

Career education and development scale for secondary and tertiary students in Vietnam

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Abstract

This article reports on the measurement properties of the Vietnamese versions of the Career Education and Development Scale-Senior and the Career Education and Development Scale-Tertiary. The International Labour Organization Vietnam facilitated collection of data from students in high schools ($N = 1463$) and universities ($N = 645$) who completed these new measures along with comparator measures of self-efficacy and career-related beliefs, and expectations. Confirmatory factor analyses revealed an eight-factor model equivalent for high school and university students. Correlations with comparator measures provide evidence of concurrent validity. These new measures of career preparedness support Vietnam's national efforts to advance career development, research, and practice. Future research recommendations focus on testing the measures' properties across different sociocultural factors and gender.

KEYWORDS

career assessment, career development, career education, secondary school students, tertiary students, Vietnam

INTRODUCTION

The United Nations Sustainable Development Goals (SDGs) provide a global policy framework for career development interventions (Robertson, 2021). The SDGs are particularly pertinent to developing nations which may not have access to career development resources which are readily available to citizens of developed nations. The present research pertains to Vietnam, a developing nation

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which aims to use career development for its economic and social advancement (International Labour Organization [ILO], 2021a).

Since the 1980s, the government of Vietnam has partnered with international agencies to advance career development strategies (Trang, 2021). ILO, for example, has made a concerted effort to support career education and development (CED) in Vietnam through its national review (ILO, 2021a) and educational resources, such as *Get Prepared for Career Readiness* (ILO, 2021b). CED learning activities are ordinarily the responsibility of teachers, as there is no formally designated profession of career development practitioner; therefore, a key strategy is to enhance teachers' capacity to deliver CED (Trang, 2021). Building teachers' capacity is essential because the government has stipulated levels of CED implementation from primary through to high school (ILO, 2021a). For example, more than 2000 teachers were trained to offer career learning activities in schools (VVOB, 2015), and ILO Vietnam operated a career training program for teachers and leaders in nonprofit and nongovernment organizations. *Song An Career Development Social Enterprise* (Song An) co-organized four national and international career development conferences which encouraged career practitioners to adopt more professional and ethical approaches to their practice. In cooperation with the Asia Pacific Career Development Association (APCDA), Song An published the initial version of *Vietnam's Competency Framework for Career Practitioners* (APCDA, 2021). Thus, much progress has been made in Vietnam to ensure access to quality career development learning experiences.

However, a report based on a survey of 1600 new graduates exposed significant gaps in the transition from school to employment (Navigos Group, 2018). Thirty-eight percent of those surveyed reported that they had no career orientation, 35% did not know how to look for a job efficiently, and 35% reflected they could not meet the employers' requirements. According to the Employment Report by the General Statistics Office Vietnam (GSO; 2020), the unemployment rate of Vietnamese students who graduated from university was three to four times higher than graduates from colleges and secondary schools, due mainly to a lack of skills, knowledge, and attitudes pertaining to career management. Nguyen et al. (2018) argue that Vietnam's approach to career counseling is outdated and not fit for purpose. Furthermore, Trang's (2021) background report to the ILO review (2021a), states, "it is essential to have an exchange with international career guidance experts to access new career guidance tools" (p. 45).

Within this economic environment demanding an expansion of CED in Vietnam, education leaders, policymakers, career practitioners, academic staff, and student support staff need access to relevant measures of career development constructs to determine students' need for CED, assist individual students to understand their own career development progress, establish the career development profile of students at different education levels, demonstrate the effectiveness of careers work, target and evaluate interventions, and facilitate evidence-based practices (Whiston et al., 2017). There is, however, limited evidence of the use of any locally standardized measures to address these needs in Vietnam's education system. A relatively simple, holistic, economical, and culturally appropriate measure is required by schools and universities to enhance CED programs and activities. The present research meets that need by providing Vietnamese language versions of the Career Education and Development Scales (CEDS; McCowan et al., 2023) for senior high school students (Career Education and Development Scale-Senior Vietnam [CEDS-Senior VN]) and tertiary students (Career Education and Development Scale—Tertiary Vietnamese [CEDS-Tertiary VN]).

