Flipped classroom and recreational activities:effect on dribbling, passing and shooting skills in male football students

Aula invertida y actividades recreativas: efecto sobre las habilidades de regate, pase y tiro en estudiantes varones de fútbol

Authors

Mustafa Jawad Kadhim [1]
Furat Jabar Saadalla [2]
Ibtihal Ahmed Sallal [3]

[1] University of diyala (Iraq)
[2] University of diyala (Iraq)
[3] University of diyala (Iraq)

Corresponding author:
Mustafa Jawad Kadhim
Mustafajawad267@gmail.com

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Abstract

Introduction and Objective: Football instruction in Iraqi secondary schools still relies on a command-style approach in which learning time is limited, learners remain passive, and skill acquisition is detached from the motivational context of play. This study examined the effectiveness of a programme integrating the flipped classroom with recreational activities on male secondary students' dribbling, passing and shooting skills, compared with traditional teaching.

Methodology: A quasi-experimental, pre-test/post-test, two-group equivalent design was used. Forty male secondary students (16–17 years) from Diyala Education Directorate schools (2025/2026) were randomly divided into an experimental group (n = 20), which received the flipped classroom with small-sided recreational games for eight weeks, and a control group (n = 20), which received conventional instruction. Dribbling speed, passing and shooting accuracy were measured with standardised field tests. Data were analysed in SPSS v.26 using paired and independent-samples t-tests, improvement rates and Cohen's d effect sizes at $p < 0.05$.

Results: Both groups improved significantly from pre- to post-test ($p < 0.05$), but the experimental group's post-test scores were significantly higher than the control group's across all three skills ($p < 0.001$), with large effect sizes for dribbling ($d = 1.83$), passing ($d = 1.17$) and shooting ($d = 1.28$). Improvement rates for the experimental group (shooting 41.58%, passing 29.60%, dribbling 12.33%) exceeded the control group's.

Conclusions: Combining flipped classroom instruction with recreational activities proved effective and is recommended as a low-cost, replicable model for Iraqi physical education directorates seeking to modernise football instruction within existing curricular time.

Keywords

Flipping classroom, recreational activity, fun learning, football skill, dribbling, passing.

Resumen

Introducción y objetivo: En la secundaria iraquí, la enseñanza del fútbol sigue basándose en un estilo de mando: escaso tiempo de aprendizaje, alumnado pasivo y habilidades desligadas del contexto motivacional del juego. El objetivo fue determinar la eficacia de un programa que integra aula invertida y actividades recreativas en regate, pase y tiro, frente a la enseñanza tradicional.

Metodología: Diseño cuasiexperimental pretest-postest con dos grupos equivalentes. Cuarenta estudiantes varones de secundaria (16–17 años) de la Dirección de Educación de Diyala (2025/2026) se dividieron aleatoriamente en un grupo experimental (n = 20), con aula invertida y juegos recreativos de espacio reducido durante ocho semanas, y un grupo de control (n = 20) con instrucción convencional. Se midieron velocidad de regate y precisión de pase y tiro con pruebas de campo estandarizadas, analizadas en SPSS v.26 mediante pruebas t pareadas e independientes, tasas de mejora y d de Cohen ($p < 0.05$).

Resultados: Ambos grupos mejoraron significativamente del pretest al postest ($p < 0.05$), pero el experimental fue significativamente superior en las tres habilidades ($p < 0.001$), con tamaños del efecto grandes para regate ($d = 1.83$), pase ($d = 1.17$) y tiro ($d = 1.28$). Las tasas de mejora del experimental (tiro 41.58%, pase 29.60%, regate 12.33%) superaron las del control.

Conclusiones: La combinación del aula invertida con actividades recreativas resultó eficaz y se recomienda como modelo replicable de bajo coste para las direcciones de educación física iraquíes que buscan modernizar la enseñanza del fútbol en el tiempo curricular existente.

Palabras clave

Aula invertida; actividad recreativa; aprendizaje lúdico; habilidades futbolísticas; regate; pase.

