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# Development and Validation of a Psychological Well-Being Scale for EFL Learners in Vocational Education

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***Abstract***

*Existing psychological well-being instruments are largely Western and post-secondary in orientation, leaving a gap for a psychometrically sound, context-sensitive tool for English as a Foreign Language (EFL) students in Indonesian vocational education. This study developed and validated the EFL Psychological Well-Being Scale (EFL-PWBS), a 12-item self-report instrument adapted from Ryff's six-dimensional eudaimonic framework to reflect vocational EFL learners' experience of AI-assisted language learning. Items were reviewed by expert judges for content and face validity, then administered to 120 second-semester vocational EFL students at an Indonesian polytechnic and analyzed using Confirmatory Factor Analysis (CFA) in JASP. Two items (PWB3, PWB7) were removed during model re-specification due to low loadings and high modification indices. The re-specified 10-item, single-factor model showed good fit (CFI = .939; TLI = .909; SRMR = .063; RMSEA = .081), high internal consistency (Cronbach's alpha = .917; McDonald's omega = .935), and acceptable convergent validity (AVE = .591; standardized loadings .700–.850). These results confirm the EFL-PWBS as a reliable and valid instrument for measuring psychological well-being among vocational EFL learners. Vocational English educators, researchers, and policymakers are encouraged to adopt the EFL-PWBS to monitor and support students' psychological well-being in technology-enhanced language learning environments.*

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**Keywords: Confirmatory Factor Analysis; EFL Instrument Validation; Indonesian Vocational Education; Psychological Well-Being; Ryff's Eudaimonic Model**

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## INTRODUCTION

The increasing interest in Positive Psychology in Second Language Acquisition (SLA) has shifted scholarly attention toward the emotional and psychological aspects of language learning, rather than treating psychological well-being (PWB) merely as a secondary factor. PWB is now increasingly recognized as an important dimension of learner development. The construct of PWB is grounded in Ryff's eudaimonic model, which views well-being not simply as the pursuit of happiness, pleasure, or the absence of negative emotions, but as the process of achieving meaningful personal development and realizing one's potential. In this perspective, individuals experience well-being through positive psychological functioning, personal growth, meaningful relationships, and a sense of purpose in life. Ryff's model identifies six distinct but interconnected dimensions of PWB: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. These dimensions provide a comprehensive understanding of how individuals develop psychological resources, establish their identities, and engage meaningfully with their social and learning environments, including in the context of language learning (Gao et al., 2025; Tang & Zhu, 2023).

According to empirical research, the dimensions discussed above have been shown to have an important role in second language classrooms (EFL) around the world. For example, teacher emotional support contributes 74% of the variance in learner engagement and 63% of the variance in learner well-being in second language classrooms (Alrabai & Algazzaz, 2024). Further, social support from peers mediates the burnout process by providing a means for learners to see themselves with an ideal L2 self-concept (Xie & Chen, 2025). Similarly, findings from recent studies suggest that constructs from positive psychology (for example, foreign language enjoyment, ideal L2 self, and grit) combined represent the best predictors of EFL learners' oral performance and psychological well-being (Esmaeilee et al., 2025; Fathi & Behzadpoor, 2025; Namaziandost et al., 2024). In addition, grit, academic self-efficacy, and support from teachers are significant predictors of EFL students' psychological well-being. This establishes that psychological characteristics are active variables in influencing language learning trajectories and are not background variables (Alqarni, 2022; Huo, 2022; Tang & Zhu, 2023).

As generative artificial intelligence continues to integrate with digital learning platforms, the language learning environment in which learners find themselves is evolving rapidly. This provides the learner with new opportunities for progress as well as additional sources of psychological pressure. Generative AI-modified environments can have a measurable impact on EFL students' anxiety, depression, and emotional well-being. Therefore, evaluations of technology-mediated instruction should consider more than just language usage (Guo & Wang, 2025; Yang & Yang, 2025). Multiple studies provide evidence linking AI-modified speaking assessment and AI-enhanced oral tasks to improved speaking performance, increased enjoyment, and a greater willingness to communicate. Moreover, foreign language anxiety is also lower in both instances (Ebadi et al., 2024; Sayed et al., 2024; Zhang et al., 2024). In addition, Control-Value Theory has been used as a framework to understand the role of perceived control and perceived value in AI-enhanced learning environments on participants' emotional engagement and academic success (Hu & Zhang, 2025; Zhao & Yang, 2026). Finally, learner self-efficacy and perceived support from their instructor moderates the

extent to which AI-enhanced environments foster psychological growth or stress (Zhao et al., 2026). At the same time, excessive technology usage leads to technostress, digital burnout, and cognitive overload, which negatively impact individual well-being (Qi & Derakhshan, 2025), while gamified AI platforms can provide positive benefits for motivation, self-kindness, and decreasing anxiety (Kamal & Khaidzir, 2026; Liu et al., 2025). Additionally, systematic reviews of the integration of AI into EFL have shown that technology-enhanced teaching methods can have an impact on learners' emotion and psychology if they are well designed (AlTwijri & Alghizzi, 2024; Kundu & Bej, 2025).

