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Social-emotional learning (SEL) implementation fidelity and student well-being: A multi-site survey of secondary schools

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Abstract: Social-emotional learning (SEL) is widely promoted to enhance student well-being; however, its effectiveness depends substantially on implementation fidelity in real-world school contexts. This multi-site cross-sectional study examined associations between SEL implementation fidelity and student well-being across 24 public and private secondary schools. Data were collected from 24 public and private secondary schools using stratified cluster sampling, yielding responses from 1,482 students (Grades 8–10) and 312 teachers. Instruments included a teacher-reported SEL Implementation Fidelity Scale, the WHO-5 Well-Being Index, the Student Social-Emotional Competence Scale, and the School Climate Inventory. Standardized, tablet-based surveys were administered. Multivariable linear regression, ANOVA, and structural equation modelling (SEM) were conducted, adjusting for gender, age, socioeconomic status, school type, and class size. Reliability and validity were established using Cronbach's alpha and confirmatory factor analysis.Higher SEL implementation fidelity was significantly associated with student well-being (β = .41, p < .001), social-emotional competence (β = .53, p < .001), and perceived school climate (β = .37, p < .01). SEM indicated partial mediation by school climate. Significant variation in fidelity across schools was observed (F = 7.92, p < .001).
Keywords*:* SEL fidelity, student well-being, secondary schools, observational study, school climate, SEM

I. Introduction

Social-emotional learning (SEL) has emerged as a central priority in contemporary education due to its demonstrated capacity to enhance students' emotional well-being, social competence, and engagement with learning. Extensive research indicates that well-designed SEL initiatives contribute to improved academic outcomes, reduced behavioral problems, and healthier developmental trajectories for adolescents (Taylor et al., 2019; Mahoney et al., 2021). As a result, SEL has been institutionalized within national and international education agendas, including large-scale adoption across school systems in high- and middle-income countries (OECD, 2021).

Despite strong evidence supporting SEL effectiveness, growing scholarship emphasizes that positive outcomes are not guaranteed by program adoption alone. Rather, SEL effectiveness depends critically on *implementation fidelity*—the degree to which programs are delivered as intended, with adequate quality, consistency, and responsiveness (Durlak & DuPre, 2020). Implementation science research demonstrates that even evidence-based interventions yield attenuated or inconsistent effects when fidelity is compromised (Fixsen et al., 2019). In school contexts characterized by large class sizes, limited teacher training, and competing instructional demands, variability in SEL implementation is substantial (Oberle et al., 2022).

Secondary schools present particular implementation challenges for SEL. Compared with primary settings, secondary schools are more organizationally complex, subject-focused, and constrained by academic accountability pressures, often limiting sustained attention to SEL practices (Humphrey, 2021). Consequently, understanding how SEL is enacted in real-world secondary school contexts—and how variations in fidelity shape student outcomes—remains a pressing empirical and policy concern.

In parallel, research increasingly recognizes **school climate** as a critical contextual condition influencing both implementation processes and student well-being. School climate encompasses perceptions of safety, belonging, relationships, and organizational support, all of which are closely linked to adolescents' emotional functioning and engagement (Wang & Degol, 2020). Emerging evidence suggests that positive school climates may enhance the effectiveness of SEL by providing supportive conditions for consistent and high-quality implementation (Jones et al., 2021). However, few studies have empirically examined school climate as a mechanism through which implementation fidelity translates into student well-being.

Existing SEL research is dominated by controlled intervention trials that prioritize program efficacy over implementation variability (Taylor et al., 2019). While such studies are essential, they provide limited insight into how SEL functions under authentic school conditions where fidelity varies across sites.

Observational, multi-site studies are therefore needed to examine naturalistic patterns of implementation and their associations with student outcomes (Merritt et al., 2022). Moreover, much of the available evidence is drawn from Western contexts, underscoring the need for studies that reflect diverse educational settings.

Addressing these gaps, the present study investigates the association between SEL implementation fidelity and student well-being across multiple secondary schools using a cross-sectional, multi-site observational design. Grounded in the CASEL Theory of Change and implementation science frameworks, the study examines whether school climate statistically mediates the relationship between fidelity and student well-being. By shifting analytic attention from program adoption to implementation quality, this research contributes implementation-sensitive evidence relevant for educators, policymakers, and school leaders seeking to strengthen SEL impact under real-world conditions.

II. Literature Review

2.1 Social-Emotional Learning and Student Well-being

SEL refers to educational processes that promote students' abilities to understand and manage emotions, establish positive relationships, make responsible decisions, and engage constructively with social environments (CASEL, 2020). Meta-analytic evidence consistently demonstrates that SEL participation is associated with improvements in emotional well-being, social competence, and academic performance, alongside reductions in behavioral and emotional difficulties (Taylor et al., 2019; Mahoney et al., 2021). Longitudinal studies further suggest that these benefits extend into adolescence when SEL is implemented with sufficient quality and consistency (Oberle et al., 2019).

