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PSYCHOMETRIC PROPERTIES OF THE PERMA-PROFILER FOR INDONESIAN COLLEGE STUDENTS: A RASCH MODELLING ANALYSIS

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ABSTRACT

Previous studies on student wellbeing have revealed that mental illness and poor wellbeing are prevalent among college students. However, previous studies have highlighted the usefulness of the PERMA-Profiler a scientifically developed tool for measuring well-being across various contexts, sparking significant discussion and interest. This study used Rasch analysis to investigate PERMA-Profiler in Indonesian tertiary educational settings. A survey was conducted among 508 Indonesian higher education students, including those in the language and mathematics education field, selected by convenience sampling. The quantitative data were computed employing Rasch model analysis, utilizing WINSTEPS. We employed independent t-tests and analysis of variance tests (ANOVA) to examine some responses based on the academic year and field of study. The findings showed that the PERMA profiler was suitable for measuring well-being in tertiary educational settings. The findings of the Rasch model indicated that the PERMA profiler instrument in the Indonesian context was valid and reliable and showed high internal consistency. At the same time, the separation of person and item for the PERMA question showed a good range of instruments from various items and respondents. The results of the independent t-test of PERMA based on the field of study showed a significant difference as the mathematics education students were reported to feel happier than the language education students. However, there was no significant difference in the PERMA profiler based on the academic year level, as suggested by the one-way ANOVA analyses.

Keywords: higher education, PERMA, Rasch analysis, well-being

1. Introduction

Positive psychology is a relatively recent sub-discipline of psychology (van Zyl et al., 2024; Zagaria & Lombardi, 2024). Positive psychology is now being studied by numerous experts all around the world. It highlights the identification of variables that create strengths, help people develop, and promote psychological health as well as subjective contentment and happiness (Kun et al., 2017). Seligman (1999) indicated that positive psychology concentrates on developing an individual's most positive attributes. According to Seligman's new theory, a definition of well-being is the cultivation of one or more of these five factors: positive emotion, engagement, meaning, positive relationships, and achievement. Seligman's well-being theory has been studied in several different areas, including education and work settings (Lambert D'raven & Pasha-Zaidi, 2016).

Well-being has been the subject of a lot of empirical studies; it is the ability to accept life with a positive mental attitude and to judge life as satisfactory in a range of settings (Donaldson & Donaldson, 2020). Nevertheless, a variety of approaches have been employed to define and assess well-being to date. Although some scholars disagree on what defines well-being, this construct positively relates to academic achievement, productivity, and life satisfaction (Hidayat et al., 2020). Most contemporary psychological theories agree that happiness comprises both hedonic (as in life satisfaction, happiness, and the existence and lack of positive and negative affect) as well as eudemonic elements (indicators of healthy psychological functioning, including a sense of purpose or healthy interpersonal interactions) (Hamzah & Ismail, 2018).

However, past research on students' well-being found that students in higher education also have mental illness and weak well-being. Pitt et al. (2018) found that issues related to academic, personal, family-related, life balance, social support, and starting college were the primary factors, which could also be considered biological and psychological stressors. Furthermore, academic stress was, for example, shown to be prevalent in 51% of Indonesian higher education students. More recently, because of the COVID-19 pandemic effects, students experienced anxiety and emotional distress due to the lack of internet coverage sources. Farooq et al. (2020) also reported that the lack of college student participation is one of the significant issues for students during the pandemic. While there are some studies on hedonic components, little research has looked at the comprehensive model of well-being (aspects of hedonic and eudemonic). Accordingly, this study used Rasch analysis to investigate PERMA-Profiler in Indonesian tertiary educational settings.

Prior works have contributed to much debate and offered data on the validity of PERMA in various settings (e.g., Wammerl et al., 2019). The latest research, for example, revealed that psychological well-being could be moderated by ethnicity (Abdullahi et al., 2021). Previous studies have highlighted the inconsistency in research findings related to the PERMA framework (Elfida et al., 2021; Wibowo et al., 2021). By using the PERMA model, researchers can achieve a more organized and in-depth understanding of the factors that impact happiness in Indonesia. This approach helps to address the contradictions in prior studies, offering a more accurate perspective on how cultural and social factors influence individuals' well-being. Moreover, most past studies analyze proof of validity and reliability issues across diverse cultures using confirmatory factor analysis (CFA) and exploratory factor analysis (EFA). The use of Rasch modeling analysis in the present research will provide new knowledge to the existing literature regarding the validity of the PERMA profiler in the setting of tertiary education in Indonesia. Existing research indicates that comparison research using the PERMA profiler is a widely used indicator of subjective well-being. Nevertheless, the PERMA profiler's internal structure, the connection between sub-constructs, and content are crucial aspects of CFA and EFA. The current study focuses on the PERMA profiler's utilization of the Rasch measurement model to evaluate

divergent responses, including person-fit statistics and item-fit statistics, individual response and quality of instrument and considering solely on item-fit statistics (high correlation among questions (Bond & Fox, 2017). Therefore, the research question was: Is the PERMA profiler valid and reliable for Indonesian settings, and is there any significant difference in PERMA based on the field of study and academic year level?

2. Literature Review

Well-being holds many meanings and understandings. It can be measured objectively and subjectively. In this study, the focus is given on subjective well-being. This refers to 5 domains as proposed by Seligman (2018). Some synonymous words with subjective well-being based on theoretical definitions are happiness, thriving, flourishing, hedonic level, and life satisfaction. These words are often used interchangeably with subjective well-being. Past studies have proven that subjective well-being, joy, and positive traits are connected to different desired results such as lower divorce rates, enhanced academic performance, strengthened relationships and friendships, and improved physical health (Diener & Chan, 2011; Idris et al., 2023).

