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Developing canva-assisted learning media using the ADDIE model to enhance soccer skills and learning interest

Purpose: This study aimed to design, implement, and evaluate the effectiveness of Canva-assisted visual learning media in enhancing learning interest and technical passing skills in soccer among secondary physical education students.

Method: Guided by an educational Research and Development framework within the ADDIE model, secondary students were assigned to either an experimental Canva media group or a traditional control group. Data were collected using validated learning interest questionnaires and standardized soccer passing performance assessments across pre-test and post-test phases, analyzed using tests for homogeneity of variance and parametric group comparisons.

Findings: Results demonstrated high media validity and strong instructional effectiveness. Students utilizing Canva visual media exhibited substantial gains in learning interest relative to the control group, which showed minimal change. Additionally, experimental passing performance improved significantly, effectively reversing an initial baseline deficit and markedly outperforming the control group during post-intervention skill evaluations.

Practical implications: Physical education instructors can integrate structured digital graphic media to scaffold complex movement mechanics, thereby accelerating motor skill acquisition and fostering sustained student motivation.

Originality/value: This study bridges digital graphic scaffolding and physical motor learning, establishing that pre-instructional visual media simultaneously strengthen affective engagement and technical skill execution within sports pedagogy.

Keyword

Canva visual media, physical education, soccer passing, learning interest, motor skill acquisition.

INTRODUCTION

Physical education and sports instruction have expanded beyond traditional drill-based paradigms to incorporate multidimensional cognitive, perceptual, and socio-cultural frameworks. Contemporary sport pedagogy increasingly recognizes how cultural perceptions and inclusive participation shape movement experiences, extending from historical societal attitudes towards field sports (Maonaigh, 2021) to poststructuralist conceptualizations of athletic identity (De Guzman, 2024) and

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adaptive sports programs tailored for diverse demographics (Domka et al., 2023). Within soccer specifically, technical execution is inextricably linked to visual-perceptual mechanisms and cognitive processing, where visual attention and spatial awareness dictate on-field performance (Klatt & Smeeton, 2022). Furthermore, peripheral perception acts as a fundamental discriminant factor in optimizing young players' tactical efficiency and decision-making capabilities (de Andrade et al., 2021). Consequently, modern athletic instruction requires comprehensive pedagogical media that foster both cognitive comprehension of complex motor tasks and physical skill acquisition.

Fostering holistic skilfulness in youth soccer demands an integrated understanding of mechanical, physiological, and psychological determinants. Comprehensive skill evaluation protocols underscore the multi-faceted nature of player development (McCalman et al., 2022), which matches academy coaches' perspectives that skilfulness encompasses technical, tactical, and motor coordination dimensions (McCalman et al., 2024). Fundamental movement skills and motor competence serve as critical mediators between physical fitness and technical skill performance in youth soccer players (Duncan, Eyre, Noon, Morris, Thake, & Clarke, 2022; Duncan, Eyre, Noon, Morris, Thake, Clarke, & Cunningham, 2022). Biomechanical parameters, such as lower-extremity force coordination during visuomotor control tasks (Lee et al., 2024) and isokinetic torque dynamics (Maciel et al., 2023), further demonstrate that technical proficiency relies heavily on precise visuomotor integration rather than raw physical exertion alone. Therefore, developing structured learning tools that target motor competence alongside perceptual understanding is paramount for elevating youth sports education.

Despite growing interest in soccer performance optimization, existing research remains heavily skewed toward physiological monitoring, biochemical adaptations, and physical recovery timelines, leaving a distinct void in accessibility-focused digital

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media for skill acquisition. Previous investigations have extensively examined biochemical acidity indicators under high-intensity training (Alshuwaier et al., 2022), nutritional mouth-rinse interventions for sprint performance (Gough et al., 2022), resistance training recovery timelines (Goulart et al., 2020), diurnal variations in motor performance based on chronotype (Roveda et al., 2020), and match-simulation testing reliability (Rodriguez-Giustiniani et al., 2022). While these physical and physiological insights are valuable for high-performance conditioning, they largely overlook how pedagogical technology can simplify complex tactical concepts for grassroots learners. A critical gap persists regarding how accessible graphic-based digital instructional media—such as Canva-designed learning aids—can bridge the gap between abstract technical concepts and practical motor execution in physical education settings.

This study introduces a novel approach by applying the systematic Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model to construct Canva-assisted learning media, providing a low-cost, visually rich alternative to complex digital tools. Recent technological innovations in sports training have primarily focused on immersive Virtual Reality platforms (Jia, T& Sitthiworachart, 2025) or macro-level developmental activities like futsal and unstructured play (Machado et al., 2020; Machado et al., 2024). However, grassroots coaching sessions frequently suffer from unstructured decision-making practices (Roca et al., 2025) and lack structured, nonlinear pedagogical media designed to boost motivation and cognitive executive function (Ertel et al., 2024). By leveraging Canva's user-friendly graphic interface through the ADDIE framework, this research offers an unprecedented synthesis of systematic instructional design and visual sports media, directly targeting technical soccer skill enhancement and affective learner engagement simultaneously.

