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The contribution of subjective wellbeing to the improvement of the academic performance of university students through time management as a mediator factor: A structural equation modeling

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Abstract

Introduction: In recent years, there has been a growing focus on assessing life satisfaction among students, as a way of measuring their overall wellbeing. This study aims to investigate how positive feelings (PF) and negative feelings (NF) predict academic performance (AP) through time management (TM) as a mediator in this process.

Methods: This cross-sectional study was conducted among Moroccan students from the University of Sidi Mohamed ben Abdullah in Fez. A total of 540 students (288 females, 53.3%; 252 males, 46.7%; with a mean age of 21.51 and a standard deviation of 3.86) completed a pencil and paper questionnaire. A questionnaire was adopted as a tool in this research. Positive emotions (Pe), Negative emotions (Ne), and Life satisfaction were measured on a five-rank scale for each variable (strongly agree = 5, strongly disagree = 1).

Results: The results of using structural equation modeling showed that the life satisfaction factor, which includes two dimensions, PF and NF, has a significant influence on academic performance.

Discussion: Creating a supportive and positive learning environment can enhance students' wellbeing and improve academic performance.

Take-home message: The study underscores the crucial role of prioritizing wellbeing, creating a positive learning atmosphere, and mastering time management as key factors in enhancing university students' academic performance.

Keywords: Academic performance; life satisfaction; positive and negative feelings; time management.

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INTRODUCTION

During the crucial phase of their academic journey, university students face, more often than not, numerous psychological challenges- feelings of anxiety, stress, and even learned hopelessness, to name but a few- that can influence their performance negatively, leading to low academic achievement. Other factors contributing to academic failure include a lack of satisfaction with their field of study, uncertainty about their future career prospects, and a general lack of motivation [1,2]. For a long time, educators have believed that students' cognitive abilities and the relationship between faculty and students are the main, if not the only, factors that determine students' academic performance [2–5]. Previous research has focused primarily on teaching methods and instructional design, with less emphasis on how external factors and attitudes can influence the student's academic success. However, non-academic factors that influence students' chances of succeeding in higher education are equally important and merit research [6–8].

Positive Psychology (PP) has contributed significantly to the extensive study of the relationship between the students' subjective wellbeing (SWB) and academic performance. SWB is not synonymous with happiness; instead, a general index that describes people's subjective evaluation of their level of wellbeing. Researchers have noted that a high level of SWB improves people's health, longevity, work, income, social relations, and societal benefits [9].

Furthermore, SWB is a multifaceted construct that encompasses various components, including Life Satisfaction (LS), Positive Affect (PA), and Negative Affect (NA), among others. LS pertains to a person's cognitive assessment of their overall life positivity, whereas PA and NA capture the emotional dimension of SWB [9]. Therefore, LS, PA, and NA are complementary terms-yet distinct

aspects of the same umbrella term, SWB. More specifically, researchers have observed that students who have reported high life satisfaction have appeared to be more resilient and less easily affected by academic challenges. This idea was supported by the opposite observation, where students who reported low levels of life satisfaction appeared to experience difficulty in focusing on their studies, and their academic performance dropped as a result [10–12].

Numerous benefits have been associated with high levels of life satisfaction. Research has found that individuals with higher levels of life satisfaction tend to have better job performance, greater career satisfaction, increased organizational commitment, and reduced intentions to leave their jobs [12,13]. Further research suggests that life satisfaction is linked to positive educational outcomes. Multiple studies have shown that in addition to not experiencing psychological distress, having high life satisfaction is crucial for promoting student engagement and academic achievement in university students [12,14]. High life satisfaction is also associated with positive academic expectations, increased academic self-efficacy, greater progress toward academic goals, and reduced academic stress. Some studies suggest that students with higher life satisfaction also achieve higher Grade Point Averages (GPAs) in college [12,13,15].

The study of Heffner and Antaramian (2016) found evidence supporting the hypothesis that LS is an accurate predictor of student engagement. LS was found to predict an additional 3.8-5.3% variance in self-reported cognitive, affective, and behavioral engagement. This finding is consistent with prior research confirming the relationship between LS and academic achievement reported in previous research [14]. According to Long and Huebner (2014), Life Satisfaction can be a social and affective indicator to gain insight into how students cope with their academic challenges. Additionally, LS involves an individual's self-descriptive image of wellbeing in life as a whole, including specific domains such as family, friends, and school life [16]. It is also referred to as a reflective cognitive evaluation of a person's quality of life using subjective standards [17]. Therefore, understanding students' satisfaction with their lives can provide important information for educators and researchers to use to enhance students' wellbeing and academic success [18].

