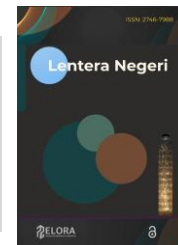




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Adolescent spirituality under digital distraction: how self control shapes the effect of fear of missing out and school climate

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ABSTRACT

The rapid expansion of digital technology has increased adolescents' vulnerability to Fear of Missing Out (FoMO), potentially affecting their spiritual development. This study examined the structural relationships among FoMO, school climate, self-control, and adolescent spirituality, with self-control as a moderating variable. A quantitative cross-sectional study was conducted with 100 junior high school students selected through purposive sampling. Data were collected using a 28-indicator questionnaire on a five-point Likert scale and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. The measurement and structural models demonstrated satisfactory validity, reliability, and model fit. School climate had the strongest direct effect on adolescent spirituality, followed by FoMO and self-control. Self-control significantly moderated the relationships between both FoMO and school climate with adolescent spirituality. Higher self-control reduced the adverse effects of FoMO and enhanced the positive influence of a supportive school environment. These findings indicate that adolescent spirituality is shaped by the interaction of environmental and psychological factors. The study contributes an integrated structural model and highlights the importance of strengthening positive school climates and self-control development in character and spiritual education programs.



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Introduction

Adolescence constitutes a decisive developmental period in which identity formation, moral orientation, life purpose, interpersonal belonging, and self-transcendent values are progressively consolidated. Within this developmental process, spirituality functions as a psychological and existential resource through which adolescents interpret life experiences, establish meaningful connections, regulate adversity, and orient their conduct toward values extending beyond immediate personal gratification. Longitudinal evidence indicates that spirituality is associated with character strengths, subjective well-being, and prosocial development among middle-school adolescents, while other findings connect spiritual resources with academic resilience and future-oriented functioning (Caton & Watters, 2023; Kor et al., 2019). School-based research further demonstrates that spirituality and supportive educational environments contribute to the development of generous purpose, moral identity, and hope, suggesting that adolescent spirituality should be considered a multidimensional developmental outcome rather than merely an expression of formal religious participation

(Aldridge & McLure, 2024; Quinn, 2017). Accordingly, examining the determinants of adolescent spirituality is increasingly urgent because this construct may serve as a protective foundation for psychological resilience, ethical conduct, prosocial engagement, and meaningful life orientation during a period marked by substantial biological, social, and technological change (Caton & Watters, 2023; Kor et al., 2019; Quinn, 2017; Sahib et al., 2025).

Beyond the increasing exposure to digital environments, adolescent spirituality has emerged as an important developmental resource that promotes psychological resilience, adaptive coping, and positive youth development (Hardy et al., 2021; King et al., 2023; Roeser et al., 2022). Spirituality enables adolescents to construct meaning in life, develop moral awareness, and maintain emotional balance when facing social and environmental challenges, thereby contributing to healthier psychological functioning (Zhang et al., 2023; Roeser et al., 2022). Recent evidence further suggests that adolescents with stronger spiritual well-being demonstrate better emotional adjustment, greater life satisfaction, and lower vulnerability to problematic digital behaviours because spirituality strengthens internal values and self-regulatory capacities (George et al., 2024; Zhang et al., 2023). Within educational settings, a positive school environment characterized by trust, supportive teacher student relationships, and school connectedness facilitates adolescents' opportunities to internalize prosocial and spiritual values (Arslan et al., 2022; Chen et al., 2023; Chu et al., 2024). Likewise, adolescents who possess stronger self-regulation are more capable of translating positive school experiences into meaningful personal growth and value-oriented behaviours, suggesting that self-control functions as an important psychological mechanism linking environmental support with spiritual development (Liu et al., 2024; Tomczyk et al., 2023). Although previous studies have separately established the contributions of school climate, self-control, and spirituality to adolescent well-being, empirical evidence examining these constructs within a single structural framework remains limited, particularly in the context of digital challenges faced by contemporary adolescents (Chen et al., 2023; George et al., 2024; King et al., 2023). Consequently, investigating the combined influence of Fear of Missing Out, school climate, and self-control on adolescent spirituality provides an important contribution to understanding how environmental and psychological resources jointly foster adolescents' spiritual development in the digital era (Hardy et al., 2021; Chu et al., 2024; Zhang et al., 2023).

The urgency of this issue has intensified as adolescent development increasingly unfolds within a digitally saturated social environment. Digital platforms facilitate communication, self-expression, information exchange, and peer affiliation, yet they simultaneously expose adolescents to continuous social comparison, algorithmically curated experiences, and persistent awareness of other people's activities. Empirical research demonstrates that fear of missing out, commonly abbreviated as FoMO, is consistently related to problematic social media engagement, heightened social comparison, and lower self-esteem (Servidio et al., 2024). A four-wave longitudinal investigation involving 1,419 Dutch adolescents aged 11–15 years found that increases in FoMO predicted subsequent problematic social media use at the within-person level, whereas reduced life satisfaction preceded increases in FoMO during early adolescence (Li et al., 2024). More recent three-wave evidence among 672 early adolescents similarly revealed that FoMO predicted later problematic social media use and that the relationship could become reciprocal across subsequent periods (Fang et al., 2025). These findings establish FoMO as more than a temporary digital discomfort; it represents a psychosocial vulnerability capable of reorganising adolescents' attention, social priorities, self-evaluation, and emotional investment in online experiences (Deniz, 2021; Fang et al., 2025; Li et al., 2024; Servidio et al., 2024).

