

FACTORS INFLUENCING THE SENSE OF SCHOOL BELONGING AMONG 15-YEAR-OLD STUDENTS IN VIETNAM: EVIDENCE FROM PISA 2022

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ABSTRACT

A sense of school belonging is widely recognized as a fundamental component of students' well-being and educational success. This study examines the factors influencing the sense of school belonging among 4,959 Vietnamese 15-year-old students using data from the Programme for International Student Assessment (PISA) 2022. Specifically, the study investigates the relative contributions of individual characteristics, psychosocial attributes, and school environmental factors to students' perceptions of belonging within the school community. Weighted multiple linear regression analysis was employed to examine the effects of twelve explanatory variables grouped into four conceptual domains. The proposed model explained 18.86% of the variance in students' sense of school belonging. The findings indicate that perceived school safety, positive teacher–student relationships, and emotional regulation are the strongest positive predictors of school belonging. In contrast, experiences of bullying, school absenteeism, and mathematics anxiety are found to have significant negative effects. The results highlight the importance of fostering supportive and inclusive school environments that promote students' psychological well-being and social connectedness. The study recommends strengthening school safety initiatives, enhancing teacher–student relationships, increasing family engagement, and expanding school-based mental health services to reduce bullying and improve students' sense of belonging. These findings provide empirical evidence to inform educational policies and school practices aimed at promoting student well-being in Vietnam.

Keywords: school belonging; PISA 2022; Vietnamese students; school bullying; student well-being; educational psychology.

Introduction

The sense of school belonging is understood as the extent to which students feel accepted, respected, and included as part of the school community (Baumeister & Leary, 1995; Goodenow, 1993). It is considered a core component of student well-being and is recognized as having far-reaching effects on motivation, academic achievement, mental health, and behavior (Osterman, 2000; Strayhorn, 2018). According to belongingness theory, the need for connection and group membership is identified as a fundamental psychological need; when this need is satisfied within the school environment, students are more likely to demonstrate active engagement and to develop stronger adaptability and resilience in the face of challenges (Baumeister & Leary, 1995).

In the global context, a decline in students' sense of school belonging has been observed across many education systems, particularly following the COVID-19 pandemic (OECD, 2023b). Data from PISA 2022 (Programme for International Student Assessment) indicate that only a small number of countries have maintained or improved students' sense of belonging between 2018 and 2022, whereas a declining or unstable trend has been reported in most systems. In Vietnam, 82% of students were found to feel a sense of belonging to their school, which is higher than the OECD average (75%) and represents an improvement compared to 2018. However, 14% of students were reported to feel lonely, and 21% were found to feel excluded or like outsiders, indicating that a vulnerable group of students who lack connection to the school community still exists (OECD, 2023b).

It has been shown in many international studies that the sense of belonging is influenced by individual factors (such as gender and socio-economic status), relationships with teachers and families, school environment conditions (such as safety and discipline), and negative experiences such as bullying (Liu et al., 2021; Xu et al., 2021). A safe school environment and positive teacher-student relationships have been identified as strong predictors of school belonging, whereas bullying has been recognized as one of the most significant negative factors, weakening belonging and contributing to a negative cycle affecting both mental health and academic achievement (Glew et al., 2008; Wilson, 2004; Swearer, 2011; Xu et al., 2021).

Although a large body of international research on school belonging has been conducted, studies in Vietnam remain limited, particularly quantitative studies based on nationally representative data. Within the Vietnamese cultural and educational context, in which high academic pressure, achievement orientation, and collectivist values are emphasized (Le et al., 2020), the determinants of school belonging may differ from those identified in Western contexts.

The urgency of this study is further highlighted by the implementation of the 2018 General Education Curriculum, which emphasizes the development of students' comprehensive qualities and competencies, and by the "Happy School" initiative, in which school belonging is considered a key indicator of a safe, friendly, and violence-free learning environment (Ministry of Education and Training, 2019). However, existing Vietnamese studies have primarily relied on small local samples, and nationally representative evidence has remained limited. The PISA 2022 dataset, which includes 4,959 students representing 63 provinces and cities, is considered the first comprehensive empirical basis for supporting national education policies related to holistic education and SDG4.

