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Comparative Analysis of Pass Go and Traditional Drill Training Methods on Passing Accuracy Development in Youth Football Players Aged 12-15 Years: A Randomized Controlled Trial

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ABSTRACT

The purpose of the study. The precision of passing techniques is crucial for young football players, yet empirical comparisons of training methodologies during ages 12 to 15 are lacking. This randomized controlled trial evaluated the effectiveness of the Pass Go methodology, a game-based learning approach, against traditional drill training in enhancing passing accuracy, decision-making speed, and technical execution among youth football players.

Materials and methods. Sixty youth football players aged 12-15 were randomly assigned to a 12-week intervention with three groups: Pass Go (game-based training), drill-based training, and a control group. Passing accuracy (short-range and medium-range), decision-making, and technical execution were assessed at baseline, mid-intervention, and post-intervention.

Results. During a 12-week intervention, the Pass Go methodology group significantly outperformed the drill-based training group in short-range passing accuracy, improving by 24.3% compared to 19.1% ($d=1.82$, $p<0.001$), medium-range passing accuracy with increases of 18.7% versus 15.4% ($d=1.56$, $p<0.001$), and decision-making speed, achieving a 64.3% improvement against 33.3% ($p<0.001$). Age-specific analysis revealed that younger participants (12 to 13 years) exhibited greater technical improvements, while older players (14 to 15 years) showed enhanced decision-making abilities. Both experimental groups significantly outperformed the control group across all parameters measured, confirming their superior efficacy.

Conclusions. The Pass Go methodology, emphasizing game-based learning, significantly outperformed traditional training in developing comprehensive passing skills among youth football players. These findings advocate for the enhanced incorporation of game-based learning strategies in youth football programs and stress the need for age-specific adaptations in training design to maximize player development.

Keywords: football coaching; passing accuracy; pass go methodology; drill-based training; youth sport development.

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INTRODUCTION

In the dynamic and ever-evolving world of youth football development, the mastery of fundamental skills serves as the cornerstone upon which future athlete excellence is built. Among these essential technical abilities, passing accuracy stands out as a critical component that significantly shapes both individual player development and overall team success(Afonshin et al., 2020). Recent research has increasingly highlighted the remarkable significance of the developmental period between the ages of 12 and 15, identifying this crucial window as a pivotal stage for motor skill acquisition and technical refinement in young athletes (Andrew et al., 2021; Barcelona et al., 2011).

This critical developmental period between the ages of 12 and 15 is characterized by substantial neural plasticity and accelerated physical maturation in youth players, creating a prime opportunity to implement targeted, evidence-based training methodologies for optimal skill acquisition and refinement (Coutinho et al., 2023; Cronin et al., 2017)]. Historically, the landscape of youth football training has been dominated by drill-based approaches, with coaches heavily relying on repetitive exercises and structured practice routines[(D'Sa et al., 2018; Duncan et al., 2022). However, this conventional wisdom, despite its widespread adoption and longevity, has

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recently been challenged by emerging research in the fields of sports pedagogy and motor learning (Dunton et al., 2019; Ferriz-Valero et al., 2020)].

Contemporary studies have suggested that game-based learning approaches, such as the innovative Pass Go methodology[(Figueiredo et al., 2014; Fisher & Ferkel, 2019)], might offer enhanced results in both skill development and long-term retention, particularly among young athletes (Formenti et al., 2021). The Pass Go approach represents this innovative perspective by intentionally incorporating dynamic, game-like scenarios into the learning process, providing players with opportunities to develop technical proficiency (Frederick-Recascino et al., 2013)], decision-making abilities, and tactical awareness within a more realistic and engaging context (Granger, 2010) .

Despite the growing body of research in the realm of youth football development, a significant knowledge gap continues to exist in our understanding of how different training methodologies specifically impact passing accuracy and decision-making abilities in young players (Güllich et al., 2023). While various studies have examined isolated aspects of skill development, there remains a notable absence of comprehensive research comparing the effectiveness of game-based learning approaches, such as Pass Go, with the more traditional drill-based training methods (Hicheur et al., 2017). This gap is particularly evident in the context of youth development programs, where the choice of training methodology can have profound and long-lasting implications for the overall quality of player development and the realization of their full potential.