The conceptual framework

Marciniak et al. (2022) published a comprehensive review of the constructs *career maturity*, *career readiness*, and *career adaptability* that have been used to understand the career preparedness of adolescents, which they defined as "the attitudes, knowledge, competencies and behaviors necessary

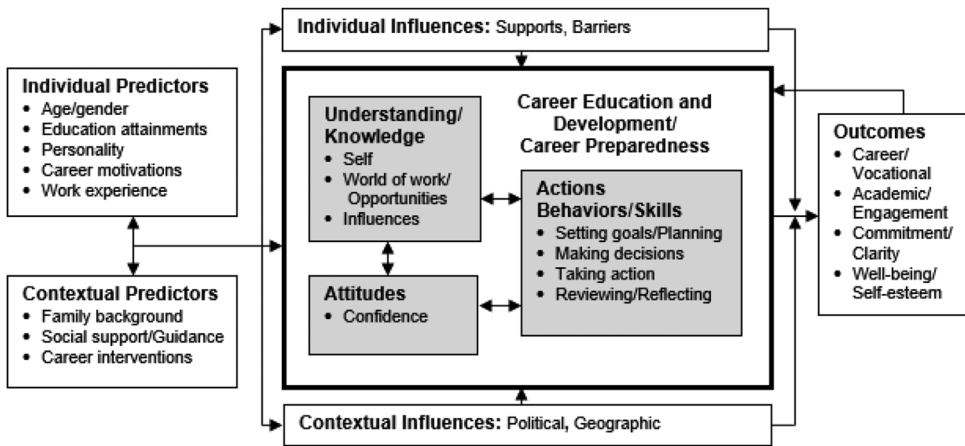


FIGURE 1 Conceptual model for the CEDS. Adapted from McCowan et al. (2023). Copyright 2023 by Authors. Creative Commons noncommercial CC BY-NC.

to deal with expected and unexpected career transitions and changes” (p. 19). Based on their review, Marciniak et al. developed an integrative conceptual framework which builds on extant frameworks (e.g., Lent & Brown, 2006; Rottinghaus & Miller, 2013). The integrative framework consists of individual and contextual predictors, personal proximal and contextual influences, and outcomes. The core components of the career preparedness model created by Marciniak et al. (2022) are *attitudes* (e.g., confidence, self-efficacy), *knowledge and competencies* (e.g., preferred occupation, world of work), and *behaviors* (e.g., self-exploration, environment exploration).

McCowan et al. (2023) adapted the framework of Marciniak et al. (2022) to inform the design of the four versions of the CEDS for use in primary (elementary) school, junior high school, senior high school, and college and university. Figure 1 depicts the adapted framework with eight factors specified within their respective core component. The four versions are appropriate to age and developmental stage, holistic, brief, and useful for individual students, teachers, career practitioners, and institutional administrators. The original eight-factor model was affirmed by confirmatory factor analyses with evidence of concurrent validity in correlations with career-related constructs, and a shorter version was affirmed for students in elementary school (e.g., self-efficacy, vocational outcome expectations; McCowan et al., 2023).

The present research

The purpose of the present research is to appraise the measurement properties of the CEDS-Senior VN and CEDS-Tertiary VN. The original English language versions of the CEDS-Senior and CEDS-Tertiary were made available to the experienced and qualified staff of the career social enterprise, *Song An* in Vietnam and were translated into Vietnamese. These translated versions were checked by Vietnamese teachers, parents, and career practitioners, and pilot-tested by students. No amendments were recommended by the reviewers. The present research question is: Can the original eight-factor model of the CEDS be affirmed in Vietnamese language versions? An affirmative answer would provide initial evidence of cultural validity of the CEDS (Leong & Brown, 1995). We answered the research question via two separate studies collecting data from students in senior high schools (Study 1) and universities (Study 2) across Vietnam.

STUDY 1: CEDS-SENIOR VN

Method

Participants

ILO representatives visited each school, explained the purpose of the study, obtained appropriate ethics clearances, and invited students in the designated grade/year levels to participate in the online survey. Most of the schools involved were relatively large (>1000 students) and Vietnamese was the language of instruction in all of them. The final sample was $N = 1283$ students in Grades 10–12. Unusable responses ($n = 180$) were removed from the initial sample ($N = 1463$) because of missing data. There were $n = 846$ (65.9%) females, $n = 409$ (31.9%) males, and $n = 28$ (2.2%) “other.” Students were in Grade 10 ($n = 458$, 35.7%), Grade 11 ($n = 520$, 40.5%), and Grade 12 ($n = 305$, 23.8%). There were 11 secondary schools and colleges, with $n = 1198$ (93.4%) participants from private schools and $n = 85$ (6.6%) from public schools. Participants were in schools in the northern ($n = 762$, 59.4%), central ($n = 484$, 37.7%), and southern ($n = 37$, 2.9%) regions of Vietnam.

