showed coefficients above 0.3 between most items with their respective predicted dimension; (b) the Bartlett's test of sphericity was significant ($p < 0.001$); and (c) the Kaiser–Meyer–Olkin measure of sample adequacy was 0.92.

Kaiser's rule, scree plot, and model comparison were used to examine the factor structure. The eigenvalues of five factors were greater than 1, which indicated that five factors could be extracted from the data (Kaiser's rule). Figure 1 shows the scree plot. The number of points above the substantial drop indicates the number of factors to be extracted [47]. The result of the scree plot identified four factors. Table 1 shows the fit indices for the three models: three-factor model, four-factor model, and five factor model. The criteria of comparative fit index (CFI), Tucker–Lewis Index (TLI), root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), Akaike information criteria (AIC), and Bayesian information criteria were used to evaluate the models. These indices were recommended as $CFI \geq 0.90$, $TLI \geq 0.90$, RMSEA, and $SRMR \leq 0.08$ [48,49]. Additionally, smaller AIC and BIC indicated better model fit [48,49]. The results indicated that the four-factor model and five-factor model fitted better to the data compared to the three-factor model. However, the model fit of the four-factor model was not acceptable due to low CFI and TLI indices. The factor structure and combination of items in the five-factor model were not consistent with the original design. There were also items of low factor loadings and cross-loadings in both the four-factor model and the five-factor model. In addition, Kaiser's rule tended to overestimate the number of factors [50].

Table 1. Summary of Exploratory Factor Analysis (EFA) Model Fit Statistics.

Model	χ^2	<i>df</i>	CFI	TLI	AIC	BIC	Adjusted BIC	RMSEA	SRMR
Three Factor (29 items)	1076.449 **	406	0.863	0.827	27,002.272	27,545.982	27,095.531	0.083	0.049
Four Factor (29 items)	879.290 **	296	0.894	0.854	26,715.594	27,358.857	26,825.929	0.076	0.038
Five Factor (29 items)	738.076 **	271	0.915	0.873	26,545.960	27,284.947	26,672.714	0.071	0.033
Three Factor (20 items)	491.346 **	133	0.902	0.860	19,184.538	19,555.946	19,248.244	0.089	0.056
Four Factor (20 items)	291.152 **	116	0.952	0.921	18,972.222	19,408.722	19,047.092	0.067	0.029

Note. ** $p < 0.01$.

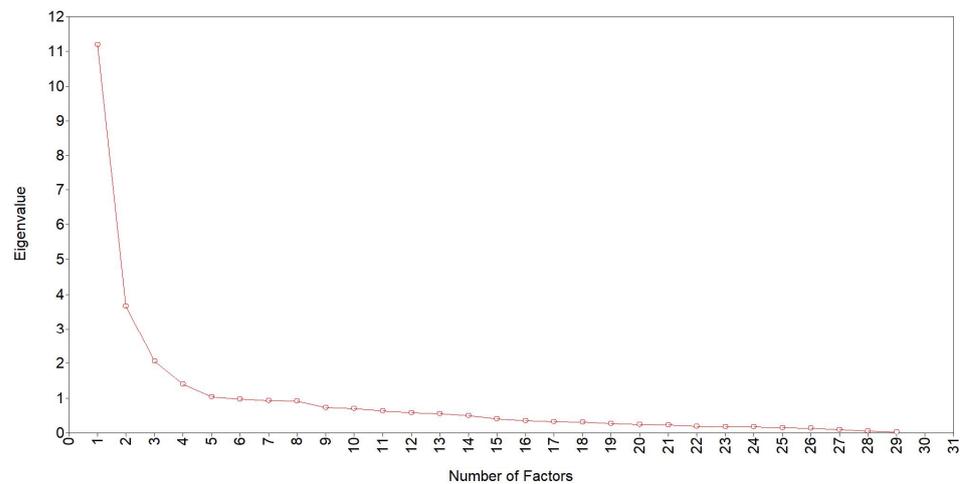


Figure 1. Scree plot (29 Items).

