



The Contribution of *Passing* Skills and *IQ* to the Success of Constructive Build-Up by U-16 Players

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Abstract

This study examined the contributions of passing skill and intelligence quotient (IQ) to successful constructive build-up play among U-16 soccer players at SSB Galasiswa. Constructive build-up was operationally defined as the organized development of an attack from the defensive line toward midfield and the attacking line through ball retention, passing accuracy, decision-making, ball control, and off-the-ball movement. A quantitative correlational design was used with a saturated sample of 25 U-16 players. Data were obtained through a passing test, the Culture Fair Intelligence Test (CFIT), and a performance assessment during a 5-a-side small-sided game. Simple and multiple correlations were analyzed. Passing was positively correlated with constructive build-up success ($r = .716$, $R^2 = .512$, $p < .001$), and IQ also showed a positive correlation ($r = .507$, $R^2 = .257$, $p = .010$). Simultaneously, passing and IQ were associated with build-up success ($R = .756$, $R^2 = .572$, $F(2, 22) = 14.70$, $p < .001$). Passing was the stronger contributor, while IQ provided an additional contribution related to information processing and decision-making during build-up play.

Keywords: passing, intelligence quotient, constructive build-up, U-16 players, soccer

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A. Introduction

Soccer is an invasion game that requires players to integrate technical skills with an understanding of game situations. During possession, passing transfers the ball between teammates to retain possession, change the direction of play, and advance the attack (Nurcahyo & Kusnandar, 2022). In this study, constructive build-up was operationally defined as the organized development of an attack from the defensive line toward midfield and the attacking line through a sequence of actions that maintains possession. Its success was assessed through passing accuracy, decision-making accuracy, ball control, and active movement to create space (Danurwindo et al., 2017).

Preliminary observations of the U-16 players at SSB Galasiswa showed variation in their ability to retain possession and develop attacks. Some players passed accurately, controlled the ball effectively, and moved into spaces that supported attacking progression, whereas others frequently misplaced passes, made decisions slowly, and failed to create passing options. These conditions indicate that successful build-up may be associated not only with the technical execution of passing but also with the player's capacity to process information and select an appropriate response within a limited time.

Passing is a fundamental skill that supports continuity of possession and coordination among players (Febrianto, 2016; Rustanto, 2017). Players with strong passing ability can direct the ball according to the positions of teammates, pressure from opponents, and available space. During build-up, passing quality must be connected to situational perception because players need to evaluate risk, select a target, and execute an action before the game configuration changes. Passing should therefore be understood not merely as a technical movement but as a technical-tactical action performed in a dynamic playing environment.

In addition to technical skill, soccer involves cognitive processes such as attention, pattern recognition, anticipation, working memory, action selection, and outcome evaluation (Habekost et al., 2024). Research involving adolescent players has also indicated an association between cognitive functioning and game performance (Sabarit et al., 2020). However, the CFIT measures general nonverbal intelligence rather than soccer-specific tactical intelligence. Its association with build-up performance therefore needs to be tested empirically and interpreted cautiously.

Previous studies have more frequently examined passing accuracy or cognitive

functioning separately, while evidence concerning their simultaneous contribution to constructive build-up in a small-sided game among U-16 players remains limited. The novelty of this study lies in testing a combined technical factor and general intelligence against a build-up performance indicator that is more representative of actual play. This study therefore aimed to analyze: (1) the contribution of passing skill to successful constructive build-up; (2) the contribution of IQ to successful constructive build-up; and (3) the simultaneous contribution of passing skill and IQ to successful constructive build-up among U-16 players

at SSB Galasiswa.

B. Methods

This study employed a quantitative correlational design to examine the relationships between two predictor variables, passing skill (X1) and intelligence quotient/IQ (X2), and successful constructive build-up (Y). This design identifies the strength of statistical relationships and does not establish causality. The population comprised all U-16 players at SSB Galasiswa, and all 25 players were included through saturated sampling.

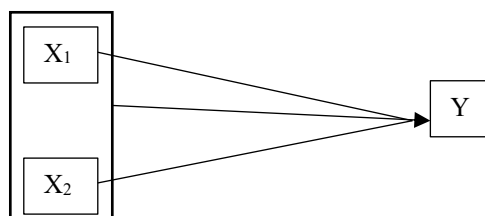


Figure 1. Research Design

Source: Syafrida (2021)

Notes:

X1: Passing skill

X2: Intelligence quotient (IQ)

Y: Successful constructive build-up

Passing skill was measured through three straight-pass attempts over a distance of 7 meters, with observations covering the preparatory position, execution, and follow-through. Intelligence quotient was measured using the Culture Fair

Intelligence Test (CFIT), which consists of 50 items across four subtests and requires 30 minutes to complete. Constructive build-up performance was assessed during a 10-minute 5-a-side small-sided game using four indicators: passing accuracy, decision-making accuracy, ball control, and active movement to create space. Ten assessors observed player performance during the test. The source document did not report validity or reliability

coefficients for the passing test or build-up rubric and did not provide inter-rater reliability. The findings related to these instruments should therefore be interpreted cautiously, and future studies should report content validity and the intraclass correlation coefficient (ICC) among assessors. Analyses were conducted using SPSS 16. The r values for simple relationships and R for the simultaneous relationship were obtained from the square root of R^2 . The significance of each simple relationship was evaluated using t with $df = 23$, while the multiple model was evaluated using F with $df = (2, 22)$, at $\alpha = .05$. Outputs for normality, linearity, homoscedasticity, and outlier checks were unavailable in the source document and could not be reported without additional data; this limitation was considered when interpreting the results.