The philosophy of real happiness predates the well-being theory (Seligman, 2018). However, there seems to be no single metric that encompasses subjective well-being or what it implies to be happy. Some economists use the term 'subjective well-being' as a synonym for 'happiness', but happiness is a smaller construct in psychology than subjective well-being. Subjective well-being is connected to a higher feeling of meaning and purpose, which can be categorized into physical, psychic, social, and religious aspects (Sahrah & Yuniasanti, 2020). Subjective well-being is not a unified concept (Steptoe et al., 2015). It can be distinguished into cognitive well-being, affective well-being, and achievement well-being. Cognitive well-being is associated with being satisfied with living circumstances; affective well-being is linked to happy emotions; and achievement well-being refers to a better quality of life. More recently, there are three different categories of subjective well-being: evaluative well-being, also known as life satisfaction hedonic well-being, or feelings of joy, sadness, anger, tension, pain and eudemonic well-being (sense of goal and meaning in life) (Steptoe et al., 2015). Evaluative well-being is measured by asking people's feelings regarding the quality of their lives or how satisfied they are with their lives. At the same time, people who are asked to score their experience of numerous affect adjectives such as joyful, sad, and furious refer to hedonic health. The focus of eudemonic wellness is on the assessment of one's life meaning and purpose. The concept of subjective well-being is broad in the current literature however, the current research concentrates on eudemonic and hedonic wellness. Therefore, to measure eudemonic and hedonic wellness as presented by Seligman (2018), the positive emotion, engagement, relationships, meaning, and accomplishment (PERMA) framework (Butler & Kern, 2016) was used.

Positive emotion refers to affective well-being or good feelings. It is combined with a favorable assessment (Seligman, 2018). Hedonic feelings such as happiness, pleasure, and comfort are all examples of positive emotions. Positive emotions help to increase productivity, improve physical health, deepen bonds, and inspire optimism and hope for a better future. Conversely, the heightened level of hopelessness will hurt the academic performance of university undergraduates (Muin & Perveen, 2020). At the same time, positive emotions encourage broad thinking, which leads to adaptive behavior. These feelings are essential for happiness because they assist in increasing the positive aspects associated with past experiences and protect against destructive emotions or diseases in the future (Seligman et al., 2006). Numerous life outcomes have been demonstrated to benefit from experiencing good emotions, involving psychological stability, cognitive function, job productivity, and higher levels of abstraction. A profound psychological connection (being motivated, engaged, and immersed) to a specific activity, organization, or cause

is engagement (Khaw & Kern, 2014). This degree of psychological engagement requires extreme attention, absorption, and focus. Deep engagement provides meaning, understanding, improved performance, and happy emotions. At the same time, developing and sustaining strong and helpful connections helps someone feel welcomed, loved, and supported at school (Stefa, 2018).

Positive relationships are defined as feelings of belonging to a group, experiencing the affection and support of friends and family, and being content with one's social network or a degree of compassion and creativity in social relationships. Relationships are the “expedient” of conveying and accepting thanks, compassion, love, and assistance, all of which are regarded as essential for boosting well-being (Giangrasso, 2021). In addition, meaning refers to something higher than our existence but has an intrinsic worth (social commitment). Khaw and Kern (2014) also include a sense of direction and purpose in life. Low levels of unpleasant psychological states are predicted by the presence of meaning in one’s life. Finally, accomplishment is the main intrinsic, defined as personal desire, determination, and personality diversity. Success achieved by applying one's abilities and efforts to definite and set goals is the route of accomplishment.

Seligman (2018) focuses on hedonic and eudemonic perspectives in his PERMA, which focuses on hedonic and eudemonic perspectives in his PERMA, emphasizing the emotional aspects as well as human self-development (flourish). It is believed that this model can help individuals achieve a fulfilling, happy, and even meaningful life. The PERMA wellness model helps one to understand these elements and what can be done to maximize each element to achieve a life full of happiness. The five phases of PERMA models are positive emotion, engagement, relationship, meaning, and accomplishment. Some studies show that pursuing each PERMA aspects PERMA aspect is also linked to well-being. For example, Goodman et al. (2018) discovered a high relationship between PERMA dimension and subjective well-being. Gander et al. (2016) also propose causal links between PERMA pursuit and well-being. Seligman (2018) argued that subjective well-being and PERMA are not mutually exclusive. PERMA consists of (at least some of) the components of well-being, and individuals who have one of the components have a nearly equal chance of having the others. According to Seligman (2018), each component must possess the following three characteristics to qualify as a component of well-being: it adds to happiness, it is pursued for its reason, and it is defined and assessed separately from the other factors.

In this study, we build on the PERMA framework proposed by Butler and Kern (2016) and propose a unified application of PERMA to higher education (grounded in science vs grounded in art). This study is based on a comprehensive review of relevant theory and previous research, ultimately focusing on one key dimension: the PERMA profiler. The tool provides a detailed perspective with five distinct sub-dimensions – positive emotions, engagement, relationships, meaning and achievement. Each sub-dimension plays a crucial role in shaping the complex landscape of PERMA in higher education and highlights the dynamic interplay between theoretical foundations and practical applications in educational settings. The PERMA framework provides a valuable system for understanding the happiness of Indonesia's culture and social environment, especially given the inconsistent discovery, which has been reported in many studies. Studies have shown that the components of the PERMA profiler are connected and create a network that reflects the complexity of happiness (Elfida et al., 2021; Wibowo et al., 2021). This interconnectedness suggests that improving one aspect of well-being can positively impact others, which is essential for designing interventions that aim to enhance overall life satisfaction. The PERMA-Profiler has proven to be a reliable and effective instrument for assessing the five core dimensions of well-being, making it valuable for both academic research and real-world applications across diverse populations. Previous studies have highlighted that perceived social support is a significant predictor of subjective well-being, including among Indonesian populations such as veterans and local communities (Setiasih & Jayanti, 2018).

In this study, we present a research framework informed by established theories and prior empirical findings (see Figure 1). This framework not only informs the direction of the current research but also lays the groundwork for future inquiries into well-being in educational contexts. Specifically, this study adopts Seligman's (2011) PERMA model as the conceptual foundation for evaluating student well-being in higher education. The five key dimensions—Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment—are central to this model and are measured using the PERMA-Profiler (Butler & Kern, 2016), a validated survey tool. The university setting serves as the contextual lens through which student well-being is explored, offering a comprehensive understanding of how these dimensions manifest in the higher education environment.