Even though there is a strong base of evidence for Well-Being Literacy (WBL), there exists a significant methodological void in studies of the phenomenon in the field of WBL. Much of the research available has been conducted in East Asian and higher education settings, and the majority of studies have used self-report measures that have not been validated in vocational and under-resourced settings (Huang, 2024). The Well-Being Literacy framework has had little theoretical development, and many researchers have acknowledged a need for better context-specific measurement tools, rather than continuing to repurpose global instruments (Smid et al., 2024; Yildirim & Atay, 2024). Due to the unique stressors associated with Indonesia's vocational orientation, coupled with an increase in generative artificial intelligence and e-portfolios, the measurements previously available to research and measure the psychological phenomenon of WBL are both not theoretically calibrated and lack empirical validation of their ability to measure the psychological experience of this population. Successful comparable instrument development is seen in other areas of educational technology; for example, constructing AI readiness scales using expert judgment followed by confirmatory factor analysis is possible and has resulted in meaningful outcomes (Dai et al., 2020; Fan & Cui, 2024).

In the current study, we have filled an important research gap that was previously recognized by testing and improving the EFL Psychological Well-Being Scale (EFL-PWBS). The EFL-PWBS was created following Ryff's six-dimensional conceptualization of eudaimonic well-being, and customized using descriptors specific to English as a Foreign Language (EFL) learners (e.g., Autonomy in Learning Language, Control Over Resources for Learning Language, Language Growth, Collaborative Learning of Language, Language Learning Goals, and Realistic Language Self-Assessment). The use of expert judgment procedures ensured that the EFL-PWBS had content and face validity prior to entering into empirical testing, and Confirmatory Factor Analysis (CFA) of the EFL-PWBS with polytechnic students (n = 120) using JASP software provided clear psychometric evidence. The present study has created a validated, purpose-driven instrumentation tool for the EFL learner population, which will provide researchers and practitioners in technology-enhanced EFL contexts with a sound and theoretically consistent methodology for assessing EFL learner psychological well-being.

This study is guided by two research questions: (1) Does the EFL-PWBS exhibit a statistically sound and well-fitting factor structure, as confirmed through Confirmatory Factor Analysis (CFA) and evidenced by accepted goodness-of-fit indices, including the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Standardized Root Mean Square Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA)? and (2) To what degree

does the EFL-PWBS satisfy the psychometric criteria for internal consistency reliability and convergent validity, as measured by Cronbach's Alpha (α), McDonald's Omega (ω), standardized factor loadings (λ), and Average Variance Extracted (AVE) values? Correspondingly, the objectives of this study are twofold: (1) to examine the factorial validity of the EFL-PWBS through CFA by evaluating the overall goodness-of-fit of the proposed measurement model against established psychometric thresholds, specifically a CFI and TLI of ≥ 0.90, an SRMR of ≤ 0.08, and an RMSEA of ≤ 0.08, with a sample of 120 EFL learners enrolled in Indonesian vocational education institutions; and (2) to evaluate the psychometric soundness of the EFL-PWBS by assessing its internal consistency reliability through Cronbach's Alpha and McDonald's Omega, both benchmarked against the 0.70 minimum threshold, and its convergent validity through standardized factor loadings (λ ≥ 0.70) and Average Variance Extracted (AVE ≥ 0.50), thereby confirming that the retained items reliably and consistently represent the underlying psychological well-being construct as experienced by EFL learners in the Indonesian polytechnic context.

The development and validation of a psychometrically sound instrument for measuring psychological well-being in EFL contexts requires engagement with four interconnected bodies of scholarship: the conceptual basis of Ryff's eudaimonic model and its limitations when applied outside the cultures in which it was validated; the empirical evidence on the psychological well-being of EFL learners and how it is currently measured; the rapid, ongoing integration of generative artificial intelligence into EFL learning and its psychological consequences, for which no validated measurement instrument currently exists; and the methodological principles that govern the development and validation of scales through factor analysis in applied linguistics. Together these four bodies of scholarship identify an instrumentation gap that the EFL Psychological Well-Being Scale (EFL-PWBS) is intended to fill, and they build a logical case for a reliable, consistent, and contextually relevant instrument to measure well-being among Indonesian vocational English language learners in the age of AI-assisted learning.