Introduction

Physical education (PE) is widely regarded as a foundation for lifelong physical activity, health and social development, and learning to move well is central to that role. In Iraqi schools, football carries much of this weight: it is the most widely played and most culturally significant game pupils encounter. A good football lesson draws pupils into regular, enjoyable activity and builds cooperation and communication; a poor one reproduces the boredom, passivity and disengagement that still characterise much traditional PE across the region (Hameed et al., 2026). The gap between what a lesson could be and what it currently is marks the starting point of this study.

Organised sport is built on basic motor skills, and there is now reasonable evidence that developing technical football skills in early-to-mid adolescence benefits athletic performance, self-confidence and social integration through team play (Masrun et al., 2025). Three skills are central to the school game and difficult to fake: dribbling — moving with the ball under pressure; passing — the glue of collective play; and shooting — the skill that converts tactical work into results. Sulistiyono et al. (2023) validated authentic instruments confirming that these three skills form the measurable core of school football competence.

The problem lies in how football is taught. Fieldwork on recreational-activity planning in the Diyala Education Directorate (Kadhim, 2022) found that a command style dominates most subjects: lengthy verbal explanation, pupils organised in stationary lines, and little of the game itself surviving in the lesson. Structured lesson observation underpinning that analysis is concrete on this point: in typical 90-minute units most time is absorbed by explanation, demonstration and the management of queues and transitions, while in classes of thirty or more pupils each learner receives very few skill repetitions, and small-sided or play-based activities, where they appear at all, feature as an unstructured reward at the end of the lesson rather than as a vehicle for skill development (Kadhim, 2022). Active learning time is scarce, repetitions per pupil are few, and the motivational pull of play — the very thing that makes football appealing to adolescents — is designed out. The result is a well-known and persistent gap between intended curricular goals and pupils' actual competence, alongside a decline in motivation across the secondary years.

Two developments in teaching offer a complementary way forward, and this study draws on both. The first is the flipped classroom, which simply relocates the timing of instruction: explanation is delivered as short pre-class videos on pupils' own devices, freeing lesson time for social, scaffolded practice (Bergmann & Sams, 2012). Abeysekera and Dawson (2015) describe flipped learning as a family of approaches in which learners acquire content before class and then use class time to apply it rather than merely receive it. The implication for PE is direct: moving demonstration and explanation to the pre-class phase can return almost the entire lesson to motor practice.

The second development is skill learning through structured play, recently termed fun learning in both Iraqi and international literature. In a systematic review and meta-analysis, Mao et al. (2022) showed that integrating football with education improves general motor performance and pupils' tactical decision-making. Kadhim (2022) added the complementary point that, although recreational activity is widely seen as beneficial for pupils' physical, psychological and social development, its planning and delivery remained weak and loosely structured rather than a deliberate path to skill. The games-teaching literature supplies the mechanism: Renshaw et al. (2015) argue that a game-based approach with deliberate tactical constraints lets technical skill develop together with perception and decision-making, rather than in the sterile isolation of queue-and-repeat drills. Small-sided games achieve exactly this density — reducing player numbers yields more ball contacts, passes, dribbles and shots per unit of time than full-sided games or static repetition (Hill-Haas et al., 2011). Recent work in this journal has extended small-sided formats beyond conditioning into vehicles for developing the technical and tactical behaviour of young players (Ferraz et al., 2025; Hidalgo De Mora et al., 2025) and for enhancing physiological capacities such as maximal oxygen uptake (Muhyi et al., 2025), while laboratory comparisons of expert and novice players highlight execution time and decision-making as key discriminators of football performance (Calle-Jaramillo et al., 2024). A social dimension completes the picture: Darnis and Lafont (2021) show that structured verbal interaction between peers during game-based football improves skill, game performance and involvement.