The prominence of FoMO presents a critical problem for spirituality because the two constructs represent potentially competing psychological orientations. Spirituality is generally expressed through reflection, gratitude, interconnectedness, moral commitment, transcendence, and a stable sense of meaning, whereas FoMO is sustained by external monitoring, perceived social exclusion, comparison with others, and the persistent need to remain digitally connected. Research has shown that FoMO is positively associated with problematic platform use and social comparison while being negatively associated with self-esteem and life satisfaction (Deniz, 2021; Li et al., 2024; Servidio et al., 2024). At the same time, longitudinal findings indicate that spirituality supports prosociality, character development, and subjective well-being, which are psychological outcomes that may be weakened when adolescents organise their self-worth around external validation and digitally displayed peer experiences (Caton & Watters, 2023; Kor et al., 2019). Although these findings do not yet demonstrate a direct causal decline in spirituality resulting from FoMO, they provide a theoretically defensible basis for proposing that persistent fear of social exclusion may divert adolescents from inward reflection, value consistency, gratitude, and meaning-centred development (Fang et al., 2025; Kor et al., 2019; Li et al., 2024; Servidio et al., 2024).

However, adolescent spirituality is not shaped exclusively by individual digital behaviour because schools represent a central developmental ecology in which values, relationships, norms, safety, belonging, and future aspirations are continuously negotiated. Longitudinal evidence shows that students' perceptions of school climate are associated with subsequent social and emotional health, particularly through dimensions such as safety, teacher relationships, peer relationships, instructional support, and institutional conditions (Wong et al., 2021). A three-wave study of 1,357 students further demonstrated that a positive school climate predicted stronger school identification, which subsequently supported resilience and more favourable mental-health outcomes, including lower anxiety and depression and higher happiness and life satisfaction (Sahib et al., 2025). In faith-oriented educational settings, school-climate dimensions such as peer connectedness, inspirational teaching, practical service, cultural affirmation, and value-based conduct showed significant structural relationships with moral identity and hope for the future (Aldridge & McLure, 2024). Earlier evidence also indicated that school generosity and community-oriented spirituality were related to adolescents' development of purpose beyond the self (Quinn, 2017). Collectively, these studies justify the positioning of school climate as an external developmental resource that may cultivate spiritual meaning, ethical identity, interpersonal connectedness, and future-directed hope (Aldridge & McLure, 2024; Quinn, 2017; Sahib et al., 2025; Wong et al., 2021).

Nevertheless, the existence of a positive school climate may not automatically neutralise the psychological pressures generated by digital connectivity. Adolescents who study within supportive institutions may continue to experience compulsive checking, online comparison, concern about exclusion, and difficulty disengaging from digitally mediated peer activities. Consequently, individual regulatory capacity must be considered alongside environmental protection. Self-control refers to the capacity to inhibit immediate impulses, regulate attention and emotion, resist distractions, and maintain behaviour in accordance with enduring goals and internalised values. Empirical evidence indicates that self-control plays an important explanatory role in the relationship between FoMO and social media addiction, with lower self-control increasing vulnerability to problematic digital engagement (Kovan et al., 2024). FoMO also appears to operate within a broader process involving unmet psychological needs, diminished life satisfaction, problematic social media use, and weakened self-evaluation (Deniz, 2021; Li et al., 2024; Servidio et al., 2024). From a developmental perspective, self-control may therefore preserve spiritual orientation by enabling adolescents to restrict reactive digital behaviour, maintain value consistency, allocate attention to reflective activities, and resist the pressure to derive self-worth from continuous social surveillance (Kor et al., 2019; Kovan et al., 2024; Li et al., 2024; Servidio et al., 2024).

The principal research problem concerns the fragmented manner in which these constructs have been examined. Contemporary FoMO studies have primarily concentrated on problematic social media use, smartphone dependence, social comparison, self-esteem, loneliness, and life satisfaction rather than spirituality as a developmental outcome (Deniz, 2021; Fang et al., 2025; Li et al., 2024; Servidio et al., 2024). Research on school climate has generally investigated mental health, school identification, resilience, moral identity, hope, and prosocial behaviour, while only a limited number of studies have explicitly incorporated spiritual development (Aldridge & McLure, 2024; Quinn, 2017; Sahib et al., 2025; Wong et al., 2021). Similarly, available spirituality studies have demonstrated relationships with well-being, resilience, character strengths, and purpose but have rarely incorporated digital vulnerability and self-regulatory capacity within the same structural framework (Caton & Watters, 2023; Kor et al., 2019). This separation prevents a comprehensive understanding of how digital pressure, institutional context, and personal regulation jointly shape spirituality during adolescence (Aldridge & McLure, 2024; Kovan et al., 2024; Li et al., 2024; Kor et al., 2019).

A further methodological limitation is that many previous investigations have evaluated direct associations or mediation mechanisms without examining whether self-control changes the strength of the relationship between FoMO and adolescent spirituality. For example, self-control has been tested as a mediator linking FoMO with social media addiction, while social comparison and self-esteem have also been examined as sequential mediating mechanisms (Kovan et al., 2024; Servidio et al., 2024). Longitudinal models have clarified the temporal ordering between FoMO, problematic social media use, and life satisfaction, but they have not incorporated school climate and spirituality into an integrated model (Fang et al., 2025; Li et al., 2024). Studies of school climate have successfully employed structural equation modelling to explain moral identity, hope, resilience, and psychological adjustment, yet they have not tested whether personal self-regulation buffers the effects of digital social pressure on spiritual development (Aldridge & McLure, 2024; Sahib et al., 2025). Therefore, a moderation model is theoretically warranted because it can determine whether the negative association between FoMO and spirituality becomes weaker among

adolescents possessing stronger self-control, rather than assuming that FoMO affects every adolescent uniformly (Kovan et al., 2024; Li et al., 2024; Sahib et al., 2025; Servidio et al., 2024).