Measures

The Career Education and Development Scale-Senior Vietnam

Table 1 shows the English language items of CEDS-Senior VN. The eight subscales represent the three core components of the Marciniak et al. (2022) model: knowledge/competencies (self, opportunities, influences); attitudes (confidence), and behaviors (goal setting, decision-making, taking action, reflecting/reviewing). Each subscale has three items. Participants respond to a 5-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5). The original studies of two independent samples (McCowan et al., 2023) found Cronbach α coefficients of self (0.77, 0.87), influences (0.62, 0.78), opportunities (0.81, 0.87), goals (0.86, 0.90), decision-making (0.76, 0.86), taking action (0.78, 0.85), reflecting/reviewing (0.78, 0.85), and confidence (0.74, 0.86). Table 2 presents the Cronbach α coefficients found in the present study.

The New General Self-Efficacy Scale

The New General Self-Efficacy Scale (NGSES; Chen et al., 2001) is an eight-item measure of self-efficacy. Participants respond to a 5-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5). Sample items include “In general, I think I can obtain outcomes that are important to me” and “I will be able to achieve most of the goals that I have set for myself.” Higher scores are reflective of higher self-efficacy. Chen et al. (2001) found that the NGSES demonstrated high reliability and high content and predictive validity. For example, the principal components analysis yielded a single-factor solution on three separate occasions, $\alpha = 0.87$, 0.88, and 0.85 respectively. The NGSES was found to be theory based, unidimensional, internally consistent, and stable over time (Chen et al., 2001). Cronbach α coefficients found in the present study are reported in Table 2.

The Vocational Outcomes Expectations-revised form

The revised Vocational Outcomes Expectations scale (VOE; McWhirter et al., 2000, Metheny & McWhirter, 2013) is a 12-item measure of respondents’ perceptions of their ability to accomplish

TABLE 1 CEDS-senior VN items and their standardized factor loadings for Study 1.

Item	Item text	Factor loadings
sel1	I have a good understanding of my interests and how they might relate to future courses or careers	0.77
sel2	I have a good understanding of my personal strengths and abilities	0.75
sel3	I am aware of the subject(s) which I like or do well in, and how it/they might relate to future courses or careers	0.68
inf1	I have a good understanding of my parent's views regarding future courses and careers that might interest me	0.54
inf2	I understand the importance of making course/career decisions which are mine and not influenced by my friends or social media.	0.67
inf3	I understand the importance of making course/career decisions which are mine but are done with help from teachers and parents	0.66
opp1	I have a good understanding of the world or work and future careers options	0.77
opp2	I have a good understanding of the range of subjects/courses which are available for me to study and where they might lead in terms of careers.	0.84
opp3	I have a good understanding of the many different career pathways open to me.	0.75
goal1	I have set myself clear and achievable course/career goals	0.77
goa2	I have developed a career plan for myself	0.83
goa3	My course/career plans contain short, medium, and long-term goals	0.76
dec1	I am good at making sound career/course choices and decisions.	0.72
dec2	I am able to seek detailed course and career information to assist me make good decisions.	0.64
dec3	I usually consider my course/career options carefully before making decisions	0.55
act1	I am able to construct a competitive resume and cover letter.	0.69
act2	I can competently complete job/course/career-related applications.	0.76
act3	I am able to locate appropriate information on entry prerequisites for jobs and/or courses of further study.	0.70
ref1	I review my course/career plans approximately every six months.	0.68
ref2	I regularly check course/career information to see if there are any changes relevant to my course/career planning.	0.80
ref3	I have developed appropriate back-up plans if my first choice doesn't eventuate.	0.69
con1	I know what steps I need to take to progress my course/career planning	0.74
con2	I feel confident that I have a good idea of what course/career direction(s) or pathway(s) I want to take.	0.79
con3	I am confident that I will have successful future.	0.57

Abbreviations: act, taking action; con, confidence; dec, decision-making; goa, goal setting; inf, understanding influences; opp, understanding opportunities; ref, reflecting/reviewing; sel, understanding self.

career aspirations. Participants respond to a 5-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5). Sample items include, "My career planning will lead to a satisfying career for me," "I have control over my career decisions," and "The future looks bright for me." Higher scores are reflective of higher vocational expectations. Evidence of adequate internal consistency, test–retest reliability, and concurrent validity of the measure for high-school samples were reported by McWhirter et al. (2000) and Metheny and McWhirter (2013). For example, test–retest reliability over 9 weeks yielded a coefficient $r = 0.59$ and an $\alpha = 0.83$ and in the subsequent study an $\alpha = 0.93$ was obtained. Table 2 presents the α coefficients found in the present study.

TABLE 2 CEDS senior VN measures' descriptive statistics, alpha reliability coefficients, skewness, kurtosis, standard error, and scale score correlations.

