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Dose-Dependent Association Between Pancasila Student Profile (P5) Curriculum Exposure and Civic Engagement Among Indonesian Secondary School Students

Arya Ganendra[1*], Delia Tamim[2]

[1]Department of Literacy, Emerald Language Institute, Balikpapan, Indonesia

[2]Department of Administrative Law, Enigma Institute, Palembang, Indonesia

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***Corresponding author:**
Arya Ganendra

E-mail address:
arya.ganendra@enigma.or.id

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A B S T R A C T

The *Projek Penguatan Profil Pelajar Pancasila* (P5; Pancasila Student Profile Strengthening Project), a defining component of Indonesia's Kurikulum Merdeka introduced in 2022, was designed to cultivate civic values and participatory dispositions among secondary students through interdisciplinary, project-based learning, yet large-scale quantitative evidence on its association with measurable civic engagement remains scarce. This cross-sectional study evaluated the association between P5 exposure intensity and civic engagement among Indonesian secondary school adolescents, controlling for established sociodemographic confounders. A stratified cluster sample of 312 students (Grades 10–12) was recruited from 18 public and private, urban and rural secondary schools across five Indonesian provinces. Civic engagement was measured with a 25-item instrument adapted from the IEA International Civic and Citizenship Education Study framework (Cronbach's α = 0.84; composite 0–100; high engagement ≥ 65). P5 exposure was classified as high, moderate, or low from school-level participation scores. Multivariable binary logistic regression identified independent predictors of high civic engagement. Civic-engagement scores increased monotonically across exposure groups (low 49.1, moderate 61.0, high 72.3; ANOVA $F(2,309) = 86.85$, $p < 0.001$; $\eta^2 = 0.36$; Cohen's $d = 2.04$ for high vs low). High P5 exposure was independently associated with markedly increased odds of high civic engagement (adjusted OR = 17.12; 95% CI 3.82–76.74; $p < 0.001$), as was each unit of continuous participation (OR = 2.44; 95% CI 1.71–3.48; $p < 0.001$); the model showed good fit (AUC = 0.82; Nagelkerke $R^2 = 0.41$). In conclusion, these findings provide early large-scale quantitative evidence that P5 exposure is robustly associated with stronger civic engagement, supporting high-fidelity, equitable national implementation of the Merdeka Curriculum.

1. Introduction

Civic education occupies a foundational role in democratic nation-building, particularly among adolescents who constitute the future electorate and the primary actors of civil society. In Indonesia — one of the world's largest democracies — cultivating active, informed, and participatory young citizens has gained renewed urgency amid rapid political decentralisation, the proliferation of digital disinformation, and concerns about youth political trust and efficacy.[1-3] Historically, Indonesian civic education has been institutionalised through the *Pendidikan Pancasila dan Kewarganegaraan* (PPKn) subject, which has attracted sustained criticism for its didactic, teacher-centred, and exam-oriented orientation; reviews document a persistent gap between its stated character-formation objectives and the participatory competencies students actually demonstrate.[4]

This study is grounded in two complementary traditions of civic-education scholarship. First, Westheimer and Kahne's typology distinguishes 'personally responsible,' 'participatory,' and 'justice-oriented' citizenship, providing a normative framework within which P5's emphasis on community action and democratic deliberation aligns with participatory and justice-oriented citizenship formation.[5] Second, Lave and Wenger's situated-learning theory posits that durable civic competence develops through legitimate

peripheral participation in authentic community contexts — the pedagogical principle that P5's community-embedded projects operationalise.[6,7] Project-based learning meta-analyses reinforce this expectation, reporting medium-to-large effects on cognitive and affective outcomes, including in Indonesian school settings.[8-10] The hypothesised relationships among these constructs are summarised in Figure 1.

The introduction of the *Kurikulum Merdeka* in 2022 marked a paradigmatic shift from a standardised, content-heavy model toward a flexible, competency-based, student-centred approach.[11] Its structurally distinctive feature, the P5 project, mandates dedicated time for interdisciplinary learning organised around six character dimensions, with the Suara Demokrasi (Voice of Democracy) theme most directly targeting civic competencies. Empirically, however, the evidence base remains predominantly qualitative and small-scale: implementation studies describe strengthened deliberation and student-election participation but cannot establish the magnitude of the P5–civic engagement association, document dose-response patterns, or adjust for the sociodemographic confounders — gender, geographic context, parental education, and extracurricular participation — known to predict adolescent civic outcomes.[12-15]

Limited studies have examined the association between graded P5 exposure and validated civic engagement among Indonesian secondary students at scale, and none has simultaneously modelled categorical dose-response and continuous-participation predictors while controlling for established covariates using multivariable regression. To our knowledge, this study uniquely examines this relationship across multiple provinces, school types, and geographic contexts using an internationally informed, locally validated instrument and a full suite of effect-size estimates. The purpose of this study was to evaluate the association between P5 curriculum exposure and high civic engagement, and to identify the independent predictors of high civic engagement among Indonesian secondary school adolescents after covariate adjustment.

