
Predictors of student-athlete satisfaction and retention in school football league

ENDARMAN SAPUTRA^{1*}, REZA HADINATA², ALEK OKTADINATA³, WAWAN JUNRESTI DAYA⁴, DAVID IQRONI⁵

Abstract

This study examined how coach competency, competition quality, dual-career support, and psychosocial development predict student-athlete satisfaction and, in turn, retention intention in the Jambi School Football League (JSFL), Indonesia. Methods A cross-sectional survey was completed by 154 student-athletes, and the reflective measurement and structural models were estimated using Partial Least Squares Structural Equation Modeling (PLS-SEM) in RStudio with the *semnir* package. Results: Psychosocial development was the strongest predictor of satisfaction ($\beta = .639$), while coach competency showed a smaller, qualified positive effect ($\beta = .143$). Competition quality ($\beta = .069$) and dual-career support ($\beta = .105$) were not significant. Satisfaction strongly predicted retention intention ($\beta = .807$). The model explained 78.0% of the variance in satisfaction and 65.1% in retention intention. Because the HTMT ratio between psychosocial development and satisfaction was elevated (HTMT = .950), the dominant psychosocial-development effect should be interpreted as provisional pending measurement refinement. Conclusion: Development-oriented experiences appear central to sustaining participation in Indonesian school football, with coach competency playing a complementary role.

Keywords

coach competency, competition quality, dual-career support, psychosocial development, retention intention

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^{1*}Universitas Jambi, Indonesia, Corresponding email: endarman@unja.ac.id

^{2,3,4,5} Universitas Jambi, Indonesia

Introduction

School-based football leagues occupy a distinctive position in national sport-development systems: they operate as educational activities, mechanisms for talent identification, and, for many adolescents, a first encounter with formally organized competition. In Indonesia, the expansion of school football competitions, including the JSFL, forms part of a broader policy emphasis on strengthening grassroots football while using sport to promote character education and physical literacy. The sustainability of these systems nevertheless depends on retaining student-athletes across competitive seasons. This concern mirrors the wider pattern of adolescent sport dropout, in which participation commonly declines during the secondary-school years (Crane & Temple, 2015; Witt, 2018).

Retention intention, the athlete's self-reported likelihood of continuing participation in a given sport context, has long been theorized as a downstream consequence of psychological satisfaction and commitment. The Sport Commitment Model proposed that continuation is jointly shaped by enjoyment, personal investment, social constraints, involvement opportunities, and involvement alternatives (Scanlan et al., 1993, 2016). Self-Determination Theory similarly holds that need-supportive sport environments those supporting autonomy, competence, and relatedness sustain engagement, whereas need-thwarting environments accelerate dropout (Deci & Ryan, 2000). Building on this tradition, the present study models Student-Athlete Satisfaction (SAS) as the proximal psychological predictor of retention intention, and examines four upstream structural, organizational, relational, and developmental conditions: dual-career support, competition quality, coach competency, and psychosocial development.

Dual-career support, the institutional and interpersonal accommodation that enables athletes to balance academic obligations with training and competition demands has been associated with athlete wellbeing and continuation in European settings (Stambulova et al., 2015; Stambulova & Wylleman, 2019), but has rarely been tested among secondary-school athletes in Southeast Asian education systems. Competition quality encompassing organizational fairness, competitiveness, officiating, and scheduling integrity has been theorized as a determinant of participant satisfaction and continued involvement in sport service-quality research (Theodorakis et al., 2013; Yoshida & James, 2010). Coach competency, operationalized across motivation, technique, game-strategy, and character-building domains (Myers et al., 2006), has predicted athlete satisfaction in Western coaching-science samples (Myers, 2013) but remains underexamined among Indonesian school-level coaches, many of whom also serve as physical education teachers. Finally, psychosocial development athletes' perceived gains in competence, confidence, character, connection, and self-regulation through sport has been positioned within the Positive Youth Development (PYD) literature as both an outcome and mechanism of sustained engagement (Fraser-Thomas et al., 2005; Lerner et al., 2005), yet it has seldom been tested alongside structural and organizational predictors within one retention-oriented model.

The Indonesian school football context

Compared with European and North American systems, Indonesian school sport occupies a distinctive institutional position. Leagues such as the JSFL are commonly organized through collaboration among schools, local football bodies, and university sport-science partners. Unlike the centralized dual-career infrastructures documented in the European GEES project and formalized in the FEPSAC Position Statement (Stambulova et al., 2024), support for school-athletes in Indonesia is predominantly informal and often depends on individual teachers and coaches. Coach preparation is also heterogeneous, as school-level coaches may hold general physical education credentials rather than sport-specific licenses. These conditions make the JSFL an informative setting in which to examine whether constructs developed largely in higher-resource sport systems retain their predictive relevance and relative ordering in an emerging, education-embedded context.