The novelty of the proposed study lies in constructing and empirically testing an integrated structural model that positions adolescent spirituality as the central outcome of interacting digital, institutional, and personal mechanisms. Unlike earlier research that predominantly treated FoMO as an antecedent of problematic social media use or addiction, this study examines whether FoMO is associated with the erosion of meaning, connectedness, inner stability, and value-oriented development (Fang et al., 2025; Li et al., 2024; Servidio et al., 2024). The model simultaneously incorporates school climate as a contextual protective factor and self-control as a moderating mechanism that may weaken the adverse relationship between FoMO and spirituality (Aldridge & McLure, 2024; Kovan et al., 2024; Sahib et al., 2025; Wong et al., 2021). The application of structural equation modelling further permits the assessment of latent constructs, measurement validity, direct structural paths, and interaction effects within a unified analytical framework. Accordingly, this research advances the literature by connecting adolescent spirituality research with digital well-being and school-climate scholarship, while providing evidence that may inform school-based programmes addressing digital self-regulation, supportive relationships, meaning formation, and spiritual development (Caton & Watters, 2023; Kor et al., 2019; Quinn, 2017; Sahib et al., 2025).

Despite the theoretical grounding provided above, a precise operationalization of spirituality is necessary before the proposed structural model can be evaluated. In this study, spirituality is defined as a multidimensional psychological construct encompassing a) personal meaning and purpose in life; b) transcendence or connectedness to something beyond the self; c) value-based and moral orientation; and d) interpersonal or communal connectedness. This conceptualization draws on established multidimensional spirituality frameworks such as Fisher's Spiritual Health and Life-Orientation Measure (SHALOM), which operationalizes spirituality across personal, communal, environmental, and transcendental domains, and the Multidimensional Measure of Religiousness/Spirituality developed by Fetzer/NIA both of which have documented reliability and construct validity in adolescent populations. Adopting a validated multidimensional instrument allows spirituality to be treated as a measurable latent variable rather than an abstract or unobservable construct, and it clarifies which indicators (e.g., items assessing meaning-making, transcendent awareness, moral commitment, and connectedness) will load onto the latent factor in the structural equation model.

Fear of Missing Out (FoMO) is operationally defined as a dispositional apprehension that others may be having rewarding experiences from which one is absent, measured using established scales such as the Fear of Missing Out Scale (FoMOs; Przybylski et al., 2013), which captures cognitive and behavioural components of social-comparison-driven digital engagement. School climate is operationally defined following Wong et al. (2021) and Aldridge and McLure (2024) as adolescents' perceptions of safety, teacher-student relationships, peer relationships, and institutional support, typically assessed via validated school climate inventories. Self-control is operationally defined as the capacity for impulse inhibition, attentional regulation, and goal-consistent behaviour, commonly measured using the Brief Self-Control Scale (Tangney et al., 2004). Based on this operational framework, the present study addresses the following research questions: 1) Does Fear of Missing Out significantly and negatively predict adolescent spirituality?; 2) Does school climate significantly and positively predict adolescent spirituality?; and 3) Does self-control moderate the relationship between Fear of Missing Out and adolescent spirituality, such that the negative association is weaker among adolescents with higher self-control?

Method

This study employed a quantitative research design using Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the proposed relationships among fear of missing out, school climate, adolescent spirituality, and self-control. PLS-SEM was selected because the research model includes multiple latent constructs and a moderation relationship, with the analysis focusing on both the predictive relationships among constructs and the assessment of the measurement properties of the proposed model. Specifically, the analysis examined the direct effects of fear of missing out and school climate on adolescent spirituality and tested whether self-control moderates the relationship between fear of missing out and adolescent spirituality. The target population consisted of junior high school students enrolled in public secondary schools. Participants were selected using purposive sampling based on three inclusion criteria: 1) active junior high school students aged 12–15 years; 2) regular users of social media platforms; and 3) willingness to participate voluntarily with parental or legal guardian consent. This age group was considered

appropriate because adolescence is characterized by substantial social, psychological, and digital development, including increased engagement with social media, identity formation, and sensitivity to peer influence. A total of 100 respondents who satisfied the inclusion criteria participated in the study. To address the adequacy of the sample for the proposed moderation model, an a priori statistical power analysis was conducted using *G-Power*. The analysis considered an alpha level of 0.05, statistical power of 0.80, the expected effect size, and the number of predictors included in the model. The resulting minimum sample size was used as the basis for evaluating the adequacy of the 100 respondents included in the analysis. This approach provides a more statistically grounded justification of sample adequacy than relying solely on the conventional ten-times rule.

Primary data were collected through a structured self-administered questionnaire distributed directly to eligible respondents following approval from the participating schools and the provision of informed consent by parents or legal guardians. All questionnaire items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale was selected because it is appropriate for assessing latent psychological and behavioral constructs and is commonly applied in PLS-SEM research (Hair et al., 2022). The research instrument comprised four latent constructs with a total of 28 indicators adapted from previously established measurement instruments. Fear of missing out (X_1) was measured using six items adapted from the Fear of Missing Out Scale developed by Przybylski et al. (2013). The instrument assesses individuals' concerns about missing rewarding social experiences and their desire to maintain continuous connection with others. School climate (X_2) was measured using six items adapted from the Delaware School Climate Survey Student (DSCS-S) developed by Bear et al. (2011). The items assessed students' perceptions of teacher support, peer relationships, school safety, fairness, and school connectedness. Adolescent spirituality (Y) was measured using eight items adapted from the Spiritual Well-Being Scale developed by Paloutzian and Ellison (1982) and subsequently applied in adolescent populations by Kor et al. (2019). The indicators covered dimensions related to meaning in life, inner peace, connectedness, gratitude, hope, and transcendence. Self-control (Z) was measured using eight items adapted from the Brief Self-Control Scale developed by Tangney et al. (2004), covering impulse control, emotional regulation, self-discipline, delayed gratification, and behavioral regulation.