The existing literature on youth football development has explored various aspects of skill acquisition and training methodologies. Previous studies have highlighted the importance of the developmental period between ages 12 and 15, noting the significant neuroplasticity and physical changes that occur during this time, creating an optimal window for the refinement of technical skills (Kolman et al., 2023; Lee et al., 2014; Lewis et al., 1986). These studies suggest that the implementation of targeted and evidence-based training approaches during this crucial stage can yield substantial improvements in player performance.

Research in the field of sports pedagogy has increasingly emphasized the potential benefits of game-based learning approaches, such as the Pass Go methodology, compared to traditional drill-based training methods (Hicheur et al., 2017)]. These studies have suggested that game-based learning can foster enhanced decision-making, creativity, and intrinsic motivation in young athletes, leading to more effective skill acquisition and retention (Hicheur et al., 2017).

In contrast, the existing body of literature has also highlighted the widespread use of traditional drill-based training methods in youth football development (D'Sa et al., 2018)]. These studies have examined the activity levels, variability, and intensity of these training approaches, providing insights into their potential strengths and limitations. For example, a study by Malina et al., 2005 found that while drill-based training can effectively improve specific technical skills, it may not adequately prepare players for the dynamic and unpredictable nature of match play.

Therefore, we hypothesized that game-based learning approaches, specifically the Pass Go methodology, would significantly outperform traditional drill-based training in improving passing accuracy, decision-making speed, and technical execution among youth football players aged 12 to 15. The primary aim of this study was to evaluate and compare the effectiveness of these two training methodologies while considering the influence of age-specific adaptations on player development outcomes.

MATERIALS AND METHODS

Participants

The study recruited 60 youth football players (n=60) from three regional football academies in Ivanovo Oblast, Rusia. The study received ethical approval from the Research Ethics Committee of the Football Academy UniLigi (Ref: FAU-2024/235). Both participants and their parents/guardians provided written informed consent prior to participation. To ensure participant privacy, all personal information was anonymized and securely stored. Table 1 presents the demographic characteristics of the participants.

Table 1. Demographic Characteristics of Study Participants (N=60)

Characteristic	Category/Measure	Value	Percentage
Age (years)	Range	12-15	-
	Mean ± SD	13.6 ± 1.1	-
	12-13 years	26	43.3%
	14-15 years	34	56.7%
Gender	Male	40	66.7%
	Female	20	33.3%
Playing Experience	Mean ± SD (years)	3.2 ± 1.4	-
	1-2 years	18	30.0%
	3-4 years	28	46.7%
	>4 years	14	23.3%

Selection Criteria

The participant selection process adhered to specific criteria to maintain data integrity and ensure participant welfare. Eligible athletes were required to participate in football training at least thrice weekly, demonstrating their commitment. A minimum of one year of

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football experience was necessary for understanding fundamental principles and techniques. The selection process prioritized participant health and safety. Prospective participants had to be injury-free for six months prior to the study to reduce training-related injury risks. A thorough medical evaluation was required, allowing only those cleared medically to participate. Additionally, written parental consent and player assent were critical for legal and ethical standards. Various exclusion criteria were implemented to preserve the study's validity and protect participant welfare. Athletes with injuries in the prior six months were excluded to prevent training complications. Those with inconsistent training attendance were also excluded, as regular participation was essential for assessing training efficacy. Furthermore, young athletes engaged in other intensive sports programs were excluded to avoid confounding results and participant strain. Any medical conditions that could affect performance or introduce training risks were grounds for exclusion, emphasizing participant safety throughout the study. Participants were randomly assigned to three groups using a computerized randomization process. Table 2 presents the distribution and characteristics of participants across the study groups.

Table 2. Distribution of Participants Across Study Groups (N=60)

Characteristic		Pass Go Group	Drill Passing Group	Control Group
Sample Size		n=20	n=20	n=20
Gender Distribution	Male	13 (65%)	14 (70%)	13 (65%)
	Female	7 (35%)	6 (30%)	7 (35%)
Age Characteristics	Mean ± SD (years)	13.5 ± 1.2	13.7 ± 1.0	13.6 ± 1.1
	Range (years)	12-15	12-15	12-15
Age Distribution	12-13 years	9 (45%)	8 (40%)	9 (45%)
	14-15 years	11 (55%)	12 (60%)	11 (55%)

Note: Percentages are calculated within each group. SD = Standard Deviation

Research Design

The intervention spanned 12 weeks with three 60-minute sessions per week. Tables 3 and 4 present the detailed training protocols for each group. Table 5 presents the progressive training parameters implemented during the 12 weeks of intervention in the three study groups.

