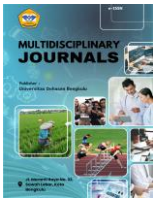

MJ
Multidisciplinary Journals
Volume 2 Issue 3, 2025 (91-100)
ISSN (*online*) : **3047-8499**
Homepage : https://jurnalunived.com/index.php/MJ
Doi : https://doi.org/10.37676/mj

Exploring Well-Being Influences On Mathematics Learning At University

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Received [20-07-2025] Revised [01-09-2025] Accepted [03-09-2025]

Abstract. This study explores the influence of well-being on mathematics learning among university students. It addresses the limited research on how well-being affects mathematics learning in higher education. Data from 68 respondents were processed using quantitative methods; this study investigated the relationship between several aspects of well-being and mathematics learning. The results demonstrated that psychological health and Behavior significantly influence students' mathematical understanding. While subjective well-being, Emotion, and spiritual well-being showed less significant effects in this context. The study highlights the importance of backing students' emotional and mental well-being to enhance their learning in mathematics at the university level. It accentuates that academic programs should arrange these aspects to create a more effective learning environment.

Keywords: *Well-being, Mathematics Learning, Psychological Factors* .

INTRODUCTION

Students at university level have a heavy academic burden and responsibilities, therefore it is important to maintain student well-being, as students must balance the demands of learning mathematics. Therefore, sufficient psychological, social, and environmental support is required to help pupils manage stress and improve their academic comprehension (Chemagosi, 2024). Student well-being plays a crucial role because many experience significant academic pressure and math anxiety, which not only hinder their understanding of complex concepts but also hurt their mental health and overall learning motivation (Hill et al., 2021).

In addition to internal factors, external support systems also significantly impact how well children perform, especially when learning math. A supportive learning environment and ongoing social support can reinforce students' ability to engage with mathematical material and achieve better academic outcomes. Students' mathematics achievement can be improved with a positive classroom atmosphere. In dealing with complex mathematical problems, students' regulation and their ability to think creatively are needed, as explained by Niu et al. (2020). Furthermore, Chen, Bian, and Zhu (2023) found that social support has a positive influence on academic engagement among university students, with life satisfaction and academic motivation serving as mediators in this relationship. This result from the study indicates that students who perceive strong social support are more likely to be academically engaged, particularly in areas such as mathematics learning.

By examining how social and educational policies affect students' mathematical outcomes and the affective factors that influence mathematics learning, such as individual beliefs, emotional reactions, and outside support networks, the current study seeks to build on this

foundation and examine the impact of welfare on mathematics learning. Recent work by Schoenholzer and Burger (2024) underscores the importance of early investment in children's education and family support through welfare policies, linking these to long-term educational attainment. At the same time, Travero and Japos (2024) highlight the interplay between affective determinants such as motivation, anxiety, self-perception, and academic achievement in mathematics. A holistic understanding is used to examine aspects of improving student well-being and performance that are needed in learning mathematics at the university level.

From a theoretical standpoint, the educational theories and practices used in this study emphasize the importance of student well-being in learning mathematics at the university level. The research combines psychological, spiritual, and subjective well-being components to understand how motivation, emotional states, social support, and educational contexts influence academic accomplishment. The results show that fear of mathematics can be minimized by addressing emotional resilience and mental health; this can also increase student activeness in learning. This study proves that creating a well-being-oriented learning strategy to create a comfortable learning environment and manage emotions well can foster mathematical competence in students. Based on these results, this study is useful for teachers, legislators, and mental health professionals who want to improve the quality of student well-being and academics at the higher education level.

To guide this investigation, the study examines how different aspects of well-being affect college students' understanding of mathematics. Earlier studies have demonstrated the significance of well-being in academic settings. For example, increased student success and engagement were positively associated with psychological well-being and intrinsic motivation (Smith et al., 2021). Furthermore, it demonstrated how supportive learning environments might improve student experiences and reduce academic stress (Johnson & Lee, 2022).

Based on this review, the following hypotheses are proposed. Well-being is hypothesized to influence students' Mathematics Learning significantly (H1). Furthermore, the study posits that Behavior also significantly influences students' Mathematics Learning (H2). Additionally, it is hypothesized that Psychological Well-Being significantly influences students' Mathematics Learning (H3). The study also explores the impact of Emotion, hypothesizing that it significantly influences students' Mathematics Learning (H4). Finally, it is hypothesized that Spiritual Well-Being significantly influences students' Mathematics Learning (H5).

