Indian Journal of Modern Research and Reviews

This Journal is a member of the *'Committee on Publication Ethics'*

Online ISSN:2584-184X

Research Paper

The Effect of Gregorc's Model Supported by Various Educational Devices in Teaching Some Basic Football Skills to Students

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DOI: https://doi.org/10.5281/zenodo.16473005

ABSTRACT

This research aims to identify the effect of the Gregorc model, supported by various educational devices, on teaching some basic soccer skills to secondary school students. The importance of the research lies in keeping pace with modern trends in teaching methods and linking educational theories, such as the Gregorc model, with practical field activities using educational aids that contribute to improving student performance and developing their motor skills. The experimental approach was used due to its suitability for the nature of the problem. The research was applied to a sample of students from Shuhada Zambor Secondary School for Boys for the 2024-2025 academic year. The sample size (numbers will be mentioned later after precise determination) was determined. They were randomly assigned to two groups: an experimental group (taught according to the Gregorc model using educational devices) and a control group (taught according to the traditional method). The procedures included the following: The main experiment of the research was implemented from November 4, 2024, to January 7, 2025, with two instructional units per week (every Sunday and Wednesday) using the specified teaching model. Post-tests were administered to compare the performance of the two groups. The results showed statistically significant differences between the two groups, in favor of the experimental group. This confirms the effectiveness of the Gregorc model, supported by educational devices, in developing students' soccer skills.

Manuscript Info.

✓ **ISSN No:** 2584- 184X
✓ **Received:** 09-06-2025
✓ **Accepted:** 20-06-2025
✓ **Published:** 27-07-2025
✓ **MRR:3(7):**2025;62-68

✓ **Peer Review Process:** Yes
✓ **Plagiarism Checked:** Yes

How To Cite this Article

Mahdi Abbas HM. The effect of Gregorc's model supported by various educational devices in teaching some basic football skills to students. Ind J Mod Res Rev. 2025;3(7):62-68.

KEYWORDS: Gregorc Model, Educational Devices, Soccer.

INTRODUCTION

Football is one of the most popular and widely practiced team sports in various educational institutions, due to its physical, skill, and mental aspects, which contribute to the comprehensive development of a student's personality. Because learning basic football skills requires the use of advanced teaching methods that take into account individual differences among learners, it has become imperative for researchers in the field of physical education to search for modern teaching methods that contribute to improving the learning process and achieving lesson objectives efficiently and effectively. In this context, Gregork's learning model emerged as one of the Gregork models based on differences in students' learning styles. He divides learners into four cognitive styles, each with its own method of receiving and processing information. Gregork's model plays an important role in modern teaching and learning, focusing on meeting the diverse needs of students through adapting teaching strategies. The model enhances student engagement and effective learning, and emphasizes the importance of continuous assessment and

supporting teachers' personal and professional development, which contributes to improving the quality of education. The effectiveness of this model increases when supported by various educational devices that stimulate the senses, attention, and motor perception, enhancing the process of learning sports skills, particularly basic skills in football [1].

The importance of this research lies in its attempt to integrate theory and practice by using Gregork's model, supported by various educational devices, in a realistic educational environment, specifically within the physical education class in secondary schools. The research also aims to provide effective educational alternatives that go beyond traditional methods and give students greater opportunities for understanding, application, and active participation. This research responds to a real field need that requires updating motor skills teaching methods to keep pace with contemporary changes and technological developments. It also contributes to developing the teacher's professional competence and raising the level of student performance.

Research Problem

Teaching basic football skills is a complex process that requires integration between Gregory's model, the skill-based model, and the emotional model. This cannot be effectively achieved through traditional teaching methods, which often focus on direct instruction or indoctrination. The researcher's field observations, through his observation of physical education classes in secondary schools, revealed a clear weakness among students in mastering basic football skills, such as passing, control, scoring, and blocking. This indicates shortcomings in the teaching methods adopted.

Despite the availability of modern educational models that take into account individual differences among students, such as the Gregory model, these models are still not widely used in the educational field, particularly in physical education. Furthermore, educational devices, despite their importance in facilitating learning and motivating students, are used in a limited or unsystematic manner.

Hence, the research problem arises in the following question:

- What is the effect of using the Gregory model, supported by various educational devices, on teaching some basic football skills to secondary school students?