In parallel, PA manifests in the individual's inclination to experience positive emotions and interact positively with others despite life's challenges. On the other hand, NA involves negatively experiencing the world. According to Watson et al. (1988) PA and NA are, statistically speaking, independent constructs. However, Lim et al. (2010) reported a positive correlation between the two in a study conducted in Japan [19].

PA and NA constitute two dimensions of an individual's emotional experiences. Even though they are opposite ends of the same dimension, PA and NA are orthogonal dimensions of emotional experience, with high NA signifying subjective anguish and aversive involvement and low NA representing tranquility and calm. On the other hand, PA indicates how individuals interact in enjoyable interactions with their surroundings. Hence, high PA is characterized by attentiveness and excitement, whereas low PA is characterized by lethargy and melancholy [19].

According to Diener (1984), these three constructs are the most stable components of subjective wellbeing and are the best indicators of an individual's perceived quality of life [12]. Existing research has demonstrated that when individuals assess their life satisfaction, the balance between positive and negative emotions plays a crucial role as a source of information [20–22]. Furthermore, experimental studies have provided evidence that positive and negative experiences have a causal impact on satisfaction judgments [23]. These findings align with the cognitive perspective of affect-as-information, suggesting that individuals rely on their emotional experiences to form judgments about their life satisfaction [8,22].

Given the state of the art described above, these theoretical constructs lend themselves to Engine Modelling of Wellbeing (EMWB). This latter is a holistic framework Jayawickreme et al. (2012) developed to integrate the affective, cognitive, and exogenous variables under the same systematic conceptual mechanism. According to Jayawickreme et al. (2012), human functioning takes a [INPUT \rightarrow PROCESS \rightarrow OUTCOME] schemata, i.e., an engine schema. Inputs are Exogenous and endogenous variables influencing wellbeing, such as income, adequate nutrition, education, Healthcare, etc.

Processes are psychological processes and mechanisms that affect people's choices. For instance, cognitive evaluations, positive affect, self-control, capabilities, etc. Finally, outcomes are external behaviors of wellbeing such as contribution to the human heritage relationships, accomplishments, and relationships [24]. However, it is important to note that EMWB acknowledges the existence of a feedback chain of causality, i.e., high academic performance, for example, could affect reciprocally SWB.

Accordingly, recognizing the reflective effect between SWB and academic performance (AP) in the Engine Model, this study aims to investigate the direct effect of SWB, measured through LS, PA, and NA, on university students' academic performance, measured through students' GPA, through Time Management (TM) as a mediator. TM controls the student's ability to complete their academic tasks on time by scheduling their daily activities. Therefore, it involves various cognitive processes such as planning a schedule, prioritizing what to study sequentially, mapping workload on timetables, etc. It was strongly recommended that students keep control of their time when completing academic tasks to achieve high levels of academic performance [25]. Aduke's study (2015) results indicated a strong relationship between students' academic performance and their time management skills. It gives the impression that students must effectively use their time to complete their various assignments successfully. Since students complete their tasks on time, time management and academic success are strongly intertwined [25].

Although previous research has not directly investigated the mediating role of time management, the integrative association among the three variables under one unified, systematic engine model suggests a promising avenue for exploring this aspect. By addressing this research gap, our paper aims to shed light on the complex interplay between these variables and contribute to the existing literature in this field.

METHODS

Study design

A cross-sectional study was conducted in Morocco from March to July of 2022.

Study participants

The study included 540 students from the University of Sidi Mohamed ben Abdullah in Fez, Morocco, consisting of 252 females (47.66%) and 288 males (53.34%), with an average age of 22.42 years (SD age = 4.081). The survey was administered on paper to students from different faculties and disciplines, including science, literature, engineering, and other technical and professional disciplines. Participants' selection was based on non-probabilistic sampling (voluntary response sampling). Participation by students was optional, and they did not receive any incentives or motivation.

Instrumentation and procedure

A questionnaire was adopted as a tool in this research. The questionnaire, originally validated for university students by Mansy and Kazem (2010), was employed in the current study in its Arabic version [27].

The first dimension of the scale n is "Subjective Wellbeing" (SWB). It is represented in this study by positive emotions (Pe), Negative emotions (Ne), and Life satisfaction (Ls), which are as follows:

- "I feel joy most of the time" (Pe1).
- "I feel peace of heart and peace of mind" (Pe2).
- "I often feel sad for no apparent reason" (Ne1).
- "I feel anxious and stressed" (Ne2).
- "I have a high degree of life satisfaction" (Ls1).
- "I feel good about my current situation" (Ls2).

The negative emotions were reversed on the scale, which means that the scoring for those items was inverted to reflect the opposite direction of the construct. The reliability coefficient for this dimension is ($\alpha = .75$).

