A Construct Validation Study of the Career Well-Being Scale for Vocational School Students using Confirmatory Factor Analysis

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Abstract: This study focuses on the concept and measurement of career well-being as part of the early detection for career planning preparation among vocational high school (VHS) students. The aim is to assist students in fostering optimal career development, ultimately reducing the risk of anxiety and stress that could interfere with their future careers. This research employs a quantitative scale study, with a measurement tool that has been adapted and translated into Indonesian. The respondents in this study (N = 201) are students of Vocational High School 1 Bantaeng, who are currently enrolled in their educational program. Data collection was conducted using the Career Well-Being Scale (CWS), developed by Coetzee et al. (2021), which aims to assess career well-being in career choice, consisting of 14 items across three dimensions. The data analysis employed descriptive statistics and Confirmatory Factor Analysis (CFA), conducted using the JASP statistical software. Based on the results, the Career Well-Being Scale demonstrated excellent consistency in measuring the construct among VHS students. This instrument has proven to be reliable for providing stable and valid measurements, with items that mutually support each other in depicting the dimensions of career well-being.

Keywords: development of the scale, career well-being; scale validation, students.

▪ **INTRODUCTION**

Recent studies indicate that vocational high school (VHS) graduates face significant challenges regarding career certainty after graduation (Naru & Muslikah, 2016). Data shows that VHS contributes the largest number of unemployed individuals among the working-age population, with approximately 1,780,095 people unemployed (Alfatih, 2024). The intense competition in the labor market and limited job absorption by companies are the main factors that hinder the career development of VHS graduates (Sawaliyah, 2022). As a result, many graduates choose to continue their studies at university rather than compete for job opportunities (Mentari & Irafahmi, 2022).

Furthermore, although some VHS graduates have successfully secured employment, many often feel that they lack career well-being. One of the main reasons for this is the mismatch between the study program they pursued in school and the job they are doing (Pratiwi, Purnamasari, & Prasetyo, 2021). Previous research has revealed that an individual's success, well-being, and career development are strongly influenced by their interests and skills. The mismatch between the skills they possess and the demands of the job can lead to stress, depression, and anxiety, which negatively affect their career well-being (Luo, 1999). Therefore, it is important to measure the career well-being of students during their school years to provide an overview of their readiness to enter the workforce in the future (Potgieter, Coetzee, & Ferreira, 2021).

Studies also suggest that the level of career preparedness individuals have today is closely related to their future career well-being. Career well-being not only influences

psychological aspects but also social-emotional aspects, which in turn impact long-term satisfaction in their career planning and development. With proper career planning, individuals tend to feel more satisfied and develop positively in their careers (Mohammed, Kumar, & Padakannaya, 2021; Potgieter et al., 2021).

Following recent literature, career well-being is a multi-dimensional concept: emotional satisfaction with the choice of career, perceived meaningfulness in career paths, and the availability of social support. While these dimensions have been addressed with working adults, they have as yet not been discussed with younger populations, especially VHS students who are still choosing their future careers. This study, therefore, fills a critical research gap by focusing on this demographic and informs the development of tailored interventions to address these unique challenges among VHS students in workforce preparation.

Although the measurement of career well-being has been widely discussed in the context of employees and professional workers, studies focusing on career well-being during school years, particularly among VHS students, remain limited (Engelbrecht, 2019; Lee & Flores, 2019; Steiner & Spurk, 2019). Therefore, this study aims to develop a career well-being measurement scale for pre-career students, which can provide an early indication of their career readiness. Measuring satisfaction with the program they choose in VHS becomes an important indicator in assessing their future career well-being. As a reference, (Coetzee, Ferreira, & Potgieter, 2021) mengembangkan Career Satisfaction and Well-Being Scale (CSW), developed the Career Satisfaction and Well-Being Scale (CSW), which has been shown to have a consistent factor structure and can be applied as a measurement tool in career development for VHS students.