Beyond this contextual gap, the present study advances a specific theoretical contribution. Dual-career, service-quality, and coaching-competency perspectives were developed primarily in resource-rich, performance-oriented sport systems in which structural and organizational conditions may be especially salient. PYD theory, by contrast, emerged largely from community and school-based programs in which developmental value is central. Indonesian school football occupies a hybrid position: it is simultaneously a competitive league and an education embedded activity. We therefore introduce a heuristic hygiene-versus-driver distinction as the authors' own integrative framing, rather than as an established sport-management theory. In this framing, structural and organizational conditions may enable participation by reducing barriers, whereas psychosocial development may more directly generate satisfaction. The study tests this proposition by estimating the four predictors jointly. Its objectives were: (1) to examine the effects of dual-career support, competition quality, coach competency, and psychosocial development on student-athlete satisfaction; (2) to test satisfaction as the proximal predictor of retention intention; and (3) to derive contextually grounded recommendations for school sport management, coach education, and league governance in Indonesia.

Literature Review and Hypothesis Development

Student-athlete satisfaction and retention intention

Satisfaction has long been established in sport management and sport psychology research as the proximal psychological state linking environmental and relational conditions to behavioral continuation. Within the Sport Commitment Model, enjoyment and investment operate as the dominant antecedents of the psychological resolve to continue participation (Scanlan et al., 1993, 2016), while service-quality research in sport consistently positions satisfaction as the key mediating construct between perceived organizational quality and behavioral loyalty outcomes such as continued attendance or participation (Theodorakis et al., 2013; Yoshida & James, 2010). Self-Determination Theory offers a complementary account: environments that satisfy athletes' basic psychological needs for autonomy, competence, and relatedness foster higher satisfaction and more autonomous, durable forms of motivation,

which in turn predict sustained engagement (Deci & Ryan, 2000; Vasconcellos et al., 2020). On this theoretical basis, it is hypothesized that student-athlete satisfaction functions as the central proximal driver of retention intention in the present model:

H5: *Student-athlete satisfaction (SAS) has a significant positive effect on retention intention (RI)*

Coach competency and student-athlete satisfaction

Coach competency, as operationalized by Myers et al. (2006) in the Coaching Competency Scale, comprises motivation, game-strategy, technique, and character-building competencies. Athletes' evaluations of these competencies have been shown to predict satisfaction with the coach and broader indices of sport commitment (Boardley et al., 2008; Myers, 2013). Coaches occupy a proximal position in the athlete's daily sport environment, mediating both technical-developmental and socio-emotional dimensions of participation; low perceived competency has been linked to reduced enjoyment and elevated dropout risk (Fraser-Thomas et al., 2008). In Indonesian school football, coaching roles are frequently filled by physical education teachers with variable formal coaching certification, raising the practical stakes of this relationship. It is hypothesized:

H1: *Coach competency (CC) has a significant positive effect on student-athlete satisfaction (SAS)*

Competition quality and student-athlete satisfaction

Competition quality captures athletes' perceptions of the organizational integrity of the league in which they compete, including fairness of officiating, competitive balance, and scheduling reliability (Yoshida & James, 2010). Service-quality frameworks in sport management have shown that perceived organizational quality shapes participant satisfaction (Alexandris et al., 2002; Theodorakis et al., 2013). In Indonesian school leagues, which often operate with constrained administrative and financial resources relative to professional academy systems, competition quality was theorized as a potentially decisive determinant of athletes' satisfaction. It is hypothesized:

H2: *Competition quality (CQ) has a significant positive effect on student-athlete satisfaction (SAS)*

Dual-career support and student-athlete satisfaction

Dual-career support refers to the institutional, coaching, familial, and peer-based accommodations that enable athletes to pursue academic development alongside sport participation (Stambulova & Wylleman, 2019). The FEPSAC Position Statement on athletes' dual careers similarly concludes that adequate school-sport balance is associated with wellbeing and continued participation across European contexts, while unresolved role conflict remains among the most consistently reported drivers of discontinuation (Stambulova et al., 2024). Indonesian student-athletes in school football leagues plausibly face comparable dual-role strain arising from compulsory curriculum demands and limited institutional flexibility, though

this has not yet been empirically documented in the Indonesian secondary-school setting. It is hypothesized:

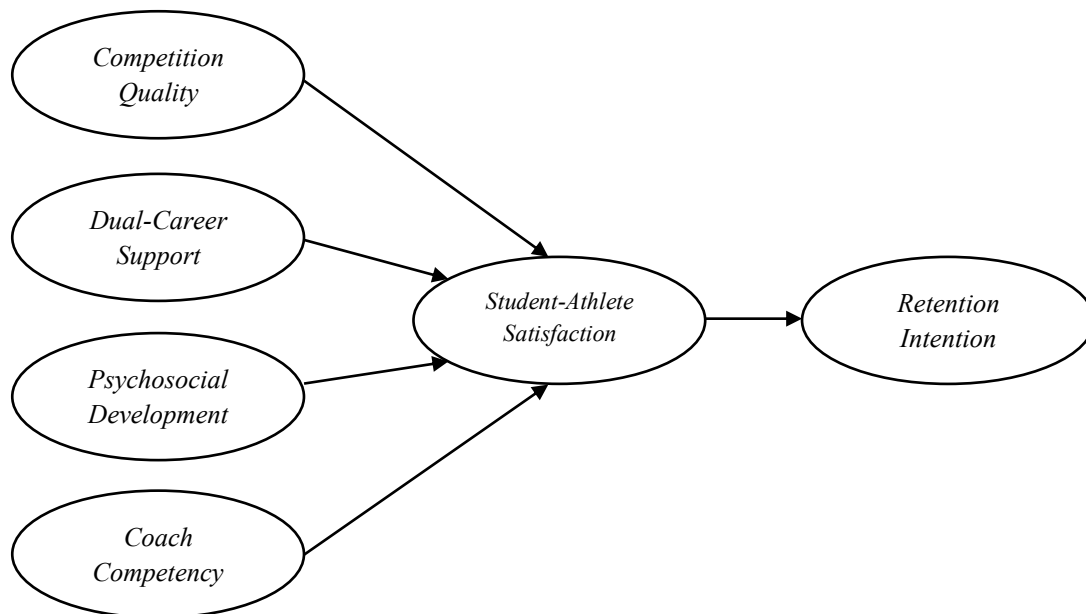
H3: *Dual-career support (DCS) has a significant positive effect on student-athlete satisfaction (SAS)*