On this basis, two research questions are addressed: (i) which individual, psychological, relational, and school-environment factors are found to have significant effects on the school belonging of 15-year-old students in Vietnam

according to PISA 2022 data; and (ii) what policy implications can be derived from the quantitative results in order to enhance students' sense of school belonging in the Vietnamese context.

The main contributions of this study are presented in two aspects. First, the PISA 2022 dataset, comprising 4,959 nationally representative 15-year-old students, is utilized to examine factors associated with school belonging in Vietnam. Second, a unified multivariate model is developed in which four groups of factors are simultaneously considered: individual factors (gender, socio-economic status), psychological factors (emotional regulation, test anxiety), relational factors (family support, teacher-student relationships), and school environment factors (safety, bullying, absenteeism). The empirical results are expected to provide evidence to support Vietnam's "Happy School" policy and the implementation of the 2018 General Education Curriculum.

1. Theoretical Framework and Research Model

Theoretical Background

The theory of school belonging

The concept of school belonging is grounded in the belongingness theory proposed by Baumeister and Leary (1995), in which it is argued that human beings are driven by an innate need to establish and maintain positive, stable, and meaningful social relationships. When this need is fulfilled, positive emotional experiences, better mental health, and higher levels of motivation are likely to be experienced by individuals. In the school context, school belonging is reflected in the extent to which students perceive themselves as important members of the school community, in which they are respected, accepted, and meaningfully connected with teachers, peers, and the learning environment (Goodenow, 1993; Osterman, 2000).

A large body of research has demonstrated that school belonging has positive effects on multiple aspects of student development, including academic motivation, academic achievement, individual well-being, and the ability to cope with stress (Goodenow, 1993; Osterman, 2000; Strayhorn, 2018). Conversely, a lack of school belonging has been associated with loneliness, anxiety, depression, school dropout behavior, and

other behavioral problems (Baumeister & Leary, 1995; Wilson, 2004).

In addition, school belonging has been conceptualized as comprising three dimensions, including cognitive engagement, emotional engagement, and behavioral engagement (Tăng Thị Thủy et al.). In the Vietnamese context, where academic pressure is high and competition is intense, school belonging is considered to play an important protective role in maintaining students' mental health and learning motivation.

Factors affecting school belonging

Individual factors

Gender has been considered an important but inconsistent predictor in studies on school belonging. In some studies, higher levels of belonging have been reported among female students, which has been attributed to stronger communication skills, emotional expression, and more developed social support networks. In contrast, other studies have suggested that greater social sensitivity, pressure to maintain harmonious relationships, and traditional gender norms may expose female students to higher levels of stress, fear of evaluation, and vulnerability to bullying or social exclusion, thereby increasing the risk of feeling disconnected from the school environment (H. Korpershoek et al., 2020). In addition, in the post-COVID-19 context, in which mental health issues have been increasingly observed, school belonging has been considered an even more critical issue (Đặng Quang Trí et al., 2025).

Students from higher socio-economic and cultural status (ESCS) families are generally provided with more opportunities to participate in school activities, experience less stigmatization, and receive better support resources; as a result, higher levels of school belonging are often reported among these students (OECD, 2023b). However, this relationship may not be linear, as it has been suggested that school belonging may be highest among students with medium socio-economic status, since both extreme groups (very low and very high SES) may face difficulties in social integration. Furthermore, students with higher academic performance tend to receive more recognition and positive feedback from teachers

and peers; therefore, they are more likely to feel valued and to experience a stronger sense of belonging (OECD, 2023b).

Psychological and social factors

Positive emotional co-regulation has been shown to help students manage stress, build better relationships, and participate more effectively in school activities; as a result, school belonging is enhanced (Freire et al., 2020). In addition, students with higher academic self-efficacy are more likely to engage actively in learning, seek support when needed, and feel more confident in the school environment, which contributes to a stronger sense of belonging (Freire et al., 2020; Strayhorn, 2018).

Academic anxiety, particularly mathematics anxiety, has been found to reduce student participation in learning activities and weaken academic confidence; consequently, a negative impact on school belonging is observed (OECD, 2023b).

