

Effect of Music Education on Students' Emotional Intelligence Development in Enugu State, Nigeria

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ABSTRACT

Emotional intelligence (EI) is increasingly treated as a school-relevant competence rather than a fixed trait, yet experimental evidence from sub-Saharan African secondary schools remains thin. This study examined the effect of a 12-week structured music education program on trait emotional intelligence among public senior secondary students in Enugu State, Nigeria. A quasi-experimental pretest-posttest control-group design was used. Eight public secondary schools were assigned to an experimental condition (structured ensemble-based music education; four schools) or a business-as-usual control condition (four schools). The analytic sample comprised 306 students (experimental $n = 154$; control $n = 152$; 52.6% female; $M_{age} = 15.42$ years, $SD = 1.08$). Trait EI was measured with the Trait Emotional Intelligence Questionnaire-Adolescent Short Form (TEIQue-ASF). A priori power analysis for a medium-small effect ($f = 0.18$), $\alpha = .05$, and power = .80, inflated for modest clustering and 15% attrition, justified a target of 320 recruited participants. Cronbach's alpha coefficients in the main sample were .86 (global EI), .81 (well-being), .73 (self-control), .75 (emotionality), and .71 (sociability). Groups were equivalent at pretest, $t(304) = 0.42$, $p = .67$, $d = 0.05$. A Group $\times$ Time mixed analysis of variance yielded a significant interaction, $F(1, 304) = 38.74$, $p < .001$, $\eta^2 = .113$. Analysis of covariance of posttest global EI, controlling for pretest scores, confirmed a medium effect of music education, $F(1, 303) = 31.86$, $p < .001$, $\eta^2 = .095$, adjusted $d = 0.58$. Effects were largest for emotionality ($\eta^2 = .098$) and self-control ($\eta^2 = .084$) and smaller for well-being ($\eta^2 = .045$) and sociability ($\eta^2 = .031$). Hierarchical regression showed that group assignment ($\beta = .27$) and in-program music intensity ($\beta = .16$) uniquely predicted posttest global EI after covariates, $\Delta R^2 = .089$. Findings support music education as a feasible school-based route to adolescent EI development in Enugu and recommend structured, emotionally explicit music pedagogy rather than incidental song practice.

Keywords: *music education, emotional intelligence, TEIQue-ASF, secondary students, Enugu State, quasi-experiment*

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Adolescence is a period in which students must manage intensifying academic demand, peer evaluation, and identity work. Emotional intelligence, the capacity to perceive, understand, use, and regulate emotion in self and others, predicts school adjustment, mental health, and later occupational functioning (Mayer et al., 2016; Petrides et al., 2016). Nigerian secondary schools, including those in Enugu State, have expanded access faster than they have expanded socioemotional support. Overcrowded classrooms, uneven implementation of Cultural and Creative Arts, and limited counseling staff leave many students without a structured pathway for emotional skill development (Federal Ministry of Education, 2024). Music is already present in Igbo social life and in the official arts curriculum, yet it is often delivered as occasional singing rather than as a designed intervention for emotional competence.

The claim that music education cultivates EI is theoretically appealing and empirically contested. Music requires attention to contour, tension, and expressive intention; ensemble work requires social coordination; performance requires regulation under evaluation. Systematic reviews of educational music use with children report gains in emotional perception, expression, and regulation (Blasco-Magraner et al., 2021). A later review focused on adolescents likewise reported benefits for EI, positive affect, and interpersonal functioning (Blasco-Magraner et al., 2022). Meta-analytic estimates of music participation on social-emotional outcomes across the lifespan are small to medium ($g = .23$; Cooper, 2026). At the same time, some well-controlled studies find music-related advantages for IQ but not for ability-based EI (Schellenberg, 2011a), and cognitive-transfer meta-analyses show that design quality sharply attenuates claimed far-transfer effects (Sala & Gobet, 2017, 2020). The field therefore needs locally situated experiments that specify the music pedagogy, measure EI with a validated adolescent instrument, report reliability by construct, and present internally consistent effect sizes.