The second dimension of the scale, « Academic Performance" (AP), has three elements which are:

These variables (AP1+AP2) were measured on a five-rank scale (strongly agree = 5, strongly disagree = 1), and this estimate was reversed for (AP3). The reliability coefficient in this domain is (α = .64).

The third dimension, "Time Management" (TM), includes three elements that are:

The reliability coefficient in this domain is (α = .63).

The general reliability coefficient is ($\alpha = .79$).

Participants were asked to rate their responses on a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). For every dimension, a score was computed by summing up the scores of individual items. In terms of interpretation, higher scores on the scale signify a stronger alignment with positive statements regarding life satisfaction, time management, and academic performance. Conversely, lower scores indicate reduced agreement with these positive statements. The effect of dropping each item on Cronbach's alpha coefficient is presented in Table 1.

Table 1. Effect of dropping each item on the Cronbach's alpha coefficient.

Frequenti	Frequentist Individual Item Reliability Statistics										
Item	Cronbach's α If	Item-rest	Mean	SD							
	the item dropped	correlation		_							
Pe1	0.76916	0.53853	3.15741	1.04590							
Pe2	0.76905	0.54366	3.31667	1.01642							
Ne1	0.78552	0.37528	3.08889	1.21961							
Ne2	0.78431	0.37678	3.20926	1.06675							
Ls1	0.78680	0.35011	3.45370	1.06891							
Ls2	0.77273	0.49592	3.49815	1.11907							
TM1	0.77870	0.43659	3.08704	1.06810							
TM2	0.77831	0.44131	2.79815	1.04358							
TM3	0.78058	0.41748	3.19815	1.12634							
AP1	0.78335	0.40346	3.63704	1.30566							
AP2	0.77473	0.48543	3.32963	0.97969							
AP3	0.78233	0.39967	3.84259	1.12124							

Data analysis

To analyze the data, the researchers first assessed the internal reliability of the survey and its constructs using the Cronbach alpha method. After confirming the internal reliability, the researchers performed the confirmatory factor analysis, and four factors were obtained (see Table 2). Subsequently, the main hypotheses were tested through a series of statistical analyses. To examine the relationships between variables and assess the structural model, structural equation modeling (SEM) was performed utilizing JASP software. Through analysis using structural equation modeling, we attempt to answer the problematic question of this research: Why is there an effect from the independent variable SWB on the dependent variable AP? How does the ether move from the independent variable to the dependent variable?

Conditions must be provided for time management to become an intermediate variable, and they are as follows:

- The variable (TM) must be affected by the factor (SWB).
- -The SWB factor must affect the AP factor.
- The independent variable (SWB) must affect the variable (AP).

[&]quot;I chose the specialty that best suits my desire and competence" (AP1).

[&]quot;I am excelling in my university studies" (AP2).

[&]quot;I get poor study results" (AP3).

[&]quot;I give enough time to review my lessons" (TM1).

[&]quot;I get every task done on time" (TM2)

[&]quot;I am unable to provide the necessary time for all course units" (TM3)

The results that will come from the next analysis will confirm one of two things:

- -Either the effect of the SWB variable on the AP variable decreases or disappears in the presence of the mediating variable TM. In this case, the mediator may be partial or complete.
- Either the effect of the independent on the dependent will remain stable despite the existence of the intermediate variable. In this case, it is not appropriate for (TM) to mediate the effect of the variables (WB) and (AP).

We assessed the models using the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC). Lower values of these criteria indicate a well-fitting and more parsimonious model. The compatibility of the model was examined through the values obtained from Goodness of Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), McDonald's fit index, and expected cross-validation index (ECVI).

Ethical considerations

The study has been approved by the Institutional Ethics Review Board of the Department of Applied Psychology of the Faculty of Arts and Human Sciences in Fez, Morocco. Before collecting data, the researchers followed ethical guidelines, including obtaining permission from the administration to conduct the study, explaining the purpose of the study to the participating students, ensuring the participants' anonymity, obtaining their consent, and ensuring the confidentiality of the data.

RESULTS

Sample characteristics

Table 2 provides valuable insights into the Moroccan student population's demographic characteristics and academic specializations. The gender distribution indicates a slight majority of male students (53.34%) compared to female students (47.66%). In terms of age, the majority falls within the 21 to 24 age range (49,3%), followed by those below 20 (30%). When considering economic status, a significant portion of students (48.1%) have an income of 3000 MAD or less, while 32% fall within the 3000 to 6000 MAD range. Moving to academic specializations, the most prominent fields are sciences (23.5%), literature (22%), and Islamic Law (14%).

Table 2. Sample characteristics.