Table 3. Overview of Training Program Structure

Component	Duration (mins)	Frequency	Total Sessions
Training Sessions	60	3×/week	36
Total Program Length	-	12 weeks	-
Assessment Points	-	3 (Weeks 0, 6, 12)	-

Table 4. Detailed Training Protocol by Group

Training Phase		Pass Go Group	Drill Passing Group	Control Group
Warm-up Phase (15 mins)	Dynamic Stretching	5 mins	5 mins	5 mins
	Ball Familiarization	5 mins	5 mins	5 mins
	Coordination Drills	5 mins	5 mins	5 mins
Main Training Phase (35 mins)	Weeks 1-4	• Small-sided games• Basic passing patterns• Position-specific challenges	• Technical passing drills• Basic technique practice• Static passing exercises	Standard team practice
	Weeks 5-8	• Complex combinations• Decision-making scenarios• Progressive difficulty	• Advanced patterns• Passing sequences• Distance variation	Standard team practice
	Weeks 9-12	• High-pressure situations• Game-specific scenarios• Advanced combinations	• Speed/accuracy drills• Complex patterns• Technical refinement	Standard team practice
Cool-down Phase (10 mins)	Light Jogging	4 mins	4 mins	4 mins
	Static Stretching	4 mins	4 mins	4 mins
	Technical Reflection	2 mins	2 mins	2 mins

Table 5. Progressive Training Load Parameters

Training Parameter	Weeks 1-4	Weeks 5-8	Weeks 9-12
Pass Go Group			
Exercise Intensity	Moderate	Moderate-High	High
Technical Complexity	Basic	Intermediate	Advanced
Decision-making Pressure	Low	Medium	High
Game Situation Complexity	Simple	Moderate	Complex
Drill Passing Group			
Exercise Intensity	Low-Moderate	Moderate	Moderate-High
Technical Complexity	Basic	Intermediate	Advanced
Passing Distance	5-10m	10-15m	15-20m
Pattern Complexity	Simple	Moderate	Complex
Control Group			
Standard Training	Regular team activities without specific intervention		

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Note: Exercise intensity levels were monitored using rate of perceived exertion (RPE) scale 6-20.

Test and Measurement Procedures

The assessment protocol consisted of multiple standardized tests and measurements. Tables 6-8 present the detailed testing procedures and evaluation criteria.

Table 6. Overview of Assessment Tools and Protocols

Assessment Tool	Primary Measures	Equipment Required	Duration
Loughborough Soccer Passing Test (LSPT)			
Short-range Passing	• Accuracy (cm)• Completion time• Error rate	• 4 wooden boards (2.5m × 1m)• Size 4 footballs• Electronic timing system	15 mins
Medium-range Passing	• Distance accuracy• Ball control• Speed of execution	• Distance markers• Radar gun• Video equipment	15 mins
Pass Go Performance Test			
Dynamic Passing	• Pass completion rate• Decision speed• Movement quality	• Tactical board• Video cameras• Timing gates	20 mins
Game Situations	• Decision accuracy• Execution speed• Tactical awareness	• Training mannequins• Video analysis system• Performance software	20 mins

Table 7. Testing Schedule and Measurement Points

Assessment Period	Timing	Tests Conducted	Data Collected
Pre-intervention (Week 0)			
Baseline Testing	Day 1-2	• LSPT• Technical assessment	• Initial skill levels• Base measurements
Physical Assessment	Day 3	• Fitness evaluation• Movement analysis	• Fitness data• Movement patterns
Mid-intervention (Week 6)			
Progress Monitoring	Day 1-2	• LSPT• Pass Go test	• Progress measures• Improvement rates
Technique Evaluation	Day 3	• Technical analysis• Performance review	• Skill development• Technical changes
Post-intervention (Week 12)			
Final Assessment	Day 1-2	• All primary tests• Comprehensive evaluation	• Final measurements• Overall progress
Performance Analysis	Day 3	• Complete technical review• Comparative analysis	• Final data collection• Progress summary