Prior to hypothesis testing, the validity and reliability of the measurement instruments were assessed using the measurement model (outer model) in SmartPLS 4. Indicator reliability was evaluated based on outer loading values, with values of 0.70 or higher considered acceptable. Internal consistency reliability was assessed using Cronbach's alpha and composite reliability, with values above 0.70 indicating satisfactory reliability. Convergent validity was evaluated using the Average Variance Extracted (AVE), with a minimum acceptable value of 0.50. Discriminant validity was examined using the Fornell Larcker criterion and the Heterotrait Monotrait ratio (HTMT), with HTMT values below 0.90 indicating adequate discriminant validity (Hair et al., 2022). The results of the measurement model assessment are reported for all four latent constructs, namely fear of missing out, school climate, adolescent spirituality, and self-control. The assessment includes outer loadings, Cronbach's alpha, composite reliability, AVE, the Fornell Larcker criterion, and HTMT values to provide evidence of indicator reliability, internal consistency, convergent validity, and discriminant validity. The measurement-model assessment demonstrated that the measurement instruments were evaluated comprehensively before the structural relationships were examined. Cronbach's alpha and composite reliability were used to establish internal consistency, while AVE was used to assess convergent validity. Discriminant validity was assessed through both the Fornell Larcker criterion and HTMT. Indicators that did not meet the recommended criteria were evaluated based on their statistical contribution and theoretical relevance before determining whether they should be retained or removed. This procedure ensured that the constructs used in the structural model demonstrated adequate measurement quality.

The structural model was subsequently evaluated to test the hypothesized relationships among the constructs. Collinearity was examined using the Variance Inflation Factor (VIF), with values below 5.00 indicating the absence of critical multicollinearity. The explanatory power of the model was assessed using the coefficient of determination (R^2), while effect size was evaluated using f^2 . Predictive relevance was assessed using Q^2 . Hypothesis testing was performed using the bootstrapping procedure with 5,000 resamples at a 5% significance level. The significance of each hypothesized relationship was determined based on the path coefficient, t-statistic, p-value, and bootstrapped confidence interval. These procedures were applied to evaluate the direct effects of fear of missing out and school climate on adolescent spirituality.

The moderating effect of self-control was examined by creating an interaction term between fear of missing out and self-control. The interaction term was incorporated into the structural model to determine

whether the strength or direction of the relationship between fear of missing out and adolescent spirituality varied according to the level of self-control. A significant interaction coefficient indicated the presence of a moderating effect. The moderation analysis was interpreted together with the direct effect of fear of missing out on adolescent spirituality to provide a comprehensive explanation of the conditional relationship between the variables. To enhance transparency and replicability, the proposed structural model is presented in Figure 1. The model illustrates the hypothesized direct effects of fear of missing out (X_1) and school climate (X_2) on adolescent spirituality (Y), as well as the moderating role of self-control (Z) in the relationship between fear of missing out and adolescent spirituality. The interaction between fear of missing out and self-control is explicitly represented as the moderation path in the model. The structural model therefore consists of three principal hypothesized relationships: the effect of fear of missing out on adolescent spirituality, the effect of school climate on adolescent spirituality, and the moderating effect of self-control on the relationship between fear of missing out and adolescent spirituality. Based on the explanation the model of this research as follow:

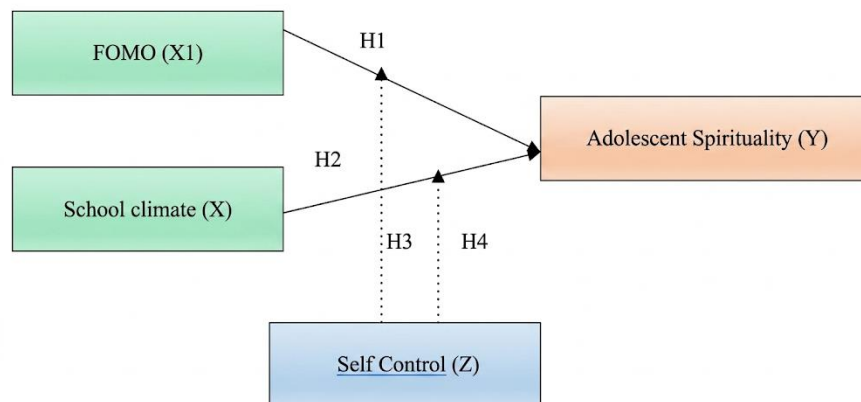


Figure 1. Frame of Thinking

H1: Fear of missing out has positive significant influence towards adolescent spirituality; H2 : School Elimate has positive significant influence towards adolescent spirituality; H3: Self-control moderates the relationship between fear of missing out and adolescent spirituality; and H4: Self-control moderates the relationship between school climate and adolescent spirituality.

Results and Discussions

The results of the outer loading analysis are presented in Figure 1.

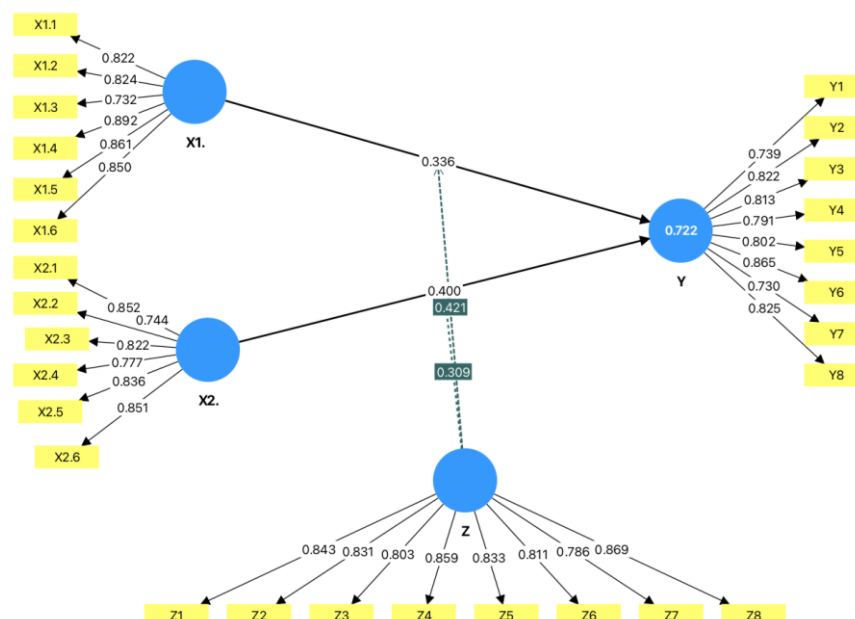


Figure 2. The Result of Outer model
Sources: Authors' own work (2026)