Classified age		Frequency	Percent %
	17 ≤ Age ≤ 20	162	30.0
	21 ≤ Age ≤ 24	266	49.3
	$25 \le Age \le 28$	89	16.5
	29≤ Age ≤ 32	18	3.3
	33 ≤ Age	5	.9
	Total	540	100.0
Gender			
	Male	288	53.3
	Female	252	46.7
	Total	540	100.0
Specialization			
	Sciences	127	23.5
	Literature	119	22.0
	Islamic Law	80	14.8
	Law	86	15.9
	Economy	35	6.5
	Engineering	37	6.9
	Medicine	41	7.6
	Technique	3	.6

	Other	12	2.2
	Total	540	100.0
Study Level			
	Bachelor's Degree	372	68.9
	License/Bac+3	90	16.7
	Master	40	7.4
	PhD	38	7.0
	Total	540	100.0
Parents' Economic St	atus		
	≤ 3000 MAD	260	48.1
	3000 < Economic Status ≤6000	173	32.0
	6000 < Economic Status ≤ 8000	48	8.9
	8000 < Economic Status ≤ 10000	33	6.1
	> 10000 MAD	26	4.8
	Total	540	100.0

The measurement model: Structural equation modeling with latent variables (SEM)

Through analysis using structural equation modeling, we attempt to answer the problematic question of this research: Why is there an effect from the independent variable SWB on the dependent variable AP? How does the ether move from the independent variable to the dependent variable?

On this basis, we need at least to work on three models (see table 4):

- The first model: We study the effect of SWB on the factors (AP) and (TM).
- The second model: It examines the effect of the factor (TM) on the factor (AP)
- The third model: We know the nature of the effect of work (SWB) on the factor (AP) through the mediating factor (TM).

Table 3. Indicators of goodness of fit for the three study models.

				Baseline test			Difference test		
	AIC	BIC	n	χ^2	df	P	$\Delta\chi^2$	Δdf	p
Model 2	8617.196	8707.319	540	34.906	6	< .001			
Model 1	16731.648	16916.186	540	145.309	47	< .001	110.403	41	< .001
Model 3	16731.648	16916.186	540	145.309	47	< .001	-9.075×10 ⁻⁹	0	

The first model: The effect of SWB on the factors (AP) and (TM)

The structural equation modeling shown in Figure 1 shows that when the first factor (SWB) changes by unit, the factor (AP) changes by 38%. And the median factor (TM) changes by 46 percent.

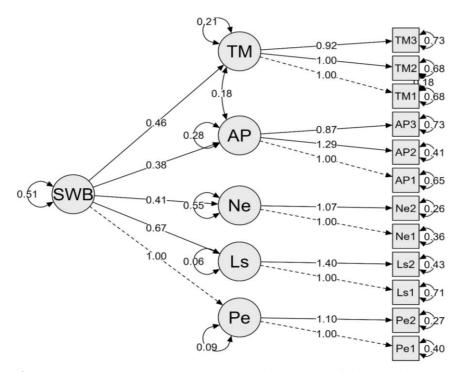


Figure 1. Structural equation modeling of the effect of life satisfaction (PF/ NF) on academic performance (AP)through the mediating factor of Time Management (TM).

Table 5 shows some interesting results of this study, which are revealed by a column of values in general. Indeed, it appears to the researchers that there is an effect of the subjective wellbeing variable (SWB) on the two variables, the mediator (TM) in 46% and the dependent variable (AP) in 38%. Thus, some conditions are met to confirm the validity of the mediator. Moreover, the influence coefficients in the standard estimates are statistically significant at the significance level of α = .001 according to the P-value column.

Table 4. This table shows how subjective well-being affects time management and academic performance through regression coefficients.

Regression	Regression coefficients											
							nfidence erval	Sta	ndardiz	ed		
Predictor	Outcome	Estimate	Std. Error	z-value	p	Lower	Upper	All	LV	Endo		
SWB	AP	0.384	0.060	6.382	< .001	0.266	0.502	0.462	0.462	0.462		
	TM	0.464	0.067	6.918	<.001	0.332	0.595	0.583	0.583	0.583		

Second model: The effect of the factor (TM) on the factor (AP)

To identify the nature of the influence of the intermediate variable in the dependent variable, the researchers performed the analysis through modeling based on linear regression (see Figure 2). We notice by the pathway that when the median (TM) changes by unit, the factor (AP) changes by 89%.

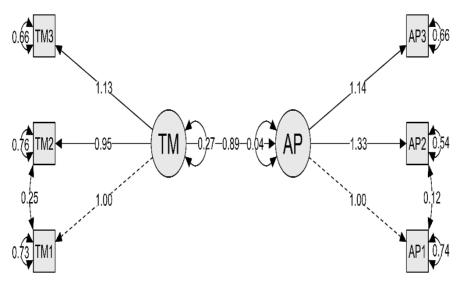


Figure 2. Pathway of the effect of life satisfaction (TM) on academic performance (AP).