This study then removed unsatisfactory items and reconducted the EFA. One item was removed because of its low factor loading (0.24). Eight items were removed considering their cross-loadings. With the pool of 20 items, the eigenvalues of four factors were greater than 1. The scree plot identified four factors (See Figure 2). The four-factor fit reasonably well to the data according to the indices (See Table 1 and Appendix A). This indicated that four factors could be extracted from the data. The items were loaded onto their respective dimensions, as designed. The factor loadings ranged from 0.60 to 0.94. (See Table 2)

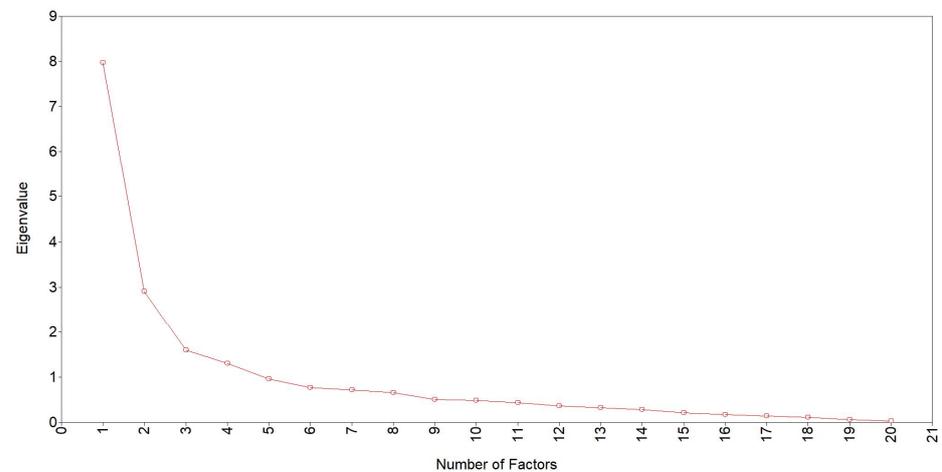


Figure 2. Scree Plot (20 Items).

Table 2. Results of Exploratory Factor Analysis (EFA).

Item	F1	F2	F3	F4
Self-seeking				
S01	−0.007	0.060	0.861	−0.132
S02	0.043	0.049	0.802	0.019
S03	0.104	0.139	0.442	0.165
S04	−0.093	0.027	0.891	0.038
S05	0.161	0.053	0.539	0.113
Competence Enhancement				
C01	−0.001	0.050	0.014	0.811
C02	0.101	−0.050	0.149	0.513
C03	−0.011	0.048	−0.069	0.697
C04	0.038	0.154	0.121	0.539

Table 2. *Cont.*

Item	F1	F2	F3	F4
Context Exploration				
E01	0.041	0.827	0.123	0.000
E02	−0.015	0.957	0.040	−0.002
E03	−0.028	0.976	0.022	−0.018
E04	0.005	0.913	−0.023	0.033
E05	0.019	0.953	0.000	0.004
E06	0.025	0.905	−0.035	0.043
Role Matching				
R01	0.432	−0.031	−0.026	0.164
R02	0.387	−0.090	0.038	0.156
R03	0.387	−0.014	0.107	0.189
R04	0.865	0.011	−0.068	0.005
R05	0.664	0.069	0.171	−0.106

The four-factor structure with 20 items confirmed the construction of PCDC ($\alpha = 0.91$). Five items formed “self-seeking” ($\alpha = 0.86$). Four items formed “competence enhancement” ($\alpha = 0.78$). Six items formed “context exploration” ($\alpha = 0.98$). Five items formed “role matching” ($\alpha = 0.73$).

3.2. CFA and ESEM

To assess the construct validity of PCDC, the CFA and ESEM were conducted by using data from Group 2. Prior to the CFA and the ESEM, the skewness and kurtosis of the 20 items were examined. Skewness ranged from -1.9 to -0.21 , and the kurtosis ranged from -1.0 to 4.86 ; these ranges are acceptable, as the absolute values of skewness and kurtosis were less than 2 and 7, respectively [46]. It can be concluded that the data were normally distributed. The PCDC was still found to be reliable. Cronbach’s alphas for the PCDC were 0.93 (total), 0.84 (self-seeking), 0.83 (competence enhancement), 0.98 (context exploration), and 0.76 (role matching).

Then, the CFA and ESEM were conducted using the maximum likelihood estimation method. The ESEM was conducted using oblique rotation with the geomin method. The criteria of CFI, TLI, RMSEA, and SRMR were used to evaluate the model fit. The results of CFA and ESEM showed good fit (See Table 3). However, three cross-loading items were observed in the results of ESEM. These three items were deleted from the CFA and ESEM models. The revised models were estimated again, indicating a good model fit (See Table 3). The CFA and ESEM of 17 items revealed that the items were significantly loaded on their corresponding factors. The standardized item factor loadings ranged from 0.49 to 0.97 in CFA and from 0.38 to 0.99 in ESEM (See Table 4). Cronbach’s alphas for the PCDC were as follows: 0.92 (total), 0.91 (self-seeking), 0.83 (competence enhancement), 0.98 (context exploration), and 0.72 (role matching). Table 5 shows the descriptive statistics and correlation of factors.

Table 3. Summary of Model Fit Statistics of Confirmatory Factor Analysis (CFA) and Exploratory Structural Equation Modeling (ESEM).