The Result of Convergent Validity

Convergent validity refers to the extent to which multiple indicators measuring the same latent construct are highly correlated and adequately represent the underlying concept (Hair et al., 2022). In PLS-SEM, convergent validity is evaluated using the Average Variance Extracted (AVE), where an AVE value of 0.50 or higher indicates that the construct explains at least 50% of the variance of its indicators, demonstrating satisfactory convergent validity (Hair et al., 2022). As presented in Table X, all constructs in this study obtained AVE values above the recommended threshold of 0.50. Therefore, it can be concluded that all latent constructs exhibit adequate convergent validity, indicating that the measurement items appropriately represent their respective constructs and are suitable for subsequent structural model analysis. The result showed on table below:

Table 1. The Result of Convergent Validity

Convergent validity	Indicator	Outer loading	Criteria	Description
	X1.1	0,822		Valid
	X1.2	0,824		Valid
	X1.3	0,732		Valid
	X1.4	0,892		Valid
	X1.5	0,861		Valid
	X1.6	0,850		Valid
	X2.1	0,852		Valid
	X2.2	0,744		Valid
	X2.3	0,822	>0,7	Valid
	X2.4	0,777		Valid
	X2.5	0,836		Valid
	X2.6	0,851		Valid
	Y1	0,739		Valid
	Y2	0,822		Valid
	Y3	0,813		Valid
	Y4	0,791		Valid
	Y5	0,802		Valid
	Y6	0,865		Valid
	Y7	0,730		Valid
	Y8	0,825		Valid
	Z1	0,843		Valid
	Z2	0,831		Valid
	Z3	0,803		Valid
	Z4	0,859		Valid
	Z5	0,833		Valid
	Z6	0,811		Valid
	Z7	0,786		Valid
	Z8	0,869		Valid
Converget Validity	Variable	AVE	Criteria	Description
	FOMO (X1)	0,692	>0,5	Valid
	SC (X2)	0,663		Valid
	AS (Y)	0,639		Valid
	SC (Z)	0,688		Valid

Sources: The Authors own Work (2026)

Convergent validity was evaluated by examining the outer loading values of each indicator and the Average Variance Extracted (AVE) for each latent construct. According to Hair et al. (2022), indicator outer loading values should exceed 0.70 to demonstrate satisfactory indicator reliability, while AVE values should be greater than 0.50 to confirm adequate convergent validity. As presented in Table X, all measurement indicators achieved outer loading values ranging from 0.730 to 0.892, exceeding the recommended threshold of 0.70, indicating that each indicator adequately represents its corresponding latent construct. Furthermore, the AVE values for fear of missing out (X₁), school climate (X₂), adolescent spirituality (Y), and self-control (Z) were 0.692, 0.663, 0.639, and 0.688, respectively, all of which are above the minimum criterion of 0.50. These findings demonstrate that all constructs exhibit satisfactory convergent validity, indicating that the measurement items share a high proportion of common variance and appropriately capture the intended

latent constructs. Therefore, the measurement model satisfies the convergent validity requirement and is suitable for further evaluation of the structural model.

The Result of Discriminant Validity

Discriminant validity is the extent to which an indicator is able to distinguish its construct from other constructs in the model. It is assessed by examining the cross-loading values, where each indicator should have a higher loading on its own construct than on other constructs. The Result of Discriminant validity based on HTMT score as follows:

Table 2. The Result of Discriminant Validity- Heterotrait Monotrait Ratio (HTMT)

Variables	X1	X2	Z	Z x X1	Z x X2
X1	0,108				
X2	0,420	0,449			
Z	0,209	0,169	0,315		
Z x X1	0,056	0,070	0,516	0,084	
Z x X2	0,080	0,031	0,429	0,111	0,269

Sources: The Authors own Work (2026)

Discriminant validity was assessed using the Heterotrait Monotrait Ratio (HTMT), which evaluates the degree to which each latent construct is empirically distinct from the others. According to Henseler et al. (2015), HTMT values below 0.90 indicate adequate discriminant validity, while more conservative studies recommend a threshold of 0.85. As presented in Table 2, all HTMT values ranged from 0.031 to 0.516, which are substantially below the recommended threshold of 0.90. Specifically, the highest HTMT value was observed between the interaction construct Self-control $\times$ Fear of Missing Out ($Z \times X_1$) and Self-control (Z) (HTMT = 0.516), whereas the lowest value was found between School Climate (X_2) and Self-control $\times$ School Climate ($Z \times X_2$) (HTMT = 0.031). These findings indicate that each latent construct demonstrates sufficient empirical distinctiveness and measures a unique conceptual domain. Therefore, the discriminant validity of the measurement model is considered satisfactory, confirming that all constructs are adequately differentiated and appropriate for subsequent structural model evaluation.