Ryff's (2013) eudaimonic framework of psychological well-being is among the most empirically and theoretically grounded multidimensional frameworks for well-being research, combining Maslow's self-actualization, Rogers' full-functioning, Allport's maturity, and Jung's individuation into six distinct dimensions, namely Autonomy, Environmental Mastery, Personal Growth, Positive Relations with Others, Purpose in Life, and Self-Acceptance, all of which have been shown to apply across diverse national groups and cultures and exist in more than 30 languages (Bowman, 2010; Diener et al., 2009; Ryff, 2013). The major theoretical strength of the eudaimonic model is its ability to document the extent to which individuals attain their full potential in all functional, not merely hedonic, areas of life, extending well-being research beyond happiness and life satisfaction into professional, educational, and developmental domains (Hills & Argyle, 2002; Ryff, 2013). At the same time, the six dimensions have been documented as having a serious limitation: they are representative of individualistic, primarily Western societies, which can lead to systematic distortion when measuring non-Western individuals (Christopher, 1999). For example, the expectation of autonomy assumes an independent self-concept that is contrary to collectivist cultural systems; environmental mastery, based on an individual control-oriented worldview, is inconsistent with

many Southeast Asian relational epistemologies; and personal growth as an individual pursuit may conflict with the social harmony and role fulfillment that are prevalent in the Indonesian educational environment. Once the psychological demands of learning English as a foreign language, including communicative anxiety, negotiating identity through language, and technology-related stress, are considered, it becomes clear that Ryff's items must be adapted for context rather than applied directly (Fan & Cui, 2024; Gao et al., 2025; Tang & Zhu, 2023). There is thus a lack of any theoretical framework addressing Ryff's six dimensions of well-being as they relate to EFL learners' psychological realities in Indonesian vocational education and training (VET), a gap that the present study addresses by developing the EFL-PWBS.

Substantial empirical evidence indicates that psychological well-being (PWB) plays a significant role in EFL learners' language learning outcomes. For instance, trait emotional intelligence enhances learners' oral performance by reducing anxiety and fostering enjoyment in EFL learning (Chen & Zhang, 2022; Namaziandost et al., 2024; Tang & Zhu, 2023). Similarly, self-efficacy, grit, and teacher support have been identified as key predictors of sustained psychological well-being (Namaziandost et al., 2024; Tang & Zhu, 2023). Among these factors, teachers' emotional support was found to be the strongest predictor of learner engagement, explaining up to 74% of its variance. Social support has also been shown to reduce learner burnout through the mediating role of a positive ideal L2 self-concept. Furthermore, longitudinal evidence suggests that positive psychological states, including enjoyment, grit, and communicative self-concept, mutually reinforce one another throughout the language learning process (Alrabai & Algazzaz, 2024; Derakhshan & Fathi, 2025; Xie & Chen, 2025).

Despite these findings, a significant methodological gap remains in measuring PWB among EFL learners. Existing studies have relied primarily on global well-being instruments (e.g., WHO, 2004), often with limited contextual adaptation, or measures targeting specific positive psychology dimensions, such as grit, enjoyment, and self-efficacy. Consequently, these instruments may not fully capture the multidimensional nature of PWB in EFL contexts. This limitation is particularly relevant to Indonesian vocational education, as previous research has predominantly focused on higher education and East Asian contexts. Vocational EFL learners may experience English learning differently because their engagement is primarily driven by professional and workplace-related needs (Huang, 2024; Smid et al., 2024). Therefore, a contextually relevant and multidimensional instrument is needed to assess PWB among Indonesian vocational EFL learners.

The increasing integration of digital technologies has further complicated the relationship between EFL learning and psychological well-being. While AI-based tools can enhance motivation, reduce anxiety, and support emotional well-being, AI-assisted speaking assessments have also demonstrated promising communicative outcomes (Ebadi et al., 2024; Kundu & Bej, 2025; Sayed et al., 2024; Yang & Yang, 2025; Zhang et al., 2024). However, excessive or poorly managed technology use may trigger technostress, digital burnout, FOMO, and cognitive overload. Research based on Control-Value Theory also suggests that limited perceived control over AI-mediated environments can undermine learners' motivation and communicative confidence (Hu & Zhang, 2025; Qi & Derakhshan, 2025; Yang et al., 2025; Zhao & Yang, 2026; Zhao et al., 2026). These concerns are particularly relevant to vocational EFL settings, where emotional regulation, digital self-efficacy, and teacher support may shape

learners' psychological responses to technology-integrated instruction (Lin et al., 2025; Shi et al., 2026; Suci et al., 2025). Nevertheless, existing instruments do not adequately capture these combined experiences, making it difficult to distinguish the psychological effects of language learning from those associated with educational technologies. The EFL-PWBS was developed to address this measurement gap.