Measure	1	2	3	4	5	6	7	8	9	10
1. SEL	0.78									
2. INF	0.39	0.64								
3 OPP	0.60	0.31	0.83							
4. GOA	0.56	0.29	0.63	0.83						
5. DEC	0.49	0.42	0.53	0.52	0.69					
6. ACT	0.31	0.18	0.44	0.44	0.46	0.76				
7. REF	0.45	0.25	0.51	0.57	0.47	0.49	0.76			
8. CON	0.57	0.36	0.67	0.65	0.59	0.50	0.59	0.73		
9. SE	0.40	0.32	0.44	0.42	0.45	0.42	0.42	0.59	0.90	
10. OE	0.47	0.47	0.46	0.45	0.57	0.37	0.40	0.62	0.64	0.92
<i>M</i>	3.70	4.14	3.37	3.46	3.83	3.32	3.36	3.50	3.68	3.90
<i>SD</i>	0.69	0.57	0.71	0.75	0.60	0.70	0.79	0.68	0.57	0.55
Skewness	-0.28	-0.57	-0.12	-0.29	-0.37	-0.46	-0.46	-0.26	-0.02	-0.30
Kurtosis	0.54	1.01	0.75	0.46	1.12	0.92	0.26	0.51	0.59	1.05

Note: Internal consistency Cronbach coefficient α is on the diagonal. All correlation coefficients are significant $p < 0.01$. Abbreviations: ACT, taking action; CON, confidence; DEC, decision-making; GOA, goal setting; INF, understanding influences; OE, outcomes and expectations; OPP, understanding opportunities; REF, reflecting/reviewing; SE, self-efficacy; SEL, understanding self.

Procedure

The ILO VN staff managed the delivery of the measures to schools and universities and approvals from local schools and parents. Ethical approval came from the Institutional Review Board of the University of the University of Southern Queensland [Approval No: H18REA258]. The CEDS-Senior VN was set up as an online survey within the secure environment of the *Song An* data management system. Administration time was an average of 8 min to complete online. Data analysis was performed with IBM SPSS and AMOS v28, and confirmatory factor analyses used cutoffs recommended by Mvududu and Sink (2013) for χ^2 , Tucker-Lewis index (TLI), comparative fit index (CFI), root-mean-square error of approximation (RMSEA), and standardized root-mean-square residual (SRMR).

Results

Model fit

The eight-factor model of the CEDS Senior VN represented an acceptable fit to the data $\chi^2(224) = 1227.670$, $p = 0.000$, $\chi^2/df = 5.481$, TLI = 0.909, CFI = 0.926, RMSEA = 0.059, CI 90% [0.056, 0.062], SRMR = 0.0463. All paths to the latent factors were also significant ($p < 0.01$) with factor loadings ranging from 0.535 to 0.839. The items' standardized weightings are shown in Table 1. Inspection of modification indices indicated a high coefficient for items 2 and 3 in the decision-making subscale. Correlating their error terms produced a better fitting model $\chi^2(223) = 972.896$, $p = 0.000$, $\chi^2/df = 4.363$, TLI = 0.931, CFI = 0.945, RMSEA = 0.051, CI 90% [0.048, 0.055], SRMR = 0.0421. In summary, the overall model had acceptable fit.

Given that the present study is the first to use the NGSES and VOE in the Vietnamese language, we tested their measurement models too. The initial model for the NGSES produced an unacceptable fit $\chi^2(20) = 295.354$, $p = 0.000$, $\chi^2/df = 14.768$, TLI = 0.924, CFI = 0.945, RMSEA = 0.104,

CI 90% [0.094, 0.114], SRMR = 0.0403. Inspection of modification indices revealed high coefficients among items 3 and 4, 4 and 5, and 7 and 8. Correlating their errors terms produced better fit $\chi^2(17) = 118.226, p = 0.000, \chi^2/df = 6.954, TLI = .967, CFI = .980, RMSEA = .068, CI 90% [.057, .080], SRMR = .0238$. The VOE's initial model was not a close fit, $\chi^2(17) = 684.329, p = 0.000, \chi^2/df = 12.673, TLI = 0.905, CFI = 0.923, RMSEA = 0.095, CI 90% [0.089, 0.102], SRMR = 0.0457$. Correlating error terms for items 11 and 12, 2 and 3, 9 and 11, 5 and 11 based on modification indices produced an acceptable fit $\chi^2(50) = 463.254, p = 0.000, \chi^2/df = 9.265, TLI = 0.933, CFI = 0.949, RMSEA = 0.080, CI 90% [0.074, 0.087], SRMR = 0.0371$. We chose to not amend the measures (e.g., remove items such as item 4 in the NGSES and 11 in the VOE) to ensure this report on their first use in the Vietnamese language was complete and to provide a baseline for future research and applications.