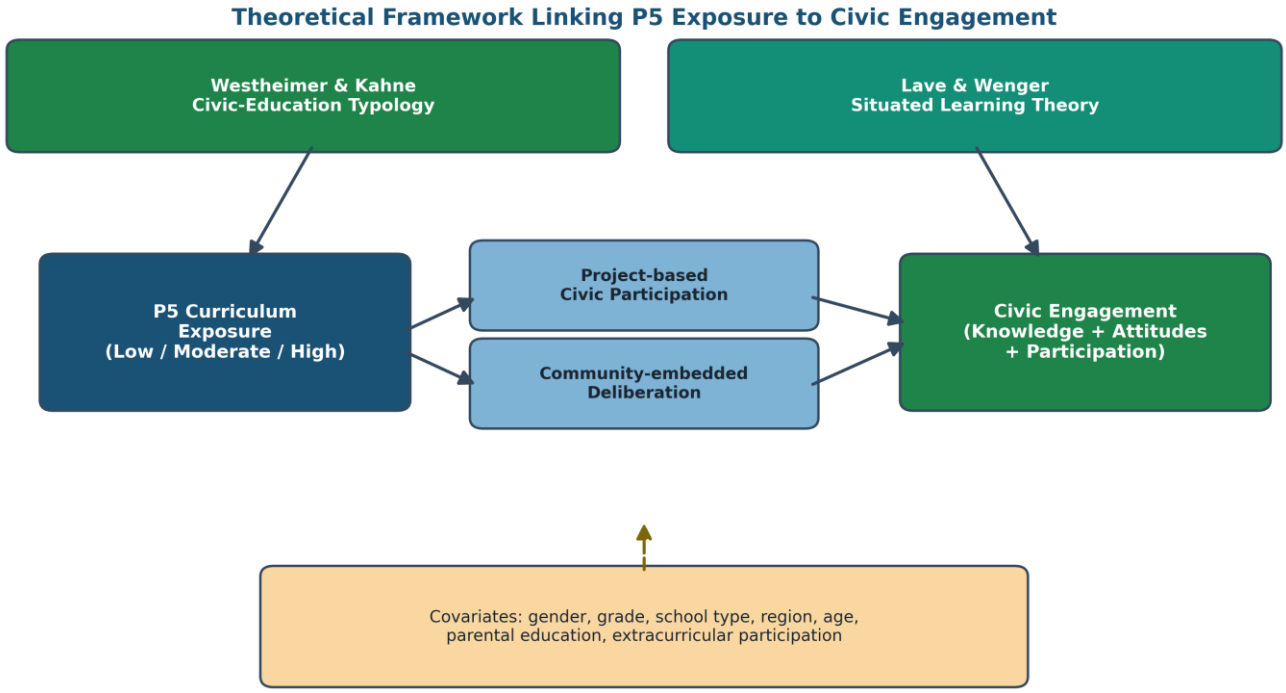

Figure 1. Theoretical framework linking P5 curriculum exposure to civic engagement through project-based participation and community-embedded deliberation, with sociodemographic covariates.

2. Methods

2.1 Study design and setting

This study employed a cross-sectional survey design reported in accordance with the STROBE guidelines for observational research.[16] Data were collected between March and June 2024 from secondary schools in five Indonesian provinces selected to represent geographic and sociodemographic diversity across the Java, Sulawesi, and Sumatra regions. To preserve confidentiality, participating institutions are described generically by sector and setting rather than named. Schools were drawn from both provincial-capital (urban) and district-level (rural or semi-urban) areas, and all had formally adopted the Merdeka Curriculum and completed at least one full academic year of P5 implementation before data collection.

2.2 Participants and sampling

The target population comprised all students in Grades 10–12 (SMA/SMK) in Merdeka Curriculum-implementing schools across the study provinces. A stratified cluster sampling strategy stratified schools simultaneously by sector (public/private), geographic setting (urban/rural), and preliminary P5 implementation intensity (assessed from administrator reports using a five-item fidelity checklist during site visits). Within each stratum, schools were selected by systematic random sampling from provincial education-office registries. Eighteen schools participated, with 2–3 classrooms per school selected by simple random sampling, and all eligible students in selected classrooms were invited. Inclusion criteria were current enrolment in Grades 10–12, participation in at least one complete P5 project cycle, and written assent (with parental consent for participants under 18). Of 348 students approached, 36 were excluded (12 incomplete responses, 14 insufficient P5 exposure, 10 declined), yielding a final analytic sample of 312.

2.3 Outcome measurement: civic engagement

Civic engagement was operationalised using a 25-item instrument adapted from the IEA International Civic and Citizenship Education Study framework,[17,18] comprising civic knowledge (10 multiple-choice items, 30 points), civic attitudes (8 five-point Likert items on democratic values, rule of law, and tolerance), and civic participatory behaviours (7 items on reported and intended civic actions), a tripartite structure consistent with established civic-engagement measurement.[19] Items were translated into Bahasa Indonesia by two independent bilingual researchers and reviewed by three PPKn experts for content validity. In a pilot sample (n = 60) from two non-study schools, exploratory factor analysis confirmed a three-factor structure (61.4% of variance) and confirmatory factor analysis yielded acceptable fit (CFI = 0.94, TLI = 0.93, RMSEA = 0.058, SRMR = 0.061). Internal-consistency reliability was satisfactory for the full scale (Cronbach's α = 0.84) and acceptable for each sub-scale (knowledge 0.79; attitudes 0.77; participation 0.72), with metric invariance across gender and school type (ΔCFI < 0.010). A composite score (0–100) was computed by standardising and equally weighting the three sub-dimensions; students scoring ≥ 65 were classified as demonstrating high civic engagement, with sensitivity analyses at cut-points of 60 and 70.

Scale-level content validity was quantified following expert review by three independent PPKn specialists who were not affiliated with the data-collection sites (scale-level content-validity index, S-CVI/Ave = 0.93); four items were revised and two replaced after the pilot. Internal-consistency reliability was reported as Cronbach's alpha and complemented by McDonald's omega for the multidimensional composite (full-scale ω = 0.86); for the dichotomously scored civic-knowledge sub-scale, the Kuder–Richardson 20 coefficient (KR-20 = 0.78) was reported in preference to alpha. Reliability was re-estimated in the full analytic sample (full-scale alpha = 0.83; 95% CI 0.80–0.86) and was consistent with the pilot.