Relational factors

Parental involvement, encouragement, and engagement in children's learning are considered important factors that help students feel supported and valued; thus, school belonging is strengthened (OECD, 2023c). Empirical studies have indicated that positive teacher-student relationships are associated with higher levels of school belonging (Uslu & Gizir, 2017). Within the PISA 2022 framework, it has been reported that students receiving greater teacher support tend to report higher levels of school belonging and better academic outcomes (OECD, 2023c).

School environment factors

A sense of physical and psychological safety at school is considered a prerequisite for the development of school belonging. When safety is ensured, students are able to focus on learning and relationship-building without fear of harm or threat (Glew et al., 2008; Wilson, 2004).

In addition, bullying has been identified as one of the most powerful negative factors affecting school belonging. Students who are bullied often experience exclusion, reduced trust in the school environment, and a higher risk of loneliness, anxiety, and depression (Swearer, 2011; Xu et al., 2021). It has been demonstrated that bullying not

only directly affects well-being but also weakens school belonging, thereby indirectly influencing students' mental health and academic achievement (Xu et al., 2021). Furthermore, Phan Thị Mỹ Hạnh and Trần Thanh Hương (2025) argued that school happiness has a significant impact on students' psychological well-being and overall development.

Learning behavior

Frequent absenteeism reduces opportunities for social interaction and participation in school activities, leading to feelings of disconnection and weak belonging to the school community (Hawkins et al., 1999). In addition, when learning is perceived as meaningful, useful, and relevant for the future, students are more likely to be motivated, actively engaged, and emotionally connected to the school (OECD, 2023b).

Selection of Independent Variables in The Model

Based on the theoretical framework and previous empirical studies, 12 independent variables were selected in this study to represent the groups of factors described above. These include gender (female), socio-economic and cultural status squared (ESCS² - included to test a non-linear relationship), emotional co-regulation (EMOCOAGR), family support (FAMSUP), quality of teacher-student relationships (RELATST), perceived safety (FEELSAFE), bullying experience (BULLIED), school absenteeism (MISSSC), perceived usefulness of learning (FEELLAH), self-efficacy in learning (SDLEFF), mathematics anxiety (ANXMAT), and mathematics achievement (PV1MATH). All of these psychosocial indicators are standardized indices developed by the OECD based on the PISA 2022 student questionnaire, ensuring measurement reliability and validity (OECD, 2023c).

Model testing and Acceptance Criteria

Coefficient of determination (R^2)

In educational research, particularly in studies involving attitudinal and psychological variables such as school belonging, the coefficient of determination (R^2) is typically lower than that observed in studies of academic achievement. This is because attitudinal variables are influenced by

numerous unobservable factors such as personality traits, individual experiences, cultural background, and other contextual conditions.

In PISA studies on well-being and school belonging, R^2 values are commonly reported to range between 0.10 and 0.25 (OECD, 2023b). Therefore, an R^2 value in the range of approximately 0.15 to 0.20 is considered acceptable and indicates that a reasonable proportion of the variance in the dependent variable is explained by the model.

Variance Inflation Factor (VIF)

The Variance Inflation Factor (VIF) is employed to detect multicollinearity in multiple regression models. A VIF value greater than 10 is generally considered to indicate serious multicollinearity problems, while values greater than 5 may raise concern.

In contrast, VIF values below 5, and ideally below 3, indicate that no significant multicollinearity problems are present in the model (Hair et al., 2010).

2. Research Methodology

Data Source

Secondary data were used in this study, derived from the 2022 Programme for International Student Assessment (PISA), which is conducted by the Organisation for Economic Co-operation and Development (OECD). PISA is an international assessment that evaluates the competencies of 15-year-old students in Mathematics, Reading, and Science, while also collecting rich contextual information on students' family background, attitudes, behaviors, and well-being through detailed questionnaires.

The PISA 2022 data were collected using a two-stage stratified sampling design following OECD international standards. In the first stage, schools were selected using stratified systematic probability proportional to size (PPS) sampling, in which the probability of selection was proportional to the number of 15-year-old students enrolled in each school. In Vietnam, 4,959 students from 163 schools across 63 provinces and cities were included in the sample (OECD, 2023d). In the second stage, students were randomly selected within each school using simple random sampling, with a target of 42 students per school.