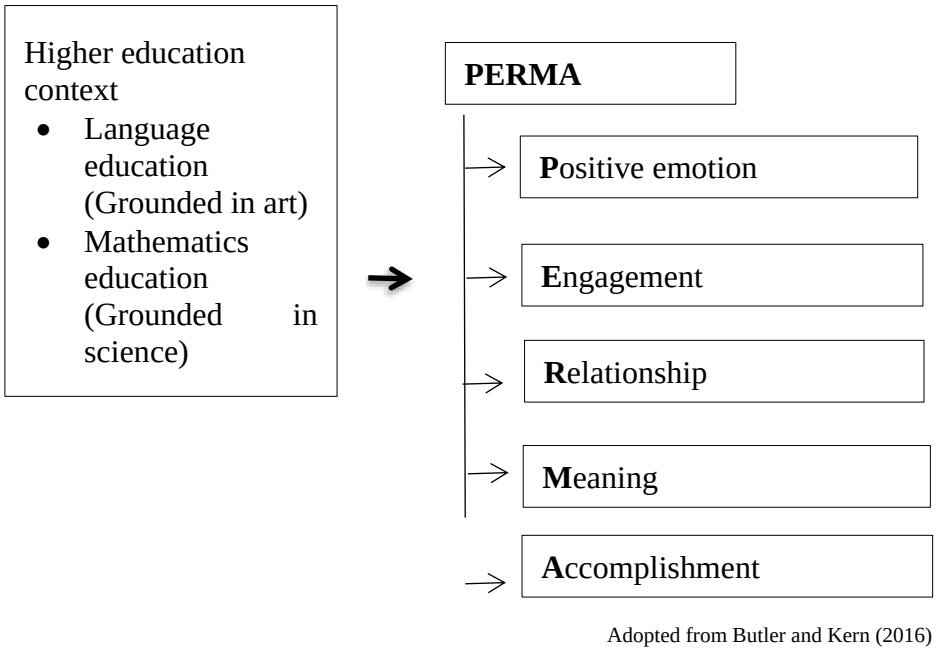


Figure 1: Research Framework

3. Method

3.1 Design and Sample

We used a quantitative approach and carried out a cross-sectional study to examine the validity and reliability of the PERMA profiler in relation to higher education at several Indonesian universities. The quantitative study is positivist, which seeks equivalence and causal relationships between its constituent aspects to understand and anticipate what happens in the social environment (Bahari, 2010). Cross-sectional research assessed a collection of individuals at a specific point to represent the population's attitudes, beliefs, actions, or characteristics (Creswell, 2020). Our current study aims to validate the PERMA profiles in university students. To test the PERMA profiler, we used Wilson's four building blocks and aligned them with Rasch models for analysis, specifically the Many Facet Rasch model and the Rasch measurement model (Wilson, 2004). These models are well established in measurement development, as evidenced by their use in previous studies (Scalise et al., 2021).

In addition, the present study's population is the higher education setting in Indonesia. For a more representative sample, we used a stratified sampling approach based on the faculty. Recognizing the diversity of programs in educational institutions, we initially stratified the sample according

to the type of program, with a particular focus on science and language areas to better reflect the wider population. For this study, we selected two programs—language education and mathematics education—and then used convenience sampling to include all students in these areas. To gather data, we distributed an online survey via Google Forms, targeting members of relevant WhatsApp groups linked to these programs. We invited participants to complete the survey to collect data from a specific group of students. This approach enhanced the representativeness of the sample and strengthened the overall foundation of the research.

Prior to completing the online questionnaires, a written consent form was submitted to the Human Research Ethics Committee of the University. The committee then forwarded the consent form, along with its confirmation letter, to the testing locations. In the first section, we obtained biographical information from participants, including gender, subject, and academic year level. A total of 508 Indonesian students (between 18 and 22 years of age) enrolled in tertiary education were included in this survey. The population comprised 420 female participants (82.7%) and 88 male participants (17.3%). There were 241 participants (47.7%) as language education students, and the rest, 267 (52.6%) as mathematics education students. The percentage of respondents from the first, second, and third years were 131 (26.0%), 213 (42.0%) and 164 (32.0%), respectively. The demographics of the sample are shown in Table 1.

Table 1: The demographic profile (N = 508)

Demographic	Sample	Percentage (%)
Gender		
Male	88	17.3
Female	420	82.7
Field of study		
Language education	241	47.4
Mathematics education	267	52.6
Academic year level		
Year one	131	26.0
Year two	213	42.0
Year three	164	32.0

3.2 Measures

Subjective well-being was evaluated using the PERMA framework, as outlined by Butler and Kern (2016). This framework served as the foundation for selecting the specific construct measures for our study. We reviewed relevant literature to identify and refine the construct measures of subjective well-being, ensuring they were consistent with well-established theoretical models. These measures were subsequently incorporated into the study's instrumentation. To ensure the accuracy of the translation of the original questionnaire into the target language, we employed the back-translation method. This method involves translating the questionnaire into the target language, followed by an independent translation back into the original language. Any discrepancies between the original and back-translated versions were carefully reviewed by our team and resolved to maintain the integrity and clarity of the items. Additionally, we engaged independent language experts to oversee the translation process, ensuring that the translated questionnaire accurately conveyed the intended meaning and was culturally appropriate for the target population. This careful and rigorous process of translation provided confidence in the reliability and validity of the measures used in our study. The PERMA scale consists of 15 questions scored on a 10-point Likert scale ranging from 1 (not at all) to 10 (always). In addition, Table 2 shows the AVE, CR, and Cronbach's alpha scores of the PERMA profiler.

Table 2: The measurement model's discriminant validity

Dimension	Sub-dimension	Overall α	α	CR	AVE
PERMA Profiler	Positive emotion	.918	.837	.846	.650
	Engagement		.713	.725	.500
	Relationship		.802	.805	.580
	Meaning		.893	.895	.739
	Achievement		.864	.866	.686

As shown in Table 2, internal consistency scores between α = .713 and α = .893 were obtained for the scale's PERMA profiler, which had excellent Cronbach alpha coefficients. Each dimension demonstrated good internal consistency, as shown by the AVE values, which ranged from .500 to .602 and were all over .500. Finally, the PERMA profile's composite reliability varied from .725 to .895, demonstrating internal solid consistency as well. Moreover, the factors for all five PERMA sub-components varied from .600 to .930. The factors loading values were more significant than the desired level of .500. The correlations between the dimensions are shown in Table 3. All dimensions were statistically significant ($p < 0.05$).