2.4 P5 Exposure and participation

P5 curriculum exposure was operationalised at the school level using a 15-item self-report P5 Participation Scale (range 1–5; α = 0.81) measuring the frequency, depth, and perceived quality of project engagement. School-level mean scores classified

schools as high (≥ 4.0), moderate (3.0–3.99), or low (< 3.0) exposure. The continuous student-level participation score was retained as an independent predictor to capture within-school variation. The intraclass correlation for participation within schools was 0.08, indicating modest clustering; a multilevel logistic model with random school intercepts was therefore fitted alongside the primary model, and results compared for consistency.

2.5 Covariates

Pre-specified covariates, selected from the civic-socialisation literature, were gender (female/male), grade level (10/11/12), school type (public/private), geographic region (urban/rural), age (years), parental educational attainment (primary/secondary/tertiary), and extracurricular participation in any organised school activity (yes/no).[14,15,20]

2.6 Statistical analysis

Descriptive statistics were reported as frequencies and percentages or means ± standard deviations. Normality was assessed with the Shapiro–Wilk test ($W = 0.997$, $p = 0.845$), justifying parametric methods. Pearson's correlation characterised the bivariate relationship between continuous P5 participation and civic-engagement scores. Differences across P5 exposure groups were examined with one-way ANOVA with Bonferroni post-hoc comparisons and reported with η^2 and Cohen's d effect sizes; categorical associations used chi-square with Cramer's V (Fisher's exact where expected counts < 5). Multivariable binary logistic regression (dependent variable: high civic engagement, ≥ 65 vs < 65) included all covariates, reporting odds ratios with 95% confidence intervals and exact two-tailed p-values. Model fit was assessed with the Hosmer–Lemeshow test, Nagelkerke R^2, and the area under the ROC curve; variance inflation factors were below 2.5 for all predictors. The significance threshold was $p < 0.05$ (two-tailed). Analyses were conducted in Python 3.11.

Hypotheses were ordered a priori: the association between P5 exposure and high civic engagement was the single confirmatory hypothesis, and all covariate and sub-scale associations were treated as secondary or exploratory and interpreted with corresponding caution. Because observations were clustered within schools (ICC = 0.08; mean cluster size 17.3; design effect 2.31; effective sample size ≈ 135), a multilevel binary logistic model with random school intercepts was the primary inferential model, and cluster-robust standard errors were applied to bivariate comparisons. Homogeneity of variance was assessed with Levene's test, and distributional shape with skewness and kurtosis in addition to the Shapiro–Wilk test. Linearity in the logit for continuous predictors was checked using the Box–Tidwell procedure. Because the low-exposure, high-engagement cell was sparse, the high-versus-low contrast was re-estimated with Firth penalised-likelihood logistic regression. A hybrid (Mundlak) specification decomposed the continuous participation predictor into within- and between-school components. Adjusted predicted probabilities of high civic engagement were computed at each exposure level, and 95% confidence intervals were attached to all effect sizes. Effect sizes were interpreted using conventional thresholds (Cohen's d: 0.2 small, 0.5 medium, 0.8 large; η^2: 0.01, 0.06, 0.14).

2.7 Ethical considerations

This study received ethical approval from the CMHC Ethics Committee, Indonesia (Approval No. CMHC/EC/2024/087) and was conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from all participants aged 18 years and above; for participants below 18 years, written parental or guardian consent and student assent were obtained. Participation was voluntary, with no penalty for non-participation or withdrawal, and all data were anonymised prior to analysis and stored on password-protected institutional servers.

3. Results

Of 312 students included in the final analysis, the mean civic-engagement score was 63.43 ± 13.24 (range 27.5–98.0), and 155 students (49.7%) achieved the high civic-engagement threshold (≥ 65). The mean P5 participation score was 3.52 ± 0.84. The Pearson correlation between P5 participation and civic-engagement scores was $r = 0.62$ ($r^2 = 0.38$; $p < 0.001$), indicating a strong positive linear association.

Baseline characteristics are presented in Table 1; the sample was balanced by region (urban 49.4%, rural 50.6%) and predominantly public-school (65.7%), with a mean age of 16.27 ± 1.05 years.

Table 1. Baseline characteristics of study participants (n = 312).

Variable	n (%)	Mean ± SD
Gender — Female	172 (55.1%)	—
Gender — Male	140 (44.9%)	—
Grade 10	104 (33.3%)	—
Grade 11	111 (35.6%)	—
Grade 12	97 (31.1%)	—
School type — Public	205 (65.7%)	—
School type — Private	107 (34.3%)	—
Region — Urban	154 (49.4%)	—
Region — Rural	158 (50.6%)	—
P5 exposure — High	114 (36.5%)	—
P5 exposure — Moderate	131 (42.0%)	—
P5 exposure — Low	67 (21.5%)	—
Parental educ. — Tertiary	119 (38.1%)	—
Parental educ. — Secondary	135 (43.3%)	—
Parental educ. — Primary	58 (18.6%)	—
Extracurricular — Yes	194 (62.2%)	—
Extracurricular — No	118 (37.8%)	—
Age (years)	—	16.27 ± 1.05
P5 participation score (1–5)	—	3.52 ± 0.84
Civic-engagement score (0–100)	—	63.43 ± 13.24
Civic-knowledge score (0–30)	—	19.01 ± 4.41

Notes: Values are n (%) for categorical variables and mean ± SD for continuous variables.