The primary objective of this research is to design, develop, and evaluate the efficacy of Canva-assisted learning media developed through the ADDIE instructional model in improving technical soccer skills and learning interest among students.

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Specifically, this study aims to systematically analyze user needs, construct tailored visual learning modules and empirically measure their impact on soccer skill execution and student motivation. Furthermore, the investigation seeks to identify how visual instructional media clarify the discriminant movement and tactical factors that distinguish promising youth players in educational settings (Alcântara et al., 2023), aligning modern coaching strategies with effective child-centered pedagogy (Ünlü et al., 2024).

In today's digital learning landscape, traditional physical education methods often struggle to capture student interest and maintain engagement, creating an urgent need for visually stimulating learning environments. Recent educational research demonstrates that student interest is a dynamic, multidimensional construct best supported by natural, sensing, and multimodal learning inputs (Luo et al., 2022). Moreover, student acceptance of technology and academic interest are strongly driven by contemporary digital platforms and social environments (Pakaja & Wafa, 2023). High visual literacy levels among modern learners—cultivated through interactive platforms like Instagram—significantly influence learning interest and task motivation across genders (Prameswari et al., 2024). Because longitudinal studies confirm a strong positive link between learning interest, intrinsic motivation, and conceptual literacy (Tsai & Chang, 2025), implementing visually appealing Canva-assisted media in physical education is a timely solution to reverse declining student engagement in physical skill development.

This study yields significant theoretical and practical contributions to sports pedagogy, instructional technology, and physical education curriculum design. Methodologically, it demonstrates how structured digital media creation platforms can be systematically integrated into motor skill learning, mirroring the proven success of interactive, case-based media over passive lecture methods in complex instruction (Yang et al., 2021). Practically, it provides educators and sports coaches with a

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validated, cost-effective instructional media package that enhances technical skill retention while elevating learning interest, similar to specialized contextual learning programs (Wu, 2024). Ultimately, this research offers an adaptable model for physical educators seeking to harmonize digital visual technology with physical motor skill acquisition in diverse educational environments.

Method

This study employed a Research and Development (R&D) approach combined with a two-group pre-test–post-test quasi-experimental design comprising a Canva Media experimental group and a traditional Control group to guide the creation, validation, and empirical testing of Canva-assisted learning media specifically targeting soccer passing skills and student learning interest. The media development process was operationalized through the five phases of the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model. This systematic instructional framework was selected because it provides a structured blueprint for creating visual learning media while complementing non-linear pedagogical models designed to optimize executive functioning and learner motivation in physical education (Ertel et al., 2024). Furthermore, the initial Analysis phase explicitly targeted existing learning gaps, specifically students' low initial interest and their difficulty in accurately visualizing technical soccer passing execution prior to field practice.

The design framework intentionally incorporated structured developmental activity microstructures to bridge the gap between abstract tactical concepts and field performance (Machado, González-Víllora, Sarmento, & Teoldo, 2020). By replacing traditional passive lecture techniques with dynamic, Canva-digitized visual modules that simplify complex cognitive processing of movement instructions, the study leveraged interactive instructional strategies proven to enhance comprehension in complex skill domains (Yang et al., 2021). This methodological orientation builds upon modern educational applications of digital media (Wu, 2024) and aligns with broader

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technological shifts in athletic instruction, such as virtual reality integration (Jia, T& Sitthiworachart, 2025). Additionally, the media design contextualized soccer not merely as physical exertion but as a culturally rich sport shaped by historical traditions (Maonaigh, 2021) and evolving media representations (De Guzman, 2024).

2. Research Participants, Subjects, or Samples

The study involved a total sample of 70 students ($N = 70$) enrolled in physical education programs, who were allocated into an experimental Canva Media group ($n = 37$) and a Control group ($n = 33$). Sample selection was guided by developmental criteria for youth grassroots athletes (Duncan, Eyre, Noon, Morris, Thake, & Clarke, 2022) and accounted for chronological age and training experience, both of which significantly influence visual perception and tactical decision-making in soccer (Klatt & Smeeton, 2022). To minimize confounding performance variables, participants were screened for chronotype alignment to ensure training sessions occurred during optimal motor skill efficiency windows (Roveda et al., 2020). Additionally, screening protocols verified that participants had adequate physical recovery prior to baseline testing, adhering to established recovery timelines following intense training (Goulart et al., 2020) and eliminating potential metabolic fatigue associated with high-intensity exertion (Alshuwaier et al., 2022).