Model	χ^2	<i>df</i>	CFI	TLI	AIC	BIC	Adjusted BIC	RMSEA	SRMR
CFA (20 items)	498.063 **	164	0.942	0.933	19,097.697	19,350.408	19,141.043	0.077	0.056
ESEM (20 items)	326.979 **	116	0.963	0.940	19,022.431	19,458.930	19,097.301	0.073	0.022
CFA (17 items)	315.948 **	113	0.960	0.952	16,191.558	16,409.080	16,228.994	0.073	0.048
ESEM (17 items)	212.325 **	74	0.973	0.950	16,165.936	16,533.515	16,228.984	0.074	0.017

Note. ** $p < 0.01$.

Table 4. Results of Factor Loadings of Confirmatory Factor Analysis (CFA) and Exploratory Structural Equation Modeling (ESEM).

Item	CFA	ESEM			
	FactorLoading	F1	F2	F3	F4
Self-seeking					
S01	0.865	−0.022	−0.035	0.929	−0.012
S02	0.889	0.134	0.049	0.772	0.015
S04	0.879	0.008	0.061	0.807	0.050
Competence Enhancement					
C01	0.819	−0.073	0.017	−0.012	0.889
C02	0.808	0.010	0.004	0.126	0.714
C03	0.767	0.146	−0.049	−0.045	0.682
C04	0.673	0.024	0.151	0.146	0.500
Context Exploration					
E01	0.882	−0.015	0.777	0.179	−0.003
E02	0.963	0.017	0.966	−0.012	0.006
E03	0.974	0.020	0.995	−0.035	−0.003
E04	0.918	0.013	0.905	−0.017	0.053
E05	0.953	−0.017	0.928	0.041	0.006
E06	0.912	−0.012	0.894	0.044	−0.022
Role Matching					
R01	0.462	0.382	−0.057	0.090	0.040
R02	0.651	0.678	0.006	0.024	−0.017
R03	0.747	0.755	0.139	−0.023	0.027
R04	0.711	0.551	0.026	0.236	0.011

Note. Item S03, S05, and R05 were removed in final CFA and ESEM.

Table 5. Descriptive Statistics and Correlation of Factors of Confirmatory Factor Analysis (CFA).

Factor	M	SD	1	2	3	4
Self-seeking	4.56	1.24	-			
Competence Enhancement	4.20	1.18	0.56 **	-		
Context Exploration	3.82	1.86	0.62 **	0.45 **	-	
Role Matching	5.16	0.81	0.61 **	0.46 **	0.27 **	-

Note. ** $p < 0.01$.

4. Discussion

This study confirmed the factor structure of the Perception of Career Development Inventory for Chinese college students. The results supported the conceptual framework that was proposed in the previous study [44]. The PCDC was refined via expert reviews and a pilot study in the development stage. Additionally, it was adjusted using iterative EFA and CFA procedures with the data from a survey. This study evaluated and selected the items from a pool of 29 items via EFA, resulting in four preliminary dimensions and twenty items. Based on CFA and ESEM, this study further confirmed the four-factor structure of the PCDC with 17 items.

The PCDC includes four dimensions, which are self-seeking, competence enhancement, context exploration, and role matching. The dimension of self-seeking is assessed by three items, all of which captured students' cognition on preference and ability concerning professional learning areas and career choice. The dimension of competence enhancement is assessed by four items. These items relate to the confidence in working competence, which derives from higher education experiences. The dimension of context exploration is assessed by six items that denote the degree of familiarity with the specific requirements of the working area. The dimension of role matching is assessed by four items, which examine students' identification of the working roles he/she will undertake in the future.

The four dimensions show the self-construction and social construction elements of a student's perception of career development. Specifically, self-seeking and competence enhancement represents the self-construction attributes of a student's perception of career

development, which reflects the self-clarity relative to career inclinations and confidence in competence deriving from self-concept. Although self-concept is perceived as an interactive outcome of the self and situation, it can be viewed as a collection of self-attributes. [11,51]. Context exploration and role matching show the socially constructed attributes. This is consistent with the internal explanatory logic of some classical career development theories. An individual's career development is always about their social position and his/her circumstances. Parsons [52] emphasized the importance of "industrial investigation" to know the job. Gottfredson [12] concluded that self-concept development is related to compromises regarding gender roles and social values. Krumboltz et al. [53] and Krumboltz [13] incorporated environmental conditions and events into the counseling model, even in a later theoretical modification. The core models of social cognitive career theory place contextual variables as predictors of career development outcomes [23].