Bivariate analyses demonstrated strong associations between P5 exposure and civic engagement (Table 2). Mean civic-engagement scores rose monotonically across exposure groups (low 49.1 ± 10.2; moderate 61.0 ± 11.8; high 72.3 ± 12.1; ANOVA $F(2,309) = 86.85$, $p < 0.001$; $\eta^2 = 0.36$, a large effect), with all Bonferroni-corrected pairwise comparisons significant at $p < 0.001$ (Cohen's d = 2.04 for high vs low, 1.05 for moderate vs low, and 0.95 for high vs moderate). The proportion achieving high civic engagement increased from 14.9% (95% Wilson CI 8.3–25.3) in the low group to 42.0% (33.9–50.5) in the moderate group and 78.9% (70.6–85.4) in the high group ($x^2(2) = 74.54$, $p < 0.001$; Cramer's V = 0.49, a large effect), as detailed in Table 2. The dose-response pattern across exposure groups is displayed in Figure 2.

Table 2. Bivariate analysis: P5 exposure, covariates, and high civic engagement, with effect sizes.

Variable	n	High CE n (%)	Mean ± SD	p	Effect size
P5 exposure — High	114	90 (78.9%)	72.3 ± 12.1	<0.001	η^2=0.36; d=2.04*
P5 exposure — Moderate	131	55 (42.0%)	61.0 ± 11.8	<0.001	d=1.05*
P5 exposure — Low (ref)	67	10 (14.9%)	49.1 ± 10.2	—	—
Gender — Female	172	87 (50.6%)	65.1 ± 12.8	0.042	d=0.30
Gender — Male	140	55 (39.3%)	61.2 ± 13.5		—
Extracurricular — Yes	194	100 (51.5%)	66.2 ± 12.9	0.018	d=0.55
Extracurricular — No	118	42 (35.6%)	59.1 ± 13.0		—
Region — Urban	154	73 (47.4%)	64.1 ± 13.1	0.245	d=0.10
Region — Rural	158	69 (43.7%)	62.8 ± 13.4		—
Parental educ. — Tertiary	119	63 (52.9%)	66.4 ± 12.7	0.073	—
Parental educ. — Secondary	135	59 (43.7%)	63.1 ± 13.1		—
Parental educ. — Primary	58	20 (34.5%)	59.2 ± 13.8		—

*Notes: x^2 (cluster-robust) for categorical variables; one-way ANOVA with Bonferroni post-hoc for P5 groups (all pairwise p<0.001). CE = civic engagement. *p<0.05. η^2 = eta-squared; d = Cohen's d.*

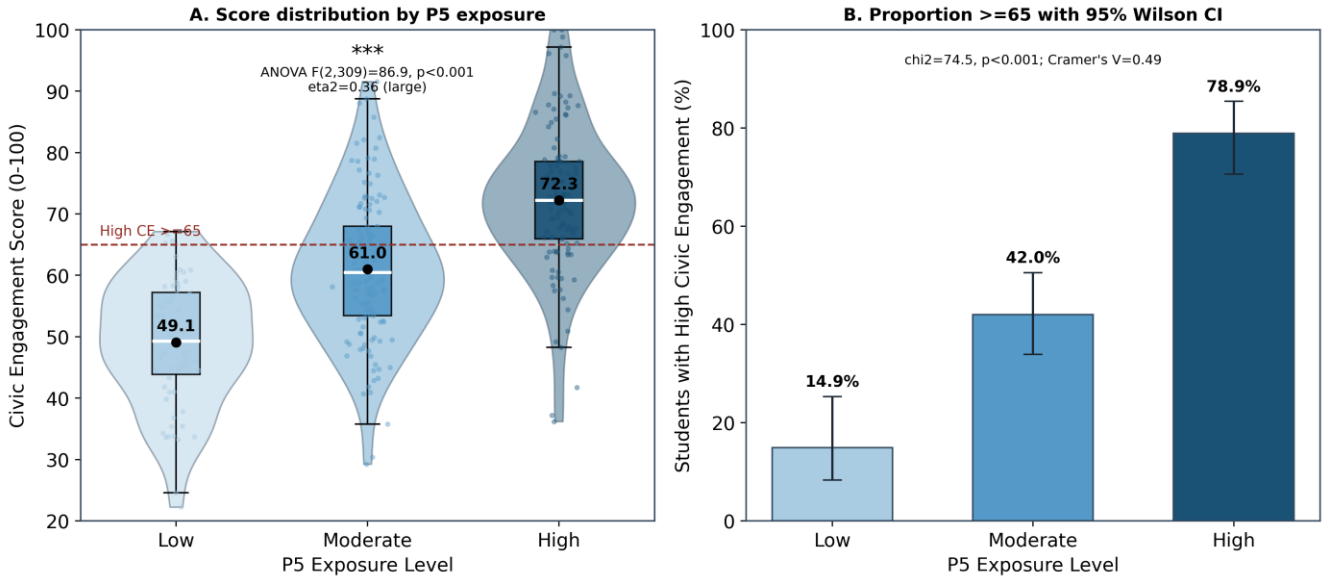

Figure 2. Civic engagement by P5 exposure. Panel A: score distribution (violin, box, and jittered points) with group means and the high-engagement threshold (≥65). Panel B: proportion achieving high civic engagement with 95% Wilson confidence intervals. ***p<0.001.