Instrument development in applied linguistics requires a sound theoretical foundation and evidence of reliability, convergent validity, and factorial validity through CFA. Although established instruments, such as the Flourishing Scale and Oxford Happiness Questionnaire, demonstrate sound psychometric properties, they were not specifically developed for EFL learners or validated within technology-enhanced second language learning contexts (Diener et al., 2009; Fornell & Larcker, 1981; Hills & Argyle, 2002; Hu & Bentler, 1999). Nevertheless, previous instrument development studies demonstrate the feasibility of developing population-specific measures through expert judgment and CFA validation, as illustrated by Dai et al.'s (2020) AI-readiness scals. However, a multidimensional instrument integrating Ryff's eudaimonic model, Indonesian vocational EFL contexts, and the psychological implications of AI-mediated learning remains lacking. Therefore, this study develops and validates the EFL-PWBS to provide a theoretically grounded, contextually relevant, and psychometrically sound measure of psychological well-being among EFL learners in technology-integrated vocational education.

## METHOD

### Research Design

To achieve validation of the findings from this study, three sequential phases were followed: (1) theory-based generation of items using Ryff's (2013) six-dimensional eudaimonic framework adapted into EFL-specific behavioral criteria; (2) expert judgment validation of the initial item pool for content and face validity by subject-matter experts; and (3) empirical validation of the refined EFL-PWBS using Confirmatory Factor Analysis (CFA) in JASP among vocational EFL students. This sequential design allowed for multiple independent evaluative layers before finally confirming the psychometric properties of the EFL-PWBS, creating a clear distinction between rigorous instrument development and simple scale adaptation (Brown, 2015; Dörnyei, 2007).

### Research Setting

This research was carried out at an Indonesian state polytechnic institution, Politeknik Negeri Bali, in Business English courses for second-semester students enrolled in the International Business Management study program at the Business Administration Department. The site is relevant for two reasons. First, polytechnic institutions in Indonesia use a professional competency-based curriculum in which English is taught as a tool for workplace communication, making this institution's EFL context structurally different from a general university EFL context. Second, at the time the data were collected, the institution was already intentionally using generative artificial intelligence tools, specifically Google Gemini, along with digital e-portfolio platforms as part of its English curriculum, confirming that participants were indeed functioning within an AI-supported EFL environment consistent with the EFL-PWBS's objectives.

**Participants and Sampling**

A total of 120 second-semester vocationally oriented EFL students (N = 120) participated in this study. Participants were recruited through purposive sampling from all available sections of Business English at the institution. Second-semester students were selected because they had sufficient experience with the institution's EFL learning environment, including its technological affordances and pedagogical demands, to provide informed responses regarding their psychological experiences. At the same time, their relatively early stage of study reduced the likelihood that their responses would be strongly influenced by the job-related pressures commonly encountered during later semesters. All participants were Indonesian nationals aged between 18 and 21 years who had studied English during their secondary education before entering the polytechnic.

Regarding ethical considerations, participation in this study was voluntary. Before data collection, participants were informed about the purpose of the study, the procedures involved, and their rights as research participants. They were also informed that they could decline participation or withdraw from the study at any time without experiencing any academic consequences. Informed consent was obtained from all participants before questionnaire administration. The confidentiality and anonymity of participants were maintained throughout the research process, and the collected data were used exclusively for research purposes.

The sample size of 120 was considered in relation to the requirements of the proposed Confirmatory Factor Analysis (CFA) model. Although larger samples are generally recommended for CFA, sample adequacy also depends on the complexity of the measurement model, the number of observed indicators, and the strength of the relationships between observed variables and their underlying latent constructs (Hair et al., 2019). The sample size was also considered in relation to established recommendations for evaluating measurement model fit and factor structures in structural equation modeling (Hu & Bentler, 1999). Therefore, the sample of 120 was considered suitable for the initial evaluation of the proposed measurement model, although the findings were interpreted with consideration of the sample-size limitation.

**Instrument**

The EFL-PWBS was designed as a self-report questionnaire with 12 items, two for each of Ryff's six adapted dimensions: Autonomy in Language Learning, Control Over Learning Resources, Growth in Language Skills, Collaborative Language Learning, Goals in Language Learning, and Realistic Language Self-Assessment (e.g., “I have realistic expectations of my language ability”). Items were presented in both Indonesian and English to eliminate comprehension-related response errors, and responses were collected on a 7-point Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree), which yields sufficient score variance for robust CFA estimation and is consistent with common practice in well-being instrumentation (Dörnyei, 2007; Ryff, 2013).

**Data Collection Procedure**

Data collection proceeded in two parts. First, a panel of applied linguistics and educational psychology experts evaluated the 12-item EFL-PWBS and its theoretical blueprint for content validity, by rating each item as relevant or irrelevant to its respective dimension, and face validity, by considering item clarity, cultural relevance, scale appropriateness, and

structural coherence; items that a majority of experts judged irrelevant or poorly constructed were revised before being administered to students. Second, the revised EFL-PWBS was distributed to all 120 students during a scheduled class period. The researcher was present throughout the survey to answer questions and to ensure that participants completed the questionnaire without being influenced by the researcher. Completion took approximately 15 minutes per participant, and all data were subsequently coded in JASP (version 0.19.3.0) for CFA.