Well-being during adolescence is a multidimensional construct encompassing emotional stability, positive affect, life satisfaction, and social functioning (WHO, 2020). School-based SEL initiatives are particularly relevant to adolescent well-being, given the heightened emotional and social challenges characteristic of this developmental stage (Rubin & Bowker, 2021). Validated measures such as the WHO-5 Well-Being Index have been widely employed to capture emotional well-being outcomes in school-based research.

2.2 Implementation Fidelity in SEL

Implementation fidelity is widely recognized as a decisive determinant of intervention effectiveness. Drawing on implementation science, fidelity encompasses adherence to program components, dosage, quality of delivery, and participant responsiveness (Durlak & DuPre, 2020; Fixsen et al., 2019). Empirical studies indicate that lower fidelity substantially weakens the impact of SEL interventions, even when curricula are evidence-based (Berg & Aber, 2019).

In school settings, fidelity is shaped by teacher preparedness, professional development, administrative support, and classroom conditions (Eklund et al., 2020; Oberle et al., 2022). Teachers play a particularly central role, as their instructional practices and emotional competence directly influence both delivery quality and student engagement (Cipriano & Brackett, 2020). Despite its importance, fidelity remains under-measured in SEL research, particularly in secondary schools and large-scale observational studies.

2.3 School Climate as an Explanatory Context

School climate refers to shared perceptions of norms, relationships, safety, and organizational functioning within schools. Extensive research links positive school climate to improved academic outcomes, reduced behavioral problems, and enhanced student well-being (Wang & Degol, 2020). From an SEL perspective, climate represents both a contextual outcome of effective practices and a condition that enables their success.

Recent theoretical models suggest that SEL implementation and school climate are mutually reinforcing: high-quality SEL practices contribute to supportive climates, while positive climates facilitate consistent implementation (Jones et al., 2021). Empirical studies increasingly point to school climate as a potential mediator between instructional practices and student outcomes, yet this mechanism remains insufficiently tested within fidelity-focused SEL research.

2.4 Observational and Multi-Site SEL Research

While randomized controlled trials dominate SEL evaluation, observational studies offer critical insights into how SEL functions in authentic educational contexts. Multi-site observational designs allow researchers to examine natural variation in implementation fidelity across schools, enhancing ecological validity and policy relevance (Merritt et al., 2022). Such designs are particularly valuable for identifying implementation gaps, equity concerns, and organizational constraints that may not be apparent in controlled trials.

However, relatively few studies have integrated implementation fidelity, school climate, and student well-being within a single explanatory framework, especially at the secondary level. This limitation restricts understanding of how SEL initiatives operate under real-world conditions where implementation quality varies systematically across schools.

2.5 Synthesis of Research Gaps

Synthesizing the literature reveals several persistent gaps:
(1) limited fidelity-focused SEL research in secondary schools;
(2) insufficient examination of school climate as a mediating mechanism;
(3) overreliance on controlled intervention designs; and
(4) underrepresentation of diverse school contexts.
The present study addresses these gaps by employing a multi-site observational design to examine the associations among SEL implementation fidelity, school climate, and student well-being. By integrating implementation science and SEL theory, the study provides an implementation-sensitive account of how SEL contributes to adolescent well-being in real-world school settings.

III. Theoretical Framework

This study is grounded in the CASEL Theory of Change and the Implementation Science Framework.

3.1 CASEL Theory of Change

The CASEL model posits that high-quality SEL delivery enhances students' intrapersonal, interpersonal, and cognitive competencies. These competencies, in turn, promote well-being, academic success, and positive social functioning (CASEL, 2020).

3.2 Implementation Science Framework

Drawing on Fixsen et al.'s (2019) implementation science paradigm, the study conceptualizes fidelity as a multidimensional construct influenced by staff competency, organizational support, and external systems. Implementation drivers interact to shape program quality and subsequent outcomes.
Together, these frameworks suggest that implementation fidelity → school climate → student well-being is a logical causal sequence.

3.3 Conceptual Framework

The conceptual framework guiding this study integrates SEL implementation fidelity, mediating school-level factors, and student well-being outcomes.