To ensure data quality, several procedures were implemented by the OECD, including: (i) approval of the national sampling frame prior to data collection; (ii) replacement of schools that refused participation; (iii) ensuring response rates of at least 85% at the school level and 80% at the student level; (iv) double translation and cultural adaptation checks for the Vietnamese-language assessment instruments; and (v) international monitoring through the PISA system and evaluation by Sampling Referees (OECD, 2023c). Vietnam fully complied with these requirements, ensuring high data reliability and national representativeness.

Vietnam first participated in PISA in 2012 and has continued to take part in subsequent cycles. In PISA 2022, Vietnam’s sample included approximately 5,000 15-year-old students from both public and private schools nationwide. The Vietnamese dataset met all technical standards regarding sampling quality and data collection procedures (OECD, 2023c). The final sample used in this study consists of 4,959 Vietnamese students with complete data for all variables included in the model (approximately 99% of the original sample).

Analytical Method

A multiple linear regression model (Ordinary Least Squares - OLS) was employed to identify the factors influencing students’ sense of school belonging. The regression model was estimated using student final weights (W_FSTUWT) provided by the OECD to ensure that the sample is representative of 15-year-old students in Vietnam. Robust standard errors were applied to correct for potential heteroskedasticity.

The regression equation is specified as follows:

Table 1. Descriptive statistics of variables in the model (N = 4,959)

Variable	Mean	Std. Dev.	Min	Max
BELONG	-0.125	0.739	-3.21	2.18
female	0.517	0.500	0.00	1.00
ESCS2	1.124	1.645	0.00	12.45
EMOCOAGR	0.142	0.982	-3.47	2.35
FAMSUP	0.089	1.018	-3.12	1.98

$$\begin{aligned} BELONG_i = & \beta_0 + \beta_1 female_i + \beta_2 ESCS2_i \\ & + \beta_3 EMOCOAGR_i \\ & + \beta_4 FAMSUP_i + \beta_5 RELATST_i \\ & + \beta_6 FEELSAFE_i \\ & + \beta_7 BULLIED_i + \beta_8 MISSSC_i \\ & + \beta_9 FEELLAH_i + \beta_{10} SDLEFF_i \\ & + \beta_{11} ANXMAT_i \\ & + \beta_{12} PV1MATH_i + u_i \end{aligned}$$

Where, $BELONG_i$ represents the sense of school belonging of student i , β_0 is the intercept, $\beta_1, \dots, \beta_{12}$ are regression coefficients representing the effect of each independent variable on the dependent variable, u_i is the error term

Before estimating the main model, multicollinearity was tested using the Variance Inflation Factor (VIF). After estimation, the coefficient of determination (R^2), F-statistic, and statistical significance levels of the regression coefficients were reported.

Although PISA data have a hierarchical structure (students nested within schools) and multilevel modelling could theoretically better account for between-school variation, this study primarily focuses on individual-level effects at the student level.

3. Results

Descriptive Statistics

Table 1 presents the descriptive statistics of the variables included in the model. The sample consists of 4,959 students, of whom 51.7% are female. All psychosocial indicators are standardized variables; therefore, their means are expected to be close to 0 and standard deviations close to 1 in the global sample. However, in the Vietnamese subsample, several indicators deviate from 0, reflecting specific characteristics of Vietnamese students compared to the OECD average.

RELATST	0.156	0.951	-2.89	2.41
FEELSAFE	0.078	0.967	-3.58	1.87
BULLIED	-0.234	0.876	-1.23	3.67
MISSSC	-0.412	0.789	-0.98	3.45
FEELLAH	0.267	1.012	-3.21	2.13
SDLEFF	0.198	0.958	-3.45	2.28
ANXMAT	0.123	1.048	-2.87	2.56
PV1MATH	469.2	93.600	198.4	789.30

(Source: Author’s calculations, 2026)

The mean value of BELONG in the Vietnamese sample is -0.125, which is slightly lower than the OECD average (0), indicating that Vietnamese students report a slightly lower level of school belonging compared to the OECD average (OECD, 2023a). However, according to the PISA 2022 report, approximately 82% of Vietnamese students agreed that they feel a sense of belonging at school, which is higher than the OECD average of about 75% (OECD, 2023d). This discrepancy may be explained by the fact that the BELONG index is a more complex composite measure, incorporating negative aspects such as loneliness and feelings of exclusion; therefore, it reflects the quality of students’ connection to school more comprehensively than single-item indicators of belonging (Goodenow, 1993).