These two bodies of work rarely meet. Flipped learning has independent support in PE: Hinojo Lucena et al. (2018, 2020) linked it to higher academic and conceptual outcomes in university PE, and Killian et al. (2022) showed that its main benefit is increased active learning time and readiness to practise. Regionally, Saber et al. (2024) applied a flipped approach to passing and stopping in futsal and reported significant gains, though class time was not devoted to play. Fun and game-based learning likewise has its own support: Hameed et al. (2026) found positive outcomes from a fun-learning programme for junior players, Camacho-Sánchez et al. (2023) reviewed 47 studies and concluded that game-based learning and gamification enhance motor learning and motivation, and Mao et al. (2022) reported the largest gains when training was play-based rather than repetition-based. Yet almost no study has combined both innovations into a single package for the core technical skills of football in the Arab and Iraqi secondary context. That is the contribution of the present study: it brings the two frameworks together and tests them empirically on data collected in the Diyala Education Directorate.

Accordingly, the research problem is stated as follows: Can an instructional programme combining the flipped classroom with recreational activities improve the dribbling, passing and shooting skills of male secondary-stage football students in Diyala schools more than the conventional method currently in use? The question matters on several levels. It tests a new pedagogical package — flipped and recreational learning as one design — in a context where, to our knowledge, it has not previously been trialled in the Arab world. It directs the attention of supervisors, curriculum planners and administrators to the practical value of pre-class online preparation combined with in-class play. And because the programme requires little beyond pupils' own smartphones, basic equipment and open space, it is applicable to almost any Iraqi secondary school regardless of resources.

Theoretical Framework

The effectiveness of combining flipped learning with recreational activities in PE can be understood through a multi-dimensional theoretical framework consisting of three pillars.

First, the flipped learning component is rooted in Cognitive Load Theory (Sweller, 1988) and Self-Determination Theory (Deci & Ryan, 1985). According to Cognitive Load Theory, shifting the delivery of explicit instruction to outside the classroom reduces extraneous cognitive load during the physical lesson, thereby freeing students' working memory for active motor practice. Concurrently, Self-Determination Theory suggests that allowing students to control their pre-class learning fosters feelings of autonomy and competence, subsequently enhancing intrinsic motivation. As established by Abeysekera and Dawson (2015), these two theories form the fundamental rationale for flipped learning. Translating these theories into the current study's design, the 6–12-minute pre-class videos were specifically structured to offload explicit verbal instruction, fulfilling the theoretical requirement to clear working memory and grant learner autonomy prior to physical execution.

Second, the recreational in-class component is underpinned by the Constraints-Led Approach (Newell, 1986), Teaching Games for Understanding (TGfU; Bunker & Thorpe, 1982), and Vygotskian social constructivism (Vygotsky, 1978). The Constraints-Led Approach posits that deliberately modifying task constraints — such as adapting the rules and spaces in small-sided games — guides the natural emergence of technical skills coupled with perception and decision-making (Renshaw et al., 2015). This aligns with TGfU principles, which advocate embedding skill acquisition within tactical play (Camacho-Sánchez et al., 2023; Mao et al., 2022). Furthermore, placing students in structured small-sided environments stimulates peer interaction, directly drawing on Vygotsky's Zone of Proximal Development (ZPD) to enhance skill and game involvement (Darnis & Lafont, 2021). Accordingly, the recreational activities in this intervention were explicitly designed as small-sided games with targeted rules to ensure that skill execution emerged organically from tactical constraints rather than isolated repetition.

Third, the interaction between these two components creates a theoretical synergy explained through the concept of Academic Learning Time in Physical Education (ALT-PE; Siedentop et al., 1982). The flipped component maximises the quantity of active learning time by eliminating time-consuming in-class lectures (Killian et al., 2022). Simultaneously, the recreational game-based component enhances the quality of that time through high-density repetition and heightened intrinsic motivation. Therefore, the proposed mechanism of change is theorised to be interactive rather than purely additive: the flipped classroom creates the critical temporal space, while the recreational small-sided games optimise the

pedagogical and motor value of that space. Building directly upon this theoretical framework, the hypotheses of this study emerge as logical predictions of this synergistic model.