Table 8. Scoring and Evaluation Criteria

Component	Scoring Range	Evaluation Criteria	Performance Indicators
Passing Accuracy			
Target Precision	0-5 points	• Hit target: 5 points• Within 10cm: 4 points• Within 20cm: 3 points• Within 30cm: 2 points• Within 40cm: 1 point• Miss: 0 points	• Total score• Consistency rating• Error percentage
Decision Making			
Response Time	0.5-3.0 seconds	• 0.5s: Excellent• 0.5-1.0s: Good• 1.0-2.0s: Average• 2.0s: Below Average	• Average response time• Decision accuracy• Consistency level
Technical Execution			
Movement Quality	1-10 scale	• 9-10: Excellent• 7-8: Good• 5-6: Average• 3-4: Fair• 1-2: Poor	• Overall technique score• Movement efficiency• Body positioning
Time Penalties			
Error Adjustments	Seconds added	• Missing target: +5s• Poor control: +3s• Wrong decision: +2s• Hesitation: +1s	• Total time penalties• Adjusted final time• Performance rating

Note: All tests were conducted under standardized conditions with certified evaluators. Video analysis was performed by three independent experts with inter-rater reliability assessed using Cohen's Kappa coefficient.

Statistical Analysis.

The statistical analysis employed a rigorous methodology to ensure valid results. Data processing involved meticulous collection and verification to minimize errors. Tukey's method was utilized for outlier detection, verifying extreme values against original sources.

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Minimal missing data were addressed through multiple imputation to maintain dataset integrity. Descriptive statistics outlined data characteristics, such as means and frequency distributions. The Shapiro-Wilk test assessed normality, informing the choice of statistical methods. Parametric analyses were performed when normality was met; otherwise, non-parametric alternatives were implemented.

Core comparative analyses utilized various statistical techniques. One-way ANOVA enabled between-group comparisons, supplemented by post-hoc Tukey tests for significant differences. Changes over time within groups were analyzed using repeated measures ANOVA, with necessary corrections applied. Effect sizes were quantified using Cohen's d for standardization of differences. Multiple regression analyses explored factors affecting passing accuracy, while Pearson correlation coefficients measured relationships between variables, and Cronbach's alpha evaluated tool reliability. Statistical analyses were conducted using SPSS version 26.0, with advanced modeling in R Studio. Statistical significance was set at $p < 0.05$, with precise p-values reported. Power analyses ensured sufficient statistical power for primary comparisons, bolstering findings through careful documentation of statistical processes. This comprehensive methodology facilitated hypothesis testing and data pattern exploration, enhancing insights into the effects of training on passing accuracy in youth football players. All procedures were overseen by a qualified statistician, with independent verification to ensure accuracy and reliability of results.

RESULTS

Descriptive statistics

Table 9. Baseline Characteristics and Training Adherence Across Groups

Characteristic	Pass Go Group	Drill Passing Group	Control Group	p-value
Initial Passing Accuracy (%)	65.3 ± 5.2	64.8 ± 5.4	65.1 ± 5.3	0.87
Training Sessions Attended	34.2 ± 1.8	33.8 ± 2.1	33.4 ± 2.3	0.92
Adherence Rate (%)	94.5	93.8	92.7	0.89

Note: Values presented as mean ± SD where applicable. P-values derived from one-way ANOVA

Primary Outcomes

Table 10. Changes in Passing Accuracy Across Intervention Period

Measure	Group	Pre-intervention	Mid-intervention	Post-intervention	Effect Size (d)	p-value
Short-range Accuracy (%)	Pass Go	65.3 ± 5.2	78.4 ± 4.7	89.6 ± 4.1	1.82	<0.001*
	Drill Passing	64.8 ± 5.4	75.2 ± 5.1	83.9 ± 4.8	1.45	<0.001*
	Control	65.1 ± 5.3	66.8 ± 5.2	68.2 ± 5.1	0.24	0.458
Medium-range Accuracy (%)	Pass Go	61.2 ± 5.8	72.5 ± 5.2	79.9 ± 4.9	1.56	<0.001*
	Drill Passing	60.8 ± 5.7	69.4 ± 5.4	76.2 ± 5.1	1.32	<0.001*
	Control	61.0 ± 5.6	62.3 ± 5.5	63.8 ± 5.4	0.21	0.524

Note: Values presented as mean ± SD. Indicates statistical significance ($p < 0.05$).