After creating the second model, the researchers learned the nature of the relationship between the mediator and academic performance to verify the second condition for confirming the study's validity by adopting the mediating variable (TM). Table 6 shows some results revealed by a column of P-values, demonstrating the statistical significance of these results at the level α = .001.

Table 5. Regression weights.

Regressio	Regression coefficients										
					95% Co	nfidence l	Interval	Sta	ndardiz	zed	
Predictor	Outcome	Estimate	Std. Error	z-value	р	Lower	Upper	All	LV	Endo	
TM	AP	0.895	0.145	6.179	< .001	0.611	1.178	0.910	0.910	0.910	

Third model: The effect of work (SWB) on the factor (AP) through the mediating factor (TM)

The researchers tried to identify the nature of the effect of the mediating variable by building a third model (see Figure 3°. The nature of this influence depends on the quality of the mediator. The effect coefficients show that the mediator in this study is almost total. The coefficient of influence of subjective wellbeing on academic performance changed from the ratio (38%) in the first model to the ratio (2%) in the second model. It can be said that this change is very large and not only expresses a decline but also confirms the disappearance of the effect of the independent variable (SWB) according to the values of the standard estimates. Thus, instead of the variable (TM) being a partial mediator, as was expected by the researchers, it became a total mediator.

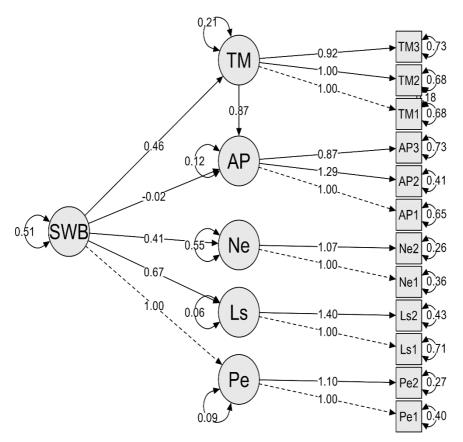


Figure 3. Structural equation modeling adopts the time management factor as an intermediate variable between the two factors: subjective wellbeing and academic performance.

On the other hand, the results, according to Table 7, confirm the presence of subjective wellbeing on time management at a rate of 46%. This effect is highly statistically significant at the significance level α = .001. The independent variable also affects the mediating variable with good statistical significance. When the factor (SWB) changes by unit, the median factor (TM) changes by 87 percent.

Table 6. The relationship between the three dimensions of the study through interactive effect values according to standard regression estimates.

						95% Cor Interval		Standardized		
Predictor	Outcome	Estimate	Std.	Z-	p	Lower	Upper	All	LV	Endo
			Error	value						
SWB	AP	-0.017	0.085	-0.204	0.839	-0.185	0.150	-0.021	-0.021	-0.021
TM	AP	0.865	0.169	5.124	< .001	0.534	1.196	0.828	0.828	0.828
SWB	TM	0.464	0.067	6.918	< .001	0.332	0.595	0.583	0.583	0.583

Referring to the Model Fit indicators, three factors have shown a good fit with Structural Equation Modeling (see Figures 1, 2, and 3) and higher standardized load with their items. We find that these indicators (table 8) are very good and correspond to the general perception of the research.

Table 7. Indicators of goodness of fit for three structural equation models.

Other fit measures										
Metric	Model 1	Model 2	Model 3							
Root mean square error of approximation (RMSEA)	0.062	0.094	0.062							
RMSEA 90% CI lower bound	0.051	0.066	0.051							
RMSEA 90% CI upper bound	0.074	0.126	0.074							
RMSEA p-value	0.038	0.007	0.038							
T-size RMSEA	0.074	0.126	0.074							
Standardized root mean square residual (SRMR)	0.046	0.037	0.046							
Hoelter's critical N (α = .05)	238.842	195.796	238.842							
Hoelter's critical N (α = .01)	270.215	261.085	270.215							
Goodness of fit index (GFI)	0.956	0.979	0.956							
McDonald's fit index (MFI)	0.913	0.974	0.913							
Expected cross-validation index (ECVI)	0.428	0.142	0.428							

Note: T-size RMSEA is computed for $\alpha = 0.05$.