**Data Analysis**

The data were analyzed using Confirmatory Factor Analysis (CFA) in JASP (version 0.19.3.0), based on the deductive theoretical framework of the EFL-PWBS, which specifies its factor structure a priori and therefore calls for confirmation rather than exploration (Brown, 2015). The analysis proceeded in two stages. In the first stage, overall model fit was assessed using CFI and TLI (threshold $\geq 0.90$), SRMR (threshold $\leq 0.08$), and RMSEA (threshold $\leq 0.08$), with primary interpretive weight given to CFI, TLI, and SRMR because of RMSEA's known sensitivity to small sample sizes (Hu & Bentler, 1999; Kenny et al., 2015); where initial model fit was poor, re-specification was carried out using theoretical justification together with modification indices.

In the second stage, the reliability of individual indicators was assessed using standardized factor loadings ($\lambda \geq 0.70$), with decisions to remove indicators grounded in theoretical as well as statistical justification (Hair et al., 2019). Fornell and Larcker's (1981) approach then provided evidence of construct reliability and convergent validity for the EFL-PWBS through three measures: Cronbach's alpha ($\geq 0.70$), McDonald's omega ($\geq 0.70$), and Average Variance Extracted (AVE $\geq 0.50$). Together, these criteria provided a complete and justifiable psychometric profile for the EFL-PWBS.

## FINDINGS AND DISCUSSIONS

Results from this research are organized into two interrelated parts that directly correspond to the two research questions guiding the empirical validation of the EFL-PWBS: the factorial validity of the EFL-PWBS, evaluated through CFA goodness-of-fit, and the psychometric quality of the EFL-PWBS measurement model, evaluated through indicator reliability, internal consistency, and convergent validity.

**Measurement Model Fit (RQ1)**

The EFL-PWBS was a 12-item test given to 120 students learning English as a foreign language (EFL) in vocational education. Before running the CFA, all twelve items were entered into a single-factor model in JASP with a single latent Psychological Well-Being (PWB) construct. The model showed that two items had psychometric issues: PWB3 (“Growth in Language Skills”) and PWB7 (Ryff's Positive Relations). Both items had factor loadings below the $\geq 0.70$ criterion for acceptable reliability and modification indices indicating a lack of systematic covariance explained by the latent construct. Both the low loadings and the high modification indices indicated a lack of proper reflective indicator behavior; had these items remained unmodified, their continued poor functioning would have produced elevated error variance and biased the overall fit of the measurement model.

The exclusion of PWB3 and PWB7 was justified on both statistical and theoretical grounds. Retaining an item with a loading below 0.70, or an item at the 0.70 threshold with a

high modification index, would have produced composite reliability estimates that do not reflect the scale's actual internal consistency, along with SRMR and RMSEA values artificially inflated by systematic residual error. A closer examination of PWB3 and PWB7 also revealed substantial conceptual overlap with adjacent, retained items within their respective dimensions: PWB3 duplicated the theme already captured by PWB4 and PWB5 in the Environmental Mastery adaptation, and PWB7 duplicated the theme of social interaction with collaborators already captured by PWB8 and PWB9 in the Positive Relations adaptation. Removing these two items reduced the pool from twelve to ten, with every dimension retaining at least one well-performing indicator. The re-specified ten-item model was then re-estimated in JASP, yielding the fit indices shown in Table 1.

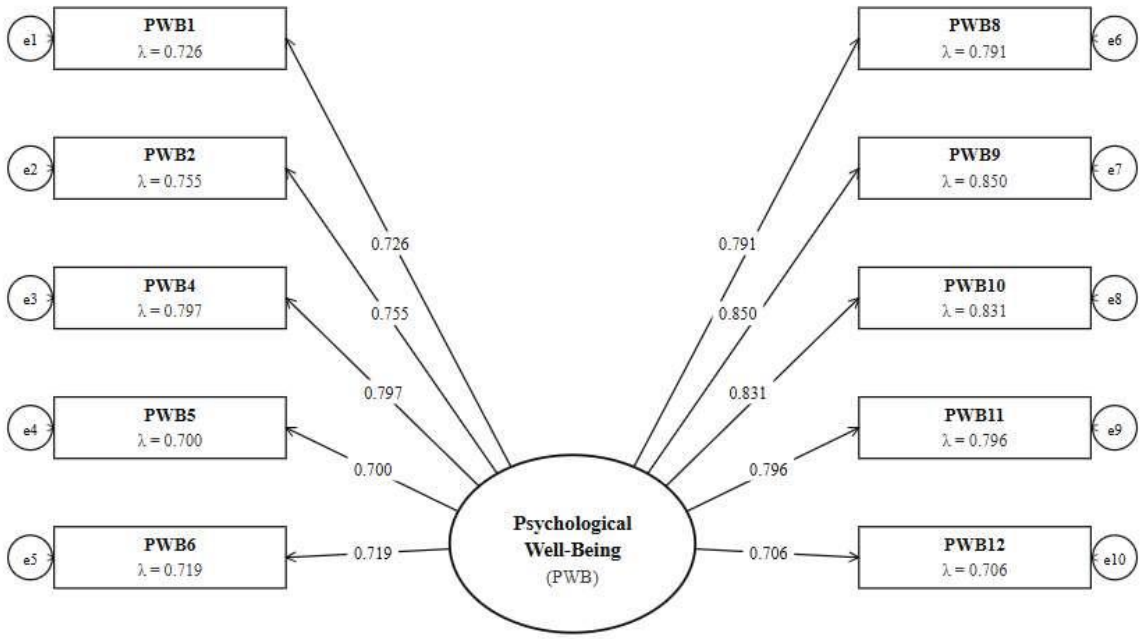
**Table 1. Goodness-of-Fit Indices for the Psychological Well-Being Measurement Model**