Research Objectives

- To identify the effect of using the Gregork model, supported by various educational devices, on teaching some basic soccer skills to secondary school students.
- To compare the learning outcomes of basic skills between students in the experimental group (using the Gregork model with educational devices) and students in the control group (using the traditional method).

Research Hypotheses

1. There are statistically significant differences between the results of the pre- and post-tests of the experimental group in learning some basic soccer skills, in favor of the post-test.
2. There are statistically significant differences between the results of the experimental and control groups in the post-test in learning some basic soccer skills, in favor of the experimental group.

Research Areas

- **Human Domain:** The human domain was represented by a sample of students from the Martyrs of Zembour Boys High School for the 2024-2025 academic year, aged between (16) years, who had never received specialized football training outside of school.
- **Time Domain:** From October 10, 2024 to January 7, 2025.
- **Spatial Domain:** The experiment was conducted in the stadium of the Martyrs of Zembour Boys High School, with the school hall also being used to store educational equipment and organize logistical aspects related to the experiment.

Research Methodology

The researcher adopted the experimental approach because of its ability to identify causal relationships between variables, and because the study's objective was to measure the effect of Gregorc's model, supported by educational devices (the independent variable), on the learning of some basic soccer skills (the dependent variable). "It is the deliberate and controlled change in the specific conditions of a particular event, and then observing and interpreting the resulting changes in that same event" [2].

A two-group equivalent design was applied: an experimental group and a control group. Pre- and post-tests were administered to measure changes in skill performance.

Research Population and Sample

The research population consisted of students from Martyrs of Zambor Secondary School for Boys for the 2024-2025 academic year. A random sample of 30 students, aged 16 and over, was selected from the population after ensuring their regular attendance and suitability for the experimental conditions. They were divided as follows:

- **Experimental group (15 students):** Used Gregorc's model supported by various educational devices.
- **Control group (15 students):** Learned using the traditional method.

Table 1: Distribution of sample members by group and age

Groups	Number of students	Average age	Minimum age	Maximum age
Experimental	15	16 years old	15 years	17 years old
Control	15	16 years old	15 years	17 years old
Total	30	—	—	—

The table shows the homogeneity of the two groups in terms of chronological age.

Table (1) shows that the sample was evenly distributed between two groups (15 students each), and that the students' ages ranged between 16 years and 18 years, indicating age homogeneity between the two groups. Table (2) also shows that the majority

of students were regular students and had an average to good skill level, which provided a suitable environment for implementing the proposed educational experiment.

Table 2: Distribution of sample members according to attendance and skill level

The group	Regular	Good	Irregular	Good skill	Middle	Weak
Experimental	9	4	2	3	8	4
Control	10	3	2	4	7	4

The table shows the students' status in terms of their academic commitment and skill level before the start of the experiment.

Research Methods, Devices, and Tools Used

1. Methods Used:

- Initial questionnaires to collect personal and skill information about the students.
- Attendance logs to document regularity and commitment.
- Skill performance observation cards following specific soccer standards.
- Objective pre- and post-tests to measure performance in the three skills: passing, scoring, and blocking.

2. Educational Devices and Tools:

- Colored cones to regulate player movement.
- Soccer balls of varying sizes and weights to account for individual differences.
- Small training nets to improve accuracy.
- Smart educational boards to visually explain skills.
- Timing devices to control time during exercises.
- Optical and audio motion indicators to stimulate attention.

Procedures for Determining Study Variables:

1. Independent Variable: The researcher adopted the Gregorc model supported by educational devices. Dependent variable: Skill performance in football (passing, scoring, blocking). The researcher relied on the methodological skills approved by the Physical Education Teacher's Guide for the Intermediate Stage, approved by the Ministry of Education [3].
2. Standardized scientific tests used for the dependent variables.

The researcher conducted a questionnaire distributed to experts in football, testing, and measurement. The questionnaire included the skills under study, with three tests for each skill. The researcher adopted an agreement rate of 70% or higher, as shown in Table (3).