Model Fit Tests

Prior to regression estimation, statistical assumptions were tested. Multicollinearity was not detected, as the Variance Inflation Factor (VIF) values for all variables remained low (mean VIF

= 1.17, maximum VIF < 1.5). The F-test indicated that the regression model was highly statistically significant (F(12, 4946) = 45.94, p < 0.001). The adjusted R-squared value was 0.1886, indicating that approximately 18.9% of the variation in students’ sense of school belonging was explained by the independent variables included in the model.

Although this level of explanatory power may be considered modest in the natural sciences, it is regarded as appropriate in behavioral and educational research, where human emotions are influenced by a large number of complex and often unobservable individual factors. This level of explanatory power is also consistent with previous international studies using PISA data (OECD, 2023c).

Regression Results

Table 2 presents the estimated results of the OLS regression model using student weights and robust standard errors.

Table 2. OLS regression results on factors affecting school belonging

Independent variable	β coefficient	Std. error	t	p-value	95% CI
female	-0.038	0.021	-1.82	0.069	[-0.079; 0.003]
ESCS2	-0.009	0.003	-2.76	0.006	[-0.016; -0.003]
EMOCOAGR	0.092	0.021	4.39	<0.001	[0.051; 0.133]
FAMSUP	0.023	0.011	2.04	0.042	[0.001; 0.045]
RELATST	0.115	0.016	7.15	<0.001	[0.083; 0.146]
FEELSAFE	0.170	0.015	11.23	<0.001	[0.141; 0.200]
BULLIED	-0.051	0.010	-5.01	<0.001	[-0.071; -0.031]
MISSSC	-0.086	0.036	-2.39	0.017	[-0.156; -0.015]

FEELLAH	0.037	0.019	1.99	0.047	[0.001; 0.074]
SDLEFF	0.043	0.019	2.32	0.020	[0.007; 0.079]
ANXMAT	-0.040	0.016	-2.50	0.012	[-0.071; -0.009]
PV1MATH	0.0005	0.0001	3.81	<0.001	[0.0002; 0.0007]
Constant	-0.506	0.065	-7.82	<0.001	[-0.632; -0.379]

(**Note:** $N = 4,959$; $R^2 = 0.1886$; $F(12, 4946) = 45.94$; $p < 0.001$. OLS regression was estimated using student final weights (W_FSTUWT) with robust standard errors.)

Strong Positive Determinants

Perceived school safety (FEELSAFE) was identified as the strongest determinant of school belonging, with the largest regression coefficient ($\beta = 0.170$, $p < 0.001$). Holding all other variables constant, a one-unit increase in perceived safety was associated with an increase of 0.170 units in school belonging. This indicates that a physically and psychologically safe school environment is a fundamental prerequisite for students' sense of belonging.

Teacher-student relationship quality (RELATST) was also found to have a strong and highly significant positive effect ($\beta = 0.115$, $p < 0.001$). Positive relationships with teachers were identified as one of the most important factors contributing to students' feelings of acceptance and connection to school. According to PISA 2022 data, the mean value of RELATST in the Vietnamese sample was 0.156, higher than the OECD average, suggesting generally positive perceptions of teacher-student relationships among Vietnamese students. However, the relatively large standard deviation (0.951) indicated that a substantial subgroup of students still experienced difficulties in establishing or maintaining positive relationships with teachers.

Emotional co-regulation (EMOCOAGR) was also found to have a significant positive effect ($\beta = 0.092$, $p < 0.001$), suggesting that students with better emotional management skills tended to report a stronger sense of school belonging.

Self-efficacy in learning (SDLEFF) ($\beta = 0.043$, $p < 0.05$), perceived usefulness of learning (FEELLAH) ($\beta = 0.037$, $p < 0.05$), and family support (FAMSUP) ($\beta = 0.023$, $p < 0.05$) were

(Source: Author's calculations, 2026)

all found to have statistically significant positive effects, indicating that academic confidence, perceived meaning of learning, and family support all contributed to strengthening school belonging.

Mathematics achievement (PV1MATH) showed a positive but very small effect ($\beta = 0.0005$, $p < 0.001$). Although statistically significant, the substantive impact of academic performance on school belonging was considered negligible.