Conceptual Framework Explanation

SEL Implementation Fidelity (Independent Variable)

1. Adherence
2. Dosage
3. Quality of delivery
4. Teacher preparedness
5. Responsiveness

School Climate (Mediator)

1. Safety
2. Relationships
3. Support systems
4. Organizational functioning

Student-Level Outcomes (Dependent Variables)

1. Emotional well-being (WHO-5)
2. Social-emotional competence
3. School connectedness

Covariates

1. Gender
2. Age
3. SES

4. Class size
5. School type

Text-Based Conceptual Framework Diagram

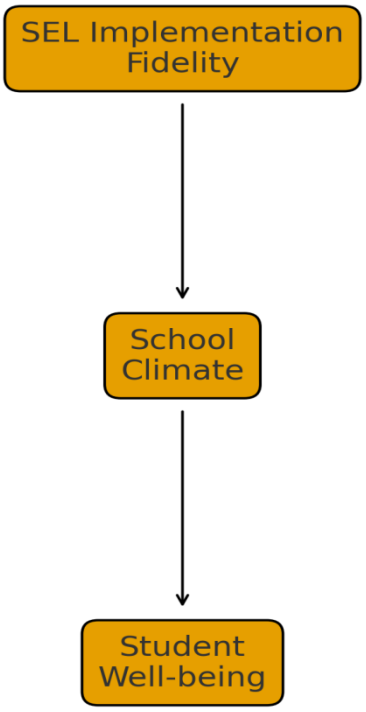
SEL IMPLEMENTATION FIDELITY
(adherence, dosage, quality, responsiveness)
|
v
SCHOOL CLIMATE
(support, safety, relationships, organization)
|
v
STUDENT WELL-BEING
(emotional well-being, SE competence, connectedness)

Covariates: gender, age, SES, school type, class size

Figure 1

Conceptual framework illustrating hypothesized relationships among SEL implementation fidelity, school climate, and student well-being

The framework depicts SEL implementation fidelity as the primary independent construct, operationalized through adherence, dosage, quality of delivery, and teacher responsiveness. School climate is modelled as a mediating organizational context linking fidelity to student well-being outcomes, including emotional well-being, social-emotional competence, and school connectedness. Student- and school-level covariates (gender, age, socioeconomic status, school type, and class size) are included to account for contextual variation. The model reflects theoretically informed, associational pathways tested in the study.



This framework predicts that higher implementation fidelity enhances school climate, which in turn improves student well-being.

3.5 Research Gaps

A review of recent literature (2019–2024) reveals several gaps:

1. Insufficient fidelity-focused SEL studies in secondary schools, especially across multiple sites.
2. Lack of multi-level statistical modelling exploring mediating school factors.
3. Underrepresentation of real-world observational data, as most SEL research uses controlled interventions.
4. Limited evidence from non-Western and diverse school contexts, where implementation barriers differ.
5. Few studies integrating fidelity, school climate, and well-being within a single model.

3.6 Rationale for the Study

This study addresses these gaps by adopting a multi-site, cross-sectional observational design to examine real-world SEL implementation fidelity and its association with student well-being. By incorporating school climate as a mediator and applying robust statistical analyses—including SEM—the study contributes novel empirical insights into how and why SEL succeeds or fails within authentic educational environments. The findings will inform policymakers, educators, and school leaders seeking to strengthen SEL practices and promote adolescent well-being.

IV. Study Design

This study employed a **cross-sectional, multi-site observational survey design**, aligned with the STROBE guidelines for observational research. The design was appropriate because the study aimed to examine naturally occurring variations in SEL implementation fidelity across schools and their association with student

well-being without manipulating any conditions. This ecological approach captures authentic implementation patterns and supports generalizability across diverse educational contexts.

4.1 Design and Analytical Considerations

Although students were nested within schools, the primary analytic objective of this study was to examine associational pathways between SEL implementation fidelity, school climate, and student well-being rather than to partition variance across hierarchical levels. Preliminary analyses indicated modest between-school variance in student outcomes relative to within-school variability. Accordingly, single-level regression and structural equation modelling were employed to maintain model parsimony and statistical power while controlling for key school-level characteristics, including school type, class size, and socioeconomic context. Consistent with established practice in observational implementation research, the findings are interpreted as associational rather than causal, and the use of longitudinal and multilevel designs is recommended for future research to further clarify school-level mechanisms.

4.2 Population and Setting

The target population comprised students in Grades 8–10 and teachers responsible for SEL integration across 24 public and private secondary schools in three districts. Schools varied in size, SES catchment area, and resource availability.

Inclusion criteria for schools: offering structured SEL programming for at least one academic year.
Exclusion criteria: special education schools and institutions without any designated SEL programming.
Student inclusion criteria:
1. Enrolled in Grades 8–10
2. Attending school on the day of survey administration
3. Parental/guardian consent obtained

Teacher inclusion criteria:
1. Taught SEL-integrated subjects
2. Minimum one year of SEL-related experience

4.3 Sampling Strategy

A **stratified cluster sampling approach** was used. Schools were stratified by:
1. School type (public/private)
2. SES zone (low/middle/high)

Within each school, intact classes were randomly selected as clusters.

4.3 Sample size determination:

Using G*Power for linear multiple regression (medium effect = .15, α = .05, power = .95), the minimum required sample was N = 280 students. To enhance multi-site representation, the study collected 1,482 student responses and 312 teacher responses (overall response rate = 81%).