The self-construction and social construction elements of the conceptual framework provide theoretical contributions that show similarities in career development perception between the West and China. A possible explanation may be that the indigenous context of China shares marketization characteristics that align with globalization. Graduates need to compete and choose their own career path, which requires self-clarity and knowledge with respect to the world of work.

The other possible theoretical contribution is the unified and comprehensive conceptual framework of career development in the Chinese higher education contexts. As it is different from the diverse constructs in vocational psychology—which were developed in the Western culture—this study attempts to integrate the career development perception of Chinese college students via one construct with multiple dimensions. Additionally, the measurement of the construct is embedded into the education process. This may facilitate a further understanding of the phenomenon of career development in Chinese HEIs, as well as the relationship between higher education teaching and a student's career development.

4.1. Practical Implementation

This study also attempted to provide practical contributions. HEIs and their teaching patterns in China are undergoing transformations. The gross enrollment rate of higher education in China has exceeded 50% in 2019 according to the Ministry of Education, indicating that China has entered the *Universal Higher Education* era [54]. Higher-education scholars and policymakers form a consensus that quality, rather than quantity, becomes the focus of higher education administration. The student's career development may become an essential component of the quality criteria for HEIs. In this regard, the PCDC designed in this study could be implemented at the student, institutional, and policy levels.

The PCDC developed in this study can help college students identify whether they are ready to step into the world of work. The four dimensions of the instrument not only promote the students' understanding of themselves, but also connect students to social circumstances. Moreover, the items have guiding effects, which may lead students to reflect on career development and take further steps to attain career-related experiences. HEIs in China may implement the measurements to monitor the teaching and learning processes. HEIs could use the instrument for evaluating both the process and outcomes of teaching. Teaching activities could also be integrated into student surveys to identify the educational effect on students' career development. From the perspective of policy making, the instrument could offer data foundations, especially when scales are combined with the structural characteristics of students, teaching activities, schools, etc.

4.2. Limitations and Future Research

Despite the theoretical and practical contributions, there were nevertheless limitations in this study. First, the convenience sample in this study resulted in a limited representativeness of the participants. The career chances of college students are differentiated, as the structure of HEIs in China is stratified according to the reputation. Due to the non-probabilistic nature of present participants, the validation of the instrument needs to

be confirmed within broader heterogeneous populations. The sample should be extended in future research to cover students from different types of colleges, learning areas, family backgrounds, demographic characteristics, and other social structure factors.

Second, the relationship between the PCDC and career-related constructs should be examined. The relationship analysis would contribute to the validation of the instrument, which provides convergent validity and discriminant validity evidence. Furthermore, a cross-culture analysis of the instrument that is developed according to different cultural contexts could be performed to compare the key features of the measurements in the Chinese population.

Third, the career development of college students is an ongoing process that takes place during higher education learning. The PCDC was employed at one point in time, which was adequate for the examination of factor structure. However, the investigation of career development patterns should follow the pace of higher education. In future research, longitudinal studies throughout the undergraduate stage and even at the postgraduate level should be considered. The analysis of the career development process in HEI may provide operational improvement implications for teaching.

Moreover, studies with a fusion of social factors, psychological factors, and time series in the Chinese higher education context are expected. A systematic analysis would promote revealing the characteristics and mechanisms of college students' career development.

5. Conclusions

The present study confirmed a four-factor measurement of the perception of career development for Chinese college students. This instrument offers indigenous career development measurement within the Chinese higher education context for research and practice. The measurement of students' perception of career development may contribute to the transformation of HEIs' teaching and the development of employability.

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Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The PCDC and data are available to colleagues upon reasonable request.

Conflicts of Interest: The author declares no conflict of interest.

Appendix A

Table A1. Correlation of factors of Exploratory Factor Analysis (EFA).

Factor	1	2	3	4	5
<i>Three-factor Model (29 items)</i>					
1	-				
2	0.33 *	-			
3	0.59 *	0.39 *	-		
<i>Four-factor Model (29 items)</i>					
1	-				
2	0.47 *	-			
3	0.26 *	0.54 *	-		
4	0.42 *	0.51 *	0.36 *	-	
<i>Five-factor Model (29 items)</i>					
1	-				
2	0.54 *	-			
3	0.47 *	0.29 *	-		
4	0.43 *	0.21 *	0.45 *	-	
5	0.46 *	0.36 *	0.37 *	0.50 *	-

Table A1. Cont.

Factor	1	2	3	4	5
<i>Three-factor Model (20 items)</i>					
1	-				
2	0.55 *	-			
3	0.48 *	0.18	-		
<i>Four-factor Model (20 items)</i>					
1	-				
2	0.21 *	-			
3	0.42 *	0.54 *	-		
4	0.29 *	0.28 *	0.49 *	-	

Note. * $p < 0.05$.

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