Objectives and Hypotheses

The study set out to determine the effect of a flipped-classroom-plus-recreational-activities programme on the dribbling, passing and shooting of male secondary-stage students (16–17 years), and to compare the outcomes with conventional teaching. Three hypotheses were tested:

- The experimental group improves significantly from pre- to post-test on all three skills, in favour of the post-test.
- The control group also improves significantly from pre- to post-test, but by a smaller margin.
- The experimental group's post-test scores are significantly higher than the control group's on all three skills, with large effect sizes.

Method

The target population was male secondary students in schools of the Diyala Education Directorate during the 2025/2026 school year. Two schools with comparable facilities, equipment and teaching climate in the same educational zone were selected, and a purposive sample of third-year secondary students (16–17 years) was drawn from them. Of 48 students across both schools, 40 met the inclusion criteria (no prior experience of a flipped-learning approach, no extracurricular football training, attendance ≥ 90%, and no musculoskeletal disorder contraindicating participation). They were randomly assigned to an experimental group (n = 20) and a control group (n = 20). Eight students were excluded owing to irregular attendance (3), club participation (2), minor musculoskeletal complaints (2) or withdrawal of consent (1). Pre-test descriptives are given in Table 1: mean age 16.7 ± 0.48 years, height 170.4 ± 3.81 cm, body mass 65.7 ± 4.73 kg.

Table 1. Descriptive statistics of the sample: skill tests and anthropometric parameters (N = 40).

Variables	Unit	Min	Max	Mean ($\bar{x}$)	SD ($\pm\sigma$)	Skewness	Kurtosis
Dribbling speed (5×10 m slalom)	sec	12.01	14.23	13.12	0.685	0.147	−1.211
Passing accuracy (10 attempts)	score	4	8	6.30	1.012	−0.318	−0.945
Shooting accuracy (10 attempts)	score	3	7	5.10	1.147	0.261	−1.082
Height	cm	164	178	170.4	3.81	0.422	−0.618
Body mass	kg	58	75	65.7	4.73	0.533	−0.791

Skewness values (−0.318 to 0.533) fall within ±3, confirming normal distribution; kurtosis values (−1.211 to −0.618) indicate acceptable curve shape.

Procedure

The study used a two-group, pre-test/post-test quasi-experimental design. The experimental group received the flipped classroom–recreational programme for eight weeks (two sessions/week; 16 sessions; 90 minutes/session). Over the same period the control group followed the standard Ministry of Education syllabus under conventional methods. Both groups were tested concurrently under identical conditions by the same evaluators.

Before each flipped session, pupils watched a short 6–12-minute video shared via WhatsApp groups and YouTube links. The videos covered dribbling mechanics, passing angles and weight, and shooting posture and follow-through (one or two videos per session). In class, no formal verbal instruction or demonstration was given except for clarifying feedback. In-class time consisted of small-sided games, target games, relay games and modified play forms, each designed so that the target skill (dribbling, passing or shooting) was performed at high frequency within an engaging, competitive environment. Ability-based grouping was used in the small-sided games to keep challenge and engagement balanced across ability levels.

The 16 sessions were organised into four two-week blocks of increasing difficulty. Block 1 (sessions 1–4) developed individual technique through dribbling and passing games and 1v1 and 2v2 formats with simple target rules. Block 2 (sessions 5–8) introduced competitive 3v3 and 4v4 games, with rules adjusted to generate more passes and more attempts on goal. Block 3 (sessions 9–12) developed

possession play and 5v5 matches combining all three skills with tactical awareness and decision-making. Block 4 (sessions 13–16) used 5v5 and 6v6 games with minimal constraints so pupils could apply the skills they had developed. Progressive overload — a core principle of motor learning — was maintained throughout.