| Fit Index | Observed Value | Recommended Threshold | Conclusion |
|---|---|---|---|
| CFI | 0.939 | ≥ 0.90 | Good Fit |
| TLI | 0.909 | ≥ 0.90 | Good Fit |
| SRMR | 0.063 | ≤ 0.08 | Good Fit |
| RMSEA | 0.081 | ≤ 0.08 | Acceptable Fit* |

**Note. RMSEA is inflated due to small sample size (N = 120). Model evaluation prioritizes CFI, TLI, and SRMR (Kenny et al., 2015).*

The CFI (0.939) and TLI (0.909) exceed the ≥ 0.90 thresholds suggested by Hu and Bentler (1999), demonstrating that the re-specified ten-item model fits the observed covariance among the items well and fits the data far better than the null model, supporting the proposition that the retained items reflect a common underlying construct of psychological well-being. The SRMR of 0.063, below the ≤ 0.08 upper limit, indicates close alignment between the model and the observed covariance matrix. The RMSEA of 0.081 is marginally above the conventional 0.08 cutoff; this marginal exceedance is attributable to RMSEA's known sensitivity to small sample sizes rather than genuine model misspecification, consistent with Kenny et al.'s (2015) recommendation that CFI, TLI, and SRMR serve as the primary fit indices for samples of this size. Together, these three indices provide sufficient evidence to affirm RQ1 and confirm that the re-specified ten-item EFL-PWBS has adequate and statistically valid factorial validity. The complete path diagram for the final measurement model, including the latent construct, the ten corresponding indicators, standardized loadings, and error terms, is presented in Figure 1.

**Figure 1. Confirmatory Factor Analysis Path Diagram of the Final 10-Item EFL Psychological Well-Being Scale (EFL-PWBS)**




**Indicator Reliability, Internal Consistency, and Convergent Validity (RQ2)**

After establishing that the purified ten-item model had an appropriate model fit, the psychometric quality of the measurement was evaluated using three sequential criteria: indicator reliability, assessed through standardized factor loadings; internal consistency, assessed through both Cronbach's Alpha and McDonald's Omega; and convergent validity, assessed through Average Variance Extracted. These results are presented in detail in Table 2.

**Table 2. CFA Results: Validity and Reliability of the EFL-PWBS**

| Items | Ryff Dimensions | EFL-PWBS Dimensions | Std. Loading (λ) | Cronbach's Alpha (α) | Composite Reliability (ω) | AVE |
|---|---|---|---|---|---|---|
| PWB1 | Autonomy | Autonomy in Language Learning | 0.726 | | | |
| PWB2 | Autonomy | Autonomy in Language Learning | 0.755 | | | |
| PWB4 | Environmental Mastery | Control Over Learning Resources | 0.797 | | | |
| PWB5 | Environmental Mastery | Control Over Learning Resources | 0.700 | | | |
| PWB6 | Personal Growth | Growth in Language Learning | 0.719 | 0.917 | 0.935 | 0.591 |
| PWB8 | Positive Relations | Collaborative Language Learning | 0.791 | | | |
| PWB9 | Positive Relations | Collaborative Language Learning | 0.850 | | | |
| PWB10 | Purpose in Life | Goals in Language Learning | 0.831 | | | |
| PWB11 | Purpose in Life | Goals in Language Learning | 0.796 | | | |

| Items | Ryff Dimensions | EFL-PWBS Dimensions | Std. Loading (λ) | Cronbach's Alpha (α) | Composite Reliability (ω) | AVE |
|---|---|---|---|---|---|---|
| PWB12 | Self-Acceptance | Realistic Language Self-Assessment | 0.706 | | | |

*Note. N = 120. Items PWB3 and PWB7 were removed to improve model fit. All factor loadings are significant at p < .001.*