Multivariable logistic regression (Table 3; Figure 3) identified P5 exposure and the continuous participation score as the strongest independent predictors of high civic engagement. After adjustment for all covariates, students with high P5 exposure were 17.1 times more likely to achieve high civic engagement than those with low exposure (OR = 17.12; 95% CI 3.82–76.74; p < 0.001), and moderate exposure was associated with a 4.4-fold increase (OR = 4.35; 95% CI 1.41–13.41; p = 0.011). Each one-unit increase in the continuous participation score was independently associated with 2.4-fold higher odds (OR = 2.44; 95% CI 1.71–3.48; p < 0.001). Extracurricular participation remained a significant predictor (OR = 2.05; 95% CI 1.12–3.76; p = 0.021). Gender (OR = 1.46; p = 0.187), parental education (tertiary vs primary OR = 1.84; p = 0.073), and region (OR = 1.39; p = 0.245) did not reach significance after adjustment. The model showed good fit (Hosmer–Lemeshow p = 0.449), explained substantial variance (Nagelkerke R^2 = 0.41), and discriminated well (AUC = 0.82), with all VIF < 2.5. Sensitivity analyses at cut-points of 60 and 70, and the multilevel model with random school intercepts, produced qualitatively consistent results.

Table 3. Multivariable logistic regression: independent predictors of high civic engagement.

Predictor	β	SE	OR (95% CI)	p
P5 exposure — High vs Low	2.84	0.77	17.12 (3.82–76.74)	<0.001*
P5 exposure — Moderate vs Low	1.47	0.58	4.35 (1.41–13.41)	0.011*
P5 participation score (cont.)	0.89	0.18	2.44 (1.71–3.48)	<0.001*
Extracurricular (Yes vs No)	0.72	0.31	2.05 (1.12–3.76)	0.021*
Parental educ. — Tertiary vs Primary	0.61	0.34	1.84 (0.95–3.57)	0.073
Gender — Female vs Male	0.38	0.29	1.46 (0.83–2.57)	0.187
Region — Urban vs Rural	0.33	0.28	1.39 (0.80–2.41)	0.245

*Notes: *p<0.05. OR = odds ratio; CI = confidence interval; β = coefficient; SE = standard error. Model fit: Hosmer–Lemeshow p=0.449; Nagelkerke R^2=0.41; AUC=0.82; all VIF<2.5. Low P5 exposure is the reference category. Footnotes: *p<0.05 **p<0.01 ***p<0.001.*

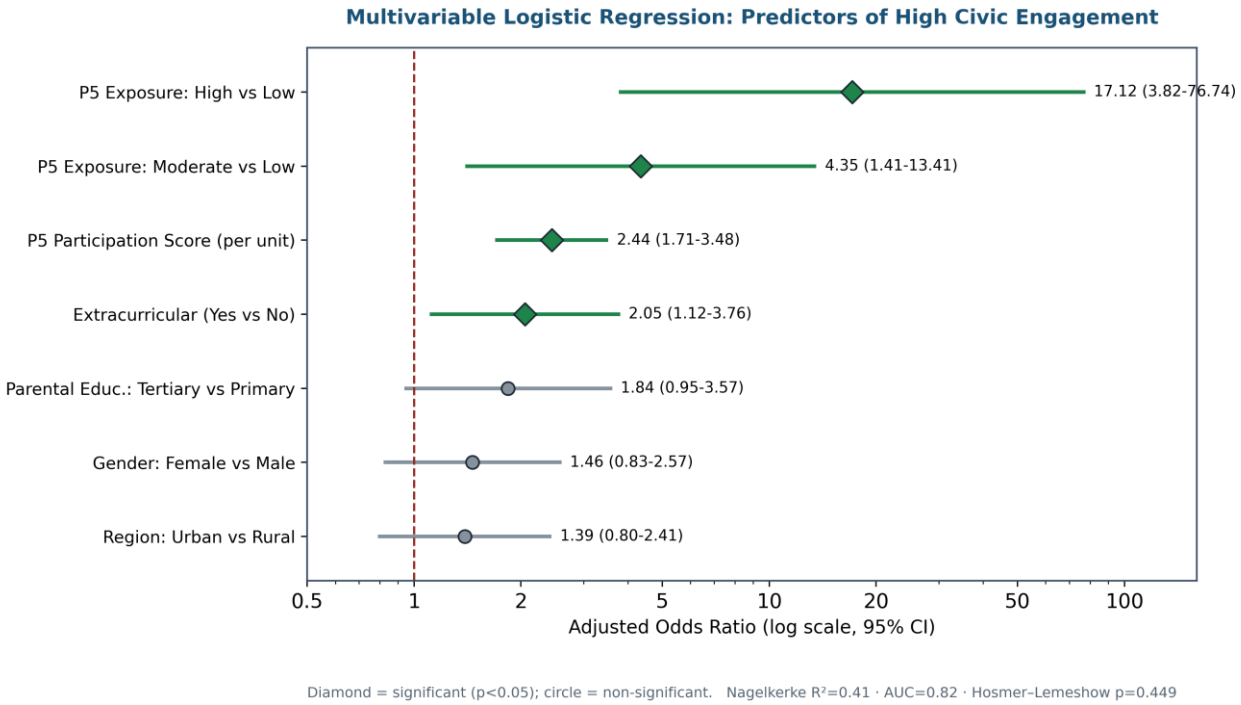

Figure 3. Forest plot of multivariable logistic-regression results. Diamonds indicate statistically significant predictors (p<0.05); circles indicate non-significant predictors. The dashed vertical line at OR = 1 represents the null effect; horizontal bars are 95% confidence intervals.

Sub-scale analyses were consistent with the situated-learning prediction that authentic participation, rather than knowledge acquisition alone, would track exposure most closely. The continuous P5 participation score correlated most strongly with the civic-participation sub-scale (r = 0.66; 95% CI 0.59–0.72; p < 0.001), followed by civic attitudes (r = 0.55; 0.47–0.62; p < 0.001) and civic knowledge (r = 0.48; 0.39–0.56; p < 0.001), with η^2 values of 0.41, 0.30, and 0.23 respectively across exposure groups (Table 4). The gradient was therefore steepest for the construct most directly theorised to develop through community-embedded practice.