The three target skills were measured with standardised field tests:

- Dribbling: 5 × 10 m Slalom Dribbling Test — pupils dribble the ball through a line of cones (2 m apart) as fast as possible; the time in seconds is recorded, with lower being better. The test was drawn from validated Arabic and international PE test batteries appropriate for the secondary age group.
- Passing: Passing Accuracy Test — pupils make 10 passes at a wall target (120 × 80 cm) from 7 m, scoring one point per pass that strikes the target (maximum 10). The instrument has been shown valid and reliable in football PE research (Sulistiyono et al., 2023).
- Shooting: Shooting Accuracy Test (SAT) — 10 shots from the shooting arc at a goal divided into six zones (corner zones worth 2 points, central zones 1 point); the maximum score is 10. The test reflects the real shooting demands of the game.

Discriminative validity and test–retest reliability were established with a pilot of 10 students from outside the main sample, using a seven-day retest interval. Results appear in Tables 2 and 3.

Table 2. Discriminative validity of the skill tests (distinguished vs. non-distinguished groups, n = 5 each).

Test	Dist. Mean (n=5)	SD	Non-Dist. Mean (n=5)	SD	Calc. t	Discrim. Validity Coeff.
Dribbling 5×10 m slalom (sec)	12.38	0.52	13.74	0.63	4.09**	0.847
Passing accuracy / 10 (score)	7.60	0.89	5.00	0.71	5.83**	0.912
Shooting accuracy / 10 (score)	6.80	0.84	3.80	0.84	6.21**	0.921

** Significant at 0.01. Validity coefficients (0.847–0.921) show each test discriminates between performance levels.

Table 3. Reliability coefficients (test–retest, n = 10, interval = 7 days).

Test	1st App. Mean	SD	2nd App. Mean	SD	Calc. t	Reliability Coeff. (r)
Dribbling 5×10 m slalom (sec)	13.09	0.691	13.11	0.679	0.81	0.996**
Passing accuracy / 10 (score)	6.30	1.005	6.40	1.012	1.23	0.987**
Shooting accuracy / 10 (score)	5.10	1.150	5.20	1.140	1.54	0.991**

** Significant at 0.01. Reliability coefficients (0.987–0.996) confirm the tests are consistent and dependable.

Data Analysis

Data were processed in IBM SPSS Statistics v.26. Analyses comprised arithmetic means, standard deviations, skewness and kurtosis, paired-samples t-tests (within-group, pre-to-post), independent-samples t-tests (between-group, post-test), Cohen's d effect sizes and improvement-percentage rates, with significance set at $p < 0.05$.

Results

Results are presented in three steps: within-group change for the experimental group, within-group change for the control group, and the between-group difference at post-test. To avoid repeating figures already given in Tables 4–6, the text reports only the direction and significance of effects; interpretation is reserved for the Discussion.

Table 4. Pre- and post-test means, SDs, t-values, significance and Cohen's d for both groups (n = 20 per group).

Test	Group	Pre Mean	Pre SD	Post Mean	Post SD	Diff.	Calc. t	Sig.	Cohen's d
Dribbling 5×10 m (sec)	EG	13.14	0.69	11.52	0.58	1.62	9.84**	0.000	2.52
	CG	13.10	0.68	12.63	0.65	0.47	2.91**	0.009	0.71
Passing accuracy / 10	EG	6.25	1.02	8.10	0.72	1.85	8.36**	0.000	2.09
	CG	6.35	1.04	7.20	0.83	0.85	3.74**	0.001	0.91
Shooting accuracy / 10	EG	5.05	1.15	7.15	0.75	2.10	8.71**	0.000	2.17
	CG	5.15	1.14	6.10	0.91	0.95	3.87**	0.001	0.93

*** Significant at 0.01 (critical t at 0.05 = 2.093, at 0.01 = 2.861; df = 19 within-group, df = 38 between-group). EG = experimental group; CG = control group.*

All three skills in the experimental group improved significantly from pre- to post-test, with effect sizes well beyond Cohen's (1988) large-effect threshold of 0.80 (Table 4). The control group also improved significantly, but with smaller effects, and its dribbling gain fell below the large-effect threshold — confirming that conventional teaching does produce learning, though at a lower rate.