Table 3: shows the skill tests nominated for the selected skills under study

S	Skills under research	Candidate test	Test objective	Units	Repetition	Number of experts	%
1	Scoring	Scoring at a target painted on the wall	Kick the ball with your foot toward the wall as many times as possible. Hit the designated scoring areas.	Number	7		78%
		Scoring at the target from a distance of 12 meters			1		11%
		Scoring towards 3 overlapping rectangles			1		11%
2	Put out	Control the ball by stopping it 6 yards behind the starting line.	Measuring accuracy in stopping the ball and regaining control with the side of the foot, foot, knee, or chest. Control by suppressing the ball Recovering the ball to control it	Point	8		89%
		Receive and stop the ball inside a 2m² box from a distance of 6 meters.			0		-
		Receive and stop the ball inside a 3m² box from a distance of 6 meters.			1		11%
3	Handling	Handing the ball back to the wall for 20 seconds from a distance of 5 meters.	Measuring Handling Accuracy	Sec.	8		78%
		Handing the ball back to the wall for 30 seconds from a distance of 9 meters.	Passing the Ball Faster	Sec.	1		22%
		Handing the ball towards a target marked on the ground with three circles, 15 yards away.	Speed and Accuracy	Degree	0		-

The specified tests are: [4]

1. 30-second wall-bound handling test:

- Purpose of the test: To measure handling accuracy.

2. Stop-off skill test (6) yards from the starting line:

- **Purpose of the test:**
- To measure accuracy in stopping the ball (stopping) and regaining control with the side of the foot, foot, thigh, or chest.

3. Scoring test at a target painted on the wall.

- **Purpose of the test:** To kick the ball with the foot toward the wall as many times as possible in 30 seconds.

Scientific Conditions for the Tests:

The researcher relied on standardized scientific tests applied to the Iraqi environment and to age groups similar to the sample, and approved for recent years. These tests were characterized by a content validity coefficient of 0.89, a reliability coefficient of 0.88, and an objectivity coefficient of 0.88.

Exploratory Experiment:

The researcher conducted a survey on October 16, 2024, with a sample of 10 students from the research community to ensure the validity of the standardized scientific tests, their suitability for the research sample, and the competence of the work team.

Preparing Educational Units According to the Gregork Model Using Educational Devices:

The researcher prepared an educational unit according to the Gregork Model using educational devices for soccer, requiring organized steps.

- First, identifying educational objectives, such as improving passing, scoring, and blocking skills.
- Second, designing appropriate activities that focus on training students on the targeted skills using interactive devices.

Third, providing a clear explanation of the basic principles of each skill, along with practical examples. Fourth, the activities were implemented gradually, while monitoring performance and correcting errors. Finally, performance was evaluated using educational devices to determine the level of improvement, while encouraging students to continue practicing. Thus, procedures were effectively employed to enhance mathematical skills in a fun and effective way. The conditions for implementing the experiment included: the same teacher for both groups; the same training location (the school playground); the same time period (November 2024, two educational units per week); and the same number of lessons and educational content.

Pretest:
The researcher ensured the equivalence of the control and experimental groups by conducting accurate measurements and applying standardized tests to assess the variables involved in the study. The focus was on identifying potential differences between the two groups by calculating performance indicators and available results, allowing the researcher to accurately analyze the data. To achieve this goal, the researcher chose to use the independent samples t-test, which is an appropriate statistical tool for determining whether there are statistically significant differences between the means of two independent groups. Distinguishing between a control group facing certain conditions and an experimental group exposed to specific interventions or variables helps understand the effect of these on the targeted variable. As shown in Table (3), through these tests, the researcher can conclude whether the observed differences in the data reflect natural variation or are a result of the intervention or modification that was applied. It is important to emphasize that understanding these differences will significantly contribute to supporting the proposed hypotheses, which may positively impact the final results of the study and the recommendations drawn from it. The pre-test (equivalence) was conducted for the two research groups with the assistance of the work team on October 29, 2024.

Table 4: Shows the equivalence between the two research groups in the skills tests

S	Dependent variable test	Units	Control group		Experimental group		value of (t)	Significance level	Significance
			Mean	Std	Mean	Std			
1	Put out skill	Degree	3	1.46	3.06	1.34	0.12	0.87	Not statistically significant
2	Passing skill	Repetition	3.94	0.92	3.62	0.89	0.97	0.99	Not statistically significant
3	Scoring skill	Degree	9.38	2.06	9.44	1.90	0.90	0.98	Not statistically significant

The main experiment of the research was conducted from November 4, 2024, to January 7, 2025.