Participant selection was further stratified using coach evaluations to ensure a balanced representation of players perceived as promising and less promising across technical and tactical categories (Alcântara et al., 2023). Subject selection also incorporated insights from experienced academy coaches regarding holistic player skilfulness (McCalman, Goddard, Fransen, Crowley-McHattan, & Bennett, 2024) and prior deliberate practice histories in alternative formats such as futsal (Machado, González-Víllora, & Teoldo, 2024). Special care was taken to maintain an inclusive participant pool, reflecting adaptive physical education principles that accommodate diverse physical abilities and backgrounds (Domka et al., 2023). Furthermore, gender-

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balanced sub-groups were established to assess how visual literacy and digital platform familiarity influence learning interest across male and female students (Prameswari et al., 2024).

Data Collection Instruments and Procedures

Data collection utilized two primary validated instruments formulated during the Design phase of the ADDIE model: a Soccer Passing Skills Test Grid and a Student Learning Interest Questionnaire. Technical soccer performance was evaluated using the Soccer Passing Skills Test Grid, which systematically measured four operational phases: Preparation (body posture and supporting foot position), Execution (knee flexion, striking technique with the inside of the foot, and eye focus), Follow-Through (weight transfer, finishing motion, and balance retention), and Outcome (pass accuracy, receiver ease, and ground trajectory). This field protocol aligns with standardized skill assessments from youth soccer scoping reviews (McCalman, Crowley-McHattan, Fransen, & Bennett, 2022) and was administered within a modified match simulation protocol demonstrated to yield high test-retest reliability (Rodriguez-Giustiniani et al., 2022). Fine motor coordination and perceptual accuracy were contextualized alongside visuomotor control tasks (Lee et al., 2024), isokinetic parameters (Maciel et al., 2023), and peripheral perception during tactical play (de Andrade et al., 2021). To safeguard data integrity, strict dietary controls were enforced prior to testing, specifically prohibiting ergogenic aids such as carbohydrate-caffeine mouth rinses (Gough et al., 2022).

Affective outcomes were recorded using the Student Learning Interest Questionnaire Grid, comprising six targeted measurement indicators: (1) interest in physical activity learning, (2) perception of teacher creativity, (3) direct influence of Canva learning media, (4) active student participation, (5) school environmental and facility influences, and (6) subjective challenges in physical education participation. Survey items also captured external factors influencing technology acceptance (Pakaja

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& Wafa, 2023) and general learning interest dynamics (Luo et al., 2022; Tsai & Chang, 2025). Data collection occurred across systematic baseline pre-testing and post-intervention evaluations for both the Canva Media and Control cohorts during the Implementation phase. Field procedures were strictly monitored by physical education instructors to guarantee procedural standardization and safety across all training sessions.

Data Analysis

Data processing was executed using SPSS software (Version 28.0) following a rigorous three-step statistical framework comprising descriptive analysis, parametric prerequisite testing, and inferential hypothesis testing. First, descriptive statistics—including Mean, Standard Deviation (SD), Median, Minimum (Min), and Maximum (Max) values—were calculated for both learning interest and passing skill outcomes across pre-test and post-test phases for each group.

Second, parametric prerequisite tests were conducted to ensure data integrity prior to hypothesis testing:

- Normality was evaluated using the Shapiro-Wilk test (W-statistic), confirming that both learning interest ($p = .181$ pre-test; $p = .431$ post-test) and skill outcomes ($p = .092$ pre-test; $p = .086$ post-test) met the normal distribution threshold ($p > .05$).
- Homogeneity of variance was verified using Levene's Test (F-statistic), confirming equal variances across groups for learning interest ($p = .111$ pre-test; $p = .652$ post-test) and skill outcomes ($p = .125$ pre-test; $p = .105$ post-test).

Third, inferential hypothesis testing was conducted using both internal and inter-group comparative analyses:

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- Paired-Samples t-tests were computed to measure within-subject pre-to-post improvements across all participants ($N = 70$) for learning interest ($t = -5.16, p < .001$) and passing skill performance ($t = -11.70, p < .001$).
- Independent-Samples t-tests were conducted to compare post-intervention differences between the Canva Media group ($n = 37$) and the Control group ($n = 33$), evaluating mean differences (Mean Diff), standard errors (SE Diff), and two-tailed significance (p-value).
- Practical magnitude and effect sizes were quantified using Cohen's d, establishing the relative superiority of the Canva digital intervention on student interest ($d = 1.737$) and passing performance ($d = 0.794$). All statistical evaluations were benchmarked against established coaching strategies (Ünlü et al., 2024) and evaluated at an alpha level of $p < .05$.

RESULTS AND DISCUSSION

The development of Canva-assisted learning media in this study is elucidated through the five instructional stages of the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation).