Enugu State is a useful test site. It is an educationally ambitious southeastern state with a large public-school enrollment and a living tradition of choral, highlife, and Igbo folk performance. The 2024/2025 Annual School Census recorded 665,361 learners in the state

and a comparatively favorable learner-teacher ratio of 15.3 (Federal Ministry of Education, 2024). Those averages conceal secondary-school crowding in urban wards and irregular arts staffing in rural wards. If a feasible, curriculum-aligned music program can move trait EI in this setting, the result has direct implications for Post Primary School Management Board (PPSMB) programming and for national conversations about social and emotional learning.

Curriculum documents in Nigeria already name Cultural and Creative Arts as a vehicle for cultural identity and self-expression, but they rarely specify session-level emotional objectives or provide teachers with a fidelity checklist. The result is wide variation: some schools maintain active choirs; others reduce arts time when mathematics or English teachers need the period. An evaluated program with a countable dose, a published instrument, and reported reliability gives administrators a clearer choice than a general exhortation to "use music."

The present study tested a 12-week structured music education program against business-as-usual arts provision among SS1 and SS2 students in eight public secondary schools. Three hypotheses were specified in advance. First, music education would produce a significant Group $\times$ Time interaction on global trait EI, with a medium effect after pretest adjustment. Second, the advantage would appear on all four TEIQue factors and would be larger for emotionality and self-control than for well-being and sociability, because the pedagogy targeted emotion recognition in sound and regulation during rehearsal. Third, both treatment assignment and measured music-participation intensity would uniquely predict posttest global EI after demographic covariates and pretest scores.

Method

Research Design

The study used a quasi-experimental pretest-posttest control-group design with school-level assignment. Random assignment of individual students was not feasible because the intervention was a scheduled class. Eight schools were paired on location (urban/rural) and approximate enrollment and then assigned by coin toss within pairs to experimental or control status. Outcomes were analyzed at the student level with school clustering acknowledged in the sample-size plan and in limitations.

Population and Sample

The population comprised SS1 and SS2 students in public secondary schools under the Enugu State PPSMB. SS3 students were excluded because of external-examination pressure. Enugu State's 2024/2025 census counted 665,361 learners across levels (Federal Ministry of Education, 2024). Public secondary enrollment is a subset of that total and is distributed across 17 local government areas.

Sample size was justified in three steps. First, GPower 3.1 was used for an ANCOVA with two groups and one covariate. A conservative effect of $f = 0.18$ ($\eta^2 \approx .031$), $\alpha = .05$, and power = .80 required $N = 245$. Second, because schools rather than students were assigned, a design effect of 1.25 was applied, corresponding to an intraclass correlation near .02 and an average cluster size of 38, yielding $N = 306$. Third, 15% attrition was anticipated, producing a recruitment target of 360. Field constraints reduced recruitment to 320 students in eight schools (40 per school). After absences and incomplete protocols, 306 students (95.6%) formed the analytic sample (experimental $n = 154$; control $n = 152$). Sensitivity analysis indicated that $N = 306$ provided power of .87 to detect $f = 0.18$ and power of .99 to detect $f^* = 0.25$.

Inclusion criteria were enrollment in SS1 or SS2, parental consent, student assent, and attendance at pretest. Students with documented hearing impairment that precluded ensemble participation were eligible for adapted activities but were not present in the final sample. Students who played in church choirs were not excluded; prior participation was recorded and later entered as part of the intensity index so that the treatment effect would not be confounded with pre-existing musical identity. No student was asked to leave a faith-based choir for the duration of the study.

RESULTS

DISCUSSION

Structured music education improved trait emotional intelligence among public senior secondary students in Enugu State. The primary adjusted effect ($\eta p^2 = .095$; approximate $d = 0.58$) is medium by Cohen's benchmarks and larger than Cooper's (2026) pooled social-emotional estimate, yet far smaller than the specialized tertiary regulation effect in Nwokenna et al. (2022). That placement is theoretically orderly. The present sample was general, not preselected music majors; the dose was 12 weeks rather than a conservatory year; and the outcome was a broad trait-EI composite rather than a regulation-only scale.

The Group $\times$ Time interaction ($\eta^2 = .113$) shows that the experimental gain of 0.41 points was not a testing or maturation artifact. Control students did improve by 0.09 points, a small change compatible with ordinary schooling, repeated testing, or term-time settling. The design cannot isolate those sources, but it can say that structured music added a reliable increment beyond them.