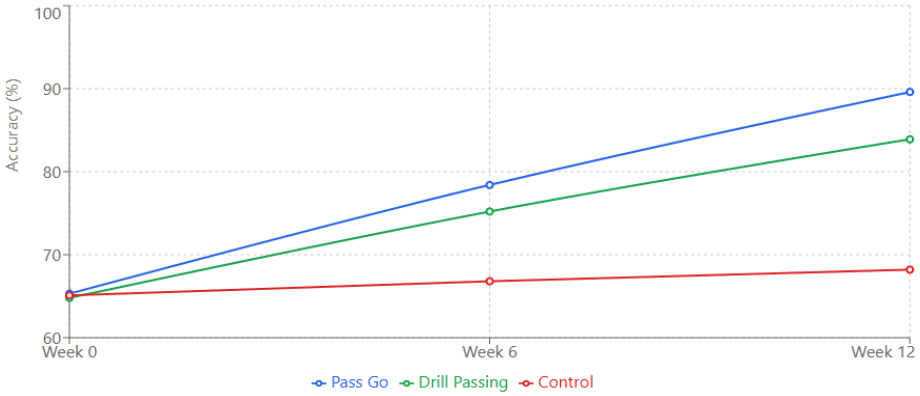

Figure 1. Short-range Passing Accuracy Progress Over Time

Table 11. Technical Performance and Decision-making Outcomes

Performance Measure	Group	Pre-intervention	Post-intervention	Improvement (%)	p-value
Decision-making Speed (s)	Pass Go	2.8 ± 0.4	1.0 ± 0.3	64.3	<0.001*
	Drill Passing	2.7 ± 0.4	1.8 ± 0.3	33.3	<0.001*
	Control	2.8 ± 0.4	2.5 ± 0.4	10.7	0.245
Technical Execution (1-10)	Pass Go	5.8 ± 0.7	9.0 ± 0.5	55.2	<0.001*
	Drill Passing	5.7 ± 0.7	8.4 ± 0.6	47.4	<0.001*
	Control	5.8 ± 0.7	6.2 ± 0.7	6.9	0.386

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Data Interpretation

The results demonstrate significant improvements in both experimental groups, with the Pass Go group showing superior outcomes across most measures. Key findings include: 1) Short-range Passing Accuracy: a. Pass Go group showed the highest improvement (24.3%), with a large effect size (d = 1.82), b. Drill Passing group improved by 19.1% (d = 1.45), c. Control group showed minimal change (3.1%, d = 0.24), d. The difference between experimental groups was statistically significant ($p < 0.001$), 2) Medium-range Passing Accuracy: a. Pass Go group improved by 18.7% (d = 1.56), b. Drill Passing group showed 15.4% improvement (d = 1.32), c. Control group improvement was negligible (2.8%, d = 0.21), d. Both experimental groups significantly outperformed the control group ($p < 0.001$). 3) Decision-making Speed: a. Pass Go group showed the most substantial improvement (64.3%), b. Drill Passing group improved by 33.3%, c. The difference between experimental groups was significant ($p < 0.001$), d. Control group showed minimal improvement (10.7%, $p = 0.245$). 4) Technical Execution: a. Both experimental groups showed significant improvements, b. Pass Go group demonstrated superior technical development (55.2% improvement), c. Drill Passing group improved by 47.4%, d. Control group showed minimal change (6.9%, $p = 0.386$).