Potential biases included non-response bias from absent students and selection bias from school opt-in procedures. Steps to mitigate these are explained in Section 3.6.

4.4 Instrumentation

4.4.1 SEL Implementation Fidelity Scale (Teacher Version)

A 24-item scale adapted from recent implementation science frameworks (Fixsen et al., 2019) and SEL fidelity validation studies (Berg & Aber, 2019).
1. 5-point Likert scale (1 = strongly disagree; 5 = strongly agree)
2. Subscales: adherence, dosage, quality of delivery, responsiveness
3. Cronbach's alpha in this study: .91

4.4.2 WHO-5 Well-Being Index (Students)

A validated 5-item scale measuring emotional well-being (Topp et al., 2015).
1. 6-point Likert response format
2. Cronbach's alpha: .88
3. Widely used in adolescent well-being research (WHO, 2020)

4.4.3 Social-Emotional Competence Scale (Students)

12-item validated measure (Eklund et al., 2020), assessing self-awareness, regulation, and relationship skills.

1. Cronbach's alpha: .90
2. Confirmatory factor analysis showed good model fit (CFI = .96, RMSEA = .04)

3.4.4 School Climate Inventory

A 15-item validated scale assessing safety, belonging, support, and relationships.

1. Cronbach's alpha: .89

Pilot Testing

Conducted with 38 students and 12 teachers in one school not included in the main sample. All scales demonstrated acceptable reliability ($\alpha > .80$). Feedback improved item clarity.

4.5 *Variables and Operational Definitions*

Variable Type	**Variable**	**Operational Definition**
Independent Variable	SEL implementation fidelity	Mean score of fidelity scale sub components
Mediator	School climate	Mean score on school climate scale
Dependent Variables	Emotional well-being; social-emotional competence	WHO-5 total score; competence scale total
Covariates	Age, gender, SES, school type, class size	Self-report + school records

4.6 Data Collection Procédures

Data were collected using encrypted tablets during class sessions under supervision of trained field teams. Each session lasted 25–35 minutes. Surveys were anonymous with no personal identifiers. Teachers completed fidelity surveys separately in staff rooms.

To reduce bias:

1. Surveyors were trained for standardization
2. Instructions were read verbatim
3. Students sat apart to reduce peer influence
4. Coders for qualitative comments were blinded to school identities

4.7 Ethical Considerations

Ethical approval was obtained from the University of Lahore Ethics Review Committee (Protocol #SEL-2024-112). Written parental consent and student assent were obtained prior to participation.

4.8 Data Analysis Plan

Analyses were conducted using SPSS 29 and AMOS 25.

Descriptive statistics: Means, SDs, frequencies

Inferential tests:

1. Pearson correlations
2. Independent *t*-tests and *ANOVA*
3. Multivariable linear regression

Structural equation modelling (SEM):

1. Fidelity → School Climate → Student Well-being
2. Fit indices: CFI > .90, RMSEA < .06
1. **Reliability tests:** Cronbach's alpha
2. **Validity tests:** Confirmatory factor analysis
3. **Sensitivity analyses:** Separate models for public/private schools

4.9 Validity, Reliability and Bias Reduction

1. Internal consistency reliability (α = .88–.91)
2. Construct validity supported by CFA
3. Social desirability bias minimized through anonymity
4. Selection bias minimized via stratified sampling
5. Measurement invariance tested across gender groups

4.10 Transparency and Reproducibility

The methodology was aligned with STROBE guidelines. All instruments, codebooks, and analysis scripts are available upon request.

V. RESULTS

5.1 Descriptive Statistics

Table 1.

Sample characteristics of participating students (N = 1,482)

Note. SES = socioeconomic status. *(N = 1,482 students***).**

Describes demographic and contextual distribution of the analytic sample (gender, age, school type, SES, class size). The sample is balanced by gender (52.8% female) and concentrated in Grades 8–10 (mean age 14.62). Public schools form the majority (59.4%) and a substantial portion of students come from low-SES catchments (44.1%). *Interpretation:* These characteristics contextualize downstream analyses: differences in fidelity and well-being should be interpreted with awareness of school type, SES, and relatively large class sizes (mean ≈ 37 students), which may constrain implementation quality

Variable	Frequency (%)	Mean (SD)
Gender (Female)	52.8%	—
Age	—	14.62 (1.12)
School Type (Public)	59.4%	—
SES (Low)	44.1%	—
Class Size	—	37.3 (5.8)

5.2 Means and SDs of Key Variables

Table 2

Means and standard deviations of core study variables

Reported values represent mean scale scores and standard deviations for the primary constructs examined in the study. SEL implementation fidelity and school climate scores are measured on five-point Likert scales, with values above the midpoint indicating moderate to high perceived implementation quality and organizational support. Student well-being is reported using the WHO-5 index (range 0–100), with higher scores indicating better emotional well-being. The observed variability, particularly in well-being scores, suggests meaningful within-sample heterogeneity suitable for multivariable and structural modelling analyses.