The T-size equivalents of the conventional RMSEA cut-off values (close < 0.05 < fair < 0.08 < poor) are **close** < 0.062 < fair < 0.091 < poor for model: Model 1

Note. The T-size equivalents of the conventional RMSEA cut-off values (close < 0.05 < fair < 0.08 < poor) are **close** < **0.062** < **fair** < **0.091** < **poor** for model: Model 3

Note. The T-size equivalents of the conventional RMSEA cut-off values (close < 0.05 < fair < 0.08 < poor) are **close** < **0.086 < fair < 0.115 < poor** for model: Model 2

DISCUSSION

Although there is a strong focus on undergraduate students' academic achievement, the psychological wellbeing of these individuals may be overlooked by various educational stakeholders. Given students' contemporary challenges and time management difficulties, achieving academic success can be particularly challenging. The study's main aim is to make predictions about the effects of the independent factors, LS, on AP by examining the role of TM as a mediator in this process.

The result of the current study supports our previous hypothesis that life satisfaction (positive and negative feelings) predicts academic performance through time management as a mediating variable. That is, life satisfaction had a significant impact on time management, and time management, in turn, had a significant and positive influence on academic performance. This suggests that when individuals experience positive emotions, they are more likely to manage their time effectively, which can lead to better academic outcomes.

Positive affect and negative affect, as described by Diener in 1984, are significant factors in understanding subjective wellbeing (SWB) [9]. Previous studies have demonstrated that when people assess their life satisfaction, the balance between positive and negative emotions experienced serves as a valuable source of information [20–22].

To our knowledge, no study has examined the complete model that explores the relationship between life satisfaction, academic performance, and time management, with time management as a mediating variable. Nevertheless, previous research has separately demonstrated the connection between these three variables.

The results of the present study are consistent with prior research demonstrating the relationship between life satisfaction and positive educational outcomes [12,27,28]. Dalli's (2014) research demonstrated a significant correlation (with a significance level of 0.01) between time management skills, academic satisfaction, and academic performance of university students. The study found that students' time management skills and satisfaction with their academic life improved, so did their academic achievement [1].

The study found that time management mediated between LS (independent variable) and AP (dependent variable), indicating that effective time management can lead to academic success. This highlights the importance of time management in various fields, particularly in educational counseling. When time is used effectively, it can provide a significant advantage in achieving academic goals.

On the one hand, it is essential that individuals involved in education, including parents, teachers, administrators, and students themselves, focus on fostering positive emotions among university students to promote a rich life of positivity and meaning. On the other hand, it is also important to work towards resolving any issues or anxieties that might cause students to become restless and lose focus, resulting in the inability to complete tasks, monotony, boredom, and failure to achieve their objectives.

Based on the results of the SEM analysis examining the relationship between the three variables, holistic student development should be emphasized. These findings contributed to the existing literature by expanding the correlates and predictors of wellbeing and mental health outcomes, which align with earlier research [29–36]. The study's findings underscore the importance of considering multiple factors contributing to academic performance. Educational institutions should adopt a holistic approach to student development, recognizing that personal wellbeing, emotions, and time management skills are interconnected with academic success.

Limitations

The study has some limitations that need to be acknowledged. Firstly, the data collected were from only one Moroccan university institution, making it difficult to generalize the results. Although the sample was diverse, the age range was limited to university students. Therefore, further research is needed to understand the role of LS in younger children. Another limitation of the study includes using a non-probabilistic sampling method, specifically voluntary response sampling, which may introduce bias and limit the generalizability of the findings.

Additionally, the study was cross-sectional, so it cannot provide a clear understanding of the long-term effects of LS on students' time management and academic performance. Although this study is one of the few to consider LS (independent variable) and AP and NP (dependent variable) and the only one to investigate the predictive power of LS overtime management and academic performance, the findings should be interpreted cautiously. Future research could benefit from using more diverse sampling methods and incorporating objective measures of academic performance to enhance the validity of the findings.

Practical implications

The findings of this study have several implications for educational interventions and programs. The present study has a practical impact on university educators, as they could utilize short assessments to determine students' levels of life satisfaction and identify those who may be at risk of facing academic challenges. By implementing interventions aimed at increasing life satisfaction, educators can promote the overall wellbeing of students by enhancing positive emotions and improving academic performance, based on the study's results. Educators can play a key role in promoting life satisfaction by creating a positive and supportive learning environment, providing opportunities for students to engage in meaningful learning experiences, and encouraging positive habits and behaviour. Educators can help students reach their full potential and achieve academic success by prioritizing students' wellbeing and creating a supportive learning environment.

Additionally, the mediating role of time management suggests that incorporating strategies and support for effective time management skills can improve academic performance. Thus, Educational institutions should prioritize providing resources and guidance to students in developing effective time management practices. The emphasis on a holistic approach underscores the need to create a supportive and positive learning environment that fosters students' wellbeing. Educational interventions can comprehensively impact students' overall success by considering both emotional and academic aspects.