This is also a novel research in terms of adapting the Career Well-Being Scale to Indonesian culture and the educational context. The validation of these principles of the psychological scale through the adaptation process ensures that this instrument is culturally relevant for Indonesian vocational high school students in terms of career well-being measurement. Up to now, few studies have investigated the role of cultural and contextual nuances on career decision-making and well-being among non-Western populations. By addressing this gap, the present study provides the much-needed insights into career readiness among VHS students in Indonesia and sets a base for further comparative studies across diverse cultural settings.

This study focuses on the concept and measurement of career well-being as part of the early detection for career planning preparation among VHS students. By measuring career readiness from an early stage, particularly through the selection of programs that align with their future career prospects, this research is expected to provide recommendations for educators, academics, and other professionals. The goal is to assist students in fostering optimal career development, which ultimately can reduce the risk of anxiety and stress that may affect their future careers.

▪ METHOD
Participant

The population for this study consists of vocational high school (VHS) students in Bantaeng Regency, South Sulawesi Province, Indonesia. A simple random sampling technique was used to select the sample, with respondents chosen based on specific criteria set by the researchers. The sample for this study includes 201 students (N = 201) from Vocational High School 1 Bantaeng, all of whom are currently enrolled in their educational program.

Research Design & Procedures

This study employs a quantitative scale design, with the measurement tool adapted and translated into Indonesian using the standards proposed by Fenn, Tan, & George (2020) Their methodology aims to develop, validate, and translate psychological tests, which are then analyzed using Confirmatory Factor Analysis (CFA) techniques. This process results in a comprehensive scale framework for the social sciences and educational fields. It begins by identifying some fundamental theoretical frameworks and previous studies from which the construct of well-being in careers draws, specifically the dimensions by Coetzee et al. (2021). Theoretically undergirded, this is therefore followed by the adaptation and translation process of the CWS into Bahasa Indonesia. After the adaptation of the instrument, a pilot study was initially done to establish its reliability and the cultural relevance of its aspects.

Results from this stage thus called for some word adjustments, so that the language used was appropriate for the intended population. Consultations during this stage involved experts in guidance and counseling, vocational education, and psychometric analysis to improve the validity of the scale content with respect to educational and cultural relevance to Indonesian VHS students. This was done to reduce the level of external variables that might influence the response. The respondents were selected using a random sampling method. A total of 201 VHS students from the defined population in Bantaeng Regency, South Sulawesi, were included in the sample. The criteria for respondents included those who had been actively registered in the vocational program and would be willing to participate voluntarily.

The collection was done in a systematic manner: the students were to complete the instrument CWS, while on hand to facilitate were trained facilitators. These were previously briefed on ensuring consistency in the process and eliminating any possible misunderstanding in regards to the items of the questionnaires. Ethical considerations were strictly observed throughout the process. Clear information regarding the purpose of the study, the procedures, and their rights as respondents regarding confidentiality and the right to withdraw from the study at any time without consequences was provided. Informed consent in writing was obtained both from the students and their guardians due to the minority age of the participants. Data analysis started with descriptive statistical methods to scan the general pattern of response and anomalies. This was followed by Confirmatory Factor Analysis, using JASP statistical software to validate the construct of the CWS within the sample. CFA was thus employed to test the three hypothesized dimensions of the scale, namely positive affective career planning, meaningfulness in career, and career networks/social support. Model fit indices include the following: RMSEA, CFI, and TLI for the assessment of the validity and internal consistency of the scale. Finally, findings were interpreted cautiously with consideration of the local context and their implications for career counseling practices. This study purports to contribute to the pool of practical tools available to educators and career counselors in facilitating optimal career development and readiness among VHS students.