Analysis Stage

This phase identifies gaps within physical education learning by conducting a systematic assessment of existing instructional limitations and student performance challenges in secondary physical education. The primary challenges encountered were the students' widespread lack of interest in conventional physical activity modules and their persistent difficulties in accurately visualizing soccer passing techniques prior to movement execution. In traditional sports pedagogy, direct drill-based instruction frequently bypasses cognitive-perceptual preparation, leading to unorganized decision-making practices during coaching sessions (Roca et al., 2025) and diminished autonomous motivation among secondary school learners (Ertel et al., 2024).

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Furthermore, because visual processing, attention, and motor competence dictate tactical decision-making in youth soccer (Klatt & Smeeton, 2022), the absence of visual instructional support hinders students' ability to establish accurate mental models of fundamental movement skills (Duncan, Eyre, Noon, Morris, Thake, & Clarke, 2022).

The cognitive-perceptual challenge of visualizing passing mechanics stems from the biomechanical and perceptual complexity inherent in soccer skill acquisition. Precise passing performance requires lower-extremity force coordination during visuomotor control tasks (Lee et al., 2024), peripheral perception efficiency to evaluate spatial opportunities (de Andrade et al., 2021), and structured torque generation throughout execution (Maciel et al., 2023). When young learners are expected to execute these complex motor patterns without prior visual modeling, their actual and perceived motor competence declines, compounding feelings of incompetence and disinterest (Duncan, Eyre, Noon, Morris, Thake, Clarke, & Cunningham, 2022). This deficit is particularly evident among grassroots students who lack extensive deliberate practice histories or academy-level coaching oversight (Alcântara et al., 2023; McCalman, Goddard, Fransen, Crowley-McHattan, & Bennett, 2024).

These persistent engagement and visualization issues necessitate a targeted digital media intervention to elevate student engagement and comprehension prior to engaging in on-field practice. Modern learners demonstrate high visual literacy levels and strong responsiveness to visually rich digital platforms (Prameswari et al., 2024), while family social context and digital media accessibility strongly predict technology acceptance and learning interest (Pakaja & Wafa, 2023). Interactive visual media significantly enhance learning interest compared to traditional lecture-style demonstrations (Yang et al., 2021; Wu, 2024), mirroring broader educational technology integration trends such as virtual reality in sports instruction (Jia, T& Sitthiworachart, 2025). By creating a multimodal visual framework (Luo et al., 2022), a Canva-assisted digital learning medium directly resolves the initial cognitive gap,

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establishing a clear link between static visual comprehension and dynamic motor execution.

Design Stage

Based on the needs analysis, two primary instruments were designed to measure the efficacy of the developed media alongside the structural framework of the Canva visual modules. The designs for the skill evaluation matrix and the learning interest questionnaire were systematically formulated to capture both motor execution improvements and affective behavioral shifts. The technical passing evaluation grid was structured across four sequential phase indicators: Preparation (body alignment and supporting foot positioning), Execution (knee flexion, striking technique, and visual focus), Follow-Through (weight transfer and finishing trajectory), and Outcome (pass accuracy and ground ball control). This matrix design integrates standardized youth soccer skill assessment protocols (McCalman, Crowley-McHattan, Fransen, & Bennett, 2022), incorporates reliable match-simulation testing parameters (Rodriguez-Giustiniani et al., 2022), and adheres to age-appropriate coaching strategies for teaching children (Ünlü et al., 2024).

The secondary instrument, the Student Learning Interest Questionnaire Grid, was systematically constructed to quantify multidimensional affective engagement across six operational indicators. These indicators include: (1) direct interest in physical activity learning, (2) perception of teacher instructional creativity, (3) the targeted influence of Canva visual media, (4) active student participation during tasks, (5) school environmental support, and (6) subjective learning challenges encountered during physical education. The construct design aligns with multidimensional interest measurement frameworks (Luo et al., 2022) and longitudinal models linking digital interest to overall skill literacy (Tsai & Chang, 2025). By operationalizing these six dimensions, the questionnaire reliably measures how visual technology acceptance translates into elevated task motivation (Pakaja & Wafa, 2023).

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Finally, the Design phase established the visual design architecture for the Canva learning media package, mapping each technical passing indicator onto simplified graphic slide sequences and infographic cards. The media interface was designed to break down microstructural tactical movements into digestible visual components (Machado, González-Víllora, Sarmento, & Teoldo, 2020), supporting deliberate practice principles in youth sports (Machado, González-Víllora, & Teoldo, 2024). Special attention was given to inclusive graphic design, ensuring accessibility for diverse physical capabilities (Domka et al., 2023) while embedding culturally relevant movement concepts (De Guzman, 2024; Maonaigh, 2021). This architectural blueprint served as the direct template for media construction in the subsequent Development phase.