Psychosocial development and student-athlete satisfaction

Psychosocial development refers to athletes' perceived gains in psychosocial competencies through sport participation, consistent with the PYD framework. The Applied Sport-Programming Model (Fraser-Thomas et al., 2005) and the Five Cs model competence, confidence, connection, character, and caring (Lerner et al., 2005) position developmentally supportive sport environments as generating intrinsically meaningful gains. Because these gains speak directly to adolescents' developmental task's identity formation, social belonging, and self-efficacy perceived psychosocial development is expected to be a particularly salient predictor of satisfaction in school-based sport. It is hypothesized:

H4: *Psychosocial development (PSD) has a significant positive effect on student-athlete satisfaction (SAS).*

Figure 1. *Proposed structural model*



Note. CQ = Competition Quality; DCS = Dual-Career Support; PSD = Psychosocial Development; CC = Coach Competency; SAS = Student-Athlete Satisfaction; RI = Retention Intention. Values on measurement paths are standardized outer loadings (λ); values on structural paths are standardized path coefficients (β). The model was specified with CQ, DCS, PSD, and CC as exogenous predictors of SAS,

and SAS as the sole proximal predictor of RI (full-mediation specification; no direct structural paths from CQ, DCS, PSD, or CC to RI were estimated).

Methodology

Research design

This study employed a quantitative, cross-sectional, explanatory survey design, consistent with prior applications of sport commitment and coaching-competency research (Carpenter et al., 1993; Myers, 2013). PLS-SEM was selected because the study emphasized prediction, included multiple reflective constructs, and used a moderate sample typical of applied sport management research (Hair et al., 2019a). Model estimation was conducted in RStudio using the semnr package (Ray et al., 2026).

Participants and sampling

Student-athletes from school teams competing in the JSFL in Jambi Province, Indonesia, were recruited through participating schools and team coaches using criterion-based sampling. Eligible participants had actively competed in the league during the data-collection season and provided assent or consent; parental or guardian consent was obtained for minors. The final analytic sample comprised 154 complete responses. The number of eligible athletes invited was not retained in the analytic dataset; consequently, a conventional response rate cannot be calculated from the available record.

Table 1. Demographic characteristics of participants (N = 154)

Characteristics	Categories	n	%
Age Group	9–12 years	44	28.6
	13–15 years	81	52.6
	16–19 years	29	18.8
Playing Position	Goalkeeper	19	12.3
	Defender	56	36.4
	Midfielder	42	27.3
	Forward	37	24.0
Playing Experience	1 season	65	42.2
	2 seasons	52	33.8
	More than 3 seasons	37	24.0
Educational Level	Elementary School	48	31.2
	Junior High School	73	47.4
	Senior High School	33	21.4

The final sample comprised 154 young football players. As shown in Table 1, 52.6% were aged 13–15 years, 28.6% were aged 9–12 years, and 18.8% were aged 16–19 years. Playing positions included defenders (36.4%), midfielders (27.3%), forwards (24.0%), and goalkeepers (12.3%). Regarding experience, 42.2% had competed for one season, 33.8% for two seasons, and 24.0% for three or more seasons. In terms of education, 47.4% attended junior high school, 31.2%

elementary school, and 21.4% senior high school or its equivalent. This variation in age, position, and experience describes a heterogeneous regional league sample, but does not establish population representativeness.

A sample of this size exceeds established minimum-sample heuristics for PLS-SEM models of this complexity (a maximum of four structural paths pointing at a single endogenous construct), which recommend at least 10 times the largest number of predictors for any construct, and is consistent with recommended thresholds for achieving adequate statistical power in models of comparable complexity (Hair et al., 2019a; Kock & Hadaya, 2018).

Instruments

A study-specific questionnaire was developed for the school football league context in Jambi Province. It comprised 24 items covering six constructs: Coach Competency (CC), Competition Quality (CQ), Dual-Career Support (DCS), Psychosocial Development (PSD), Student-Athlete Satisfaction (SAS), and Retention Intention (RI). Each construct was represented by four items and specified as reflective in the measurement model. Responses used a five-point Likert-type scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree.

The items were prepared and administered in Indonesian. The questionnaire is not presented as a validated short form or a formally translated/back-translated version of an established instrument. Appendix A reproduces all 24 administered Indonesian statements, with their item codes and English translations provided solely for reporting. These English translations were not administered to respondents and have not been separately validated.