The standardized factor loadings (λ) of all ten retained items indicate reliable indicator behavior: all ten items had loadings ranging from a minimum of 0.700 to a maximum of 0.850, satisfying the ≥ 0.70 threshold established by Hair et al. (2019). This consistent satisfaction of the loading threshold contrasts with the original twelve-item model, where the two removed items fell below the cutoff, confirming that item purification produced indicators that all provide a reliable and meaningful signal of the latent construct. PWB9 (λ = 0.850), which measures Collaborative Language Learning, had the greatest loading, suggesting that collaborative language learning experiences provide the most robust indication of psychological well-being for novice EFL learners in this sample, a pattern theoretically consistent with the culture's collectivist values and peer-centered learning environments in Indonesian polytechnic institutions. The next highest loadings occurred for PWB10 (λ = 0.831, Goals in Language Learning), PWB4 (λ = 0.797, Control Over Learning Resources), and PWB11 (λ = 0.796, Goals in Language Learning). PWB5 (λ = 0.700, Control Over Learning Resources) met the threshold at its minimum, so its retention was statistically admissible, although future iterations of the EFL-PWBS would benefit from revisiting this item's wording to better demonstrate its relationship to the latent construct. All ten loadings were statistically significant at p < .001, so all ten items provide a valid and reliable source of information regarding the measurement of psychological well-being.

The internal consistency of the EFL-PWBS was exceptionally high. Cronbach's α = 0.917 and McDonald's ω = 0.935 were derived from two different statistical approaches, and both substantially exceeded the generally accepted 0.70 benchmark and even the more stringent 0.80 threshold recommended for high-stakes settings (Fornell & Larcker, 1981). The close correspondence between these two coefficients, both exceeding 0.90, is particularly telling, because it shows that regardless of which model underlies the reliability calculation, the EFL-PWBS demonstrates a high level of reliability; when the two estimates diverge substantially, item loadings tend to be heterogeneous, and α can either underestimate or overestimate true reliability, so the close similarity observed here confirms that the ten items share a strong, homogeneous underlying variance and that the EFL-PWBS is an accurate and precise measure of psychological well-being across all of its component indicators.

Average Variance Extracted (AVE) was used to assess convergent validity, measuring how much of the variance in each indicator is explained by the latent construct rather than by measurement error. The AVE was calculated at 0.591, above the 0.50 threshold, indicating that the latent PWB construct accounts for approximately 59.1% of the variance in its ten associated indicators. Because the AVE exceeds 0.50, all ten retained items can be said to converge on a single, clearly defined latent dimension, with most of the variance in their scores attributable to systematic, construct-based sources rather than to random measurement error or item-specific variance. Combined, the results for indicator reliability, internal consistency, and

convergent validity provide an affirmative and conclusive answer to RQ2: the purified ten-item EFL-PWBS satisfies all psychometric criteria set out in the research objectives, establishing it as a reliable, internally consistent, and convergently valid instrument for measuring the psychological well-being of EFL learners in Indonesian vocational education contexts.

The goal of this research was to create a psychological well-being scale for EFL learners in Indonesia's vocational education system, a group of learners not previously identified or measured within applied linguistics. The results for both research questions support the conclusion that the EFL-PWBS is a valid instrument with good psychometric properties and solid theoretical and contextual foundations, carrying several key interpretive, integrative, and theoretical implications.

With respect to factorial validity (RQ1), the final ten-item model produced a CFI of 0.939, a TLI of 0.909, and an SRMR of 0.063, all meeting the criteria proposed by Hu and Bentler (1999); the resulting single-factor model is theoretically sound. Although Ryff's (2013) original model defines six specific psychological well-being dimensions, research has repeatedly found substantial empirical correlation among these dimensions, with a large component of shared variance when well-being is measured within a culturally appropriate context (Diener et al., 2009; Hills & Argyle, 2002). For Indonesian EFL students in vocational education, psychological well-being appears to be experienced as a unified state rather than as six distinct psychological capacities, a pattern that fits a collectivistic cultural orientation in which autonomy, relationships with others, and personal purpose are more intertwined than they would be in an individualistic orientation (Christopher, 1999; Tang & Zhu, 2023). Dropping PWB3 and PWB7 reduced the item pool from twelve to ten but increased construct coherence rather than reducing theoretical coverage, consistent with best practice in iterative scale purification (Brown, 2015; Dai et al., 2020). The marginally high RMSEA of .081 does not undermine this conclusion, since methodological research consistently shows that RMSEA overstates the degree of misfit in samples under 200 participants, and recommends that CFI, TLI, and SRMR be treated as the primary indices in such cases (Kenny et al., 2015).