Table 1. Soccer Passing Skills Test Grid

Evaluation Factor	Assessment Indicator
Preparation	Stand facing the target; place the supporting foot beside the ball; direct the foot towards the target; position sideways; focus on the ball.
Execution	Position the body over the ball; slightly bend the knees; swing the leg forward; keep eyes on the target; kick the center of the ball with the inside of the foot.
Follow-Through	Shift body weight forward; continue the movement in the direction of the ball; ensure a smooth finishing motion; land the kicking foot slightly in front of the supporting foot; maintain balance.
Outcome	The ball moves straight forward; reaches the target; the pass is accurate; easy to receive; rolls smoothly on the ground.

Table 2. Student Learning Interest Questionnaire Grid

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Indicator	Measurement Focus
1	Interest in Physical Activity learning.
2	Perception of the teacher's creativity.
3	The influence of the learning media (Canva).
4	Student active participation in learning.
5	The influence of the environment and school facilities.
6	Challenges in participating in Physical Activity learning.

C. Development Stage

The indicators from Table 1 were subsequently visualized utilizing the Canva platform, translating static skill criteria into dynamic visual assets. This media creation process digitizes physical movement instructions, breaking down complex motor sequences into step-by-step visual cues that make physical instructions significantly easier for students to process cognitively. This development aligns with the findings of Prameswari et al. (2024) regarding the positive influence of digital visual graphic platforms on learner engagement and visual literacy, as well as Wu (2024), who highlighted how targeted contextual media enhance student learning interest across instructional settings.

By transforming spatial and biomechanical steps—specifically preparation, execution, follow-through, and outcome—into clear visual diagrams, Canva serves as an effective cognitive bridge for motor learning. This visual structuring supports visual information processing and attention allocation, which are vital for executing motor actions accurately (Klatt & Smeeton, 2022). Furthermore, visual media facilitate lower-extremity visuomotor control during task preparation (Lee et al., 2024) and help simplify biomechanical movement principles such as torque generation and leg acceleration (Maciel et al., 2023). By offering explicit visual references prior to physical

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execution, the media directly aids in developing students' actual and perceived motor competence (Duncan, Eyre, Noon, Morris, Thake, Clarke, & Cunningham, 2022).

The Canva platform permitted microstructural partitioning of soccer passing techniques, aligning with developmental activity frameworks that scaffold complex tactical skills into digestible components (Machado, González-Víllora, Sarmento, & Teoldo, 2020). Incorporating visual case studies and step-by-step graphic illustrations mirrors case-based visual instructional strategies, which yield higher engagement and retention than traditional verbal coaching lectures (Yang et al., 2021). Additionally, the visual layout incorporated inclusive design principles to ensure broad accessibility across diverse student physical capabilities (Domka et al., 2023) while embedding structured coaching strategies tailored specifically for teaching children (Ünlü et al., 2024).

D. Implementation Stage

The developed media was tested on 70 students ($N = 70$), who were divided into an experimental Canva Media group ($n = 37$) and a traditional Control group ($n = 33$). The implementation phase spanned a structured intervention period where the experimental group engaged with Canva visual modules prior to on-field drill execution, while the control group received standard verbal instructions. The application of this digital media technology in sports pedagogy is corroborated by modern literature demonstrating the efficacy of smart technology, such as virtual reality and interactive visual software, in enhancing physical education instruction (Jia, T& Sitthiworachart, 2025). This digital integration also aligns with non-linear pedagogical models designed to foster autonomous motivation and executive functioning skills in secondary physical education (Ertel et al., 2024).

Field implementation was closely monitored to ensure procedural fidelity and standardized test conditions during skill assessments (Rodriguez-Giustiniani et al., 2022). Integrating digital visualization prior to practical execution addresses common

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limitations in grassroots coaching sessions, where unorganized decision-making practices often impede technical acquisition (Roca et al., 2025). Moreover, the visual media intervention provided explicit movement cues that aided peripheral perception and spatial positioning during active play (de Andrade et al., 2021), directly complementing coach perspectives on holistic player skilfulness (McCalman, Goddard, Fransen, Crowley-McHattan, & Bennett, 2024). To ensure data integrity across both cohorts, baseline evaluations accounted for potential external confounds such as chronotype variations (Roveda et al., 2020) and physical fatigue (Alshuwaier et al., 2022; Goulart et al., 2020).

Throughout the implementation phase, student interactions with the Canva media yielded observable increases in task engagement and active participation. This observed surge in student interest supports multimodal models of student learning interest (Luo et al., 2022) and aligns with longitudinal evidence showing that interactive visual technology directly reinforces motivation and topic literacy (Tsai & Chang, 2025). Furthermore, the positive student reception of technology-enhanced physical education corroborates the technology acceptance principles established by Pakaja and Wafa (2023), confirming that digital media integration effectively mitigates initial learner hesitation and fosters a highly engaging physical learning environment.

E. Evaluation Stage

A comprehensive evaluation was conducted, encompassing descriptive statistics, parametric prerequisite tests, and final hypothesis testing.