Table 3: Intercorrelations between Sub-dimensions

No	Variable	1	2	3	4	5
1	Positive emotion	(.806)				
2	Engagement	.605	(.707)			
3	Relationship	.715	.489	(.761)		
4	Meaning	.694	.570	.681	(.860)	
5	Accomplishment	.672	.566	.634	.825	(.830)

Table 3 shows that the highest link was found between meaning and accomplishment (r = .825), while the lowest was found between engagement and relationship (r = .489). Engagement (r = .605), relationship (r = .715), meaning (r = .694) and accomplishment (r = .672) indicated a significant relationship with positive emotion. At the same time, meaning (r = .570) and accomplishment (r = .566) showed a significant relationship with engagement. Finally, meaning (r = .681) and accomplishment (r = .634) also significantly correlated with the relationship. Moreover, the square roots of AVE for each dimension were larger than the associations shown above or to their right, indicating that the PERMA profiler had discriminant validity. However, to gain a better understanding of the pattern for each item, the detailed results are presented in the following section.

3.3 Analysis of Data

The data analysis for this investigation was done in stages. The quantitative data were analyzed using Rasch analysis, utilizing the WINSTEPS. We decided to pool data from all samples rather than process each group separately, even though each group may have different characteristics. This approach was chosen because all participants have one thing in common – they are higher education students. By combining the data, we aimed to gain a broader, more unified view, while acknowledging that, despite some differences, overall commonalities as students in higher education justified bringing the data together for analysis. This approach helps simplify the analysis and improves the overall applicability of the findings to the broader population of higher education students. Rasch analysis was performed to check for reliability, separation, fit statistics, unidimensionality, and item bias. WINSTEPS version 3.73 (Linacre, 2009) was used to measure

the quality of the instrument before analyzing student well-being. Another reported reliability measure was the Cronbach's alpha coefficient score.

The Rasch model is part of the item response theory (IRT), whose analysis is based on item difficulty and person ability. The proponents of the Rasch model measurement are two theorems: 1) more capable, more capable, and has a higher probability of responding correctly to all the items provided, 2) a more accessible item is more likely to be answered correctly by all people (Sumintono & Widhiarso, 2015). Regardless of its simple and easy-to-use model that requires fewer assumptions and parameters than other IRT models, the Rasch model can provide objective and unidimensional measures to validate instruments (Bond & Fox, 2017).

The current study additionally emphasizes the separation of the questionnaire, the evaluation of the PERMA instrument's ability to differentiate between "person skills" in terms of the latent trait, and the extent to which the items are used to define both the simple and complex items. A more significant separation elucidates the possibility of respondents selecting appropriate answers for each PERMA item. Hence, it is vital to note that the spread should be a minimum of three groups. At the same time, unidimensionality explains how much a form of the instrument can explain the score as proof of construct validation. This information is vital because it helps to identify the measured dimension or domain and relates to the quality of such an instrument. The evaluation of item fit statistics is evidence of construct validity. The accepted score of mean square (MNSQ), tolerated Z-Standard (ZSTD) and Correlation Points (Pt Mean Corr) based on Boone and Noltemeyer (2017) are as follows: (a) the value of tolerated infit and outfit Z-Standard (ZSTD): -2.0 <ZSTD <+2.0 (b) the value of accepted Correlation Points (Pt Mean Corr): .4 <Pt Measure Right <.85 (c) the value of accepted infit and outfit mean square (MNSQ): .5 <MNSQ <1.5.

We utilized independent t-tests and analysis of variance (ANOVA) comparisons to investigate responses based on the academic year level and field of study. We hypothesized that the academic year level and the chosen field of study might significantly influence how participants engaged with the PERMA Profiler, especially considering the potential impact of the COVID-19 pandemic on the well-being of university students from diverse backgrounds. Before conducting the one-way ANOVA test, we diligently examined the assumptions required for ANOVA.

4. Results

4.1 Instrument Validity and Reliability

The instrument's reliability and measurement properties are summarized in Table 4. Person reliability for the instrument was found to be .870, and item reliability was notably high at 0.92, significantly exceeding the minimum acceptable threshold of 0.65. These robust reliability scores indicate the stability of students' responses and the consistency of item measurements within the instrument, underscoring its reliability.

Furthermore, the Cronbach's alpha coefficient, another internal consistency measure, was calculated and yielded a high value of .910. This suggests a high level of internal consistency for the PERMA instrument in the Indonesian context, reinforcing its reliability for measuring well-being.

Table 4 also provides insights into the questionnaire's separation properties, assessing the instrument's ability to differentiate between individuals with varying levels of the measured latent trait. For the PERMA questionnaire, the separation values were 2.55 for each person and 3.33 for each item, indicating a good spread of items and respondents. As suggested by Sumintono and Widhiarso (2015), these separation scores can be used to estimate the number of distinct groups

the instrument can differentiate. Applying the formula H (separation) = {(4 x separation) + 1}/3, we obtained values of 3.73 (indicating the instrument's ability to distinguish 4 groups) for persons and 4.77 (indicating the instrument's ability to distinguish 5 groups) for items.

Additionally, Table 4 presents outfit mean-square statistics for both persons and items. These values were close to 1.0, supported by a significant chi-square score (p = .000). This alignment between the facts and the model demonstrated that the instrument's measurement properties were consistent with the Rasch model's expectations. In summary, the results in Table 4 affirm the instrument's high reliability, strong internal consistency, and ability to effectively differentiate between individuals' well-being levels, making it a reliable tool for measuring well-being in the Indonesian context.