Correlations

The NGSES and VOE correlated with each of the eight components of the revised CEDF with the coefficients ranging from $r = 0.32$ to $r = 0.64$, as shown in Table 2. These correlations with the comparator measure are evidence of concurrent validity of the CEDS-Senior. However, the results related to the two measures used in this study should be viewed with caution as the measures have not been previously validated in a Vietnamese context.

Mean differences across grade and gender

The means scores of the measured variables reveal minimal differences among Grades 10–12 and between males and females. For students in Grade 10, the means for females ranged from 4.13 (influences) to 3.31 (actions) and for males from 4.20 (influences) to 3.34 (actions). For students in Grade 11, the means for females ranged from 4.12 (influences) to 3.23 (actions) and for males from 4.17 (influences) to 3.29 (actions). For students in Grade 12, the means for females ranged from 4.15 (influences) to 3.43 (opportunities) and for males from 4.13 (influences) to 3.47 (reflection).

Multivariate analysis of variance (MANOVA) tests of the differences in means were explored. Given differences in sample sizes for each category, Box's test was applied and found equality of variance-covariance matrices for grade [Box's $M = 92.38, p > 0.05$] and gender [Box's $M = 50.59, p > 0.05$].

Mean differences were significant for grade; however, the effect size was small [Pillai's trace = 0.028, $F(16, 2492) = 2.19, p < 0.05$, partial $\eta^2 = 0.01$]. Levene's test for homogeneity of variance found a significant difference for actions [$F(2, 1252) = 3.93, p < 0.05$] and confidence [$F(2, 1252) = 4.65, p < 0.05$]. Univariate tests found significant mean differences for self [$F(2, 1252) = 5.76, p < 0.05$, partial $\eta^2 = 0.01$]; opportunities [$F(2, 1252) = 6.07, p < 0.05$, partial $\eta^2 = 0.01$]; goals [$F(2, 1252) = 4.00, p < 0.05$, partial $\eta^2 = 0.01$]; decisions [$F(2, 1252) = 5.89, p < 0.05$, partial $\eta^2 = 0.01$]; actions [$F(2, 1252) = 10.07, p < 0.01$, partial $\eta^2 = 0.02$]; reflection [$F(2, 1252) = 3.12, p < 0.05$, partial $\eta^2 = 0.01$]; and confidence [$F(2, 1252) = 6.69, p < 0.01$, partial $\eta^2 = 0.01$]. Nonetheless, the effect sizes were small. There were no significant differences in influences.

The mean differences for gender were significant; however, the effect size was small [Pillai's trace = 0.024, $F(8, 1246) = 3.80, p < 0.05$, partial $\eta^2 = 0.02$]. Levene's test for homogeneity of variance found no significant differences. There were significant differences for self [$F(1, 1253) = 18.77, p < 0.05$, partial $\eta^2 = 0.02$]; opportunities [$F(1, 1253) = 17.45, p < 0.05$, partial $\eta^2 = 0.01$]; goals [$F(1, 1253) = 6.32, p < 0.05$, partial $\eta^2 = 0.01$]; and confidence [$F(1, 1253) = 9.37, p < 0.05$, partial $\eta^2 = 0.01$]. Despite the significant differences, the effect sizes were small. There were no significant differences for influences, decisions, actions, and reflection.

STUDY 2: CEDS-TERTIARY VN

Method

Participants

The universities involved were relatively large (>3000 students), and Vietnamese was the language of instruction. The sample for Study 2 was $N = 645$ students from all year levels in universities and colleges across Vietnam. Eleven responses were excluded because of missing data or response bias; thus, leaving a final sample $N = 634$. The sample included females ($n = 476$, 74.1%), males ($n = 155$, 24.1%), and those who registered as other ($n = 11$, 1.7%). Participation by year level was the first year ($n = 352$; 54.8%), second year ($n = 96$; 15%), third year ($n = 142$; 22.1%), and a mix of final-year students in their fourth ($n = 47$; 7.3%) and fifth years ($n = 5$; .8%). Participants came from private ($n = 241$, 37.5%) in North Vietnam and public ($n = 401$, 62.5%) universities in South Vietnam.