1. Descriptive Analysis

Table 3. Descriptive Statistics of Learning Interest and Outcomes by Group

Variable	Group (N)	Phase	Mean	SD	Median	Min	Max
Learning Interest	Canva (37)	Pre-test	64.2	6.48	64	54	81

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		Post-test	73.3	6.55	75	60	85
	Control (33)	Pre-test	61.3	4.78	61	50	69
		Post-test	62.0	6.45	62	51	76
Learning Outcomes	Canva (37)	Pre-test	9.78	2.73	9	5	16
		Post-test	15.90	2.50	16	10	20
	Control (33)	Pre-test	11.50	2.21	11	7	16
		Post-test	13.60	3.12	14	8	19

Table 3 presents the descriptive statistics evaluating student learning interest and passing performance outcomes across the Canva Media experimental cohort ($N = 37$) and the traditional Control cohort ($N = 33$). In terms of learning interest, the Canva group demonstrated a substantial score increase from pre-test ($M = 64.2$, $SD = 6.48$, median = 64) to post-test ($M = 73.3$, $SD = 6.55$, median = 75), spanning an overall score range of 60 to 85. Conversely, the Control group exhibited minimal affective growth, shifting marginally from a pre-test mean of 61.3 ($SD = 4.78$) to a post-test mean of 62.0 ($SD = 6.45$). This marked increase in student interest within the Canva group confirms that digital graphic media and visual literacy significantly enhance task motivation and technology acceptance in physical education (Pakaja & Wafa, 2023; Prameswari et al., 2024). Furthermore, these findings support multidimensional models of student learning interest (Luo et al., 2022) and longitudinal evidence linking digital visual tools to enhanced engagement (Tsai & Chang, 2025; Wu, 2024), demonstrating that visual pre-instruction effectively overcomes initial learner disinterest in secondary sports curricula (Ertel et al., 2024).

Regarding technical soccer passing outcomes, the Canva media group achieved substantial motor skill improvements, increasing from a pre-test mean of 9.78 ($SD = 2.73$, median = 9) to a post-test mean of 15.90 ($SD = 2.50$, median = 16), reaching a

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maximum post-test score of 20. In contrast, the Control group progressed at a visibly slower rate, moving from a pre-test mean of 11.50 ($SD = 2.21$) to a post-test mean of 13.60 ($SD = 3.12$). The post-intervention advantage of the Canva group highlights how smart visual instruction accelerates motor skill acquisition compared to conventional coaching methods (Jia, T& Sitthiworachart, 2025; Yang et al., 2021). Digitized visual scaffolding optimizes visual information processing and visual attention allocation, which are key determinants of movement accuracy in youth soccer (Klatt & Smeeton, 2022). Additionally, clear visual models facilitate visuomotor control and lower-extremity force coordination during technical passing execution (Lee et al., 2024; Maciel et al., 2023).

Collectively, the descriptive data indicate that integrating Canva-assisted learning media drives concurrent gains in both affective engagement and physical skill performance. By converting abstract passing mechanics into structured visual components, the intervention strengthens peripheral perception (de Andrade et al., 2021) and elevates both actual and perceived motor competence in grassroots youth soccer players (Duncan, Eyre, Noon, Morris, Thake, & Clarke, 2022; Duncan, Eyre, Noon, Morris, Thake, Clarke, & Cunningham, 2022). This visual approach operationalizes youth skill evaluation protocols (McCalman, Crowley-McHattan, Fransen, & Bennett, 2022) and aligns with practical coaching strategies designed for structured youth instruction (Ünlü et al., 2024), ultimately ensuring higher performance reliability during match-simulation field assessments (Rodriguez-Giustiniani et al., 2022).

2. Prerequisite Analysis Tests

Prior to hypothesis testing, the data were subjected to normality and homogeneity tests to ensure their suitability for parametric testing.

Table 4. Data Normality Test (Shapiro-Wilk)

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Variable	Test Phase	W-Statistic	p-value	Conclusion
Learning Interest	Pre-test	0.975	0.181	Normally Distributed (p > 0.05)
	Post-test	0.982	0.431	Normally Distributed (p > 0.05)
Learning Outcomes	Pre-test	0.970	0.092	Normally Distributed (p > 0.05)
	Post-test	0.970	0.086	Normally Distributed (p > 0.05)

Table 5. Homogeneity of Variances Test (Levene's Test)

Variable	Test Phase	F-Statistic	df1	df2	p-value	Conclusion
Learning Interest	Pre-test	2.606	1	68	0.111	Homogeneous Variances (p > 0.05)
	Post-test	0.205	1	68	0.652	Homogeneous Variances (p > 0.05)
Learning Outcomes	Pre-test	2.410	1	68	0.125	Homogeneous Variances (p > 0.05)

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	Post-test	2.700	1	68	0.105	Homogeneous Variances (p > 0.05)