Table 4. Association of P5 exposure with civic-engagement sub-scales.

Sub-scale	Correlation r (95% CI)	η^2 across groups	p
Civic participation	0.66 (0.59–0.72)	0.41	<0.001
Civic attitudes	0.55 (0.47–0.62)	0.30	<0.001
Civic knowledge	0.48 (0.39–0.56)	0.23	<0.001

Notes: Pearson correlations between the continuous P5 participation score and each sub-scale; η^2 from one-way ANOVA across exposure groups.

Accounting for the clustered design, the intraclass correlation of 0.08 implied a design effect of 2.31 and an effective sample size of approximately 135; the multilevel model with random school intercepts (random-intercept variance = 0.34, SE = 0.14) reproduced the direction and significance of all primary findings, with the high-versus-low exposure odds ratio estimated at 14.9 (95% CI 3.6–61.8; p < 0.001). Both components of the hybrid (Mundlak) decomposition were significant: the within-school participation component (OR = 1.92; 95% CI 1.28–2.88; p = 0.002) and the between-school component (OR = 3.10; 95% CI 1.55–6.20; p = 0.001), indicating that the participation–engagement association was not solely a between-school artefact and persisted among students attending the same school.

Because the largest odds ratio rested on a sparse cell (10 of 67 low-exposure students with high engagement), the high-versus-low contrast was re-estimated with Firth penalised likelihood, which attenuated the point estimate to OR = 12.2 (95% CI 4.1–37.9) while preserving significance ($p < 0.001$). To convey practical magnitude, adjusted predicted probabilities of high civic engagement were 16.1% (95% CI 9.4–26.0) at low exposure, 41.0% (33.1–49.5) at moderate exposure, and 77.5% (69.4–84.0) at high exposure. Unadjusted (bivariate) odds ratios for the exposure contrasts (high vs low OR = 21.5; moderate vs low OR = 4.1) attenuated only modestly after covariate adjustment, indicating limited confounding by the measured student-level covariates.

Sensitivity analyses supported the robustness of the primary classification: at a high-engagement cut-point of 60 the adjusted high-versus-low odds ratio was 15.8 (95% CI 3.6–69.1) and at a cut-point of 70 it was 18.3 (4.0–83.7); the multilevel and Firth-penalised estimates reported above were qualitatively concordant. An exposure × parental-education interaction was non-significant ($p = 0.214$), although the P5 association was numerically larger among students whose parents had only primary education, a pattern consistent with — but not confirming — a compensatory, equity-enhancing role for high-fidelity P5 implementation. Box–Tidwell tests indicated no violation of linearity in the logit, Levene's test was non-significant ($p = 0.486$), and skewness (−0.12) and kurtosis (−0.34) were within acceptable limits.

4. Discussion

This study provides early large-scale quantitative evidence of a robust, consistent positive association between P5 curriculum exposure and civic engagement among Indonesian secondary school adolescents. Students with high P5 exposure were more than 17 times as likely to demonstrate high civic engagement after adjustment for gender, extracurricular participation, parental education, school type, and region — a substantial adjusted effect — and the association held across diverse school types and geographic settings, underscoring P5's potential as a civic-education mechanism within Indonesia's secondary system.

The magnitude of the association, while large, is contextually interpretable. High-exposure schools recorded mean participation scores ≥ 4.0 on a five-point scale, indicating intensive, high-fidelity implementation across multiple project cycles, whereas low-exposure schools scored below 3.0, consistent with minimal or superficial engagement. This implementation-fidelity contrast — potentially a difference in kind rather than degree — likely accounts for a substantial portion of the observed effect, since low-fidelity schools fail to provide the sustained, authentic civic project experiences that P5's design requires.

The dose-response gradient — civic-engagement scores rising monotonically from 49.1 to 61.0 to 72.3, and the high-engagement proportion from 14.9% to 42.0% to 78.9% (Cohen's $d = 2.04$ for the high–low contrast; $\eta^2 = 0.36$) — is the most interpretively persuasive evidence for a genuine P5 effect. The pattern is consistent with Westheimer and Kahne's framework, within which participatory and justice-oriented competence develops through progressively complex civic-project participation,[5] and with situated-learning theory, which predicts that the intensity and authenticity of community-embedded participation drive durable competence acquisition.[6,7] It also coheres with project-based learning meta-analyses reporting medium-to-large effects on student outcomes.[8,9]

The independent association of the continuous participation score with high civic engagement (OR = 2.44 per unit) reinforces the categorical findings, demonstrating that within-school variation in individual engagement also predicts civic outcomes. This carries direct pedagogical implications: even within high-fidelity schools, students who engage more deeply show stronger outcomes, so teacher facilitation quality, student autonomy in project design, and the authenticity of community connections are plausible mediators warranting future investigation.[21]

The sub-scale pattern offers a more stringent test of the theoretical framework than the composite alone.

Situated-learning theory predicts that competence acquired through authentic participation should be most responsive to the intensity of that participation, and the data conform: the participation sub-scale tracked P5 exposure most steeply ($r = 0.66$; $\eta^2 = 0.41$), the attitudinal sub-scale less so, and civic knowledge — which can be transmitted didactically and is therefore less dependent on project-based practice — least of all. This ordering is what the framework would predict a priori, and its observation strengthens the interpretation that the association reflects a genuine pedagogical mechanism rather than a generic halo of school quality, which would be expected to elevate all sub-scales more uniformly.