Instrument

The Career Well-Being Scale (CWS), developed by (Coetzee et al., 2021) is designed to measure an individual's career well-being through three key dimensions: positive affective career (6 items), meaningfulness in career (4 items), and career networks/social support (4 items). In total, the CWS consists of 14 items across these

three indicators. Respondents are asked to rate the items using a five-point Likert scale.. Coetzee et al. (2021) conducted validity tests using Exploratory Factor Analysis (EFA) and found that the three-dimensional structure of the scale and its reliability components yielded high scores. Therefore, this study aims to further test whether this scale can be adapted for use in Indonesia.

Data Analysis

Data analysis in this study involves both descriptive statistics and Confirmatory Factor Analysis (CFA), which will be conducted using JASP version 18.3. The results from the scale test are interpreted with a 95% confidence level. This analysis, using the JASP statistical software, tests the hypothesized three-dimensional structure of the scale with positive affective career planning, meaningfulness in career, and career networks/social support. Multivariate normality and sample size sufficiency had been checked on the data before conducting CFA. The analysis was also strong in terms of the assessment of model fit, considering that the sample size was 201, consistent with established guidelines with regard to CFA.

The model fit was evaluated with a variety of standard indices now commonly accepted in CFA, including the Root Mean Square Error of Approximation (RMSEA), for which values below 0.08 indicate a reasonable fit and values below 0.05 suggest a close fit. The CFI and TLI were also calculated, where values greater than 0.90 are considered acceptable and values greater than 0.95 are indicative of a well-fitting model. GFI was also reported, with the threshold for acceptability set at 0.90, and the SRMR, where values less than 0.08 indicate an acceptable fit.

The Chi-square to degrees of freedom ratio was checked (χ^2/df); the cut-off for good fit is less than 3, though up to 5 may be acceptable depending on model complexity and sample size. Further estimation of reliability by Cronbach's alpha and McDonald's omega coefficients assured that all dimensions had internal consistency, with values above the threshold of 0.70. The item-total correlations were then analyzed to confirm that every item makes a meaningful contribution to its respective dimension. Items with low correlations were flagged for possible revision or removal in order to enhance the overall reliability of the scale. Finally, the analyses involved checking the factor loading to ensure that each item falls significantly onto its intended factor and, if possible, with a standardized loading above 0.50. Items failing these criteria were critically evaluated for both their conceptual relevance and any statistical contribution to the scale. These analyses were interpreted in the context of vocational education and showed how CWS might be useful to provide an indication of career well-being among students. In light of these rigorous procedures, this study established the adapted CWS as valid and reliable for use within an Indonesian context, therefore providing a robust tool for further research and practice.

▪ **RESULT AND DISCUSSION**

The Career Well-Being Scale (CWS) is designed to measure career well-being in vocational high school (VHS) students through three key dimensions: Positive Affective Career Planning, which assesses students' motivation and emotional connection to their chosen field of study; Meaningfulness in Career, which evaluates how students perceive their chosen career path as meaningful and aligned with their life goals; and Career Networks/Social Support, which measures the level of support students receive from their social networks in achieving their career goals.

Table 1. Blueprint of career well-being scale (CWS)

Indicator	Statement
Positive Affective Career Planning Condition	I feel supported in achieving my career goals through the program I have chosen.
	I have the resources needed to achieve my career goals in the future.
	I am satisfied with the progress and growth in the career path I have chosen.
	I feel positive about the interest/field of study I have chosen.
	I always feel that I am making progress toward achieving my chosen career goals.
Meaningfulness in Career Condition	The program I have chosen is interesting and excites me.
	I feel that what I am doing in the program I have chosen is valuable and meaningful.
	The program I have chosen will contribute to a greater life purpose.
	The interest/field of study I have chosen is the result of my personal choice.
Career Networks / Social Support Condition	I receive support from others when I need it.
	I find it easy to contact others for help and support in achieving my chosen career goals.
	I have relationships with people who support me in the program I have chosen.
	I have a community network/feedback that helps me stay connected to my personal abilities and the field I can develop.