Table 4: Validity and reliability of an instrument

	Person	Item
Separation	2.55	3.33
Reliability	.87	.92
Cronbach's alpha	.91	
Chi-square (χ^2)	19291.01***	
Outfit Mean-Square		
Mean	1.00	1.00
Standard Deviation	0.67	0.29

4.2 Unidimensionality

The explained variance of PERMA in Indonesian settings exceeded the minimum value of 40%, meaning that the questionnaire can be a valid instrument to measure PERMA constructs. Table 5 indicates the explained variance of the PERMA profiler for the Indonesian context.

Table 5: Unidimensionality of the PERMA Profiler

Variance in Eigenvalue units	Eig	Obs (%)	Exp (%)
Raw variance explained by measures	12.28	46.0%	46.3%
Raw Variance explained by persons	6.1	22.1%	22.3%
Raw Variance explained by items	6.6	23.9%	24.0%
Raw unexplained variance (total)	15.0	68.2%	68.2%

The other result to note from the study was the unexplained variance in the first construct, which stated the importance of checking the second construct if both the eigenvalues for the first contrast were more than 2 and the unexplained variance in the first contrast was more than 15%. The eigenvalue of the first unexplained variance of PERMA was 2.6. In comparison, its unexplained variance in the first contrast was 9.3%. Referring to the result, there was no need to evaluate the second construct due to the fulfillment of the unexplained variance in the first contrast.

4.3 Item Fit Statistics

An analysis of the item fit statistics demonstrated the validity of the construct. Table 6 indicates the value of tolerated infit and outfit Z-Standard (ZSTD), the value of accepted infit and outfit mean square (MNSQ), and the value of accepted Correlation Points (Pt Mean Corr) for the PERMA profiler.

Table 6: Goodness of model fit of the PERMA Profiler

Item	Infit		Outfit		Pt Mea Corr
	MNSQ	ZSTD	MNSQ	ZSTD	
P_1	0.70	-4.4*	0.70	-4.5*	.68
P_2	0.85	-2.0	0.85	-2.0	.63
P_3	0.94	-0.7	1.13	1.7	.60
E_1	0.97	-0.3	0.98	-0.2	.58
E_2	1.06	0.8	1.07	0.9	.54
E_3	1.73*	8.0*	1.67	7.7*	.45
R_1	1.23	2.9*	1.26	3.3*	.60
R_2	1.28	3.4*	1.16	2.1*	.62
R_3	1.53	6.2*	1.46	5.7*	.59
M_1	0.69	-4.5*	0.66	-5.2*	.69
M_2	0.82	-2.5*	0.79	-2.9*	.66
M_3	0.90	-1.3	0.84	-2.3*	.68
A_1	0.61	-6.1*	0.63	5.8*	.71
A_2	0.71	-4.3*	0.79	-3.1	.66
A_3	0.95	-0.6	0.97	-0.3	.56
Mean	1.00	-0.4	1.00	-0.3	
SD	0.31	3.9	0.29	3.8	

Note: * item with a fit value outside acceptable score

Based on the result in Table 6, the items all met the requirements, meaning that all items were valid for measuring PERMA in the Indonesian higher education context. However, in this context, a few items revealed a large ZSTD score for items, such as items P1, E3, R1, R2, R3, M1, M2, A1, and A2. The items were not revised or eliminated from the instrument because of their acceptable infit MNSQ, outfit MNSQ, and Point Measure Correlation. The items can still be retained for measurement. Therefore, the PERMA Profiler instrument can be used for Indonesian settings because it fits the Rasch measurement model.

4.4 Rating Scale

PERMA Profiler had 10 Likert scales to express students' subjective well-being. The appropriateness of using the number of options was evaluated by conducting a Rasch rating scale analysis to comprehend and differentiate between the various categories (Adams et al., 2022). This analysis was useful in evaluating the precise number of Likert-scale items to be used, as it would be possible to modify the scale into a smaller or larger range (Ishak et al., 2018). The analysis, as shown in Figure 2, was not as we expected. We can observe the unexpected results easily in the figure where all scales were bound together with a low Rasch Andrisch threshold and did not meet a minimum of 1.4 standard scores.

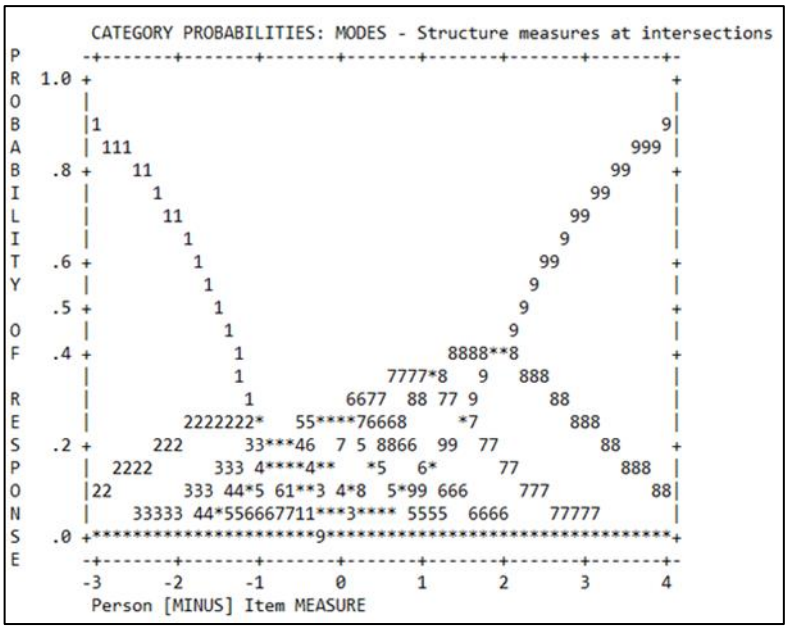


Figure 2: Rasch rating scale analysis

4.5 Test and Item Information Function

While item information function (IIF) analysis is beneficial to figure out the strength of an item to express the latent traits obtained and the deliberation of selected items, test information function (TIF) is the sum of IIF, which is presented for whole items. It shows how much information the test instrument provides is generally given to participants with specific abilities. Item information function for 15 items showed a similar trend with a curve peak of 3.2. Based on Zięba (2013), this is the maximum information each item gives. Based on Figure 3, this test provides maximum information if given to participants with abilities of around -.5 with a maximum value of 44.