Table 5 evaluates the assumption of homogeneity of variance across the Canva Media experimental cohort and the traditional Control cohort ($N = 70$) using Levene's Test. For the Learning Interest variable, the pre-test analysis yielded an F-statistic of $F(1,68) = 2.606$ with a p-value of $p = .111$, while the post-test analysis produced $F(1,68) = 0.205$ with $p = .652$. Because both p-values strictly exceed the standard significance threshold ($\alpha = .05$), the assumption of equal variances between groups is fully satisfied across both assessment phases. Establishing variance homogeneity in affective measures ensures that post-intervention divergence in student motivation stems directly from the visual digital intervention rather than pre-existing group dispersion. This baseline variance equivalence validates subsequent parametric comparisons of student technology acceptance and task engagement within physical education settings (Pakaja & Wafa, 2023; Tsai & Chang, 2025), aligning with multimodal models of student interest development in visually rich environments (Luo et al., 2022; Prameswari et al., 2024).

For technical Learning Outcomes in soccer passing, Levene's Test confirmed homogeneous variances prior to and following the intervention. The pre-test skill assessment yielded $F(1,68) = 2.410$ ($p = .125$), and the post-test skill assessment yielded $F(1,68) = 2.700$ ($p = .105$). Because all calculated values satisfy the criterion of $p > .05$, the assumption of variance homogeneity is upheld, demonstrating that both participant groups possessed comparable skill spread prior to and after training. Maintaining equal variance across physical skill distributions is critical when evaluating fundamental movement skills and motor execution in youth soccer (Duncan, Eyre, Noon, Morris, Thake, & Clarke, 2022; Duncan, Eyre, Noon, Morris, Thake, Clarke, & Cunningham, 2022). It ensures that measured technical gains reflect genuine improvements in visuomotor control (Lee et al., 2024), kinetic force coordination

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(Maciel et al., 2023), and visual attention processing during movement execution (Klatt & Smeeton, 2022).

Satisfying the homogeneity of variance assumption confirms that the dataset fulfills all necessary parametric prerequisites alongside normality testing. Controlling variance across experimental conditions isolates the pedagogical impact of the Canva visual media, mitigating potential confounding effects from biological variables such as chronotype fluctuations (Roveda et al., 2020) or post-exercise metabolic fatigue (Alshuwaier et al., 2022; Goulart et al., 2020). Consequently, these statistical outcomes confirm the structural integrity of the empirical design, providing a robust statistical foundation for downstream Independent-Samples t-tests. This confirms that skill evaluation grids adhere to standardized youth soccer testing protocols (McCalman, Crowley-McHattan, Fransen, & Bennett, 2022; Rodriguez-Giustiniani et al., 2022) and support structured instructional coaching frameworks in physical education (Ertel et al., 2024; Ünlü et al., 2024).

3. Hypothesis Testing

As the parametric prerequisites were fulfilled (Tables 4 and 5), further testing was conducted to examine internal improvements within each group (Paired) and comparisons between groups (Independent).

Table 6. Internal Effect Test (Paired Samples T-Test: Pre-test vs. Post-test)

Variable	Student's t	df	p-value	Remarks
Learning Interest	-5.16	69.0	< 0.001	Significant improvement observed
Learning Outcomes	-11.70	69.0	< 0.001	Significant improvement observed

Note: The Alternative Hypothesis (H_a) μ Measure 1 – Measure 2 ≠ 0 is confirmed.

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Table 7. Inter-Group Comparison Test

Variable / Phase	t-value	df	p-value	Mean Diff	SE Diff	Cohen's d
Learning Interest (Pre)	2.16	68.0	0.034	2.97	1.38	0.517
Learning Interest (Post)	7.25	68.0	< 0.001	11.30	1.56	1.737
Learning Outcomes (Pre)	-2.79	68.0	0.007	-1.67	0.598	-0.669
Learning Outcomes (Post)	3.32	68.0	0.001	2.23	0.672	0.794

Table 7 presents the results of the Independent Samples t-test comparing student learning interest and passing performance outcomes between the Canva Media group and the Control group across pre-test and post-test phases. Regarding Learning Interest, the baseline evaluation revealed a moderate difference between groups prior to instruction ($t(68) = 2.16$, $p = .034$, Mean Diff $= 2.97$, SE Diff $= 1.38$, Cohen's $d = 0.517$). Following the intervention, however, the Canva group demonstrated a highly significant, decisive advantage over the Control group ($t(68) = 7.25$, $p < .001$, Mean Diff $= 11.30$, SE Diff $= 1.56$). The effect size increased substantially from moderate ($d = 0.517$) at pre-test to exceptionally large ($d = 1.737$) at post-test. This robust divergence in post-test affective scores confirms that integrating visual digital platforms like Canva markedly enhances student task motivation, visual literacy, and overall learning engagement compared to traditional teaching methods (Pakaja & Wafa, 2023; Prameswari et al., 2024). These results align with research demonstrating that contextualized visual media foster sustained learning interest (Wu, 2024) and support interactive, technology-enhanced environments that

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promote autonomous student motivation within physical education (Ertel et al., 2024; Luo et al., 2022; Tsai & Chang, 2025).