Table 2. Test reliability

	If item dropped		
Item	McDonald's ω	Cronbach's α	Item-rest correlation
PAC_1	0.886	0.887	0.649
PAC _2	0.894	0.895	0.461
PAC _3	0.884	0.886	0.678
PAC _4	0.887	0.889	0.611
PAC _5	0.884	0.885	0.697
PAC _6	0.885	0.885	0.712
MCC_1	0.887	0.889	0.612
MCC_2	0.883	0.884	0.715
MCC_3	0.885	0.885	0.701
MCC_4	0.893	0.894	0.520
CN_1	0.900	0.900	0.363
CN_2	0.897	0.897	0.433
CN_3	0.892	0.892	0.526
CN_4	0.887	0.888	0.633

The reliability test results indicate that the instrument for measuring career well-being in vocational high school (VHS) students has very good internal consistency, with McDonald's omega (ω) and Cronbach's alpha (α) values above 0.80, as well as generally high item-rest correlations. This suggests that the scale is reliable for providing stable measurements. However, the item CN_1 has a lower item-rest correlation (0.363), which indicates a lack of significant contribution from this item to the total score.

Despite this, the overall reliability remains strong, and the removal of item CN_1 may be considered to improve the scale's consistency. Such a decision should take into account the relevance of the item to the construct being measured. Overall, this instrument demonstrates good reliability and can be used in further research on career well-being among VHS students.

Tabel 3. Confirmatory factor analysis (CFA)

Instrument	N	Reliability Test		Validity Test				
		Cronbach's	McDonald's	RMSEA	GFI	CMIN/DF	CFI	TLI
CWB Scale		0.896	0.897	0.071	0.992	1.988 /44*	0.995	0.994
Positive Affective Career Planning Condition		0.834	0. 834					
Meaningfulnes s in Career Condition	201	0.787	0.788					
Career Networks / Social Support Condition		0.760	0.767					

Overall, the constructs in the results of the Confirmatory Factor Analysis (CFA) shown in the table above have achieved reliability and validity test scores that categorize the model as reliable and a good fit (fit model). First, the McDonald's value was measured at 0.896, and Cronbach's alpha at 0.897. The reliability of each dimension was then assessed, showing that the Positive Affective Career Planning condition had McDonald's and Cronbach's alpha values of 0.834. The Meaningfulness in Career condition showed McDonald's at 0.787 and Cronbach's alpha at 0.788, while the Career Networks/Social Support condition showed McDonald's at 0.760 and Cronbach's alpha at 0.767. These results indicate that the Career Well-Being Scale (CWB) is reliable, as both McDonald's omega and Cronbach's alpha are greater than 0.60.

Subsequently, the validity test results were obtained, showing an RMSEA value of 0.071. The CMIN/DF value was 1.988/44, with a significance level of $0.01 < 2.0$, indicating that the model is acceptable. Furthermore, the GFI value was 0.992, CFI value was 0.995, and TLI value was 0.994, all of which are close to fit model values. Therefore, it can be concluded that the CWB scale is valid.
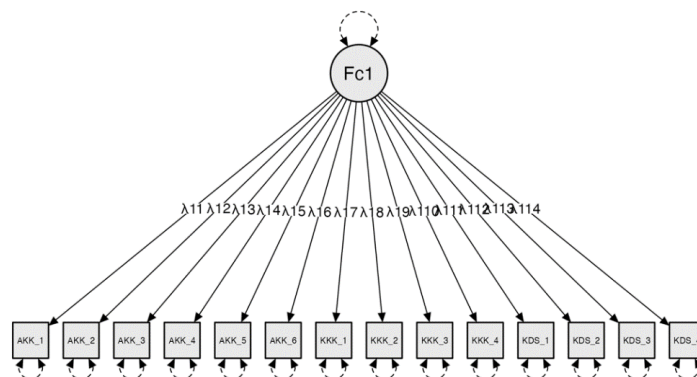
Figure 1. Model plot

The findings of this study provide support for the construct validity of the Career Well-Being Scale (CWS) as a standard measure for assessing individual career well-being in the study sample. The results offer evidence of the multidimensional nature of the three factors, with the CWB scale consistently achieving higher validity scores, including internal reliability tests for each scale item showing high scores. Thus, researchers can use this measurement to obtain total scores, complemented by subscale scores that explain the overall construct of career well-being in students. The CWB scale is a useful tool for career development and preparation, aiming to optimize individual career readiness. Each of the three CWB aspects provides a specific assessment related to the psychological, social, and emotional conditions associated with career preparation, which will foster the career well-being of vocational high school (VHS) students in the future.