LITERATURE REVIEW

While numerous studies have explored the relationship between student well-being and academic achievement, several limitations remain in the existing body of the research. Despite the growing body of research confirming the role of psychological well-being in academic achievement, studies specifically focusing on how well-being affects university-level mathematics learning remain limited. For example, Makhasane and Mokoena (2023) focused on secondary education and did not explore the specific mechanisms relevant to higher education. Similarly, Rossi et al. (2023) emphasized the influence of mathematics anxiety on arithmetic performance among college students but did not address broader well-being aspects such as emotional support or motivation. Therefore, this gap shows that additional contextualized and targeted research is required in the setting of higher education.

In support of the need for further research, empirical data further support the substantial influence that student well-being has on mathematics learning. Makhasane and Mokoena (2023) show that students' happiness and math proficiency strongly correlate, especially when they get explicit teaching. However, excessive parental involvement in homework negatively mediated this relationship. Likewise, Rossi et al. (2023) also highlighted the influence of

mathematics anxiety, which is closely linked to students' self-concept and self-efficacy, on their arithmetic performance.

To provide a deeper theoretical understanding of these findingsRyff and Singer's psychological well-being theory is particularly relevant to providing a theoretical foundation. According to the framework, self-acceptance, personal development, meaning in life, environmental competence, meaningful connections with others, and autonomy are six interrelated characteristics that define well-being. These elements offer a comprehensive framework for realizing personal well-being when viewed as a whole. Moreover, research by Zhong (2024) suggests that each dimension contributes positively to students' academic success.

This framework becomes even more significant for university students, such as those in nursing programs, who often experience high levels of anxiety and affective challenges, as the theory helps institutions design interventions that foster emotional resilience and life satisfaction, which are essential for success in school and the workplace in the future (Subida et al., 2024).

In line with the holistic view of well-being proposed by Ryff and Singer, Ellison and Fish's theory on university-level mathematics learning emphasizes the importance of connecting academic content with real-life applications and promoting meaningful social interaction among students. They contend that to improve students' comprehension, mathematics instruction should be theoretical and applicable to actual circumstances. Furthermore, the constructivist methodology of their advocate promotes students to develop their understanding by problem-solving and active investigation. In order to ensure that all children can succeed in learning mathematics, they also emphasize the importance of technology in promoting critical thinking, assisting learning, and establishing a friendly classroom environment that accommodates a range of learning styles and backgrounds (Garcia del Dujo et al., 2021).

In addition, Ed Diener's theory of Subjective Well-being (SWB), which includes psychological and spiritual aspects as well as life satisfaction, the presence of positive emotions, and the absence of negative emotions, provides a beneficial framework for comprehending the connection between well-being and academic success, especially in mathematics. Recent findings indicate that university students' life satisfaction is positively associated with their performance in mathematics, especially when instructional clarity is maintained. However, excessive parental involvement can negatively moderate this relationship (Makhasane & Mokoena, 2023). It has also been demonstrated that adverse effects, such as mathematical anxiety, considerably reduce university students' arithmetic accomplishment (Rossi et al., 2023). This statement highlights the necessity of learning that is emotionally supportive settings that boost self-esteem and lessen failure-related anxiety. These insights reflect the growing importance of considering emotional and psychological variables in mathematics learning at the university level.

METHODS

Sampling was done intentionally, namely taking a method by limiting participation to select qualified respondents. The respondents were 68 students who entered the university level in semesters 1 to 6. This was done so that the information received was in accordance with what was being analyzed. This study uses a quantitative method that focuses on collecting and analyzing numerical data, researchers use this to identify patterns and explore relationships between variables. This method involves objective measurements, according to Barella et al. (2024). For this study, writers collected data using Google Forms with a Likert scale.

This study's data analysis involves statistical analysis. Descriptive statistics like median, mean, and others are used to better understand participants' responses for each variable. In addition, the study employs Pearson correlation analysis to examine relationships between variables. The p-value is used in a hypothesis-testing approach to determine the significance of the findings.

Cross-sectional data collection was employed, and the influence of each well-being factor on students' mathematical comprehension was statistically assessed using p-value significance tests and Pearson correlation. Without any direct intervention or experimentation, this study was observational and focused on quantifying and evaluating the well-being conditions that students encountered in mathematical learning environments.

RESULTS

The data analysis results from the questionnaires administered to respondents are presented in this chapter. The results are presented methodically in line with the study's goals, which include figuring out how well-being affects students' learning of mathematics.