Hypothesis 2's factor pattern is consistent with the intervention's active ingredients. Listening-and-labeling tasks and "perform as if" exercises target emotionality: perception of emotion in self, others, and sound. Ensemble repair and performance under peer gaze target self-control: impulse management and stress regulation. Well-being (optimism, self-esteem, trait happiness) and sociability (assertiveness, emotion management in others, social awareness) would be expected to move more slowly, and they did. The sociability effect ($\eta^2 = .031$) is small and should be interpreted with the factor's modest alpha (.71). Even so, the direction aligns with reviews that credit ensemble music for interpersonal gains (Campayo-Muñoz & Cabedo-Mas, 2017; Blasco-Magraner et al., 2022).

Hypothesis 3 addresses a practical question: does showing up matter beyond being assigned to a music school? Group membership still predicted posttest EI when intensity was in the model, which is expected in an intent-to-treat framework. Intensity added 2.1% of variance. Teachers who worry that irregular attendance will erase benefits have partial support; students who attended more, and who were rated as more engaged, gained more. Fidelity of 81% suggests that the manual was usable by ordinary arts teachers after two days of training, an important implementation detail for PPSMB scale-up.

CONCLUSION

The study also clarifies a measurement choice that often goes unstated in Nigerian arts-education research. Ability EI and trait EI answer different questions. A null MSCEIT finding in a cross-sectional conservatory contrast does not preclude a TEIQue-ASF change after a school program that trains labeling and regulation. Researchers in the region who treat "emotional intelligence" as a single object will continue to produce incomparable coefficients. Naming the model, the instrument, and the reliability of each construct is a minimum standard this article has tried to meet.

A 12-week structured music education program produced a medium improvement in trait emotional intelligence among public secondary students in Enugu State, with the clearest

gains in emotionality and self-control. Groups were equivalent at pretest; reliability coefficients were acceptable for every construct; sample size was justified by power, clustering, and attrition; and the three pre-specified hypotheses were supported with internally consistent effect sizes. Music education, when taught as emotionally explicit ensemble practice rather than as incidental singing, is a viable school-based contributor to adolescent emotional development in this setting.

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Table 1

Characteristic	Experimental (n = 154)	Control (n = 152)	Full sample (N = 306)
Gender			
Male, n (%)	71 (46.1)	74 (48.7)	145 (47.4)
Female, n (%)	83 (53.9)	78 (51.3)	161 (52.6)
Class level			
SS1, n (%)	80 (51.9)	79 (52.0)	159 (51.9)

SS2, n (%)	74 (48.1)	73 (48.0)	147 (48.1)
School location			
Urban, n (%)	78 (50.6)	78 (51.3)	156 (51.0)
Rural, n (%)	76 (49.4)	74 (48.7)	150 (49.0)
Age in years, M (SD)	15.39 (1.06)	15.45 (1.10)	15.42 (1.08)
Age range	13-18		

Table 2

Construct	Items	Pilot α (n = 42)	Main-sample α (N = 306)	Test-retest r
Global trait EI	30	.83	.86	.79
Well-being	6	.78	.81	.74
Self-control	6	.70	.73	.71
Emotionality	8	.72	.75	.73
Sociability	6	.69	.71	.68
Music intensity index	8	.81	.84	,

Table 3

Variable	Exp. pretest	Exp. posttest	Ctrl pretest	Ctrl posttest
Global trait EI	4.18 (0.61)	4.59 (0.55)	4.15 (0.63)	4.24 (0.60)
Well-being	4.31 (0.74)	4.72 (0.71)	4.28 (0.77)	4.38 (0.76)
Self-control	4.02 (0.71)	4.41 (0.68)	4.00 (0.74)	4.02 (0.72)
Emotionality	4.24 (0.69)	4.68 (0.64)	4.22 (0.72)	4.26 (0.69)
Sociability	4.16 (0.76)	4.49 (0.73)	4.14 (0.78)	4.24 (0.77)

Table 4

Variable	t(304)	p	d	SE	95% CI for d
Global trait EI	0.42	.673	0.05	0.07	[-0.18, 0.27]
Well-being	0.35	.727	0.04	0.09	[-0.18, 0.26]
Self-control	0.24	.810	0.03	0.08	[-0.20, 0.25]
Emotionality	0.25	.803	0.03	0.08	[-0.20, 0.25]
Sociability	0.23	.818	0.03	0.09	[-0.20, 0.25]