Table 5. Post-test comparison of dribbling, passing and shooting between groups.

Test	EG Post Mean (n=20)	SD	CG Post Mean (n=20)	SD	Calc. t	Sig.	Cohen's d
Dribbling 5×10 m (sec)	11.52	0.58	12.63	0.65	5.92**	0.000	1.83
Passing accuracy / 10 (score)	8.10	0.72	7.20	0.83	3.74**	0.001	1.17
Shooting accuracy / 10 (score)	7.15	0.75	6.10	0.91	4.11**	0.000	1.28

** Significant at 0.01. Large t-values support the superiority of the experimental group across all three post-test skills.

The third hypothesis held for every skill (Table 5): the experimental group's post-test scores were significantly higher than the control group's, with large between-group effect sizes for dribbling, passing and shooting alike. All three differences are of clear practical as well as statistical significance.

Table 6. Improvement (%) from pre- to post-test across the three skill tests for both groups.

Test	EG Pre Mean	EG Post Mean	CG Pre Mean	CG Post Mean	EG Improv. % (vs CG)
Dribbling 5×10 m (sec)	13.14	11.52	13.10	12.63	12.33% vs 3.59%
Passing accuracy / 10 (score)	6.25	8.10	6.35	7.20	29.60% vs 13.39%
Shooting accuracy / 10 (score)	5.05	7.15	5.15	6.10	41.58% vs 18.45%

Dribbling improvement is a reduction in time — smaller is better. Across all three skills, improvement rates favour the experimental group.

Improvement rates favoured the experimental group across all three skills, with the largest margin in shooting (Table 6). This pattern is taken up in the Discussion.

Discussion

The experimental group improved on all three skills with effect sizes at the high end of the scale, supporting the first hypothesis. The most likely reason is that the two programme components worked together rather than in sequence. Relocating explanation and demonstration to pre-class videos freed almost the entire 90-minute lesson for practice, directly addressing the central weakness of command-style teaching: the overlap between explaining technique and practising it, and the shortage of repetitions. This aligns with Hinojo Lucena et al. (2020), who found flipped learning more effective than conventional PE, and with Killian et al. (2022), who identified greater time on task as its main benefit.

The recreational component then governed how that freed time was used. Rather than reverting to repetitive drilling — less motivating and less cognitively engaging for learners — it was filled with varied, purposefully planned games. Game-based learning has been shown effective for motor skills, engagement and intrinsic motivation (Camacho-Sánchez et al., 2023), while football training supports fundamental movement skills and social development within a team (Mao et al., 2022). The present results suggest that recreational games did more than add minutes of practice: they raised the quality of those minutes. Combined, the two components lift both the quantity of active learning time (the flipped side) and its quality (the recreational side) at once.

The second hypothesis — significant gains for the control group as well — is also methodologically important. It shows that learning occurred in both arms, and therefore that the greater learning in the experimental arm reflects the instructional method rather than an absence of teaching in the control group. The smaller control-group effects are consistent with the well-documented inefficiency of command-style PE in active time and repetitions, and with Kadhim (2022) on the weak practical basis of recreational activity in Diyala schools.

The third hypothesis is where the programme's advantage is clearest: the experimental group was significantly superior on every post-test skill. The largest between-group effects appeared for the skills that respond quickest to a high number of time-pressured trials in a compact space — dribbling and shooting. Passing, being more cooperative and communicative, still showed a large between-group effect; Darnis and Lafont (2021) explain why, showing that embedding passing in a tactical, talk-rich game improves execution. In short, game-embedded practice trains not only the movement but the

reading of the situation that precedes it. These findings reinforce Saber et al. (2024) on flipped futsal passing and Hameed et al. (2026) on fun learning for junior players, and demonstrate that combining flipped and fun-learning methods yields gains neither method tends to achieve alone.