Table 1. Descriptive statistics of independent variables

Variable	Mean	Median	STD
Subjective Well-Being	3.66	4	0.45
Psychological Well-Being	3.93	4	0.63
Behavior	3.68	4	0.49
Emotion	4.13	4	0.55
Spiritual Well-Being	3.72	4	0.61

The descriptive statistics, including the mean and median, provide insight into the responses for each independent and dependent variable. (Madhavan, 2025). For Subjective Well-Being (Ed Diener), the mean (3.66) and median (4.00) are very close, indicating a moderate agreement among respondents about subjective well-being. Similarly, Behavior (Fish) shows a mean of 3.68 and a median of 4.00, reflecting moderate agreement with a slight skew toward higher agreement on attitudes and behaviors regarding learning. For Psychological Well-Being (Ryff), the mean (3.93) and median (4.00) suggest that respondents lean more positively toward psychological well-being. Emotion (Singer), with the highest mean (4.14) and median (4.00), indicates strong agreement with the Emotion and purpose of learning mathematics. Spiritual Well-Being (Ellison) shows a mean of 3.72 and a median of 4.00, implying that spiritual well-being is also viewed positively but with more variation in responses. The consistency between mean and median across most variables suggests that the distribution of responses is relatively symmetrical, except for some areas (like Behavior) where slight positive skewness is observed.

Table 2. Correlation between independent variables

Variable	Correlation Coefficient (r)
Subjective Well-Being and Behavior	0.711
Subjective Well-Being and Psychological Well-Being	0,628
Subjective Well-Being and Emotion	0.753
Subjective Well-Being and Spiritual Well-Being	0,7791
Behavior and Psychological Well-Being	0.8196
Behavior and Emotion	0.7442
Behavior and Spiritual Well-Being	0.6981
Psychological Well-Being and Emotion	0.8466
Psychological Well-Being and Spiritual Well-Being	0.7241
Emotion and Spiritual Well-Being	0.8524

The Pearson correlation analysis showed a strong and statistically significant relationship between all variables tested. The highest correlation between Meaningful Life and Spiritual Well-Being (r = 0.8524) indicates that existential well-being is closely related to the individual's spiritual dimension. Strong correlations were also seen between Psychological Well-Being and Meaningful Life (r = 0.8466) and between Behavior and Psychological Well-Being (r = 0.8196), confirming that psychological well-being is closely related to self-development and interpersonal relationships. On the other hand, subjective well-being had a respectably high correlation with every other measure (r ranging from 0.628 to 0.7791), suggesting that happiness's emotional and cognitive components are also crucial for overall well-being. Overall, these findings confirm that the dimensions of happiness, psychological, social, and spiritual, are intertwined and cannot be separated in forming the well-being of students as a whole.

Table 3. Interpretation of Correlation Coefficient

Correlation Coefficient Value (r)	Interpretation of Correlation Coefficient
0.00-0.199	Very Low
0.20-0.399	Low
0.40-0.599	Medium
0.60-0.799	Strong
0.80-1.000	Very Strong

Source: Sugiyono, 2013

Table 4. Descriptive statistics of dependent variables

Variable	Mean	Median	STD
Mathemathics Learning	3.588	4	0.980

The Mathematics Learning variable has a mean score of 3.59, indicating that respondents generally rate their understanding as between "Standard" and "High" on the Likert scale. The median value of 4 shows that the middle value of responses is "High," suggesting that at least half of the respondents consider their understanding of Mathematics Learning above average. The standard deviation of 0.98 indicates a moderate level of variability, meaning that while most responses are close to the average, some respondents' ratings differ more significantly.

Table 5. Correlation independent variables with dependent variables

Variable	Correlation Coeffisient (r)
Subjective Well-Being and Mathematics Learning	0.286
Behavior and Mathematics Learning	0.597
Psychological Well-Being and Mathematics Learning	0.674
Emotion and Mathematics Learning	0.479
Spiritual Well-Being and Mathematics Learning	0.374

The correlation analysis indicates a statistically significant link between Psychological Well-Being and Mathematics Learning, which shows that Psychological has the strongest positive relationship with Mathematics Learning (r = 0.674), Behavioral (r = 0.597), and Emotion (r = 0.479) also show significant positive correlations, suggesting that both Behavior and Emotion contribute moderately to improving Mathematics Learning. Subjective Well-Being (r = 0.286) and Spiritual Well-Being (r = 0.374) exhibit weaker, implying that both Subjective Well-Being and a sense of life purpose have a moderate positive influence on Mathematics Learning. Psychological Well-Being, Emotion, and Emotion have the most substantial impacts on students' Mathematics Learning.

Table 6. Hypothesis test (t-test)

Variable	t-Stat	P-value	Interpretation
Subjective Well-Being	-1.014	0.314	Not significant (p > 0.05)
Psychological Well-Being	2.515	0.014	Significant (p < 0.05)
Behavior	0.023	0.981	Not significant (p > 0.05)
Emotion	3.087	0.003	Significant (p < 0.05)
Spiritual Well-Being	-1.297	0.199	Not significant (p > 0.05)

Based on the table above, hypothesis testing was conducted using the p-value approach. With a significance level of a 5% or 0.05, the following is the decision rule: if the p-value < 0.05, the null hypothesis (Ho) is rejected, and the alternative hypothesis (Ha) is accepted, indicating there is a substantial relationship between the independent and dependent variables. According to the results, the variable Behavior has a p-value of 0.014, and Psychological Well-Being has a p-value of 0.003, which is less than 0.05. Therefore, Ho is rejected, and Ha is accepted for these two variables, meaning that Behavior and Psychological Well-Being significantly influence students' Mathematics Learning. In contrast, the variables Subjective Well-Being (p = 0.314), Meaningful Life (p = 0.981), and Spiritual Well-Being (p = 0.199) have p-values greater than 0.05, so Ho is accepted, and Ha is rejected, indicating that these variables do not have a significant effect in the context of this study.