Negative Determinants

Bullying (BULLIED) was found to have a strong negative effect ($\beta = -0.051$, $p < 0.001$). A one-unit increase in bullying exposure was associated with a decrease of 0.051 units in school belonging, holding other factors constant. This was identified as one of the most important negative predictors of students' well-being and school connectedness.

School absenteeism (MISSSC) also had a significant negative effect ($\beta = -0.086$, $p < 0.05$), indicating that frequent absence reduces opportunities for social interaction and participation in school life, thereby weakening students' sense of connection to the school community.

Mathematics anxiety (ANXMAT) was found to negatively affect school belonging ($\beta = -0.040$, $p < 0.05$), reflecting that academic anxiety reduces students' confidence and emotional attachment to school.

The squared term of socio-economic and cultural status ($ESCS^2$) yielded a statistically significant negative coefficient ($\beta = -0.009$, $p < 0.01$), suggesting a non-linear, inverted U-shaped relationship between ESCS and the sense of belonging. This implies that the sense of belonging peaks among students with a moderate socio-economic and cultural background, whereas those at both extremes (either very low or very high) exhibit a lower sense of belonging, after controlling for other covariates.

Non-significant Factor

Gender (female) showed a negative coefficient but was only marginally significant ($\beta = -0.038$, $p = 0.069$), suggesting that female students may tend to report slightly lower school belonging than male students; however, this difference was

not statistically strong enough for a definitive conclusion.

To visualize the magnitude and direction of the effects, standardized beta coefficients are presented in Figure 1.

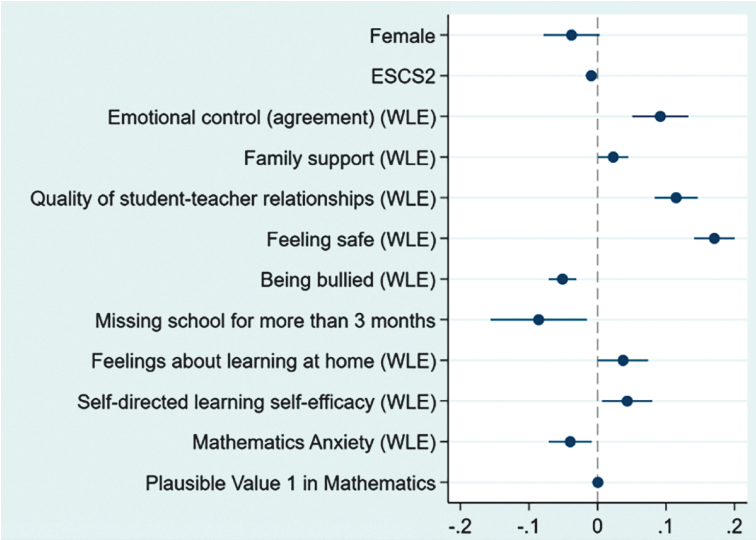


Figure 1. Effects of determinants on school belonging

(Source: Author’s analysis, 2026)

4. Discussion

The results indicate that perceived safety and the quality of teacher-student relationships are the two strongest predictors of school belonging, highlighting the central role of teachers and a safe school environment within Vietnamese school culture. This suggests that teacher-student relationships are not only a channel for knowledge transmission but also an important psychological support system through which students feel respected and accepted. However, the relatively large standard deviation of RELATST indicates that teacher support is unevenly distributed across students, particularly in contexts characterized by large class sizes and high teacher workload. In addition, although 82% of Vietnamese students reported a sense of belonging to school, which is higher than the OECD average of 75% (OECD, 2023b), a substantial proportion of students still reported feeling unsafe on the way to school, in classrooms, and in other school areas. This indicates that safety remains a major barrier to student well-being and school connectedness.

School bullying was identified as one of the strongest negative determinants of school belonging. This finding is consistent with previous

studies showing that bullying not only directly harms well-being but also weakens feelings of acceptance, thereby negatively affecting mental health and academic achievement. These results emphasize the importance of anti-bullying programs and the development of a respectful and supportive school culture. From a psychological perspective, mathematics anxiety was also found to have a significant negative effect on school belonging. In a context where mathematics is a core examination subject and strongly associated with parental expectations, academic anxiety may lead students to perceive school as a source of stress rather than support, thereby weakening their emotional connection to school.