Before distribution, three researcher colleagues read the draft questionnaire to assess language appropriateness and ease of understanding. This was a qualitative review of wording and comprehensibility. It was not a formal expert content-validation procedure, and no content-validity index or prespecified quantitative content-validity criterion is reported. The review therefore documents an assessment of language clarity without establishing formal content validity. The reliability and construct-validity statistics reported below concern this instrument in the present sample and do not substitute for content validation.

Procedure and ethical compliance

Data collection took place in May 2026 through the voluntary WhatsApp recruitment process described in Section 3.2. The survey was voluntary, involved minimal risk, and collected no sensitive identifying information. Formal ethics approval was not obtained; therefore, the study does not claim institutional review board approval. Participants received information about the study purpose, procedures, confidentiality, anonymity, withdrawal rights, and academic use of the data. Parents or legal guardians provided consent for minors, and student-athletes provided assent. Responses were anonymized at data entry.

Data analysis

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) in RStudio with the *sempr* package (Ray et al., 2021), following the two-stage evaluation procedure recommended by Hair et al. (2019, 2021). The measurement model was assessed

using outer loadings, Cronbach's alpha, rho_A, composite reliability (rho_C), and average variance extracted (AVE). Discriminant validity was evaluated using the heterotrait-monotrait ratio (HTMT), with .90 used as a conservative screening threshold and bootstrapped confidence intervals used for HTMT inference (Henseler et al., 2015). The structural model was evaluated using R^2 , adjusted R^2 , variance inflation factors, and standardized path coefficients. Statistical inference used 5,000 bootstrap resamples and 95% confidence intervals; an effect was treated as significant when its bootstrap interval excluded zero (Hair et al., 2021).

Results

Descriptive statistics and measurement model assessment

The analytic sample consisted of 154 student-athletes from the JSFL, each responding to 24 items across six latent constructs using a 5-point Likert scale. Table 2 reports item-level descriptive statistics. Mean item scores ranged from 4.04 (CQ2) to 4.55 (SAS4), indicating generally favorable perceptions across all six constructs, with construct-level means ranging from 4.10 (Competition Quality) to 4.36 (Psychosocial Development). Skewness values ranged from -1.72 to -0.01 and kurtosis values from -0.01 to 4.62; several items (e.g., CC1, CC3, SAS3, SAS4) showed kurtosis above 3, indicating a more peaked distribution than a normal curve, consistent with the ceiling effects common in self-report youth sport satisfaction measures. Because PLS-SEM does not require multivariate normality, these departures do not threaten the validity of the estimation technique, though they are reported here for transparency.

Table 2. *Descriptive statistics of measurement items (N = 154)*

Constructs	Items	Means	SD	Skewness	Kurtosis
Coach Competency (CC)	CC1	4.36	0.82	-1.72	3.99
	CC2	4.06	0.93	-0.94	0.74
	CC3	4.43	0.73	-1.65	4.48
	CC4	4.38	0.76	-1.54	3.73
Competition Quality (CQ)	CQ1	4.10	0.85	-1.00	1.54
	CQ2	4.04	0.85	-0.78	0.49
	CQ3	4.08	0.80	-0.51	-0.01
	CQ4	4.19	0.71	-0.73	1.39
Dual-Career Support (DCS)	DCS1	4.23	0.76	-0.77	0.70
	DCS2	4.35	0.75	-1.41	3.50
	DCS3	4.27	0.71	-0.86	1.61

Constructs	Items	Means	SD	Skewness	Kurtosis
Psychosocial Development (PSD)	DCS4	4.24	0.78	-0.86	0.79
	PSD1	4.34	0.72	-1.02	1.69
	PSD2	4.41	0.67	-1.21	2.89
	PSD3	4.32	0.72	-0.97	1.54
Student-Athlete Satisfaction (SAS)	PSD4	4.38	0.69	-1.13	2.43
	SAS1	4.29	0.69	-0.91	1.91
	SAS2	4.27	0.70	-0.88	1.76
	SAS3	4.32	0.71	-1.40	4.29
Retention Intention (RI)	SAS4	4.55	0.65	-1.67	4.62
	RI1	4.32	0.74	-0.98	1.25
	RI2	4.32	0.76	-0.95	1.00
	RI3	4.34	0.78	-1.16	1.51
	RI4	4.40	0.69	-1.17	2.45

Note. Construct-level means: $CC = 4.31$, $CQ = 4.10$, $DCS = 4.27$, $PSD = 4.36$, $SAS = 4.36$, $RI = 4.34$ (all on a 1-5 scale).

Table 3 reports each indicator's standardized outer loading on its designated construct. All loadings exceeded the recommended of 0.708 (Hair et al., 2019); ranging from 0.774 (CC1) to 0.931 (PSD4). CC1 (0.774) and CC2 (0.792) were the lowest-loading items but still exceeded the criterion and were retained. The remaining loadings ranged from 0.834 to 0.931, supporting indicator reliability.

Table 3. Outer loadings of indicators on their designated constructs

Constructs	Items	λ	Constructs	Items	λ
Competition Quality (CQ)	CQ1	0.834	Psychosocial Development (PSD)	PSD1	0.862
	CQ2	0.868		PSD2	0.915
	CQ3	0.889		PSD3	0.862
	CQ4	0.852		PSD4	0.931
Dual-Career Support (DCS)	DCS1	0.842	Student-Athlete Satisfaction (SAS)	SAS1	0.909
	DCS2	0.851		SAS2	0.901
	DCS3	0.895		SAS3	0.882

Constructs	Items	λ	Constructs	Items	λ
Coach Competency (CC)	DCS4	0.912	Retention Intention (RI)	SAS4	0.835
	CC1	0.774		RI1	0.888
	CC2	0.792		RI2	0.873
	CC3	0.879		RI3	0.905
	CC4	0.900		RI4	0.894

Note. λ = standardized outer loading, as reported in the structural model diagram (Figure 2). All loadings were significant at $p < .001$ based on the accompanying bootstrap analysis.