With respect to reliability and convergent validity (RQ2), the EFL-PWBS demonstrated a very good level of internal consistency ($\alpha = 0.917$, $\omega = 0.935$) and an adequate level of convergent validity (AVE = 0.591), with all ten items showing standardized factor loadings between 0.700 and 0.850 (Fornell & Larcker, 1981; Hair et al., 2019). Three patterns in these results carry interpretive weight. First, the highest factor loading, PWB9 ($\lambda = 0.850$, Collaborative Language Learning), supports evidence that social and peer-related learning experiences are associated with the highest level of psychological well-being for learners in collectivist EFL settings, where teacher emotional support accounts for approximately 74% of the variance in learner well-being and peer support helps mitigate learner burnout through its effect on learners' ideal L2 self-concept (Alrabai & Algazzaz, 2024; Xie & Chen, 2025). Second, the high loading of PWB10 ($\lambda = 0.831$, Goals in Language Learning) is consistent with positive-psychology research linking goal achievement in language learning to psychological well-being and communicative confidence (Alqarni, 2022; Fathi & Behzadpoor, 2025; Namaziandost et al., 2024). Third, the comparatively lower loading of PWB5 ($\lambda = 0.700$, Control Over Learning Resources) reflects a realistic contextual tension: Environmental Mastery, as originally conceived by Ryff (2013), presupposes a degree of personal control over

one's external environment that may be constrained by large institutional curricula or limited resource access for vocational students (Derakhshan & Datu, 2025; Huang, 2024). This pattern suggests that the Environmental Mastery subscale is the least developed source of positive well-being signals within this population, and that future theorizing about PWB in vocational EFL settings should attend more closely to how institutional arrangements enable or constrain a learner's sense of control over their environment.

Taken together, these findings support efforts to integrate the theoretical foundations of Positive Psychology with SLA (Gao et al., 2025; Smid et al., 2024) and the growing body of research on AI-supported EFL learning environments (Yang & Yang, 2025; Zhao et al., 2026). Psychological well-being in technology-integrated EFL vocational settings is best understood as a unified, holistic experience shaped simultaneously by social interaction, goal pursuit, and perceived control over one's educational experience, and the EFL-PWBS offers, for the first time, a validated way to measure this integrated experience within this unique institutional context.

These results carry relevance at three levels. For researchers, the EFL-PWBS is a reliable measurement tool for future studies examining how generative AI integration, e-portfolio assessment, and pedagogical interventions affect the psychological states of vocational EFL learners in Indonesia and similar Southeast Asian contexts. For practitioners and curriculum developers in Indonesian polytechnic institutions, the high loadings on Collaborative Learning and Goals in Language Learning indicate that learning environments built around ample peer interaction and explicit professional goal-setting will deliver the greatest psychological benefits to students. For instrument developers and measurement researchers, this study demonstrates that adapting Ryff's theoretical framework to a specific population does not always require retaining the full six-factor structure: a theoretically justified single-factor adaptation can produce psychometrically superior results while preserving theoretical coherence, a finding that should encourage further context-focused instrument development for EFL populations that currently lack this kind of attention.

## CONCLUSION

This research aimed to determine how valid and relevant the Psychological Well-Being Scale for EFL Learners is within the context of vocational education. In relation to the first research question, whether the EFL-PWBS's one-dimensionality was supported by a confirmatory factor analysis, all guidelines for assessing fit (CFI, TLI, SRMR) were met or exceeded. The one-factor, ten-item model produced adequate fit (CFI = .939, TLI = .909, SRMR = .063), representative of the population of EFL learners studied; the RMSEA value was only marginally above the conventional cutoff, a pattern attributable to the small sample size rather than to model misspecification. In relation to the second research question, concerning internal consistency reliability and convergent validity, the findings were equally supportive: the EFL-PWBS produced a Cronbach's Alpha of .917, a McDonald's Omega of .935, standardized factor loadings between .700 and .850, and an Average Variance Extracted value of .591. Together, these results indicate that the EFL-PWBS has good reliability, validity, and contextual appropriateness for measuring the psychological well-being of EFL students in Indonesian vocational education, and represent probably the first validated measure designed specifically for this population and its institutions.

The authors propose several practical applications of these results. The EFL-PWBS can serve as an evidence-based instrument for researchers seeking to understand the effects of AI-assisted learning and digital platforms on the emotional well-being of vocationally and technically oriented EFL learners, and researchers are encouraged to cross-validate the EFL-PWBS with more diverse samples and to establish its predictive validity in conjunction with structural modeling. For EFL educators and curriculum developers working in Indonesian polytechnic institutions, the high loadings on Collaborative Learning and Goals in Language Learning indicate that courses should include an abundance of collaborative communicative activities and tasks that support goal-setting around career development, to promote students' psychological functioning. Finally, the comparatively low loading associated with Control Over Learning Resources suggests that educational leaders should implement strategies that expand vocationally oriented EFL learners' access to self-directed digital resources and generative artificial intelligence tools, to strengthen their sense of autonomy within the EFL vocational curriculum.

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