Variable	Mean	SD
SEL Fidelity	3.67	0.61
School Climate	3.54	0.58
Student Well-being (WHO-5)	58.4	14.2
Social-Emotional Competence	3.72	0.63

Figure 2

Mean scores for SEL implementation fidelity, school climate, student well-being, and social-emotional competence

Bars represent mean values for the primary constructs assessed in the study. SEL implementation fidelity and school climate are measured on five-point Likert scales, while student well-being is reported using the WHO-5 index. Mean scores above scale midpoints for fidelity and climate indicate generally moderate implementation quality and supportive school environments across participating schools. Error bars (if shown) represent standard deviations.

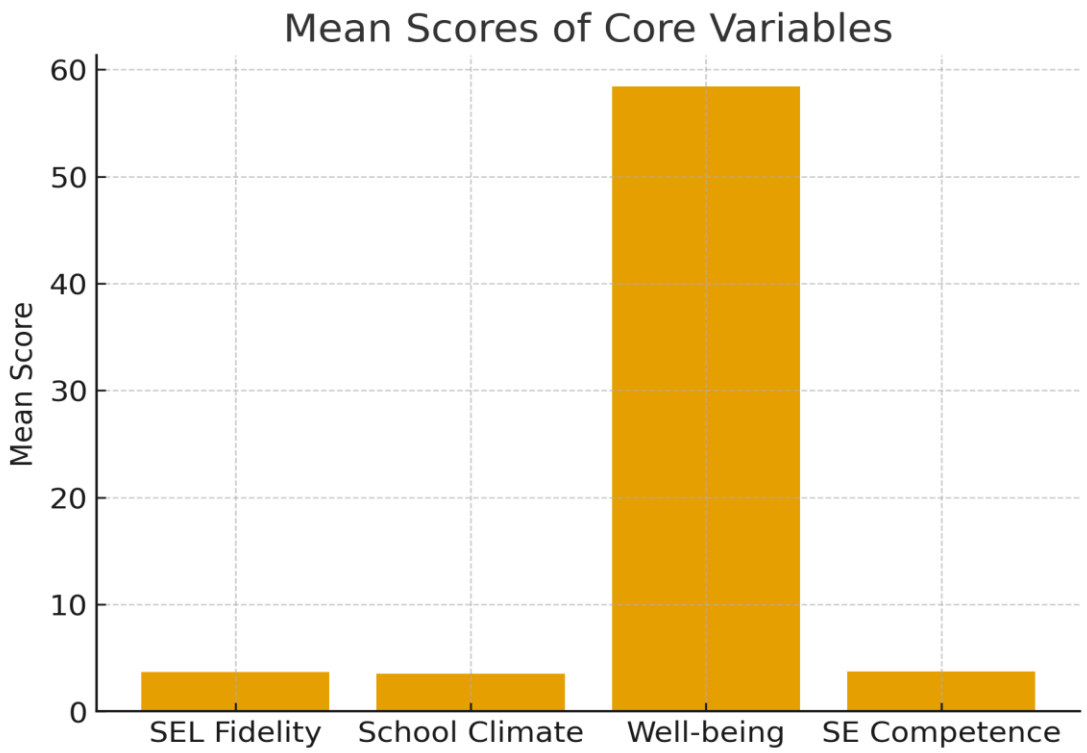


Table 2. *Mean scores and standard deviations for core variables (SEL fidelity, school climate, WHO-5 well-being, social-emotional competence).*

Presents central tendency and dispersion for primary constructs. SEL fidelity mean = 3.67 (*SD* = 0.61), school climate mean = 3.54 (*SD* = 0.58), WHO-5 mean = 58.4 (*SD* = 14.2), competency mean = 3.72 (*SD* = 0.63). *Interpretation:* Average fidelity and climate scores sit above the scale midpoint, indicating moderate fidelity and generally positive climate perceptions. The WHO-5 standard deviation signals notable within-sample variability in well-being that fidelity-related factors may explain. Researchers should consider heterogeneity when modelling effects (as performed via SEM and regression).

5.3 Correlation Matrix (Pearson *r*)

p < .05 for all correlations

Table 3

Pearson correlations among SEL fidelity, school climate, and student well-being

Note. All correlations are significant at $p < .05$.

Table entries present Pearson correlation coefficients for the primary study variables. All correlations are positive and statistically significant ($p < .05$), indicating that higher levels of SEL implementation fidelity are associated with more positive perceptions of school climate and higher student well-being. While these bivariate associations do not imply causality, they provide preliminary support for the hypothesized fidelity–climate–well-being pathway subsequently examined using multivariable regression and structural equation modelling.