Internal consistency reliability was excellent across all constructs, with Cronbach's alpha, rho_A, and composite reliability (rho_C) values all exceeding the 0.70 minimum criterion. Convergent validity was supported, with AVE values for all constructs ranging from 0.702 to 0.798, well above the 0.50 minimum threshold (Table 4).

Table 4. *Measurement model: Reliability and convergent validity*

Constructs	Cronbach's α	rho_A	Composite (rho_C)	Reliability	AVE
Coach Competency (CC)	0.857	0.870	0.904		0.702
Competition Quality (CQ)	0.884	0.887	0.920		0.741
Dual-Career Support (DCS)	0.898	0.899	0.929		0.766
Psychosocial Development (PSD)	0.915	0.918	0.940		0.798
Student-Athlete Satisfaction (SAS)	0.905	0.908	0.934		0.778
Retention Intention (RI)	0.912	0.913	0.938		0.792

Discriminant validity was evaluated using the Heterotrait-Monotrait ratio (HTMT) across all fifteen construct pairs (Table 5). Twelve of the fifteen pairs fell below the conservative 0.90 threshold, ranging from 0.632 (CC-CQ) to 0.885 (SAS-RI). Three pairs exceeded this threshold: Competition Quality and Dual-Career Support (HTMT = 0.926), Psychosocial Development and Student-Athlete Satisfaction (HTMT = 0.950), and Psychosocial Development and Retention Intention (HTMT = 0.953), indicating conceptual overlap between these constructs in the present sample. For the three elevated pairs, bootstrapped 95% confidence intervals did not include 1 (CQ-DCS [0.865, 0.974]; PSD-SAS [0.889, 0.992]; PSD-RI [0.893, 0.999]), so discriminant validity was not formally rejected under the HTMT inference criterion, but the elevated ratios are flagged as an important interpretive caveat addressed in Section 5.6.

Table 5. *Discriminant validity: Complete HTMT matrix (All 15 Construct Pairs)*

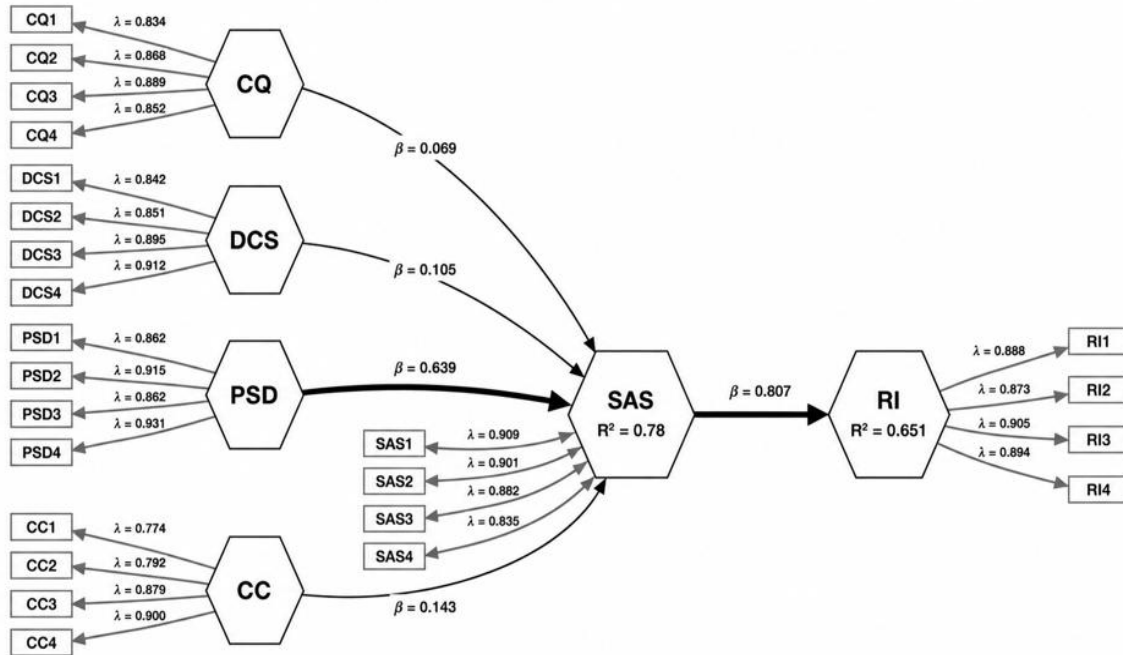
Construct Pair	HTMT	Below 0.90?
CC ↔ CQ	0.632	Yes
CC ↔ DCS	0.747	Yes
CC ↔ PSD	0.756	Yes
CC ↔ SAS	0.768	Yes
CC ↔ RI	0.691	Yes
CQ ↔ DCS	0.926	No
CQ ↔ PSD	0.777	Yes
CQ ↔ SAS	0.758	Yes
CQ ↔ RI	0.799	Yes
DCS ↔ PSD	0.879	Yes
DCS ↔ SAS	0.848	Yes
DCS ↔ RI	0.860	Yes
PSD ↔ SAS	0.950	No
PSD ↔ RI	0.953	No
SAS ↔ RI	0.885	Yes

Note. HTMT = Heterotrait-Monotrait ratio of correlations (Henseler et al., 2015). Threshold = 0.90. Twelve of fifteen pairs (80%) fall below the conservative threshold. 95% bootstrapped confidence intervals for the three pairs at or above 0.90 are reported in the text above and did not include 1 (CQ-DCS [0.865, 0.974]; PSD-SAS [0.889, 0.992]; PSD-RI [0.893, 0.999]).