The Result of Reliability Test

Table 3. The Result of Reliability Test

Variables	Cronbach Alpha	Composite Reliability	Composite Reliability (Rho_c)	AVE	Description
Fear of Missing Out (X1)	0,911	0,924	0,931	0,692	Reliabel
School Climate (X2)	0,899	0,910	0,922	0,663	Reliabel
Adolescent Spirituality (Y)	0,919	0,926	0,934	0,639	Reliabel
Self Control (Z)	0,935	0,939	0,946	0,688	Reliabel

Sources: The Authors own Work (2026)

The reliability of the measurement model was evaluated using Cronbach's alpha (CA), Composite Reliability (CR), and ρ_{cc} , as recommended by Hair et al. (2022). A construct is considered reliable when the values of Cronbach's alpha, Composite Reliability, and ρ_{cc} exceed the recommended threshold of 0.70, indicating satisfactory internal consistency among the measurement items. As presented in Table 3, all latent constructs demonstrated excellent reliability. Fear of Missing Out (X_1) achieved a Cronbach's alpha of 0.911, Composite Reliability of 0.924, and ρ_{cc} of 0.931, while School Climate (X_2) obtained values of 0.899, 0.910, and 0.922, respectively. Adolescent Spirituality (Y) also demonstrated high reliability, with a Cronbach's alpha of 0.919, Composite Reliability of 0.926, and ρ_{cc} of 0.934. Similarly, Self-Control (Z) produced the highest reliability estimates, with a Cronbach's alpha of 0.935, Composite Reliability of 0.939, and ρ_{cc} of 0.946. Furthermore, the Average Variance Extracted (AVE) values ranged from 0.639 to 0.692, exceeding the recommended threshold of 0.50, which further supports the convergent validity of all constructs. Overall, these findings indicate that all latent variables possess high internal consistency and adequate reliability, confirming that the measurement instrument is appropriate for subsequent structural model analysis.

The Result of Collonierity test

Table 4. Collonoerity Test

Indicator	VIF
X1.1	2.348
X1.2	2.113
X1.3	1.784
X1.4	3.232
X1.5	2.885
X1.6	2.738
X2.1	2.580
X2.2	1.875
X2.3	2.034
X2.4	1.990
X2.5	2.392
X2.6	2.589
Y1	1.900
Y2	2.559
Y3	2.448
Y4	2.134
Y5	2.202
Y6	3.235
Y7	1.850
Y8	2.394
Z1	2.753
Z2	1.540
Z3	2.337
Z4	2.909
Z5	2.837
Z6	2.519
Z7	2.368
Z8	3.207
Z x X1	1.000
Z x X2	1.000

Sources: The Authors' Own Work (2026)

Collinearity was assessed by examining the Variance Inflation Factor (VIF) values to determine the presence of multicollinearity among the predictor indicators prior to evaluating the structural model. According to Hair et al. (2022), VIF values below 5.00 indicate that multicollinearity is not a concern and that the predictor constructs do not exhibit excessive collinearity. As presented in Table 4, all indicators demonstrated VIF values ranging from 1.000 to 3.235, which are well below the recommended threshold of 5.00. The highest VIF value was observed for indicator Y6 (VIF = 3.235), followed by X1.4 (VIF = 3.232) and Z8 (VIF = 3.207), whereas the interaction constructs Self-Control $\times$ Fear of Missing Out ($Z \times X_1$) and Self-Control $\times$ School Climate ($Z \times X_2$) both produced VIF values of 1.000, indicating the absence of collinearity. Overall, these findings confirm that no multicollinearity issues exist among the indicators or interaction terms, suggesting that each construct contributes unique information to the model and that the data satisfy the collinearity assumption required for subsequent PLS-SEM structural model analysis (Hair et al., 2022).

The Result of Inner Model

The inner model in PLS-SEM is used to evaluate the relationship between latent variables and to test the structural model of the research. It aims to determine how strong the influence of independent variables on dependent variables is, including direct, indirect, and moderating effects. The inner model analysis is important because it shows whether the proposed hypotheses are supported and explains the predictive power of the model through values such as path coefficients, R-square, and effect size. Therefore, the inner model helps researchers understand the structural relationships among variables in the study. The result showed on Table 5:

Table 5. Path Coefficient direct Effect

	Original sample (o)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistics (O/STEDV)	P-Values)	Description
X1 -> Y	0,336	0,340	0,070	0.785	0,000	H1 Accepted
X2 ->Y	0,400	0,403	0,068	5.835	0,000	H2 Accepted
Z x X1->Y	0,421	0,405	0,072	5.809	0,000	H3 Accepted
Z x X2->Y	0,309	0,299	0,066	4.668	0,000	H4 Accepted

Sources: The Authors own work (2026)

The structural model was evaluated by examining the path coefficients, t-statistics, and p-values obtained through the bootstrapping procedure. According to Hair et al. (2022), a structural relationship is considered statistically significant when the t-statistic exceeds 1.96 and the p-value is less than 0.05. As presented in Table 5, all hypothesized relationships were found to be positive and statistically significant, indicating support for all proposed hypotheses. Fear of Missing Out (X_1) had a positive and significant effect on Adolescent Spirituality ($\beta = 0.336$, $p < 0.001$), supporting H1. Similarly, School Climate (X_2) demonstrated a significant positive effect on Adolescent Spirituality ($\beta = 0.400$, $t = 5.835$, $p < 0.001$), confirming H2. Self-Control (Z) also exerted a significant positive influence on Adolescent Spirituality ($\beta = 0.241$, $t = 2.923$, $p < 0.001$), thereby supporting H3. Furthermore, the interaction effect between Self-Control and Fear of Missing Out ($Z \times X_1$) was positive and statistically significant ($\beta = 0.421$, $t = 5.809$, $p < 0.001$), indicating that self-control significantly moderates the relationship between Fear of Missing Out and Adolescent Spirituality, thus supporting H4. Likewise, the interaction between Self-Control and School Climate ($Z \times X_2$) significantly influenced Adolescent Spirituality ($\beta = 0.309$, $t = 4.668$, $p < 0.001$), confirming H5. Overall, these findings demonstrate that fear of missing out, school climate, self-control, and the proposed moderation effects all contribute significantly to explaining variations in adolescent spirituality. The result of R^2 were described on Table 6:

Table 6. The Result of Coefficient Determination (R^2)

	R-Square	R-Square Adjusted
Adolescent Spirituality (Y)	0,722	0,707
Self Control (Z)	0,719	0,786

Sources: The Authors Own Work (2026)