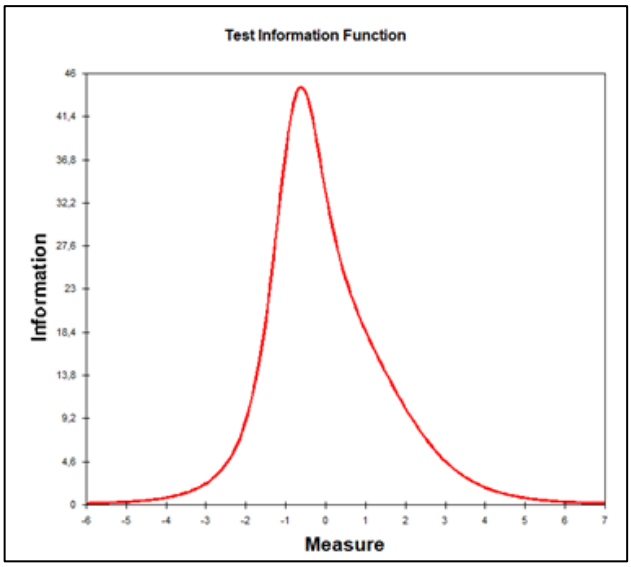


Figure 3: Test information function

4.6 PERMA-Profiler in Indonesia

The results of analyzing PERMA for Indonesian students after converting raw scores into logits are depicted in Figure 1. In general, it was revealed that the person's mean measure (logit) value was +1.41 logit (SD = .970), showing that the students feel happy, and their scores are laid out along the Wright map as provided in Figure 4. The highest logit score was 5.86, while the lowest score was -.970. The mean score of the item's mean measure (logit) was .000, while the standard deviation was .160. This shows that estimates of item difficulty on the logit scale vary widely.

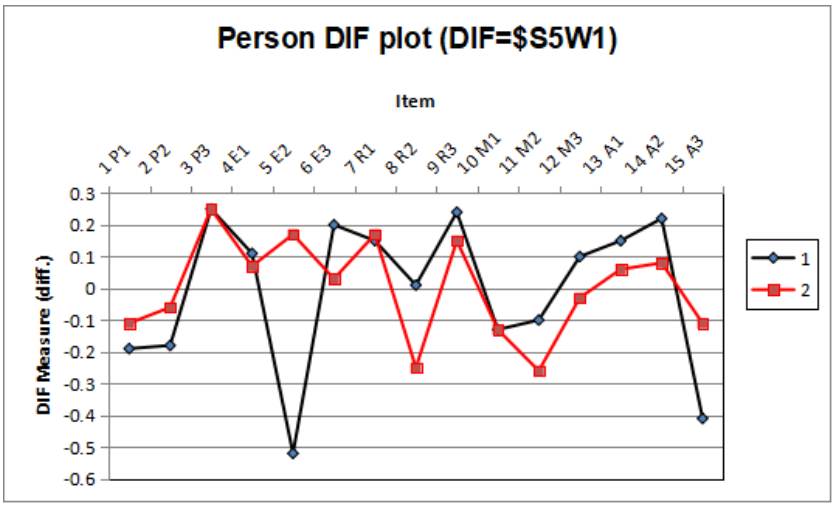


Figure 4: The mean measure (logit) value of person and item

4.7 Differences in PERMA based on Field of Studies

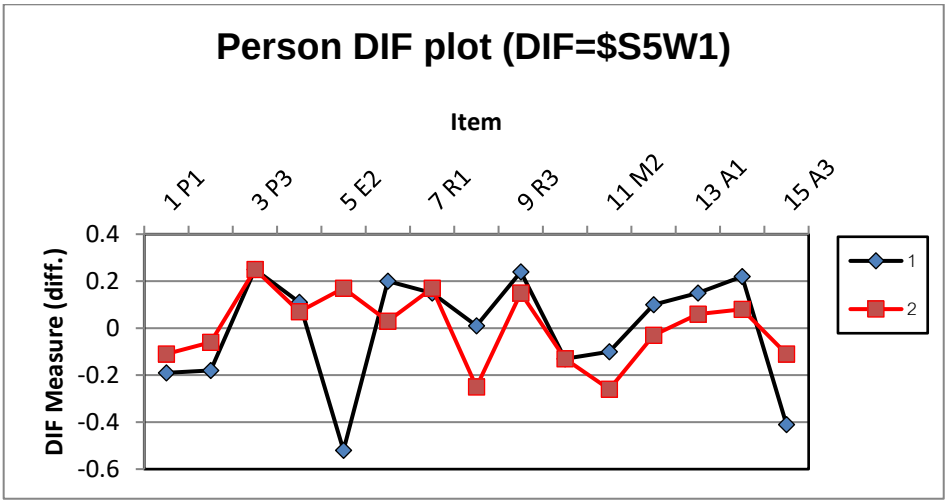
The Kolmogorov-Smirnov normal test was used for statistical analysis to explain the results. The significance levels of PERMA for language and mathematics education were more than 0.001, showing that the PERMA value distribution was normal. Therefore, to assess the language education and mathematics education groups, an independent t-test was employed. The independent t-test was conducted on the data obtained from the samples recognized by the Rasch analysis. The findings of the independent t-test of the field of study in PERMA are shown in Table 7.

Table 7: Independent t-test results

Dependent Variable	Field of study	N	Degree of Freedom	Mean	Standard Deviation	*t*	Sig
PERMA	Language	229	479	1.170	.932	-5.232	.000
	Mathematics	252		1.623	.963		

The results of the independent t-test of PERMA based on the field of study are shown in Table 7. The independent t-test analysis revealed a significant difference in PERMA across groups, $t = -5.232$, $df=479$, $p < 0.05$. The null hypothesis was rejected because mathematics education undergraduates had higher levels of PERMA than language education undergraduates. After depicting the results of 15 PERMA questionnaires, the PERMA analysis was conducted using the Rasch Model. The results of its Differential Item Functioning (DIF) analysis, as shown in Figure 5, show that some items have significant differences in PERMA score after reviewing their significance level of Chi-square. The items that showed significant results were item E2 (How

enthusiastic and interested are you in things?), item E3 (How frequently do you become engaged in what you're doing and forget the time?), item R2 (How much have you felt loved lately?) and item A3 (How often do you succeed in achieving the significant objectives you set for yourself?). Based on the DIF analysis, language, and mathematics students scored differently in the four items. The result must be considered to review overall instrument validity and reliability.