Structural model and hypothesis testing

The structural model explained a substantial variance in both endogenous constructs: Student-Athlete Satisfaction ($R^2 = .780$) and Retention Intention ($R^2 = .651$). Hypotheses were evaluated using 5,000 bootstrap resamples and 95% confidence intervals. Figure 2 presents the estimated model, including standardized outer loadings (λ) and structural path coefficients (β); detailed path statistics are reported in Table 6.

Figure 2. Structural model results (PLS-SEM, *seminr*, $N = 154$)



Note. λ = standardized outer loading; β = standardized path coefficient. Bold arrows denote significant paths (H1, H4, H5); thin arrows denote non-significant paths (H2, H3).

Table 6. Structural path coefficients and hypothesis testing

Hypothesis (Path)	β	t-value	95% CI	Decision
H1: CC $\rightarrow$ SAS	0.143	1.611	[0.033, 0.370]	Supported*
H2: CQ $\rightarrow$ SAS	0.069	0.806	[-0.103, 0.234]	Not supported
H3: DCS $\rightarrow$ SAS	0.105	0.911	[-0.122, 0.326]	Not supported
H4: PSD $\rightarrow$ SAS	0.639	7.006	[0.443, 0.800]	Supported***
H5: SAS $\rightarrow$ RI	0.807	17.369	[0.705, 0.885]	Supported***

* For H1 (CC $\rightarrow$ SAS), the *t*-statistic (1.611) falls marginally below the conventional two-tailed threshold of 1.96; however, the bootstrapped 95% confidence interval [0.033, 0.370] excludes zero, so the path is reported as statistically significant on the basis of the bootstrap confidence interval per Hair et al. (2019). *** $p < .001$.

Table 7. *Coefficient of determination (R²)*

Endogenous Constructs	R ²	Adjusted R ²	Interpretation
Student-Athlete Satisfaction (SAS)	0.780	0.774	Substantial
Retention Intention (RI)	0.651	0.649	Substantial

Note. Interpretation follows Hair et al.'s (2019) benchmarks for R² in behavioral PLS-SEM models (approximately 0.75 = substantial, 0.50 = moderate, 0.25 = weak).

Psychosocial Development emerged as by far the strongest predictor of Student-Athlete Satisfaction ($\beta = 0.639$, $t = 7.006$), supporting H4. Coach Competency showed a small positive effect on satisfaction that was significant by the bootstrap confidence interval criterion ($\beta = 0.143$, $t = 1.611$), providing qualified support for H1. Competition Quality ($\beta = 0.069$) and Dual-Career Support ($\beta = 0.105$) were not statistically significant predictors of Student-Athlete Satisfaction in this sample; H2 and H3 were therefore not supported. Student-Athlete Satisfaction was a very strong predictor of Retention Intention ($\beta = 0.807$, $t = 17.369$), supporting H5 and confirming satisfaction as the central proximal mechanism linking the upstream predictors to athletes' continuation intentions. As reported in Table 7, the model explained a substantial share of variance in both endogenous constructs (SAS: $R^2 = .780$, adjusted $R^2 = .774$; RI: $R^2 = .651$, adjusted $R^2 = .649$), consistent with Hair et al.'s (2019, 2022) benchmarks for behavioral PLS-SEM models.

Because satisfaction was specified as the sole proximal predictor of retention intention, no direct paths from CC, CQ, DCS, or PSD to RI were estimated. Thus, under this full-mediation specification, the exogenous constructs cannot explain RI independently of their modeled association with SAS. Multiplying each direct standardized coefficient by the SAS $\rightarrow$ RI coefficient provides descriptive point estimates of the implied indirect ordering (.516 for PSD, .115 for CC, .085 for DCS, and .056 for CQ). These products are approximations only: they have no bootstrapped confidence intervals and must not be interpreted as formally tested indirect effects.

Discussion

This study examined whether dual-career support, competition quality, coach competency, and psychosocial development jointly predict student-athlete satisfaction, and whether satisfaction in turn predicts retention intention, among 154 student-athletes in the Jambi School Football League. Three of five hypotheses were fully supported (H4, H5, and, with the qualification discussed below, H1), while two were not supported (H2, H3), yielding a more differentiated and, in some respects, theoretically surprising pattern than originally anticipated. Figure 2 (Section 4.2) summarizes the estimated structural model, including standardized outer loadings, standardized path coefficients, and the R² of each endogenous construct, and is referenced throughout the sections below.