The coefficient of determination (R^2) was assessed to evaluate the predictive accuracy of the structural model in explaining the variance of the endogenous constructs. According to Hair et al. (2022), R^2 values of 0.75, 0.50, and 0.25 indicate substantial, moderate, and weak explanatory power, respectively. As shown in Table 7, the Adolescent Spirituality construct (Y) achieved an R^2 value of 0.722 with an adjusted R^2 of 0.707, indicating that 72.2% of the variance in adolescent spirituality is explained by Fear of Missing Out, School Climate, Self-Control, and the interaction terms included in the proposed structural model, while the remaining 27.8% is attributable to other variables not examined in this study. Likewise, the Self-Control construct (Z) obtained an R^2 value of 0.719, suggesting that 71.9% of its variance is explained by its corresponding predictor(s) in the model. Overall, the R^2 values demonstrate that the proposed model possesses substantial explanatory power, indicating that it effectively explains the endogenous constructs and exhibits strong predictive capability (Hair et al., 2022). The result of Model Fit Showed on below:

Table 7. The Result of Model Fit

	Saturated model	Estimated model
SRMR	0,067	0,066
D_ULS	1,833	1.790
D_G	0,794	0,796
Chi-Square	415.625	411.054
NFI	0.805	0.808

Sources: The Authors Own Work (2026)

Model fit was assessed using SRMR, d_ULS, d_G, Chi-square, and NFI. As shown in Table 8, the SRMR values for the saturated (0.067) and estimated (0.066) models were below the recommended threshold of 0.08, while the NFI values (0.805 and 0.808) exceeded 0.80. These findings indicate that the proposed PLS-SEM model demonstrates an acceptable overall fit and is suitable for structural model analysis (Hair et al., 2022).

The influence of Fear of missing out towards adolescent spirituality

The findings of this study indicate that fear of missing out (FoMO) has a significant effect on adolescent spirituality, suggesting that adolescents who experience higher levels of FoMO tend to exhibit lower spiritual well-being. From the perspective of Self-Determination Theory (SDT), FoMO emerges when individuals experience unmet psychological needs for autonomy, competence, and relatedness, leading them to seek continuous social connection and external validation through digital interactions rather than developing internal meaning and self-transcendence (Przybylski et al., 2013). Such excessive orientation toward online social comparison may reduce opportunities for self-reflection, gratitude, and purpose in life, which are fundamental dimensions of spirituality. The present findings are consistent with recent studies demonstrating that FoMO is positively associated with problematic social media use, psychological distress, and reduced well-being among adolescents (Li et al., 2024; Fang et al., 2025; Servidio et al., 2024). Moreover, research by Faizah et al. (2025) reported that adolescents with higher FoMO tend to have lower self-esteem, indicating that persistent concern about missing social experiences weakens positive self-perception and psychological adjustment. In the context of spirituality, previous longitudinal research has shown that spirituality promotes character strengths, prosocial behavior, and subjective well-being among adolescents (Kor et al., 2019), whereas digital pressure and excessive dependence on peer approval may undermine these positive developmental outcomes. Similar evidence from Indonesian adolescents also demonstrated that FoMO negatively affects adolescents' worship behavior by reducing concentration, intrinsic religious motivation, and engagement in spiritual practices (Nurizki et al., 2025). Therefore, the present findings reinforce the growing body of literature suggesting that FoMO represents a psychological risk factor that may hinder adolescents' spiritual development by shifting their attention from intrinsic values and meaning toward continuous external social validation.

The influence of School Elimate towards adolescent spirituality

The findings of this study demonstrate that school climate has a positive and significant influence on adolescent spirituality, indicating that adolescents who perceive their school as safe, supportive, and value-oriented are more likely to develop stronger spiritual well-being. According to Bronfenbrenner's Ecological Systems Theory, the school represents a primary developmental environment in which students continuously interact with teachers, peers, and institutional values that shape their psychological, moral, and spiritual development. A positive school climate fosters mutual respect, trust, belonging, and meaningful interpersonal relationships, enabling adolescents to internalize positive values and construct meaning in life. This finding is consistent with previous studies showing that supportive school environments significantly promote students' resilience, hope, moral identity, and psychological well-being (Wong et al., 2021; Aldridge & McLure, 2024; Sahib et al., 2025). Similarly, Quinn (2017) reported that schools emphasizing caring relationships and shared values encourage adolescents to develop a stronger sense of purpose beyond personal interests, which constitutes an essential dimension of spirituality. Within the Indonesian context, Suud and Khilmiyah emphasized that educational environments grounded in Islamic values and positive teacher student relationships play a central role in nurturing students' spiritual awareness, empathy, and character development through value-based learning and school culture. Furthermore, Suud, Purnomo, and colleagues recently argued that a supportive educational climate built upon ukhuwah, collective empathy, relational leadership, and spiritual bonding strengthens individuals' moral commitment and spiritual identity within Islamic educational institutions, highlighting the importance of value-oriented educational environments in fostering spiritual development. These findings collectively suggest that school climate extends beyond academic support by serving as an important psychosocial context through which adolescents develop meaning, connectedness, and spiritual maturity (Suud et al.; Aziz et al., 2026; Wong et al., 2021; Aldridge & McLure, 2024; Sahib et al., 2025).

Self-control moderates the relationship between fear of missing out and adolescent spirituality.