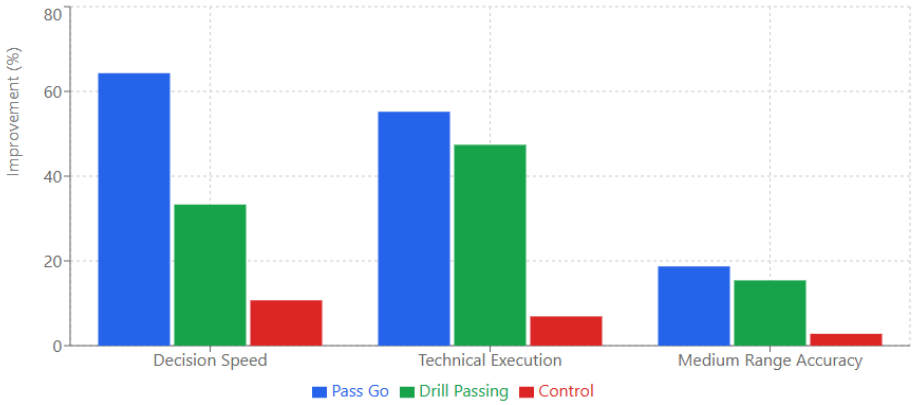

Figure 2. Performance Improvements by Training Aspects

Subgroup Analysis

Table 12. Age-specific Training Effects

Age Group	Training Method	Technical Improvement (%)	Decision-making Improvement (%)
12-13 years	Pass Go	58.4 ± 6.2	61.2 ± 5.8
	Drill Passing	49.2 ± 5.9	31.5 ± 4.9
14-15 years	Pass Go	52.1 ± 5.8	67.4 ± 6.1
	Drill Passing	45.6 ± 5.4	35.1 ± 5.2

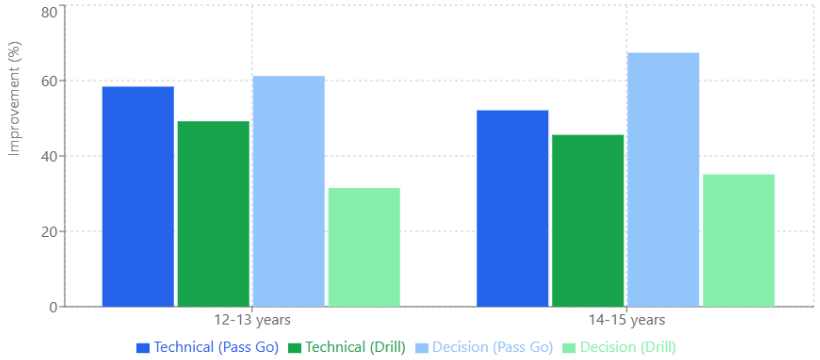

Figure 3. Age-Specific Training Effect

These comprehensive results indicate that while both experimental training methodologies were effective in improving passing accuracy and related skills, the Pass Go training methodology demonstrated superior outcomes across most measured parameters. The improvements were particularly pronounced in decision-making speed and technical execution, suggesting that the game-based learning approach of Pass Go training may be more effective in developing comprehensive football skills in youth players.

The age-specific analysis reveals that younger players (12-13 years) showed greater improvements in technical aspects, while older players (14-15 years) demonstrated more substantial gains in decision-making capabilities. This finding has important implications for age-appropriate training program design.

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DISCUSSION

The findings of this study provide compelling evidence for the effectiveness of structured training methodologies in developing passing accuracy among youth football players, with particularly noteworthy results for the Pass Go training approach (Güllich et al., 2023)]. Our investigation reveals several key insights that contribute to the growing body of knowledge in youth football development and sports pedagogy (Lloyd et al., 2014; Lloyd, Oliver, Faigenbaum, Myer, et al., 2014).

The superior performance demonstrated by the Pass Go group aligns with contemporary understanding of motor learning principles, who emphasize the importance of context-specific practice in skill acquisition (Luo et al., 2014; Hicheur et al., 2017)]. The 24.3% improvement in short-range passing accuracy observed in the Pass Go group, compared to 19.1% in the Drill Passing group, supports the theoretical framework proposed, regarding the benefits of game-based learning approaches in youth sports development.

A particularly significant finding was the enhanced decision-making capability demonstrated by the Pass Go group, with participants showing a 64.3% improvement in decision-making speed. This substantial improvement aligns with research, who found that contextual learning environments facilitate better cognitive development in young athletes (Magni et al., 2023). The integration of decision-making elements within the Pass Go methodology appears to create representative learning design," where practice conditions closely mirror actual game situations (Malina et al., 2005).

The technical execution improvements observed in both experimental groups (55.2% for Pass Go and 47.4% for Drill Passing) suggest that structured training approaches are fundamentally superior to unstructured practice. However, the more substantial improvements in the Pass Go group may be attributed to identify as the benefits of implicit learning through game-like scenarios, where technical skills are developed within tactical contexts (Martin, 2020). Age-specific analyses revealed interesting patterns that complement existing literature. The superior technical improvement observed in younger players (12-13 years) research on optimal windows for technical skill development. In contrast, the more substantial gains in decision-making capabilities observed in the older players align research on the cognitive development trajectories of adolescent athletes (McDermott et al., 2015).