CONCLUSION

The study supports the notion that life satisfaction plays a significant role in predicting academic performance, and this relationship is mediated by time management. These findings emphasize the importance of considering time management as a crucial factor in understanding the link between life satisfaction and academic achievement. Because promoting life satisfaction among students can contribute to their academic success, additional research is needed to better understand the factors contributing to it and develop effective interventions for promoting it.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

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References

- Dalli M. The university students time management skills in terms of their academic life satisfaction and academic achievement levels. Educ Res Rev. 2014;9(20):1090–1096. http://dx.doi.org/10.5897/ERR2014.1885
- Siri A, Bragazzi NL, Khabbache H, Spandonari MM, Cáceres LA. Mind the gap between high school and university! A field qualitative survey at the national university of Caaguazú (Paraguay). Adv Med Educ Pract. 2016;7:301–308. http://dx.doi.org/10.2147/AMEP.S103811.
- 3. Witkin HA, Wi HA. the role of cognitive style in academic performance and in teacher-student relations. ETS Res Bull Ser. 1973(1):i–58. Available from: https://onlinelibrary.wiley.com/doi/full/10.1002/j.2333-8504.1973.tb00450.xhttp//dx.doi.org/10.1002/J.2333-8504.1973.TB00450.X.
- 4. Shen H, Comrey AL. Predicting medical students' academic performances by their cognitive abilities and personality characteristics. Academic Medicine. 1997 [cited 2023 Jun 7]. p. 781–6. Available from: https://journals.lww.com/academicmedicine/Abstract/1997/09000/Predicting_medical_students_academic performances.13.aspx.
- 5. Ait Ali D, El Meniari A, Saidi M, Khabbache H. Exploring the TPACK of prospective nursing educators: A national study. Teach Learn Nurs. 2023 Jul 1;18(3):e52–e57. http://dx.doi.org/10.1016/J.TELN.2023.03.016
- 6. Hepworth D, Littlepage B, Hancock K. Factors Influencing University Student Academic Success. Educ Res Q. 2018;42(1):45–61.
- 7. Smith SM, Carter-Rogers K, Norris ME, Brophy T. Students Starting University: Exploring Factors That Promote Success for First-Year International and Domestic Students. Front Educ. 2022 Mar 29;7:109. http://dx.doi.org/10.3389/FEDUC.2022.779756/BIBTEX.
- 8. Khabbache H, El Alami L, Ouazizi K, Ait Ali D, El Ghouat H, Makkaoui M, et al. The effects of COVID-19 home confinement on the psychological wellbeing of the Moroccan population: Regular versus irregular dynamics. J Heal Soc Sci. 2023;8(2):151–169.
- Diener E. Subjective wellbeing. Psychol Bull. 1984 May;95(3):542–575. http://dx.doi.org/10.1037/0033-2909.95.3.542.
- 10. Rode JC, Arthaud-Day ML, Mooney CH, Near JP, Baldwin TT, Bommer WH, et al. Life satisfaction and student performance. Acad Manag Learn Educ. 2005;4(4):421–433.