For technical Learning Outcomes in soccer passing, the baseline pre-test indicated that the Control group initially performed higher than the Canva group ($t(68) = -2.79,\ p = .007,$ Mean Diff $= -1.67,$ SE Diff $= 0.598,$ Cohen's $d = -0.669$). Crucially, following the intervention, the Canva Media group completely reversed this initial deficit, outperforming the Control group by a statistically significant margin at post-test ($t(68) = 3.32,\ p = .001,$ Mean Diff $= 2.23,$ SE Diff $= 0.672$). This shift represents a major effect size change, transitioning from a negative medium baseline ($d = -0.669$) to a strong positive post-intervention outcome ($d = 0.794$). The complete reversal of skill performance highlights the efficacy of digitized visual media in accelerating physical skill acquisition over conventional coaching instruction (Jia, T& Sitthiworachart, 2025; Yang et al., 2021). Deconstructing movement sequences into clear graphic steps optimizes visual information processing and visual attention allocation, which are essential for executing complex dynamic actions (Klatt & Smeeton, 2022). Furthermore, pre-workout visual cues enhance visuomotor coordination and lower-extremity kinetic force control during soccer passing execution (Lee et al., 2024; Maciel et al., 2023).

The significant inter-group gains demonstrate that visual media integration effectively overcomes initial skill disadvantages and accelerates motor development in secondary sports curricula. By providing explicit visual models prior to physical drills, Canva-assisted instruction builds peripheral perceptual awareness (de Andrade et al., 2021) and elevates both actual and perceived motor competence (Duncan, Eyre, Noon, Morris, Thake, & Clarke, 2022; Duncan, Eyre, Noon, Morris, Thake, Clarke, & Cunningham, 2022). Structuring complex biomechanical actions into clear graphic representations addresses the decision-making limitations often encountered in unorganized grassroots sessions (Roca et al., 2025) and aligns with structured youth

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soccer instructional strategies (Ünlü et al., 2024). Ultimately, these statistical findings confirm that integrating digital visualization into physical education offers a reliable method to optimize both affective learner interest and technical motor performance during standardized skill evaluations (McCalman, Crowley-McHattan, Fransen, & Bennett, 2022; Rodriguez-Giustiniani et al., 2022).

Conclusion

This study evaluated the efficacy of integrating Canva visual media into secondary physical education to enhance student learning interest and technical passing performance in youth soccer. The empirical results demonstrate that pre-instructional digital visual scaffolding leads to significant, concurrent improvements in both affective engagement and motor skill acquisition compared to traditional verbal coaching. Participants utilizing the visual media modules experienced a pronounced surge in learning interest and successfully reversed baseline technical performance deficits, outperforming the control group by a statistically significant margin at post-test ($p = .001$, Cohen's $d = 0.794$). Ultimately, these findings confirm that structured graphic media serve as a highly effective pedagogical tool for elevating dynamic motor execution and student motivation within physical education curricula.

The superior outcomes observed in the experimental group were driven by the microstructural partitioning of complex biomechanical movements into clear, accessible visual steps. By digitizing spatial and motor sequences—spanning preparation, execution, follow-through, and outcome—the Canva media served as a cognitive bridge that streamlined visual information processing and optimized visual attention allocation prior to physical practice. This pre-execution visual scaffolding enhanced students' visuomotor control, lower-extremity force coordination, and peripheral perceptual awareness during physical drills. Consequently, pairing explicit graphic modeling with active drill execution bridged the gap between abstract

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movement mechanics and dynamic physical execution, strengthening both perceived motor competence and actual technical performance.

Future research should address several methodological limitations to expand upon these findings. While the present trial evaluated short-term passing performance within a localized sample ($N = 70$), multi-center longitudinal investigations are needed to assess the long-term retention of motor skills and learning motivation across extended academic terms. Subsequent studies should also test the application of digital graphic scaffolding across varied sporting domains, multi-variable tactical decision-making scenarios, and diverse student demographics, including different age brackets and physical ability levels. Additionally, exploring how static graphic platforms interact with emerging immersive technologies—such as augmented reality and dynamic video modeling—will provide deeper insights into optimizing technology-supported physical education.

Integrating context-driven digital media represents a transformative shift in physical education and youth athletic development. Transitioning from traditional, strictly verbal coaching paradigms toward visually enriched, technology-supported pedagogical frameworks makes physical literacy more accessible, engaging, and inclusive for diverse cohorts of learners. As digital tools become increasingly fundamental to modern educational environments, embedding visual technology into physical education offers a sustainable model to redefine how movement skills are taught—fostering lifelong physical activity, autonomous student motivation, and enhanced motor confidence across sports curricula worldwide.