Psychosocial development as the dominant predictor, psychosocial development emerged as the strongest predictor of student-athlete satisfaction ($\beta = .639$), substantially exceeding the other

paths in the model. This pattern aligns with PYD theory (Fraser-Thomas et al., 2005; Lerner et al., 2005), and with evidence from Ethiopian youth sport academies, where psychological-need satisfaction predicted developmental outcomes with coefficients of approximately $\beta = .30-.45$ after contextual factors were considered (Tadesse et al., 2022). Although the constructs and outcomes are not identical, the comparison indicates that the JSFL estimate is unusually large. It should therefore be read alongside the PSD–SAS HTMT value of .950: measurement overlap may inflate the path, and $\beta = .639$ is best treated as an upper-bound estimate pending confirmatory replication.

Why might psychosocial development dominate structural and organizational variables in an emerging, education-embedded system? The heuristic proposed here is that dual-career support and competition quality may operate mainly by removing barriers: they matter when absent or poor but may add little satisfaction once a minimally acceptable level is reached. Psychosocial development, by contrast, speaks directly to adolescents' developmental tasks identity formation, self-efficacy, and social belonging and may therefore function as an active satisfaction driver. This distinction is an interpretation generated by the present integration, not a received sport-management theory. It predicts that developmental dominance should weaken as systems professionalize and competitive stakes rise, providing a testable boundary condition for comparisons across school, academy, and elite tiers.

The qualified role of coach competency, coach competency showed a small, qualified positive effect on satisfaction ($\beta = .143$), partially replicating prior work linking perceived coaching competency to athlete outcomes (Boardley et al., 2008; Myers, 2013). The bootstrap interval excluded zero [.033, .370], but the t-value (1.611) was below the conventional two-tailed 1.96 threshold. Because these inferential summaries are not fully aligned, H1 should be interpreted cautiously and replicated with a larger sample. A plausible mechanism is that coaches influence satisfaction partly through the psychosocial experiences they facilitate rather than through an entirely separate direct pathway. This possibility was not tested and should be examined in a prespecified mediation model.

Non-significant effects of competition quality and dual-career support, contrary to the original hypotheses, neither competition quality nor dual-career support significantly predicted student-athlete satisfaction once coach competency and psychosocial development were accounted for in the same model. This does not necessarily mean these constructs are unimportant to Indonesian student-athletes; rather, several explanations merit consideration. First, the elevated HTMT ratio between competition quality and dual-career support (0.926) suggests these two constructs may not be as empirically distinct in this sample as theorized, potentially producing multicollinearity that suppresses each construct's unique explanatory contribution once both are entered simultaneously alongside coach competency and psychosocial development. Second, it is plausible that competition quality and dual-career support operate on retention indirectly, through their influence on psychosocial development or coach competency, rather than through a direct path to satisfaction—a possibility not tested in the present model but consistent with the theoretical literature (Stambulova et al., 2015; Yoshida & James, 2010) and worth examining in a revised, sequential-mediation specification. Third, from a substantive standpoint, it may be that for Indonesian secondary-school student-athletes—for whom football participation is embedded within a compulsory education system rather than an elective, resource-intensive elite pathway—the logistical friction addressed by

dual-career support and the organizational polish addressed by competition quality are less salient to day-to-day satisfaction than the relational and developmental experience of the sport itself.

Satisfaction as the central mechanism for retention, the very strong association between student-athlete satisfaction and retention intention ($\beta = 0.807$) supports satisfaction as the model's proximal psychological mechanism. Its magnitude is notable relative to adjacent continuation research: Keshtidar & Behzadnia (2017) reported a correlation of $r = 0.37$ between autonomous motivation and intention to continue sport and explained 15% of intention variance, whereas the present model explained 65.1%. These are contextual not like-for-like comparisons because the predictors, samples, and estimators differ; nevertheless, they underscore the unusually prominent role of satisfaction in the JSFL model and reinforce the need for replication, particularly given the elevated PSD RI HTMT ratio.

Implications for sport management and physical education, for sport management practice, the findings support a sequenced intervention strategy: (1) design training and competition experiences that explicitly develop life skills, character, connection, self-direction, and confidence; (2) strengthen coach education in motivational and character-building competencies; and (3) improve competition quality and dual-career support as complementary enabling conditions. A practical starting point is the Teaching Personal and Social Responsibility (TPSR) model, which embeds respect, effort, self-direction, leadership, and transfer beyond sport into structured sessions. A recent meta-analysis found positive emotional and social outcomes from TPSR-based physical education programs (Aygün et al., 2024). JSFL administrators could incorporate a responsibility focus, brief reflection, athlete leadership roles, and explicit transfer discussions into weekly coaching plans, while monitoring fidelity and developmental outcomes. These steps translate the PYD emphasis into observable coaching practice rather than treating it as a general aspiration.