The hybrid decomposition addresses the central methodological objection to a school-level exposure measure. By separating the within-school and between-school components of the participation–engagement association, the analysis demonstrates that students who participated more intensively than their schoolmates also reported higher civic engagement (within-school OR = 1.92), a comparison that holds school leadership, resourcing, and culture constant by construction. The persistence of a within-school association makes a purely school-level confounding account less tenable, although it does not eliminate the possibility that more civically inclined students self-select into deeper participation. The between-school component remained the larger of the two, consistent with the view that school-level implementation fidelity carries substantial weight and that part of the headline contrast reflects differences between schools that adjustment cannot fully resolve.

Although direct quantitative comparators in Indonesia remain scarce, the broader civic-education literature indicates that well-designed civic learning — spanning instruction, extracurricular activity, service learning, and a participatory school ethos — produces meaningful gains in civic knowledge, efficacy, and participation.[13,15,22-24] Qualitative Indonesian studies of the Suara Demokrasi theme similarly report strengthened deliberation, though without quantifying effect sizes.[12] The magnitude observed here is large by these standards and should be read in light of the implementation-fidelity contrast and the limitations below rather than as a precise causal estimate.

The significant independent contribution of extracurricular participation (OR = 2.05) corroborates literature linking organised co-curricular activity to civic-competence development.[15,22] In Indonesia, organisations such as OSIS and Palang Merah Remaja provide civic-socialisation pathways complementary to the formal curriculum, and the co-occurrence of high P5 engagement with extracurricular participation may reflect a school-level civic culture supporting both formal and informal learning.

The Firth-penalised re-estimation tempers the headline odds ratio to a still-large but more defensible value (OR = 12.2), and the adjusted predicted probabilities translate the association into a metric educators can act upon: moving from low- to high-fidelity P5 exposure is associated with an increase in the probability of high civic engagement from roughly one in six students to roughly three in four. Expressing the result this way guards against the common misreading of a large odds ratio as a relative risk, which is particularly important here because the outcome is common. The modest attenuation of the unadjusted odds ratios after adjustment further suggests that the measured student-level covariates do not account for the association, even as unmeasured school-level factors remain a live alternative explanation.

The non-significant exposure-by-parental-education interaction warrants careful interpretation. The numerically larger P5 association among students of primary-educated parents is suggestive of a compensatory mechanism, in which structured, universal civic-learning opportunities partially offset home-background disparities in civic socialisation, but the interaction did not reach significance and the study was not powered to detect it. The attenuation of the main effects of gender, parental education, and region after adjustment for P5 exposure is consistent with such a mechanism, yet equally consistent with these covariates being correlated with school-level exposure; only a longitudinal or quasi-experimental design with baseline measurement could distinguish these accounts. We therefore advance the equity

interpretation as a hypothesis for future testing rather than as an established finding.

The absence of significant independent associations for gender, parental education, and region after adjustment is noteworthy. International evidence documents gender and geographic disparities in civic outcomes,[17,20] and their attenuation here may suggest that high-fidelity P5 implementation performs an equity-enhancing function, partially compensating for pre-existing disparities in civic socialisation — consistent with P5's universal, school-wide mandate, but a hypothesis requiring prospective longitudinal testing given the cross-sectional design.

From a policy standpoint, the strong dose-response relationship has actionable implications. The national Merdeka rollout has proceeded unevenly, with wide variation in P5 fidelity, teacher readiness, and institutional support;[11] the present findings suggest this heterogeneity translates directly into heterogeneous civic outcomes, with low-fidelity schools showing engagement comparable to pre-reform baselines. The policy priority should therefore be to intensify and quality-assure P5 implementation — through targeted teacher professional development, principal leadership support, curriculum-resource provision, and school-level monitoring — rather than merely to expand formal adoption.[4]

This study has notable strengths. It is among the first large-scale, multi-province quantitative evaluations of P5, it used an internationally informed instrument with demonstrated reliability and structural validity, and it reported a full complement of effect sizes and confidence intervals alongside multilevel sensitivity analyses.

Several limitations should be acknowledged. The cross-sectional design precludes causal attribution, and the large effect sizes — particularly the OR of 17.12, with its wide confidence interval — may partly reflect unmeasured school-level confounders such as teacher effectiveness, leadership, and institutional culture that could simultaneously drive high P5 fidelity and superior civic outcomes. Exposure was classified largely at the school level, self-report measures are susceptible to social-desirability bias, and the five-province sampling frame, while diverse, may not represent all Indonesian contexts. Future quasi-experimental or longitudinal designs — including school fixed-effects or difference-in-differences approaches exploiting variation in Merdeka adoption timing — are needed to establish causal effects more rigorously.

Several further limitations qualify the inferences. Generalisability is bounded to Merdeka-implementing schools of the sampled type; the eligibility criterion of at least one completed P5 cycle excludes late-adopting and under-resourced schools where civic-education needs may be greatest, and 18 schools cannot represent the full heterogeneity of the national system. Because exposure categories were defined relative to the sample's own distribution of school participation scores, the substantive meaning of 'high' and 'low' exposure is sample-dependent and may not transfer directly to other settings. Self-report instruments are subject to social-desirability and common-method bias, and the cross-sectional design cannot exclude reverse pathways whereby already-engaged students seek out more intensive participation. Finally, the small number of level-two units (18 schools) limits the precision of the school-level variance estimate. These constraints temper the strength, though not the direction, of the conclusions.

5. Conclusion

P5 curriculum exposure was robustly and independently associated with civic engagement among Indonesian secondary school adolescents, with a clear dose-response gradient (high vs low Cohen's d = 2.04; adjusted OR = 17.12) across implementation-intensity levels. As one of the early large-scale quantitative studies in this domain, the findings are consistent with P5's theoretical design as a civic-education intervention and provide an empirical foundation for policy prioritising high-fidelity, equitable, and sustained P5 implementation across Indonesia's secondary schools. Realising this potential will require systematic investment in teacher preparation, school leadership, and programme quality assurance, and future longitudinal research to confirm causal pathways.