Results related to learning behavior and attitudes indicate that frequent absenteeism is both a manifestation and a cause of disconnection, as students lose opportunities for social interaction, group participation, and relationship-building with peers and teachers. In contrast, perceived usefulness of learning and self-efficacy in learning were found to have positive effects on school belonging, suggesting that when students perceive learning as meaningful and believe in their own academic abilities, stronger attachment to school is

likely to be developed. The non-linear relationship between ESCS² and school belonging suggests that students with medium socio-economic status may experience the highest level of “fit” within the school environment, while those at both extremes (very low or very high ESCS) may experience a cultural mismatch. This finding highlights the importance of an inclusive and diverse school environment in which students from different socio-economic backgrounds are equally accepted.

Although this study provides several practical contributions, certain limitations should be acknowledged. First, due to the use of cross-sectional PISA 2022 data, only statistical associations can be identified, while causal relationships cannot be established; relationships may be bidirectional or influenced by mediating variables. For example, perceived safety and school belonging may mutually influence each other, and bullying experiences may be both a cause and a consequence of social exclusion. Second, the model explains only 18.86% of the variance in BELONG; although this level is considered acceptable in educational research on attitudes, it suggests that many other factors such as personality traits, specific lived experiences, school culture, and relationships with individual teachers have not been included. Third, the use of only one plausible value (PV1MATH) instead of all ten may reduce the precision of estimates related to mathematics achievement, even though its effect on school belonging was relatively small. In addition, all variables were self-reported by students, which may introduce measurement error and response bias.

5. Policy Implications

The findings show that perceived safety ($\beta = 0.170$) and teacher-student relationships ($\beta = 0.115$) are the most influential factors affecting school belonging.

At the school level, it is recommended that administrative performance pressures on teachers be reduced, and evaluation criteria should prioritize time spent supporting individual students. Measures to enhance school safety, such as establishing dedicated counseling spaces, should also be implemented.

At the teacher level, training in empathy, active listening, and the implementation of classroom emotional check-in activities at the beginning of

lessons are recommended to identify students at risk of isolation or absenteeism.

At the macro level, the Ministry of Education and Training is advised to adjust school performance evaluation systems by reducing the weighting of academic scores, increasing the importance of student well-being indicators, and issuing national standards for safe schools.

Based on these findings, key policy recommendations include prioritizing school safety, improving teacher-student relationship quality, strengthening psychosocial support, reducing academic anxiety, enhancing family involvement, and fostering an inclusive school culture. Reducing absenteeism through early intervention is also considered an important component of a comprehensive strategy to improve school belonging and student well-being, providing empirical evidence for the development of the “Happy School” initiative in Vietnam.

This study identified the factors influencing school belonging among 15-year-old students in Vietnam using PISA 2022 data. The results indicate that school belonging is influenced by an interconnected system of factors, including the school environment, social relationships, individual psychological factors, and learning behaviors. The strongest positive predictors include perceived safety ($\beta = 0.170$), teacher-student relationship quality ($\beta = 0.115$), emotional co-regulation ($\beta = 0.092$), self-efficacy in learning ($\beta = 0.043$), perceived usefulness of learning ($\beta = 0.037$), and family support ($\beta = 0.023$). Negative predictors include school absenteeism ($\beta = -0.086$), bullying ($\beta = -0.051$), mathematics anxiety ($\beta = -0.040$), and a non-linear relationship with socio-economic status (ESCS²: $\beta = -0.009$).

REFERENCES

- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117(3), 497-529. <https://doi.org/10.1037/0033-2909.117.3.497>
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56(2), 81-105. <https://doi.org/10.1037/h0046016>
- Dang, Q. T., et al. (2025). Developing a scale and empirical research on the happiness index at