Measures

The Career Education and Development Scale—Tertiary Vietnamese

The CEDS-Tertiary VN is like the CEDS-Senior VN and has three items per subscale. Participants respond to a 5-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5). However, the wording of nine items was changed to reflect the more advanced stage of career development of university and college students. For example, item 2 in CEDS Senior VN “I have a good understanding of my personal strengths and abilities” is in CEDS Tertiary VN “I understand that I need to develop my graduate attributes to make me more attractive to future employers.” (See Table 3 for the English version of CEDS-Tertiary VN together with the standardized factor loadings for each item.) Like Study 1, NGSES (Chen et al., 2001) was used as the measure of self-efficacy. Cronbach α coefficients of internal consistency found in the present study are reported in Table 4.

The career futures inventory short form

The nine-item short-form (CFI-9; McIlveen et al., 2013) of the Career Futures Inventory (CFI; Rottinghaus et al., 2005) was used to explore possible career planning attitudes. The CFI-9 measures career adaptability (CA), career optimism (CO), and perceived knowledge (PK). It was also designed to be a diagnostic screening tool for career counseling and educational interventions. Participants respond to a 5-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5). The original CFI-9 had a good fit to the data collected from university students $\chi^2 = 50.80(24)$ $p < 0.001$; CFI = 0.993; RSMEA = 0.038; and it had internal consistency coefficients of $\alpha = 0.82$ for CA, $\alpha = 0.84$ for CO, and $\alpha = 0.86$ for PK. Cronbach α coefficients found in the present study are reported in Table 4.

Procedure

Study 2 followed a similar procedure to Study 1. The ILO VN took responsibility for data collection and local ethics approvals (ILO, 2021). Overall ethical approval for the research was granted by the University of Southern Queensland [Approval No: H18REA258]. The survey took on average 8 min to complete online.

TABLE 3 CEDS-tertiary VN items and their standardized factor loadings.

Item	Item text	Factor loading
sel1	I have a good understanding of my personal strengths and attributes, and how they might relate to future careers or further study options.	0.79
sel2	I understand that I need to develop my graduate attributes in order to make me more attractive to future employers	0.77
sel3	I can communicate strong evidence of my interests, skills, and attributes to future employers	0.77
inf1	I understand the importance of making course/career decisions which are mine and not influenced by my friends and/or social media.	0.79
inf2	I understand that access to career opportunities could depend on a range of circumstances like government policies or specific locations, or growth industries	0.74
inf3	I am able to manage the expectations of significant others on my career/course choices & direction	0.67
opp1	I have a good understanding of the world or work and future careers options within it	0.81
opp2	I have a good understanding of the range of units/subjects/courses/programs which are available for me to choose and where they might lead in terms of careers	0.84
opp3	I have a good understanding of many different career pathways open to me.	0.84
goal1	I have set myself clear and achievable career/ course goals	0.86
goa2	I have developed a career plan for myself	0.84
goa3	My course/career plans contain short, medium, and long-term goals	0.82
dec1	I am good at making sound career/course choices and decisions	0.81
dec2	I am able to seek detailed course and career information to assist me make good decisions	0.82
dec3	I usually consider my career/course options carefully before making decisions	0.82
act1	I can competently complete job/course/career-related applications.	0.78
act2	I am confident I will perform well at job/career-related interviews	0.84
act3	I am strong at professional networking	0.81
ref1	I review my course/career plans often	0.76
ref2	I regularly check course/career information to see if there are any changes relevant to my course/career planning	0.84
ref3	I have developed appropriate back-up plans if my first choice(s) don't eventuate	0.77
con1	I feel confident that I have a good idea of what career/course direction(s) or pathways I want to take	0.85
con2	I am confident I will get appropriate employment/further study opportunities upon graduation	0.85
con3	I am confident I will have a successful future	0.73

Abbreviations: act, taking action; con = confidence; dec, decision-making; goa, goal setting; inf, understanding influences; opp, understanding opportunities; ref, reflecting/reviewing; sel, understanding self.

Results

Model

The eight-factor model of the CEDS Tertiary VN had a good fit to the data $\chi^2(224, N = 642) = 729.304, p = 0.000, \chi^2/df = 3.256, TLI = 0.942, CFI = 0.953, RMSEA = 0.059, CI 90\% [0.055, 0.064], SRMR = 0.039$. All paths to the latent variables were also significant ($p < 0.01$) with factor loadings ranging from 0.67 to 0.86. Items and loadings are shown in Table 3.

TABLE 4 CEDS- tertiary VN measures' descriptive statistics, alpha reliability coefficients, skewness, kurtosis, standard error, and scale score correlations.