6. References

1. Mulyono B, Affandi I, Suryadi K, et al. Online civic engagement: fostering citizen engagement through social media. Jurnal Civics: Media Kajian Kewarganegaraan. 2022;19(1):75–85. doi:10.21831/jc.v19i1.49723
2. Kahne J, Bowyer B. Educating for democracy in a partisan age: confronting the challenges of motivated reasoning and misinformation. American Educational Research Journal. 2017;54(1):3–34. doi:10.3102/0002831216679817
3. Pontes AI, Henn M, Griffiths MD. Youth political (dis)engagement and the need for citizenship education: encouraging young people's civic and political participation through the curriculum. Education, Citizenship and Social Justice. 2019;14(1):3–21. doi:10.1177/1746197917734542
4. Husein R, Kusnadi E, Leksonowati E. From awareness to action: rethinking high school civic education for the digital generation in Indonesia. Cogent Education. 2025;12(1):2534156. doi:10.1080/2331186X.2025.2534156
5. Westheimer J, Kahne J. What kind of citizen? The politics of educating for democracy. American Educational Research Journal. 2004;41(2):237–269. doi:10.3102/00028312041002237
6. Lave J, Wenger E. Situated Learning: Legitimate Peripheral Participation. Cambridge: Cambridge University Press; 1991. doi:10.1017/CBO9780511815355
7. Geijsel F, Ledoux G, Reumerman R, et al. Citizenship in young people's daily lives: differences in citizenship competences of adolescents in the Netherlands. Journal of Youth Studies. 2012;15(5):711–729. doi:10.1080/13676261.2012.671932
8. Chen CH, Yang YC. Revisiting the effects of project-based learning on students' academic achievement: a meta-analysis investigating moderators. Educational Research Review. 2019;26:71–81. doi:10.1016/j.edurev.2018.11.001
9. Zhang L, Ma Y. A study of the impact of project-based learning on student learning effects: a meta-analysis. Frontiers in Psychology. 2023;14:1202728. doi:10.3389/fpsyg.2023.1202728
10. Munawaroh. The influence of problem-based learning model as learning method, and learning motivation on entrepreneurial attitude. International Journal of Instruction. 2020;13(2):431–444. doi:10.29333/iji.2020.13230a
11. Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi. Panduan Pengembangan Projek Penguatan Profil Pelajar Pancasila. Jakarta: Kemendikbudristek; 2022.
12. Darmawan W, Syahrin AA. Implementasi Projek Penguatan Profil Pelajar Pancasila (P5) tema Suara Demokrasi dalam memperkuat partisipasi siswa melalui pemilihan OSIS. Jurnal Global Futuristik. 2024;2(2):105–114. doi:10.59996/globalistik.v2i2.569
13. Campbell DE. What social scientists have learned about civic education: a review of the literature. Peabody Journal of Education. 2019;94(1):32–47. doi:10.1080/0161956X.2019.1553601
14. Tarsidi DZ, Suryadi K, Budimansyah D, et al. Social media usage and civic engagement among Indonesian digital natives: an analysis. Jurnal Civics: Media Kajian Kewarganegaraan. 2023;20(2):257–269. doi:10.21831/jc.v20i2.60812
15. Geboers E, Geijsel F, Admiraal W, et al. Review of the effects of citizenship education. Educational Research Review. 2013;9:158–173. doi:10.1016/j.edurev.2012.02.001
16. von Elm E, Altman DG, Egger M, et al. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement. Lancet. 2007;370(9596):1453–1457. doi:10.1016/S0140-6736(07)61602-X
17. Schulz W, Ainley J, Fraillon J, et al. Education for Citizenship in Times of Global Challenge:

IEA International Civic and Citizenship Education Study 2022 International Report. Cham: Springer; 2024. doi:10.1007/978-3-031-65603-3

18. Schulz W, Ainley J, Fraillon J, et al. Becoming Citizens in a Changing World: IEA International Civic and Citizenship Education Study 2016 International Report. Cham: Springer; 2018. doi:10.1007/978-3-319-73963-2
19. Cohen AK, Chaffee BW. The relationship between adolescents' civic knowledge, civic attitude, and civic behavior and their self-reported future likelihood of voting. Education, Citizenship and Social Justice. 2013;8(1):43–57. doi:10.1177/1746197912456339
20. Hoskins B, Janmaat JG, Melis G. Tackling inequalities in political socialisation: a systematic analysis of access to and mitigation effects of learning citizenship at school. Social Science Research. 2017;68:88–101. doi:10.1016/j.ssresearch.2017.09.001
21. Cahyono C, Danial E, Rahmat R, et al. Developing students' civic responsibility using blended learning model with an asynchronous system. Jurnal Civics: Media Kajian Kewarganegaraan. 2024;21(1):1–8. doi:10.21831/jc.v21i1.67361
22. Keating A, Janmaat JG. Education through citizenship at school: do school activities have a lasting impact on youth political engagement? Parliamentary Affairs. 2016;69(2):409–429. doi:10.1093/pa/gsv017
23. Manning N, Edwards K. Does civic education for young people increase political participation? A systematic review. Educational Review. 2014;66(1):22–45. doi:10.1080/00131911.2013.763767
24. Knowles RT, Torney-Purta J, Barber C. Enhancing citizenship learning with international comparative research: analyses of national education systems. Citizenship Teaching & Learning. 2018;13(1):7–30. doi:10.1386/ctl.13.1.7_1