Notes: 1) Language 2) Mathematics

Figure 5. Differential Item Functioning (DIF) analysis of the field of the study

4.8 Differences in PERMA based on Academic Year Level

The difference in PERMA between first-, second-, and third-year students was determined using one-way ANOVA analysis. The variance homogeneity test was conducted before the one-way ANOVA test using Levene's statistics of equality of error variances, with an F value of 1.423, df = 2, and a sig. of .242 ($p > .05$). The variances of the constructs were evenly distributed. This result showed that the one-way ANOVA might be used to determine the significant difference in the students' PERMA. The one-way ANOVA was conducted on the data obtained from the samples recognized by the Rasch analysis. The findings of the one-way ANOVA of the academic year level in PERMA are shown in Table 8.

Table 8: One-way ANOVA results

Dependent Variable	Academic year	N	Mean	Standard Deviation	Sum of Squares	df	Mean Square	*F*	Sig.
PERMA	Year 1	125	1.331	.894	1.443	2	.721	.758	.469
	Year 2	204	1.465	1.022					
	Year 3	152	1.392	.974					

The results of the one-way ANOVA analyses of PERMA based on academic year level are shown in Table 8. For the PERMA, no significant univariate main effects for academic year level were found [$F= .758$, ($p = .469$, $p > .05$)]. Hence, the null hypothesis failed to be rejected because the level of PERMA across groups did not significantly differ. After contemplating the difference based on 15 items of PERMA, the following is the analysis for each item referring to Differential Item Functioning (DIF) as yielded by Rasch analysis. The findings were presented in Figure 6 by grounding the probability of the $\chi 2$ test, where the p-value should be lower than .05. There was no substantial difference among first, second, and third-year students as depicted by the one-way

ANOVA test. Based on DIF analysis, some items showing significant results were item P3 (What percentage of the time do you feel content in general?), E2 (How enthusiastic and interested are you generally about things?) and R2 (How much have you felt loved lately?). The three items revealed significantly different results of PERMA score, which needed to be considered to accept the PERMA-profiler for the Indonesian context.

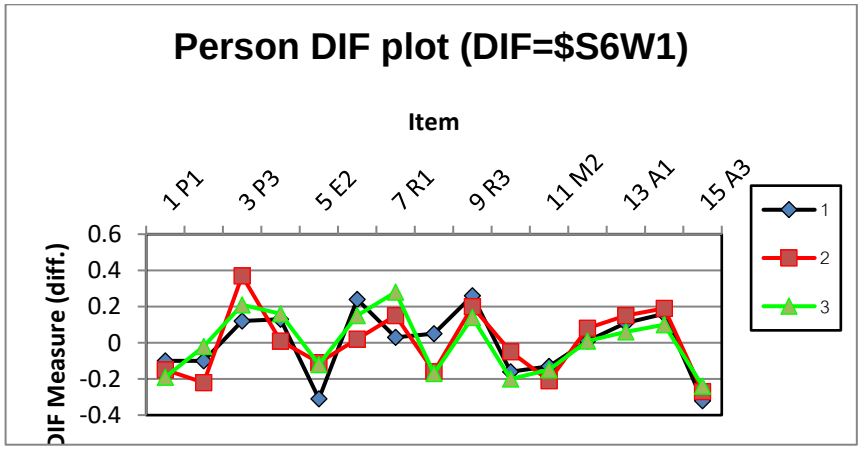


Figure 6: Differential Item Functioning (DIF) analysis of academic year level

5. Discussion

The work aimed to test Seligman's (2018) well-being theory at the tertiary educational level in Indonesian settings employing Rasch analysis. In general, the results of this study suggest that the PERMA Profiler was able to locate itself in a variety of cultural contexts, including Indonesia. As such, this indicates that the Indonesian form of this tool is a valid and reliable measure of well-being. Corresponding to our research question, the PERMA profiler instrument generally had an excellent Rasch model feature. Following Seligman's PERMA framework (Seligman, 2018), all five sub-components were unidimensional. The results of our study were completely consistent with those of earlier studies (e.g., Choi et al., 2019). We discovered that the more significant education level of populations that call for sophisticated opinions is the source of the similarities between the present study and past studies on the PERMA profiler. Moreover, detailed discussions are provided in the following sections.

It is concluded that PERMA instruments for the Indonesian settings can be utilized as a valid measurement. The current result was supported by prior investigations (Butler & Kern, 2016). PERMA comprises (at least some of) the components of happiness, and people who have one have a nearly equal likelihood of having other components. In addition, the findings of the Rasch model indicated that the PERMA profiler questionnaire in the Indonesian settings was reliable. The current findings appear to be in line with prior studies (e.g., Hidayat et al., 2020). Again, based on the criteria on MNSQ, ZSTD, and Pt Mean Corr, the evaluation of items fit statistics for PERMA profiler was in line with a previous study done by De Carvalho et al. (2023), who stated that the first-order five-component model of PERMA outperformed the others in terms of fit using CFA analysis. A few items in this study revealed great ZSTD values, but Alkhadim et al. (2021) emphasized that the execution of other requirements suggested that the high ZSTD score had been overlooked. Last but least, the results of the Rasch modelling also indicated a broad dispersion of measurements in question complexity over the logit scale. The results showing the happy feelings of Indonesian higher education students were also discovered in another research (e.g., Susanti &

Supradaniati, 2018). For example, Susanti and Supradaniati (2018) indicate that Indonesian students hold high autonomy, personality development, positive interaction, and great purpose in life.