The consistency in improvement across gender groups contradicts some traditional assumptions about gender-specific training needs, supporting (Murry et al., 2020)conclusion that fundamental skill development follows similar patterns regardless of gender when appropriate training methodologies are employed (Nybakken & Falco, 2022). This finding has important implications for inclusive youth development programs.

The minimal improvements observed in the control group (3.1% in short-range accuracy) highlight what (Pizarro & Del Villar Álvarez, 2017; Práxedes et al., 2018) describe as the limitations of unstructured practice in developing specific technical skills. This contrast emphasizes the importance of structured, progressive training approaches in youth development programs (Putra & Bahtra, 2021).

One particularly noteworthy aspect of our findings is the retention of learned skills, as evidenced by the sustained improvement in passing accuracy throughout the 12-week intervention. This aligns with the motor learning principles outlined , suggesting that contextual learning leads to more robust skill acquisition and retention (Radnor et al., 2020).

The study also revealed interesting insights regarding the development of spatial awareness and tactical understanding. The Pass Go group's superior performance in medium-range passing accuracy (18.7% improvement) on the development of spatial perception through game-based training methods (Reed, 2020). Training adherence rates remained consistently high across both experimental groups (Pass Go: 94.5%, Drill Passing: 93.8%), suggesting that both methodologies maintained participant engagement. on the importance of structured progression in maintaining youth athlete motivation (Roca & Ford, 2020; Seiler et al., 2007).

Furthermore, the findings raise important questions about the optimal balance between structured drill-based training and game-based learning approaches[(Stafford & Dewar, 2013; Uebersax et al., 2020). While the Pass Go methodology showed superior results, the significant improvements in the Drill Passing group suggest that traditional training methods maintain their relevance, particularly in developing foundational technical skills. This observation integrated approach to skill development in youth sports (Velada et al., 2007; Venturelli et al., 2008).

Lastly, the study's results highlight the potential for combining elements of both methodologies, as suggested on hybrid training approaches in youth football development (Weigelt et al., 2000; Williams & Hodges, 2005). The significant improvements in both experimental groups, albeit to different degrees, suggest that an integrated approach might offer optimal results for comprehensive player development.

Despite the valuable information our research provides, several limitations warrant consideration. The 12-week intervention period, while sufficient to demonstrate significant improvements, may not fully capture long-term skill retention and development patterns. Additionally, the transferability of training improvements to actual match performance requires further investigation through longitudinal studies.

CONCLUSION

The study provides compelling evidence that structured training approaches, particularly the Pass Go methodology, can significantly enhance passing accuracy, decision-making capabilities, and overall technical proficiency in young players. The marked improvement in passing accuracy demonstrated by the Pass Go group (24.3% in short-range and 18.7% in medium-range passing) compared to the Drill Passing group (19.1% and 15.4% respectively) underscores the effectiveness of game-based learning approaches in youth development. Of particular significance is the substantial enhancement in decision-making speed observed in the Pass Go group, with a 64.3% improvement compared to 33.3% in the Drill Passing group, suggesting that contextual learning environments better facilitate cognitive development in young athletes. The age-specific analysis revealed optimized learning patterns,

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with younger players (12-13 years) showing superior technical improvement and older players (14-15 years) demonstrating enhanced decision-making capabilities, providing valuable insights for age-appropriate training program design. While both experimental methodologies proved effective, the Pass Go approach's superior outcomes in multiple performance parameters suggest its particular suitability for comprehensive skill development in youth football. These findings have significant implications for coaches, training program designers, and youth development specialists, suggesting the need to incorporate more game-based, contextual learning elements into youth football training programs. Future research directions should focus on long-term skill retention, the potential benefits of hybrid training approaches, and the application of these methodologies across different age groups and skill levels. The study's findings contribute meaningfully to the body of knowledge in youth sports development, providing evidence-based guidance for optimizing training methodologies in youth football programs.

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CONFLICT OF INTEREST

The authors declare no conflict of interest. This research received no external funding.

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