- http//dx.doi.org/10.5465/AMLE.2005.19086784.
- 11. Mihanović Z, Batinić AB, Pavičić J. the link between students' satisfaction with faculty, overall students' satisfaction with student life and student performances. Rev Innov Compet. 2016;2(1):37–60. http://dx.doi.org/10.32728/ric.2016.21/3.
- 12. Antaramian S. The importance of very high life satisfaction for students' academic success. Cogent Educ. 2017;4(1). http://dx.doi.org/10.1080/2331186X.2017.1307622.
- 13. Binti N, Sobri M, Ismail A, Faizah W, Yaacob W, Nordin NI, et al. Statistical Analysis of Student's Life Satisfaction at Higher Learning Institution. J Math Comput Sci. 2022;8(2):12–20.
- 14. Heffner AL, Antaramian SP. The Role of Life Satisfaction in Predicting Student Engagement and Achievement. J Happiness Stud. 2016;17(4):1681–1701. http://dx.doi.org/10.1007/S10902-015-9665-1/METRICS.
- 15. Ibrahim SS, Abedin NFZ, Sharip SM. The Relationship Among Academic Achievement, General Life Satisfaction and General Health. Proc Colloq Adm Sci Technol. 2015;157–165. http://dx.doi.org/10.1007/978-981-4585-45-3_17.
- 16. Long RF, Huebner ES. Differential validity of global and domain-specific measures of life satisfaction in the context of schooling. Child Indic Res. 2014;7(3):671–694. http://dx.doi.org/10.1007/S12187-013-9231-5.
- 17. Pavot W, Diener E. Review of the Satisfaction With Life Scale. Psychol Assess. 1993;5(2):164–172. http://dx.doi.org/10.1037/1040-3590.5.2.164.
- El Achkar AMN, Leme VBR, Soares AB, Yunes MAM. Life Satisfaction and Academic Performance of Elementary School Students. Psico-USF. 2019;24(2):323–335. http://dx.doi.org/10.1590/1413-82712019240209.
- 19. Lim YJ, Yu BH, Kim DK, Kim JH. The positive and negative affect schedule: psychometric properties of the korean version. Psychiatry Investig. 2010;7(3):163–169.
- 20. Schimmack U, Oishi S, Diener E. Cultural influences on the relation between pleasant emotions and unpleasant emotions: Asian dialectic philosophies or individualism-collectivism? Cogn Emot. 2002;16(6):705–719.
- 21. Suh E, Diener E, Oishi S, Triandis HC. The Shifting Basis of Life Satisfaction Judgments Across Cultures: Emotions Versus Norms. J Pers Soc Psychol. 1998;74(2):482–493. http://dx.doi.org/10.1037/0022-3514.74.2.482.
- 22. Kuppens P, Realo A, Diener E. The Role of Positive and Negative Emotions in Life Satisfaction Judgment Across Nations. J Pers Soc Psychol. 2008 Jul;95(1):66–75. http://dx.doi.org/10.1037/0022-3514.95.1.66.
- 23. Schwarz N, Clore GL. Mood, misattribution, and judgments of wellbeing: Informative and directive functions of affective states. J Pers Soc Psychol. 1983 Sep;45(3):513–523. http://dx.doi.org/10.1037/0022-3514.45.3.513.
- 24. Jayawickreme E, Forgeard MJC, Seligman MEP. The Engine of Wellbeing. Rev Gen Psychol. 2012;16(4):327-342. doi: 10.1037/a0027990.
- 25. Aduke F. Time Management and Students Academic Performance in Higher Institutions, Nigeria-A Case Study of Ekiti State. Int Res Educ. 2015;3(2). http://dx.doi.org/10.5296/ire.v3i2.7126.
- Mansy M, Kazem AM. Development and validation of a quality-of-life scale for university students at Sultanate of Oman. [cited 2023 Oct 31]; Available from: http://search.mandumah.com/Record/1210090/1D38A42E876DEC580CFA1F9A154E87BDhttp//dx.doi. org/10.1017/S0144686X00004566.
- 27. Shareef MA, Alamodi AA, Al-Khateeb AA, Abudan Z, Alkhani MA, Zebian SI, et al. The interplay between academic performance and quality of life among preclinical students Career choice, professional education and development. BMC Med Educ. 2015;15(1):1–8. Available from: https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-015-0476-1.
- 28. Salmela-Aro K, Tynkkynen L. Trajectories of life satisfaction across the transition to post-compulsory education: Do adolescents follow different pathways? J Youth Adolesc. 2010;39(8):870–881.
- 29. Masoom Ali S, Yildirim M, Abdul Hussain S, Vostanis P. Self-reported mental health problems and post-traumatic growth among children in Pakistan care homes. Asia Pac J Soc Work. 2020;30(1):62-76.
- 30. Yildirim M, Belen H. Fear of happiness predicts subjective and psychological wellbeing above the Behavioral Inhibition System (BIS) and Behavioral Activation System (BAS) model of personality. J Posit Psychol Wellbeing. 2018;2(1):92-111.
- 31. Yıldırım M, Çelik Tanrıverdi F. The Fragility of Happiness Scale: evidence of its psychometric adequacy in Turkish. Ment Health Relig Cult. 2021;24(8):837-849.

- 32. Yıldırım M, Maltby J. Examining irrational happiness beliefs within an adaptation-continuum model of personality and coping. J Ration Emot Cogn Behav Ther. 2022;40(1):175-189.
- 33. Yildirim M, Alshehri NA, Aziz IA. Does self-esteem mediate the relationship between gratitude and subjective wellbeing? Pol Psychol Bull. 2019:50(2):149-156.
- 34. Yildirim M, Iqbal N, Khan MM, O'Reilly M, Vostanis P. Psychosocial needs and supports for street children in India: Stakeholder perspectives. Int J Child Develop Mental Health. 2020;8(2):19-28.
- 35. Yildirim M, Turan ME, Albeladi NS, Crescenzo P, Rizzo A, Nucera G, et al. Resilience and perceived social support as predictors of emotional wellbeing. J Health Soc Sci. 2023;8(1):59-75.
- 36. Yıldırım M, Çağış ZG, Batra K, Ferrari G, Kızılgeçit M, Chirico F, et al. Role of resilience in psychological adjustment and satisfaction with life among undergraduate students in Turkey: A cross-sectional study. J Health Soc Sci. 2022;7(2):224–235. doi: 10.19204/2022/RLFR8.



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