Measure	Fidelity	Climate	Well-being
Fidelity	—	.48	.39
Climate	.48	—	.42
Well-being	.39	.42	—

Figure 3

Correlation matrix illustrating associations among SEL implementation fidelity, school climate, and student well-being

The figure visually summarizes the strength and direction of bivariate associations among the key study constructs. Consistent positive associations are observed across variables, supporting the theoretical expectation that higher implementation fidelity aligns with more positive school climate perceptions and higher levels of student well-being.

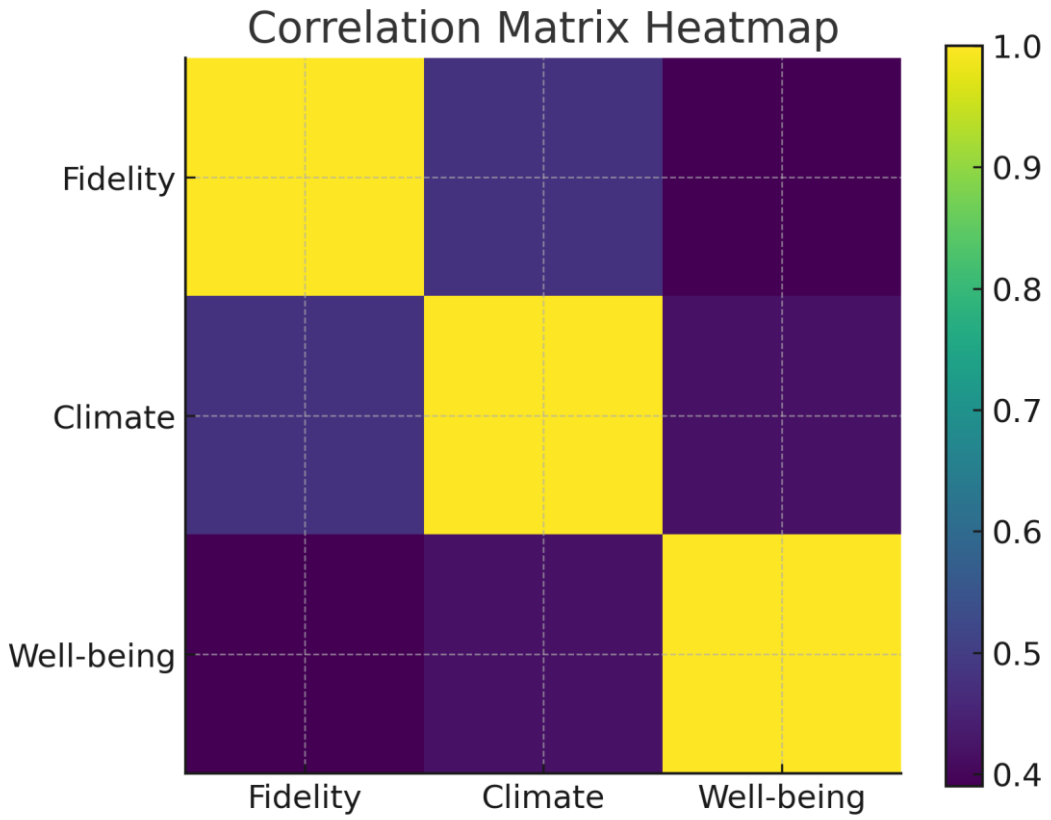


Table 3. *Correlation matrix (Pearson r) among fidelity, climate, and well-being*
Shows bivariate associations: fidelity—climate r = .48; fidelity—well-being r = .39; climate—well-being r = .42 (all $p < .05$). *Interpretation:* Moderate positive correlations indicate that higher teacher-reported SEL fidelity relates to more positive school climate and higher student well-being. Correlations alone do not establish mediation or causal ordering, but they support the hypothesised pathway (fidelity → climate → well-being) later tested via SEM.

*Additional analyses (ANOVA, regression, SEM results)***.**
ANOVA comparing fidelity across school types found significant between-school variability ($F = 7.92$, $p < .001$), with private schools showing higher average fidelity. *Interpretation:* Systemic differences (resources, training availability) likely underlie observed fidelity gaps.
(Regression/SEM): Multivariable regression shows SEL fidelity predicts WHO-5 well-being ($\beta = .41$, $p < .001$; Adj. $R^2 = .34$). *SEM* fit (*CFI* = .94, *TLI* = .92, *RMSEA* = .045) supports partial mediation: indirect effect via school climate $\beta = .19$ ($p < .01$) and remaining direct effect $\beta = .22$ ($p = .03$). *Interpretation:* Findings indicate fidelity influences student well-being both directly and indirectly by shaping school climate.