- HUFLIT. *HUFLIT Journal of Science*.
- Freire, S., Ferragut, M., & Blanco, H. (2020). Social-emotional competencies and school adjustment: A mediation model. *Journal of Adolescence*, 80, 165-175. <https://doi.org/10.1016/j.adolescence.2020.02.012>
- Glew, G. M., Fan, M. Y., Katon, W., & Rivara, F. P. (2008). Bullying, psychosocial adjustment, and academic performance in elementary school. *Archives of Pediatrics & Adolescent Medicine*, 159(11), 1026-1031. <https://doi.org/10.1001/archpedi.159.11.1026>
- Goodenow, C. (1993). The psychological sense of school membership among adolescents: Scale development and educational correlates. *Psychology in the Schools*, 30(1), 79-90. [https://doi.org/10.1002/1520-6807\(199301\)30:1<79::AID-PITS2310300113>3.0.CO;2-X](https://doi.org/10.1002/1520-6807(199301)30:1<79::AID-PITS2310300113>3.0.CO;2-X)
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Prentice Hall.
- Hawkins, J. D., Catalano, R. F., Kosterman, R., Abbott, R., & Hill, K. G. (1999). Preventing adolescent health-risk behaviors by strengthening protection during childhood. *Archives of Pediatrics & Adolescent Medicine*, 153(3), 226-234. <https://doi.org/10.1001/archpedi.153.3.226>
- Korpershoek, H., Canrinus, E. T., Fokkens-Bruinsma, M., & de Boer, H. (2020). The relationships between school belonging and students' motivational, social-emotional, behavioural, and academic outcomes in secondary education: A meta-analytic review. *Research Papers in Education*, 35(6), 641-680. <https://doi.org/10.1080/02671522.2019.1615116>
- Le, T. T. H., Tran, T., Trinh, T. P. T., et al. (2019). Reading habits, socioeconomic conditions, occupational aspiration and academic achievement in Vietnamese junior high school students. *Sustainability*, 11(18), Article 5113. <https://doi.org/10.3390/su11185113>
- Liu, Y., Li, H., & Chen, L. (2021). Sense of belonging and academic performance among international students: The mediating role of homesickness. *Studies in Higher Education*, 46(3), 584-597. <https://doi.org/10.1080/03075079.2019.1654454>
- Ministry of Education and Training. (2019). *Plan No. 103/KH-BGDDT dated February 8, 2019 on implementing and improving pedagogical behavior capacity and teacher ethics for a happy school*.
- OECD. (2023a). *PISA 2022 results (Volume I): The state of learning and equity in education*. OECD Publishing. <https://doi.org/10.1787/53f23852-en>
- OECD. (2023b). *PISA 2022 results (Volume II): Learning to learn and live together*. OECD Publishing. <https://doi.org/10.1787/a97def61-en>
- OECD. (2023c). *PISA 2022 technical report*. OECD Publishing.
- OECD. (2023d). *PISA 2022 results: Country note - Viet Nam*. OECD Publishing.
- Osterman, K. F. (2000). Students' need for belonging in the school community. *Review of Educational Research*, 70(3), 323-367. <https://doi.org/10.3102/00346543070003323>
- Phan, T. M. H., & Tran, T. H. (2025). Happiness at school and its correlation with academic performance of high school students. *Dong Thap University Journal of Science*, 15(1), 45-56.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879-903. <https://doi.org/10.1037/0021-9010.88.5.879>
- Strayhorn, T. L. (2018). *College students' sense of belonging: A key to educational success for all students* (2nd ed.). Routledge. <https://doi.org/10.4324/9781315148007>
- Swearer, S. M. (2011). Bullying in different contexts: A brief comparison. In D. L. Espelage & S. M. Swearer (Eds.), *Bullying in North American schools* (2nd ed., pp. 87-108). Routledge.
- Tang, T. T., et al. (2022). Assessing students' connectedness with the university during the learning process: A study at the VNU University of Education. *Vietnam Journal of Educational Sciences*, 18(6), 57-64.
- Uslu, F., & Gizir, S. (2017). School belonging of adolescents: The role of teacher-student relationships, peer relationships, and family involvement. *Educational Sciences: Theory & Practice*, 17(1), 63-82. <https://doi.org/10.12738/estp.2017.1.0104>
- Wilson, D. (2004). The interface of school climate and school connectedness and relationships with aggression and victimization. *Journal of School Health*, 74(7), 293-299. <https://doi.org/10.1111/j.1746-1561.2004.tb08286.x>
- Xu, M., Guo, X., & Zhang, K. (2021). Bullying victimization and school belonging: A meta-analysis. *School Psychology Review*, 50(2), 249-267. <https://doi.org/10.1080/2372966X.2021.1871994>