C. Results and Discussion

Passing skill showed a strong positive relationship with successful constructive build-up ($r = .716$, $R^2 = .512$, $t(23) = 4.91$, $p < .001$). Thus, 51.2% of the variance in

build-up scores was associated with variation in passing skill within this sample. This percentage is a coefficient of determination and does not demonstrate a causal effect.

IQ showed a moderate positive relationship with successful constructive build-up ($r = .507$, $R^2 = .257$, $t(23) = 2.82$, $p = .010$). Accordingly, 25.7% of the variance in build-up scores was associated with variation in IQ scores. This relationship was weaker than the relationship between passing skill and build-up performance.

Simultaneously, passing skill and IQ were strongly associated with successful constructive build-up ($R = .756$, $R^2 = .572$, $F(2, 22) = 14.70$, $p < .001$). Together, the two predictors explained 57.2% of the variance in build-up scores, while the remaining 42.8% was associated with factors not included in the model. The combined R^2 exceeded the passing-only R^2 by 6.0 percentage points; however, the unique contribution of each predictor cannot be determined precisely without the regression coefficient table.

Table 1. Regression Coefficient

Relationship	n	r/R	R ²	Test statistic	df	p
Passing → build-up	25	.716	.512	$t = 4.91$	23	< .001
IQ → build-up	25	.507	.257	$t = 2.82$	23	.010
Passing + IQ → build-up	25	.756	.572	$F = 14.70$	2, 22	< .001

The results showed that passing skill had a stronger relationship with successful build-up than IQ. This finding is reasonable because passing is the principal action used to maintain ball circulation and shift the point of attack. Accurate passes reduce turnovers, give teammates time to organize their positions, and allow the ball to progress beyond opposing lines of pressure. This result is consistent with Parulian et al. (2026), who identified passing accuracy as an important element of ball possession and chance creation. In practice, coaches should train passing quality under pressure rather than accuracy only in unopposed situations. The association between IQ and build-up suggests that general cognitive capacity may support information processing but is not equivalent to game intelligence. A cognitive model of soccer proposes that play proceeds through situation assessment, response selection and execution, and outcome evaluation (Habekost et al., 2024). During this process, players must monitor the positions of teammates and opponents, recognize space, and select an option within a limited time. Sabarit et al. (2020) similarly reported an association between cognitive functioning and game performance among adolescent players. Nevertheless, the

weaker relationship for IQ than for passing supports the view that a general cognitive test does not fully capture soccer-specific knowledge and decision-making. The combined R^2 of .572 also indicates that build-up success is not determined solely by these two predictors. Visual scanning, body orientation, first-touch quality, understanding of positional principles, teammate support, opponent pressure, and playing experience may also contribute. Integrative training that combines technical and cognitive demands is recommended for young players because soccer requires perception, decision-making, and action to occur together (Mao, 2024). Coaches can use rondos and small-sided games with ball-progression rules, touch restrictions, target zones, and video-based feedback to develop passing accuracy and action selection simultaneously. Interpretation of these findings is limited by the correlational design, the small sample from a single soccer school, the absence of instrument validity and reliability statistics, and the unavailability of assumption-test and inter-rater reliability results.

D. Conclusion

Passing skill was strongly and positively associated with successful constructive build-up among U-16 players ($r = .716$; $R^2 = .512$), whereas IQ showed a

moderate positive relationship ($r = .507$; $R^2 = .257$). Simultaneously, passing skill and IQ were strongly associated with build-up success ($R = .756$; $R^2 = .572$). These findings indicate that build-up training should integrate technical passing proficiency with perceptual and decision-making demands. Coaches are encouraged to use representative game-based practices, such as rondos and small-sided games, that require players to scan their surroundings, create supporting angles, and select passing options under pressure.

The limitations of this study include the small sample drawn from a single soccer school, a correlational design that does not support causal conclusions, the use of the CFIT as a measure of general intelligence rather than soccer-specific tactical decision-making, and the absence of reported instrument validity and reliability, inter-rater reliability, descriptive statistics, and assumption-test results. Future studies should employ multisite samples, game-situation-based decision-making instruments, a validated build-up rubric, inter-rater ICC, and longitudinal or experimental designs.

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