Measure	1	2	3	4	5	6	7	8	9	10	11	12
1. SEL	0.82											
2. INF	0.71	0.77										
3. OPP	0.66	0.62	0.87									
4. GOA	0.63	0.59	0.73	0.88								
5. DEC	0.69	0.71	0.70	0.71	0.86							
6. ACT	0.56	0.53	0.63	0.58	0.57	0.85						
7. REF	0.58	0.58	0.64	0.70	0.67	0.64	0.83					
8. CON	0.61	0.59	0.71	0.70	0.69	0.70	0.72	0.85				
9. SE	0.59	0.63	0.61	0.64	0.66	0.68	0.70	0.74	0.95			
10. CA	0.56	0.61	0.57	0.57	0.64	0.61	0.64	0.67	0.79	0.92		
11. CO	0.58	0.60	0.61	0.62	0.67	0.54	0.65	0.67	0.72	0.73	0.92	
12. PK	0.50	0.54	0.60	0.55	0.54	0.63	0.56	0.61	0.64	0.58	0.56	0.67
<i>M</i>	3.77	3.76	3.48	3.67	3.77	3.31	3.70	3.59	3.66	3.82	3.86	3.35
<i>SD</i>	0.74	0.74	0.74	0.74	0.72	0.73	0.73	0.73	0.70	0.75	0.81	0.65
Skewness	-1.17	-1.22	-0.78	-1.07	-1.42	-0.39	-1.09	-0.89	-1.08	-1.41	-1.18	-0.53
Kurtosis	3.14	3.21	1.95	2.48	4.07	1.40	2.53	2.29	3.36	3.94	2.47	2.93

Note: Internal consistency Cronbach coefficient α is on the diagonal. All correlation coefficients are significant $p < 0.01$. Abbreviations: ACT, taking action; CA, career adaptability; CO, career optimism; CON, confidence; DEC, decision-making; GOA, goal setting; INF, understanding influences; OPP, understanding opportunities; PK, perceived knowledge; REF, reflecting/reviewing; SE, self-efficacy; SEL, understanding self.

Like Study 1, we tested the measurement models for the NGSES and CFI-9 because this is the first to explore their properties in the Vietnamese language. The initial model for the NGSES produced an equivocal fit on some indicators, $\chi^2(20) = 212.789$, $p = 0.000$, $\chi^2/df = 10.639$, TLI = 0.941, CFI = 0.958, RMSEA = 0.123, CI 90% [0.108, 0.138], SRMR = 0.0275. Inspection of modification indices revealed high coefficients for the same items in Study 1: 3 and 4, 4 and 5, and 7 and 8. Correlating their errors terms produced an acceptable fit, $\chi^2(17) = 82.783$, $p = 0.000$, $\chi^2/df = 4.870$, TLI = 0.976, CFI = 0.986, RMSEA = 0.078, CI 90% [0.061, 0.095], SRMR = 0.0168. The CFI-9 model had acceptable fit to the data, $\chi^2(24) = 89.469$, $p = 0.000$, $\chi^2/df = 3.728$, TLI = 0.977, CFI = 0.985, RMSEA = 0.065, CI 90% [0.051, 0.080], and SRMR = 0.0349.

Correlations

As shown in Table 4, CFI-9 subscales correlated strongly with the eight factors of the CEDS with the coefficients ranging from $r = 0.50$ to $r = 0.67$. The NGCES also correlated with all eight subcomponents. Ranging from $r = 0.59$ to $r = 0.70$. These correlations with comparators measures are additional evidence of validity of the CEDS-Tertiary. Like Study 2, the results related to the comparator measures used in this study should be viewed with caution as the measures have not been previously validated in a Vietnamese context.

Mean differences across year-level and gender

Differences between the mean scores for students' year of enrolment (first to final) and their gender were examined. For students in the first year, the means scores for females ranged from 3.80

(decisions) to 3.32 (actions), and for males from 3.84 (self) to 3.41 (actions). For students in middle years, the mean scores for females ranged from 3.83 (decisions) to 3.18 (actions) and for males from 3.75 (goals) to 3.21 (actions). For students in the final year, the mean scores for females ranged from 3.81 (influences) to 3.36 (actions) and for males from 3.89 (influences) to 3.11 (action).

Given differences in sample sizes for each category, Box's test was applied and found unequal variance-covariance matrices for year-level [Box's $M = 225.54$, $p < 0.05$] and gender [Box's $M = 73.08$, $p < 0.05$]. Therefore, we used Bartlett's test of sphericity to ensure the data were amenable to further analyses. Bartlett's tests were acceptable for year-level [$\chi^2 = 3766.37$, $p < 0.05$] and gender [$\chi^2 = 3794.95$, $p < 0.05$].

Mean differences for year level were not significantly different, and Levene's test for homogeneity of variance was nonsignificant for all subscales. Univariate tests found no significant mean differences for all the subscales except confidence where the means were significantly different [$F(4, 626) = 2.53$, $p < 0.05$, partial $\eta^2 = 0.02$].