Discriminant validity risk between psychosocial development and satisfaction, the single most important qualification to this study's central finding concerns the elevated HTMT ratio between Psychosocial Development and Student-Athlete Satisfaction (HTMT = 0.950, 95% CI [0.889, 0.992]). Although this interval does not formally cross the upper bound of 1 and therefore does not trigger outright rejection of discriminant validity under the Henseler et al. (2015) criterion, a ratio this close to the ceiling means the two constructs are, empirically, sharing the large majority of their indicator variance in this sample. Practically, this raises a specific interpretive risk: part of what the model attributes to "PSD predicting SAS" ($\beta = 0.639$) may instead reflect two overlapping measures of a single underlying psychological state a generalized sense of positive experience in the sport program rather than two conceptually and empirically distinct constructs in a genuine causal sequence. If this is the case, the reported path coefficient should be read as an upper-bound estimate of the PSD $\rightarrow$ SAS relationship rather than a precise effect size, and the claim that psychosocial development is the "dominant predictor" of satisfaction (Section 5.1) should be treated as provisional pending confirmatory work with more discriminant item sets. The same caution extends, to a lesser but non-trivial degree, to the HTMT between PSD and Retention Intention (0.953) and between Competition Quality and Dual-Career Support (0.926); in the latter case, this overlap offers one plausible explanation for why both CQ and DCS failed to reach significance once entered into the same model (Section 5.3), since two highly correlated predictors can suppress each other's unique

variance even when each retains a genuine, if smaller, independent relationship with the outcome.

The administered item content suggests a possible basis for the PSD-SAS overlap. PSD3 concerns mental strength and confidence in facing everyday challenges, whereas SAS1 concerns enjoyment of the league experience and SAS3 concerns satisfaction with interactions with teammates and coaches (Appendix A). A broadly favorable appraisal of the league could contribute to responses across these item sets, despite their different referents. This is a possible interpretation of the item content, not an empirically established explanation of the elevated HTMT ratio. The language review by three researcher colleagues did not assess whether these constructs were sufficiently distinct.

Three courses of action are recommended before this specific finding is treated as conclusive. First, the item content of the PSD and SAS scales should be re-examined qualitatively (e.g., through cognitive interviewing with a small sample of student-athletes) to identify and reword or remove items that may be eliciting near-identical responses. Second, a confirmatory factor analysis with a fixed correlation test (e.g., constraining the inter-construct correlation to 1 and comparing model fit via a chi-square difference test) could provide a more formal test of whether PSD and SAS are statistically distinguishable in this population. Third, and most directly, the structural model should be re-estimated after removing or combining the most highly cross-loading items, to determine whether the PSD → SAS path coefficient remains large and significant, shrinks substantially, or the two constructs collapse into one any of which would materially change the study's substantive conclusions and should be reported transparently in any subsequent revision or replication.

Additional limitations, several further limitations qualify these conclusions. First, the cross-sectional design precludes causal inference; longitudinal designs tracking athletes across seasons would strengthen claims about the temporal ordering of psychosocial development, satisfaction, and retention. Second, retention intention, rather than actual behavioral retention, was measured. Third, the elevated HTMT ratio between competition quality and dual-career support (Section 5.3) similarly indicates that discriminant validity, while not formally violated by the confidence-interval criterion, is a genuine concern beyond the PSD-SAS pair discussed above; future work should revisit item content across all overlapping scales to sharpen conceptual boundaries. Fourth, the sample ($N = 154$) is adequate but modest for a model of this complexity, and the borderline $CC \rightarrow SAS$ effect in particular warrants replication with a larger, ideally multi-region, sample. Fifth, the sample was drawn from a single regional league within one Indonesian province, limiting generalizability to other regions, school levels, or sports. Finally, the model as specified tested only indirect (fully mediated) effects of the four exogenous constructs on retention intention via satisfaction; a model additionally specifying direct paths to retention intention, and/or sequential mediation among the exogenous constructs themselves, would provide a more complete test of the underlying theoretical mechanisms and is recommended for future research.

Voluntary recruitment through teachers and coaches may also have introduced self-selection bias. The absence of recruitment records prevents assessment of school-level coverage and calculation of a response rate, limiting evaluation of nonresponse and sample representativeness. In addition, the study-specific questionnaire received a qualitative review of language and comprehension, but formal content validity was not established. Future

research should assess item relevance and construct coverage through a documented content-validation procedure and cognitive interviews with student-athletes.

Conclusion

This study's central theoretical contribution is to show that, within a hybrid, education-embedded football system, developmental predictors can dominate the structural and organizational predictors that anchor much of the existing dual-career and sport service-quality literature. Rather than simply reporting that four predictors were tested and one prevailed, the findings suggest a boundary condition for existing theory: dual-career support and competition quality may function more as participation-enabling "hygiene" conditions than as direct satisfaction drivers in settings where sport is compulsory-education-embedded rather than elective and competition-first, whereas psychosocial development speaks directly to adolescents' core developmental tasks and may therefore carry disproportionate weight in shaping satisfaction and retention. This reframes the practical contribution as well: rather than treating coaching, competition organization, and dual-career accommodation as competing investment priorities, school football administrators and physical education policymakers are better served by treating psychosocial development as the primary design target for programs, with coaching quality as a secondary but genuine lever, and competition-quality and dual-career improvements as longer-horizon, complementary investments whose benefits may be realized indirectly.

Future investigations should adopt longitudinal designs to establish temporal ordering and test the proposed hygiene-versus-driver framing across educational and competitive levels. Prespecified sequential and multiple-mediation models could examine whether competition quality and dual-career support operate through coaching and developmental experiences. Measurement refinement particularly for the PSD, SAS, RI, CQ, and DCS item sets and replication across regions, educational tiers, and sports beyond football are also required to establish the model's boundary conditions.

Disclosure Statement

No potential conflicts of interest were reported by the authors.

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