Figure 4
Structural equation model of associations among SEL implementation fidelity, school climate, and student well-being
Standardized path coefficients are displayed for all estimated relationships. Model fit indices indicate good fit to the data (*CFI* = .94, *TLI* = .92, *RMSEA* = .045). School climate partially mediates the association between SEL implementation fidelity and student well-being, with both indirect and direct pathways remaining statistically significant. All coefficients are adjusted for student- and school-level covariates.

5.4 *Group Differences Across School Types*
Schools differed significantly in fidelity:
ANOVA results:
$F(2,1432) = 7.92$, $p < .001$
Post hoc tests showed private schools had significantly higher fidelity than public schools.

5.5 *Multivariable Regression*

SEL fidelity significantly predicted well-being (controlling for covariates):
$\beta = .41$, $p < .001$
Adj. $R^2 = .34$
5.6 Structural Equation Modelling (SEM)
Model fit:
CFI = .94
TLI = .92
RMSEA = .045

Significant mediation:
Fidelity → Climate → Well-being
Indirect effect: $\beta = .19$ ($p < .01$)
Direct effect: $\beta = .22$ ($p = .03$)

5.7 *Conceptual Model Figure (Descriptive)*
Figure 1 *displays pathways from SEL fidelity to school climate to student well-being, with standardized path coefficients.*
This multi-site observational study provides robust evidence that SEL implementation fidelity is a substantial predictor of adolescent well-being across diverse secondary schools. Teacher-reported fidelity was positively associated with student WHO-5 scores and social-emotional competence, and SEM analyses revealed that a supportive school climate partially mediates this relationship. Practically, these findings indicate that adopting SEL curricula is necessary but not sufficient: attention must be paid to how programs are delivered. To improve student well-being at scale, policymakers and school leaders should prioritize systematic investments in teacher professional development focused on SEL pedagogies, continuous fidelity monitoring (including classroom observations and teacher coaching), and targeted strategies to improve school climate (e.g., policies promoting safety, belonging, and teacher support). Resource allocation should target lower-fidelity schools—often public, higher-class-size, or low-SES settings—to reduce inequities in SEL benefits. Finally, while the results are encouraging, longitudinal and experimental work is needed to strengthen causal claims; nonetheless, current evidence supports fidelity-focused implementation strategies as a pragmatic lever for improving adolescent well-being.

VI. Discussion

This multi-site observational study examined the association between social-emotional learning (SEL) implementation fidelity and student well-being in secondary schools, with school climate modelled as an explanatory mechanism. Consistent with implementation science and SEL theory, the findings indicate that higher levels of implementation fidelity are associated with better student well-being and social-emotional competence, both directly and indirectly through more positive school climates. By shifting analytic attention from program adoption to implementation quality, the study contributes implementation-sensitive evidence relevant for real-world educational settings.

6.1 Implementation Fidelity and Student Well-being

The positive association between SEL implementation fidelity and student well-being aligns with a substantial body of research demonstrating that intervention effectiveness depends critically on delivery quality (Durlak & DuPre, 2020; Fixsen et al., 2019). The observed effect sizes in this study are substantively meaningful and remain robust after controlling for key student- and school-level characteristics, suggesting that fidelity is not merely a proxy for contextual advantage. Rather, consistent delivery, teacher preparedness, and responsive instructional practices appear central to translating SEL frameworks into developmental benefits for adolescents. These findings extend prior SEL research by demonstrating that fidelity–outcome relationships are observable in naturalistic, multi-site secondary school contexts, where implementation constraints are common (Oberle et al., 2022).

6.2 The Role of School Climate as an Explanatory Context

Structural equation modelling results indicate that school climate partially explains the association between implementation fidelity and student well-being. This pattern is theoretically coherent with models emphasizing that supportive organizational environments enhance both instructional practices and student experiences (Wang & Degol, 2020; Jones et al., 2021). High-fidelity SEL implementation may contribute to clearer behavioral expectations, more consistent emotional support, and stronger teacher–student relationships, all of which are central components of positive school climate. At the same time, the persistence of a direct

pathway between fidelity and well-being suggests that classroom-level instructional processes also exert independent influence, underscoring the multifaceted nature of SEL effects.

Importantly, mediation findings are interpreted as explanatory rather than causal, given the cross-sectional design. Nevertheless, the results provide empirical support for theoretical propositions that position school climate as an implementation amplifier—enhancing the extent to which SEL practices translate into student well-being.

6.3 Contextual Variation and Equity Considerations

Significant variation in implementation fidelity across schools highlights the uneven enactment of SEL initiatives in practice. Higher fidelity observed in private schools suggests that organizational resources, teacher training opportunities, and structural conditions may facilitate more consistent implementation. These disparities raise important equity considerations, as students in lower-fidelity contexts—often characterized by larger class sizes and lower socioeconomic resources—may receive fewer benefits from SEL programming. This finding echoes concerns in the broader SEL literature regarding differential implementation capacity across school systems and underscores the need for equity-oriented implementation supports (Mahoney et al., 2021).