Finally, the results of the independent t-test of PERMA based on the field of study showed a significant difference in which mathematics education students felt happier than language education students. The findings were in line with Hidayat et al. (2022), which indicated that the well-being of university students was affected by various backgrounds. Although the level of the PERMA profiler for mathematics education was higher than at of language education, the Rasch finding suggested interesting results for some items in a few sub-dimensions. For instance, it is noticeable that language students felt excited and interested in things more than mathematics students. Moreover, it is conceivable that they rated the question (item E2) among the highest items in the survey. Another item from the emotion construct also revealed a statistically significant difference in which mathematics students felt that they often lost track of time while doing something they enjoyed (item E3). It is interesting to note that both majors had different tendencies to rate items under the same construct. Based on the analysis, while mathematics students felt that they had been feeling loved (item R1), language students could handle their responsibilities (item A3).

However, there was no significant difference based on academic year level on the PERMA profiler. This output was in line with Rasch's modeling analysis. Based on DIF (analysis by item), however, the first and second-year students showed significant differences in items P3 (In general, to what extent do you feel contented?), E2 (How enthusiastic and interested are you generally about things?) and R2 (How much have you felt loved lately?). First-year students rated the three items with higher scores than other student groups. While first-year students rated items P3 and E2 with higher scales than second-year students, they rated a lower score on item R2. The following provided results of comparing the first-year, second year, and third-year students in the sub-dimension of relationship. The only item showing a significant difference was the second item of relationship construct, where the third-year mathematics and language students were asked if they felt loved. Lastly, it was found that the second year and third-year students had shown a significant difference on items P1 and P2 at positive item construct. Overall, the current findings did not support the previous research (Bewick et al., 2010), which revealed that once students begin university, there is a larger demand for their well-being. One possible explanation for this finding was that all students faced the same Covid situation, which forced them to adjust to the new teaching environment.

However, cultural influences play a crucial role in shaping how individuals respond to the PERMA-Profiler, as their perceptions and expressions of well-being are deeply rooted in societal norms, values, and beliefs. In collectivist cultures—common in many Asian societies—well-being is often linked to maintaining social cohesion, strong community bonds, and fulfilling family obligations. Consequently, respondents from these backgrounds may give higher importance to the "Relationships" aspect of PERMA, while potentially downplaying "Accomplishment" or "Positive Emotion" if these are viewed as individualistic or culturally inappropriate to emphasize. Moreover, variations in emotional expression and communication norms across cultures can impact how people understand and answer items on the PERMA-Profiler. For example, cultures that value emotional restraint might result in individuals reporting lower levels of positive emotions, despite experiencing them. In addition, subtle differences in language and the translation of questionnaire items may further affect comprehension and response accuracy, underscoring the need for cultural sensitivity in the interpretation and application of well-being assessments.

In conclusion, numerous empirical studies on happiness have been carried out. Interestingly, the most recent information has expanded the topic and offered proof of PERMA's applicability in various contexts. The purpose of this study was to use Rasch modeling analysis to explore PERMA at the higher educational level in the Indonesian setting. Overall, the PERMA profiler is fit to evaluate well-being in the Indonesian higher education context. The findings of the Rasch model indicated that the PERMA profiler tool was accurate and effective in the Indonesian scenario and showed high internal consistency. At the same time, the separation of person and item for PERMA questions elucidates the excellent range of instruments extending from various items and respondents. Regarding unidimensionality, the explained variance of PERMA in the Indonesian context exceeded the recommended score. Moreover, mathematics education students had higher levels of PERMA than those in language education, while the level of PERMA across the academic year level did not significantly differ. The implications of this study suggest that, from an educational viewpoint, well-being interventions should be customized to address the unique needs of students in various fields of study. For instance, students in language education may benefit from extra support that helps increase their sense of achievement and alleviates the stress associated with more subjective evaluations. Moreover, providing more opportunities for positive emotional experiences in language education could help narrow the well-being disparity between different disciplines. By recognizing these differences, educators can be better equipped to create a more supportive and balanced learning environment for all students.

6. Limitations and Future Studies

Some limitations of the current study deserve to be mentioned. First, although our results show that the PERMA profiler of the student is empirically reliable and valid in higher education, this is only true in the case of higher education for mathematics and language education field. Hence, the PERMA profiler instrument has the potential to be implemented for research and practice in this context only. A complete validation of the PERMA profiler instrument should be studied in the future, including a larger sample across field and academic year levels. Second, since the current findings suggest that mathematics education students had higher levels of PERMA than those in language education, it is striking that language students felt more excited and interested in some items in positive emotion and relationship sub-components than mathematics students. Upcoming research should be done in depth by conducting a mixed approach design and qualitative methods to examine further the viewpoints of higher education students under this phenomenon. Third, this study solely looked at the field of education and academic year-level variations in PERMA profiler use. Since the current findings indicated that various backgrounds could lead to different measurement results, future research could revise and remove the items by considering the current findings. In addition, one should be careful to select the sample background and the number of populations. The factor of gender, however, can have a substantial impact on PERMA profiler use. Future research could focus on understanding the pattern of the PERMA profiler based on the gender factor since this variable is sensitive toward emotion, engagement, and purpose in life. The COVID-19 pandemic likely had a considerable impact on students' well-being throughout the study period, and a more in-depth analysis is needed to explore how external factors, including remote learning, social isolation, and heightened stress due to the uncertainty of the situation, may have affected the outcomes. The shift to online education, for instance, could have introduced new challenges in terms of student engagement, motivation, and academic performance, potentially influencing their emotional and psychological well-being.

Again, it is recommended that future research adopt a longitudinal design to monitor fluctuations in student well-being over extended periods. Such an approach would allow researchers to capture

the evolving nature of well-being and better understand how prolonged exposure to academic pressures, varying levels of institutional support, and environmental changes influence students' mental and emotional states. Furthermore, future studies should delve deeper into the role of external factors—such as the enduring effects of the COVID-19 pandemic, financial stress, cultural expectations, and transitions between online and face-to-face learning environments. Examining these variables in greater detail can shed light on their complex interplay with the components of well-being as defined by the PERMA model. This enhanced understanding can guide the formulation of more tailored, inclusive, and sustainable well-being initiatives within higher education institutions, ultimately promoting student success and resilience in diverse educational contexts.

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