The findings demonstrate that the most important factors influencing mathematics learning are Behavior and psychological well-being. On the other hand, subjective well-being, meaningful life, and spiritual well-being do not matter in this situation. This lack of significance in Subjective Well-Being, Meaningful Life, and Spiritual Well-Being suggests that behavioral and psychological well-being play a more substantial role in students' understanding and application of mathematical concepts. Subjective well-being, spirituality, and life purpose seem to have less of an impact. Therefore, in order to promote students' learning of mathematics in an academic setting, attempts to improve their psychological and behavioral situations might be a crucial first step.

DISCUSSION

The results of this study are in line with the social cognitive theory put forward by Bandura (Bandura, 2020). According to Bandura, people who believe they can finish a job are more likely to be persistent, motivated, and strategic in their learning. This idea is consistent with study findings demonstrating the beneficial effects of behavioral elements, including initiative, discipline, and learning techniques, on mathematics learning.

Moreover, additional theoretical support comes from Ryff's model of Psychological Well-Being. Ryff identifies dimensions such as personal growth, autonomy, and purpose in life as core to psychological flourishing, which directly correlates with deeper learning engagement (Ryff & Keyes, 1995). These theories prove that pupils with strong psychological and behavioral traits are better intellectually equipped to comprehend challenging mathematical ideas.

However, not all of the findings are consistent with previous theoretical forecasts. For example, according to Ed Diener's Subjective Well-Being Theory, people's general functioning, including their ability to learn, is greatly influenced by their level of pleasure, life satisfaction, and positive affect (Diener, 2009). Based on this theory, students who are emotionally well and satisfied with life are expected to perform better academically (Kaya & Erdem, 2021). This could

be caused subjective well-being alone is not as important in influencing mathematical performance as other elements as academic engagement and weariness (Malabayas et al., 2022)

Furthermore, Singer highlights that an essential element of all emotions is the sympathetic nervous system's activation, which influences cognitive functions (Singer, 1962). Nevertheless, when learning mathematics many pupils might not go trough major emotional swings (Suparman & Juandi, 2024).

In addition, Ellison's Spiritual Well-Being Model also posits that spiritual fulfillment contributes to inner peace and focus, both valuable in academic contexts (Ellison, 1983). The weaker effects found in this study for these three variables-subjective well-being, meaningful life, and spiritual well-being may reflect specific contextual factors or limitations in how these constructs interact with cognitive tasks such as Mathematics Learning rather than contradicting the theories outright.

The study results indicate that academic interventions should enhance students' behavioral and psychological well-being, as both significantly influence mathematics learning. Teachers who promote self-regulated learning and emotional resilience can be beneficial. Other well-being variables also indicate a goos learning environtment, although the benefits are not as significant. Improving children's academic performance may be easier with holistic strategies that support cognitive and emotional development.

CONCLUSION

The study's conclusions show that, among the various aspects of well-being studied, behavioral and psychological well-being are the most important, and both significantly affect students' conceptual understanding of mathematics. Statistical investigations found that both of these factors have positive and significant impact. This study contributes to the growing conversation on well-being and academic performance by examining various aspects of well-being.

Despite some advantages, this study has some shortcomings. The use of self-reported Likert Scale data and accuracy may be affected by relatively small samples and the generalizability of the results. This study also cannot show causal relationships between variables because it was designed cross-sectionally. Future studies are encouraged to employ experimental or longitudinal methods, as well as to include larger and more diverse samples to support causal findings. By broadening the focus to include additional academic disciplines or more general learning objectives, a greater understanding of the relationship between academic performance and student well-being also can be reached.

LIMITATION

It is important to recognize several limitations of this study. First, the study's conclusions may have been influenced by a number of research errors. For example, the use of self-reported Likert-type responses and the small sample size may reduce the reliability of the results due to response bias. Moreover, the cross-sectional nature makes determining the causal relationships between variables difficult. Potential multicollinearity among the independent variables, along with the exclusive focus on Mathematics Learning as the outcome, may also limit the broader applicability of the conclusions. These factors suggest that future research should consider larger and more diverse samples, incorporate additional academic. outcomes, and employ longitudinal or experimental designs to explore causal relationships better.

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