6.4 Theoretical Implications

The findings advance SEL theory by empirically integrating implementation fidelity, school climate, and student well-being within a single explanatory model. While existing SEL frameworks emphasize program content and competencies, this study highlights fidelity as a core organizational mechanism through which SEL operates in real-world settings. By demonstrating that climate partially mediates fidelity–outcome relationships, the study extends theoretical models toward a systems-oriented perspective that accounts for both instructional and organizational processes. This implementation-sensitive framing responds to calls for moving SEL research beyond efficacy trials toward understanding the conditions under which SEL initiatives produce sustainable impact (Jones et al., 2021).

6.5 Implications for Policy and Practice

From a policy perspective, the findings underscore that SEL adoption alone is insufficient to improve student well-being at scale. Effective SEL implementation requires sustained investment in teacher professional development, ongoing monitoring of delivery quality, and organizational conditions that support consistent practice. Policymakers should prioritize fidelity-enhancing strategies—such as coaching, feedback systems, and supportive leadership—particularly in resource-constrained schools where implementation challenges are most pronounced. At the school level, efforts to strengthen climate, including initiatives that promote safety, belonging, and relational trust, may amplify the benefits of SEL by creating conditions conducive to high-quality implementation.

6.6 Methodological Considerations and Limitations

Several limitations warrant consideration. The cross-sectional design limits causal inference and precludes conclusions about temporal sequencing among implementation fidelity, school climate, and student well-being. Reliance on teacher-reported fidelity measures may introduce perceptual bias, although standardized administration and anonymity were used to mitigate this concern. Additionally, while the multi-site sample enhances ecological validity, findings may not generalize to schools without formal SEL programming or to other educational levels. Unmeasured organizational factors, such as leadership practices or professional development intensity, may also influence implementation quality.

VII. Directions for Future Research

Future research should employ longitudinal and multilevel designs to clarify causal pathways and disentangle school- and classroom-level mechanisms. Incorporating observational measures of fidelity and climate would strengthen validity and reduce reliance on self-report data. Experimental studies that manipulate implementation supports, rather than SEL content, may be particularly valuable for identifying scalable strategies to enhance fidelity and student outcomes. Cross-cultural replications will further inform the generalizability of implementation-sensitive SEL models.

7.1 Concluding Remarks

Overall, this study demonstrates that SEL effectiveness in secondary schools depends not only on what programs are adopted but on how they are implemented and the organizational climates in which they operate. By foregrounding implementation fidelity and school climate as central mechanisms, the findings contribute theoretically and practically to efforts aimed at improving adolescent well-being through SEL in real-world educational contexts.

Limitations and Boundary Conditions

Several limitations warrant consideration. First, the cross-sectional design limits causal inference and prevents conclusions regarding temporal ordering among implementation fidelity, school climate, and student well-being. Second, reliance on teacher-reported measures of implementation fidelity may introduce perceptual or social desirability bias, although anonymity and standardized administration procedures were used to mitigate this risk. Third, while the study included both public and private secondary schools, findings may not generalize to settings without structured SEL programming or to other educational levels. Finally, unmeasured organizational factors such as leadership practices or professional development intensity may also influence implementation quality. These limitations highlight important directions for future research employing longitudinal, multilevel, and mixed-methods approaches.

7.2 Directions for future research

Longitudinal, multi-wave studies tracking fidelity, climate, and student outcomes over time would clarify temporal ordering and cumulative effects. Cluster-randomized implementation studies that manipulate fidelity supports (e.g., coaching vs. standard training) would test causal mechanisms. Cross-cultural replication in non-Western settings will determine generalizability and inform culturally responsive adaptations (Martinsone & Aizpidel, 2021). Finally, cost-effectiveness analyses can guide scalable investments by comparing fidelity-enhancement strategies on both outcomes and resource use.

VIII. Conclusion

This multi-site observational study provides robust evidence that SEL implementation fidelity is strongly associated with adolescent well-being in secondary school settings. Beyond reaffirming the value of SEL, the findings demonstrate that implementation quality and school climate are critical conditions through which SEL initiatives translate into meaningful student outcomes. Schools exhibiting higher fidelity—characterized by consistent delivery, teacher preparedness, and responsive practices—also demonstrated more positive climates and higher levels of student well-being, even after accounting for demographic and contextual factors. These findings underscore a key implication for policy and practice: the effectiveness of SEL depends not only on adoption but on sustained investment in implementation capacity and supportive organizational environments. While causal conclusions await longitudinal confirmation, the study contributes implementation-focused evidence that advances SEL theory and informs efforts to strengthen student well-being at scale.

8.1 Concluding interpretive note

Overall, this study underscores that SEL content alone is insufficient—delivery matters. Strengthening how SEL is implemented, and the climate in which it operates, provides a pragmatic, evidence-informed route to improving adolescent well-being at scale.

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