In line with the research findings of Coetzee et al. (2021) and Potgieter et al. (2021), individual career well-being can be measured using the CWB scale, which reveals areas that need improvement in career preparation and self-managed career development efforts. School counselors can certainly use this scale as a tool or inventory to measure the general career development of students, especially in situations where students need effective strategies to help them build career self-efficacy in finding suitable jobs and work opportunities (Allan, Rolniak, & Bouchard, 2020; Xu, Zhang, Cui, Hu, & Yu, 2023).

The findings of this study demonstrate that the Career Well-Being Scale (CWS) adapted for vocational high school students in Indonesia is both reliable and valid, as evidenced by robust internal consistency and strong construct validity (Brown, 2015; Hair et al., 2019). Confirmatory Factor Analysis (CFA) results indicate that the three-dimensional structure of the scale—comprising positive affective career planning, meaningfulness in career, and career networks/social support—adequately represents the concept of career well-being (Hu & Bentler, 1999). The reliability coefficients, including Cronbach's alpha and McDonald's omega, surpass the generally accepted thresholds, suggesting that the scale items are consistent and contribute significantly to their respective dimensions (Kline, 2016).

The implications of these findings for the field of education are substantial. By providing an empirically validated tool for measuring career well-being, this study offers educators and counselors a reliable mechanism to assess and support students' career readiness during a critical stage of their educational journey (Savickas, 2013). The early detection of challenges related to career planning, satisfaction, and support networks enables targeted interventions to address gaps and enhance students' preparedness for the workforce. This is particularly valuable in vocational education settings, where alignment between educational programs and labor market demands is essential for successful student outcomes (OECD, 2020).

The results highlight the importance of fostering positive affective career planning in vocational high schools. When students perceive their career choices as aligned with their interests and skills, they are more likely to experience motivation, satisfaction, and a sense of progress in their educational and career paths (Lent & Brown, 2013). Similarly, the meaningfulness of career choices emerged as a critical dimension, underscoring the need for vocational programs to cultivate a sense of purpose and alignment with students' long-term goals (Steger et al., 2012). The dimension of career networks and social support further emphasizes the role of community, peers, and mentors in shaping students' career trajectories (Parker et al., 2019).

In the context of Indonesian vocational education, the validated scale offers opportunities to assess how well current programs address students' career well-being. Educators can use the CWS to identify areas requiring improvement, such as enhancing career counseling services, strengthening the alignment of vocational curricula with industry needs, and fostering supportive networks within schools (Watts, 2015). The insights gained from such assessments can inform policy development and the design of programs that better prepare students for the challenges of the modern labor market.

▪ **CONCLUSION**

Based on the research findings, the Career Well-Being Scale adapted from Coetzee (2020) demonstrates excellent consistency in measuring the construct among vocational high school (VHS) students. This instrument has proven to be reliable in providing stable and valid measurements, with the items supporting each other in describing the dimensions of career well-being. Overall, this scale is effective for further research and has the potential to provide relevant insights into the career well-being of VHS students. As a recommendation, although this instrument has shown good reliability, further development could be carried out by considering the local context and specific characteristics of VHS students, so that the scale becomes more adaptive and inclusive of dimensions that are relevant to their conditions. Additionally, it is important to continue monitoring and testing the validity of this scale in broader populations to improve measurement accuracy across various educational contexts.

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