The improvement rates sharpen the picture. The experimental group's shooting gain (41.58%) far exceeded the control group's (18.45%), suggesting that the recreational component is not merely more enjoyable but genuinely more effective for developing shooting: repeated shooting across target games, penalties and small-sided games under time and defensive pressure builds automaticity through game-like repetition. This reflects Renshaw et al.'s (2015) principle of modification through exaggeration — adapting the game to maximise the frequency of the target skill under time pressure.

The programme's cost is negligible and its reach is wide. It requires only a smartphone to record and share videos — already used in school WhatsApp groups — together with basic football equipment and open space, none of which exceeds the stock of an ordinary school. This is not structural or budgetary engineering but a re-balancing of how football teaching time is used; directorates that take the evidence seriously can achieve real improvement without changing their structures or budgets.

Limitations and Future Research

Several limitations frame these findings. The sample was confined to 40 pupils in two schools within a single directorate, which limits generalisability. Only male students in one age band (16–17 years) took part, so the effects cannot be assumed to hold for younger pupils or girls. The intervention ran for eight weeks with no delayed post-test, so the durability of the gains was not tested. The design was quasi-experimental with intact groups, and only skill outcomes were measured — no game-play or physiological data were collected.

These boundaries point to clear next steps. Larger, more diverse samples — including female students and other age groups, with follow-up measurement three to six months after the programme — would test generalisability and retention. Extending the integrated flipped–recreational approach to other football skills (heading, throw-in, goalkeeping) and to other team sports would show whether it transfers beyond the three skills studied here. Furthermore, while the theoretical framework posits a synergistic (interactive) effect between flipped learning and recreational games, the two-group quasi-experimental design employed cannot statistically isolate an interaction effect from an additive one. Future research should employ a 2×2 factorial design (flipped only, recreational only, combined, and control) to empirically test this theoretical interaction.

Conclusions

The experimental group improved significantly from pre- to post-test on all three skills, with effect sizes far above Cohen's 0.80 large-effect criterion — gains that are both statistically significant and practically meaningful. The control group also improved, but by a smaller margin, showing that conventional instruction develops skill at an observable yet slower rate than the integrated programme. Between groups, the experimental group was significantly superior on all three skills with large effect sizes, confirming the programme's advantage over conventional teaching.

- Improvement rates for the experimental group (dribbling 12.33%, passing 29.60%, shooting 41.58%) were well above those of the control group (3.59%, 13.39%, 18.45%).
- Pre-class video learning and in-class recreational small-sided games work synergistically, raising both the quantity and quality of active learning time beyond what either produces alone.
- Effective innovation in Iraqi secondary football teaching needs no extra resources, structural reform or expensive technology — only a deliberate rebalancing of pre-class and in-class time around purposeful play. This is directly relevant to policy in Diyala and other Iraqi settings.

Recommendations

- Disseminate the flipped classroom–recreational programme to schools in Diyala as an effective, low-cost model for teaching dribbling, passing and shooting.
- Generalise it to female secondary students and to other age groups (preparatory and primary), adjusting video complexity and game difficulty accordingly.
- Extend it to other football skills (heading, throw-in, goalkeeping) and other team sports (futsal, basketball, volleyball, handball).
- Provide PE teachers with the full package: the testing protocol, a graded set of activities, and a guide to producing the videos.
- Train teachers and supervisors to create short, clear PE videos using the smartphones and video-sharing platforms already present in pupils' daily lives.
- Reframe recreational activity, in the thinking of planners and supervisors, as an integral skill-teaching element rather than an optional add-on at the end of a lesson; this requires pedagogical redesign, not additional funding.
- Conduct longitudinal follow-up studies to determine whether gains persist at three to six months and whether the motivational benefits of play endure across the school year.

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Authors and translators' details:

Mustafa Jawad Kazem	Mustafajawad267@gmail.com	Author
Furat Jabar Saadalla	basic2020saadall ı@uodiyala.edu.iq	Author
Ibtihal Ahmed Sallal	basiceng19@ı diyala.edu.iq	Translator