The findings indicate that self-control significantly moderates the relationship between fear of missing out (FoMO) and adolescent spirituality, suggesting that adolescents with higher levels of self-control are better able to regulate the detrimental influence of FoMO on their spiritual development. This finding is consistent with Self-Control Theory proposed by Tangney et al. (2004), which posits that self-control enables individuals to regulate impulses, delay gratification, and align their behaviors with long-term values rather than immediate emotional or social rewards. In the context of social media, adolescents experiencing high FoMO tend to seek continuous online engagement to avoid missing rewarding social experiences (Przybylski et al., 2013). However, strong self-control allows adolescents to manage these impulses, reduce compulsive social media engagement, and preserve time and attention for activities that foster spiritual growth, such as self-reflection, worship, and meaningful interpersonal relationships. Recent empirical evidence likewise demonstrates that self-control is a protective psychological resource that weakens the negative consequences

of FoMO by reducing problematic social media use, emotional dysregulation, and digital dependency (Li et al., 2024; Fang et al., 2025; Servidio et al., 2024). Moreover, Li and Nie (2023) found that self-control serves as a significant psychological mechanism through which spirituality promotes healthier adolescent behavior, highlighting its role in strengthening positive developmental outcomes under challenging digital environments. These findings also align with the perspective of Suud and colleagues from Universitas Muhammadiyah Yogyakarta, who argue that adolescents' spiritual development is closely related to their capacity for self-regulation, emotional control, and internalization of moral values through positive educational experiences. Rather than functioning solely as behavioral restraint, self-control enables adolescents to prioritize religious and personal values over transient social pressures generated by digital interactions. Likewise, Abd. Madjid, Suud, and colleagues reported that self-control and a supportive school environment contribute significantly to the development of positive adolescent behavior by strengthening moral awareness and value-oriented decision-making through educational processes. Therefore, the present findings extend previous research by demonstrating that self-control not only directly supports adolescent spirituality but also functions as an important buffering mechanism that attenuates the adverse influence of FoMO. Adolescents with stronger self-control are less likely to be psychologically dominated by the fear of social exclusion and are more capable of maintaining spiritual commitment despite the increasing social and technological pressures characteristic of the digital era.

Self-control moderates the relationship between school climate and adolescent spirituality.

The findings of this study demonstrate that self-control significantly moderates the relationship between school climate and adolescent spirituality, indicating that the positive influence of a supportive school climate on adolescents' spirituality becomes stronger among students who possess higher levels of self-control. According to Social Cognitive Theory (Bandura, 1986), environmental influences do not automatically shape individual behavior; rather, their effects depend on individuals' capacity for self-regulation. In educational settings, a positive school climate characterized by supportive teacher student relationships, fairness, safety, and positive peer interactions provides opportunities for adolescents to internalize moral and spiritual values. However, these environmental resources are more likely to translate into spiritual growth when students are capable of regulating their emotions, impulses, and behaviors. Adolescents with strong self-control are more likely to interpret positive school experiences constructively, engage in reflective learning, and consistently practice values aligned with spirituality despite various social and academic challenges. These findings are supported by recent evidence showing that self-control enhances adolescents' psychological adjustment and enables students to benefit more effectively from positive school environments (Li et al., 2023; Li et al., 2021; Ding & Fang, 2025). Likewise, a meta-analysis by Li et al. (2021) concluded that supportive school environments, particularly school discipline, teacher support, and positive teacher student relationships, significantly contribute to the development of students' self-control, which subsequently promotes adaptive developmental outcomes. Furthermore, Husna, Partino, Abd. Madjid, and Suud (2025) demonstrated that self-control and school climate jointly predict positive adolescent behavior by strengthening students' moral awareness, emotional regulation, and value-based decision-making within Islamic educational settings. Therefore, the present findings suggest that self-control functions as an important personal resource that maximizes the beneficial influence of a positive school climate on adolescent spirituality. Even when schools provide supportive learning environments, adolescents with stronger self-control are better able to internalize spiritual values and translate them into consistent attitudes and behaviors, thereby reinforcing the synergistic relationship between environmental support and individual self-regulation in fostering spiritual development.

Conclusions

This study demonstrates that school climate is the strongest direct predictor of adolescent spirituality, with a positive and significant effect ($\beta = 0.400$, $t = 5.835$, $p < 0.001$), followed by fear of missing out, which also has a positive and significant effect ($\beta = 0.336$, $t = 4.785$, $p < 0.001$). These findings indicate that the school environment plays an important role in explaining variations in adolescent spirituality, while fear of missing out is also significantly associated with spiritual development. Furthermore, self-control significantly moderates the relationships between fear of missing out and adolescent spirituality ($\beta = 0.421$, $t = 5.809$, $p < 0.001$) and between school climate and adolescent spirituality ($\beta = 0.309$, $t = 4.668$, $p < 0.001$). The positive interaction effects indicate that these relationships vary according to adolescents' level of self-control. Overall, adolescent spirituality appears to be influenced by the interaction between contextual conditions, particularly school climate, and individual psychological resources. Strengthening supportive school climates alongside the development of self-control may therefore provide a relevant approach to supporting adolescent spiritual development in the digital era. This study has several limitations. The cross-sectional design limits

the ability to establish temporal or causal relationships, so the findings should be interpreted as statistical associations rather than definitive causal effects. The sample consisted of 100 junior high school students selected through purposive sampling, which limits generalizability across educational levels, regions, and sociocultural backgrounds. The relatively small sample should also be considered when interpreting the moderation effects, as interaction effects generally require greater statistical power. In addition, the use of self-report questionnaires may introduce common method and social desirability biases. Finally, the model did not include other potentially relevant factors, such as parental religiosity, family functioning, peer support, digital literacy, resilience, and psychological well-being.

Based on these findings, schools should strengthen value-oriented school climates through supportive teacher student relationships, positive peer interactions, school safety, fairness, and learning environments that encourage moral reflection and spiritual development. Self-control development, digital well-being education, and reflective learning activities may also be integrated into character education to help adolescents regulate impulses, emotions, attention, and behavior in response to digital pressures, including fear of missing out. Future research should employ longitudinal or experimental designs to provide stronger evidence regarding the temporal and causal mechanisms of adolescent spirituality. Larger and more diverse samples across regions, educational levels, and sociocultural contexts are also recommended to improve external validity. Multi-source or objective measures should be considered to reduce common method and social desirability biases. Future studies could incorporate additional variables, including family spirituality, parental support, religious commitment, digital literacy, resilience, psychological well-being, and peer relationships. For moderation research, a priori power analysis should be conducted before data collection, with statistical power, standardized interaction coefficients, and confidence intervals reported to strengthen evidence for the robustness and replicability of the findings.

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