Mean differences for gender were significantly different [Pillai's trace = 0.025, $F(8, 622) = 1.97$, $p < 0.05$, partial $\eta^2 = 0.03$]. Levene's test for homogeneity of variance was nonsignificant for all subscales except decisions [$F(1, 629) = 4.06$, $p < 0.05$]. Univariate tests found no significant mean differences for all subscales.

DISCUSSION

The present research affirmatively answered the research question, "Can the original eight-factor model of the CEDS be affirmed in Vietnamese language versions?" via separate studies which administered the CEDS-Senior VN and the CEDS-Tertiary VN in samples of high school and university students. Both studies found an eight-factor model consistent with the original measure (McCowan et al., 2023) that was based on the conceptual framework of Marciniak et al. (2022). The majority of CEDS subscale mean scores were relatively consistent across year levels and gender. Both studies revealed correlations among the CEDS subscales and comparator measures of self-efficacy and vocational expectations and beliefs.

Nguyen et al. (2018) argue that career counseling practices should be culturally relevant to Vietnam. Leong and Brown (1995) differentiate cultural validity and cultural specificity of career development theories and models. The present findings are initial evidence of the CEDS and their conceptual framework's cultural validity (i.e., its transfer from an English language version to a Vietnamese language version). However, there is a need to provide evidence of cultural specificity whereby local, nuanced approaches to the conceptual framework and the CEDS generate new perspectives for their applications and modifications.

Trang's (2021) review calls for collaboration among career counselors to share knowledge about career assessment tools. Having Vietnamese versions of the CEDS available to practitioners enhances the range of resources available to practitioners. Their application and critique of this new assessment resource may lead to enhancements in its cultural specificity.

Implications for practice

The brevity and holistic nature of the Vietnamese versions of CEDS mean that they can be used for different purposes: as self-assessment tools for individual students' career explorations in counseling; as formative assessment tools to inform students' career learning; and as pre- and postmeasures of career interventions to evaluate their impact and outcomes (cf. Whiston, et al., 2017). The CEDS may also be a basis for learning and/or discussion with parents and teachers, parents are afforded an opportunity to learn about models of career decision-making to complement traditional parent-oriented decision-making on behalf of their children (ILO, 2021a; Trang, 2021). Nguyen et al. (2018)

challenged the cross-cultural utility of psychometric measures originating from Western theories and applied them to Vietnam without due regard to the local context. Following the recommendations of Nguyen et al. (2018), there is scope to combine the CEDS with narrative counseling to enhance contextualization to local cultural norms and practices.

Limitations

The findings should be treated with caution due to a few limitations. First, the two studies were conducted at a time when COVID-19 had a high presence in Vietnam. There is no way to account for how the pandemic influenced data collection. Future data collection would enable comparison of the measurement models before and after the pandemic's impact on Vietnam's education systems. The data are self-reported, collected online voluntarily, and some participants did not complete the survey or adopted a response-biased approach to completion. Thus, the findings are susceptible to self-report bias (e.g., where participants over- or under-estimate their career understandings, behaviors, and attitudes; Donaldson & Grant-Vallon, 2002). Dyadic or 360-degree data collection methodology, which compares the self-reports with other relevant data and personal observations, would address this concern. Nonetheless, the present samples are sufficient in size to eliminate missing and biased data. Although data were collected from a range of institutions in different locations, no socioeconomic data were collected. Thus, we are unable to discern whether the CEDS factors' mean scores varied across levels of socioeconomic status.

Future research

The present studies could be used as the baseline for future studies using Vietnamese CEDS in different samples of institutions in different locations, and to find evidence of the impact of socioeconomic status and/or ethnicity on student responses (Choi et al., 2012). Also, longitudinal studies connecting course/career outcomes as a criterion would provide evidence of predictive validity (Sikora, 2020). Research could also investigate any difference between the responses from students who had participated in career programs and those who have not. Although the effect sizes are small, the significant differences in some subscales for gender warrant further investigation (Casale, 2020; Bleidorn et al., 2016).

CONCLUSION

Vietnam's high schools and universities need contemporary resources to implement their nation's plans for CED. The findings of our research partially meet that need by providing two new psychometric measures based on contemporary research and theory: the CEDS-Senior VN and CEDS-Tertiary VN. These tools will be valuable for career development of practitioners, teachers, and administrators who are responsible for the implementation and evaluation of CED learning in Vietnam.

DATA AVAILABILITY STATEMENT

Vietnamese language versions of the CEDS and the data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

This research was approved by the Human Research Ethics Committee of the University of Southern Queensland, Australia.

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