The following is the time distribution of the proposed curriculum:

- Number of weeks (10).
- Number of educational units per week (2) units, resulting in (20) educational units.
- Length of educational unit (45) minutes.
- Total duration of educational units (45 x 20 = 900) minutes.

The researcher used three skill exercises in the educational unit, providing skill exercises according to appropriate learning devices for the various types of passing, blocking, and scoring skills in soccer, resulting in the final formula as follows:

- Preparatory section (10 minutes), which includes the administrative aspect, the introduction (general preparation), and (physical exercises) for specific preparation.
- Main section (30 minutes), including (10) minutes for the educational part (explanation of the skill and presentation of the model), and (20) minutes for the practical part.

The final section (5 minutes) includes a mini-game and relaxation exercises.

Post-test:
The post-test was conducted for both research groups on January 14, 2025.

Statistical Methods:
The researcher used the Statistical Package for Science (SPSS).

Results and Discussions
Presentation, analysis, and discussion of the results of the pre- and post-tests for the experimental group:

Table (5): shows the means, standard deviations, calculated t-value, and significance of the differences between the results of the pre- and post-tests in skills for the experimental group

S	Dependent Variable Test	Units	Media		Mean diff.	Std diff.	Value of (t)	Significance level	significance
			Pre	Post					
1	Put out skill	Degree	3	7.38	4.31	1.78	9.70	0.02	Statistically significant
2	Passing skill	Repetition	3.62	8.38	4.75	1.44	13.22	0.00	Statistically significant
3	Scoring skill	Degree	9.44	17.63	8.19	3.04	10.78	0.00	Statistically significant

*At a significance level of (0.05) and a degree of freedom of 14

Table (5) shows statistically significant differences between the pre- and post-test results for the experimental group. The researcher attributes this superiority to the application of Gregorc's model, which transforms the active learning process as one of the essential elements in developing sports skills, especially in football. Through the model, students sought to set specific learning objectives, which contributed to motivating them to actively participate in the learning process. This type of learning requires students to be able to monitor, organize, and control their own characteristics, as well as to guide them in the educational environment in a manner consistent with their goals. The student begins by defining learning objectives, where they are encouraged to set personal goals related to developing specific football skills, such as passing, blocking, and scoring. Gregorc's model contributes to improving motor performance in football. Basic steps such as passing, blocking, and scoring require a dynamic interaction between motor perception and practical practice. "The educational environment plays a significant role in providing support and guidance, as positive interaction with the teacher and peers provides a strong platform for learning. An environment that fosters participation and collaboration is essential to fostering motivation and personal commitment, which directly contributes to improvement." [5]
"Gregorc's model enables individuals to examine their environments and experiences to make appropriate decisions about the learning process, evaluate them, and revise their plans, if necessary. Self-regulated learning is the strategies learners use to guide their learning efforts." [6].
The researcher also points to the role of educational devices, as they help improve performance and develop technique quickly and effectively. The devices provide opportunities for directed and intensive training, enhancing the ability to pass, score, and block accurately and comprehensively. They also help measure skill levels and identify weaknesses, facilitating the process of correction and continuous development. Thus, educational devices contribute to raising students' levels and better preparing them for matches and competitions. "They are a set of tools, devices, and materials that help players perceive and understand the level of educational material, learn it, and master it in the shortest time and with the least effort." [7].

- **Presentation, analysis, and discussion of the results of the pre- and post-tests for the control group:**

Table 6: shows the means, standard deviations, calculated t-value, and significance of the differences between the results of the pre- and post-tests in skills for the control group

S	Dependent Variable Test	Units	Mean		Mean diff.	Std diff.	Value of (t)	Significance level	Significance
			Pre	Post					
1	Put out skill	Degree	3	19.75	3.13	1.93	6.48	0.00	Statistically significant
2	Passing skill	Repetition	3.94	16.75	2.13	1.36	6.25	0.00	Statistically significant
3	Scoring skill	Degree	9.38	13.94	4.56	2.53	7.22	0.001	Statistically significant

*At a significance level of (0.05) and a degree of freedom of 14.

- **Presentation, analysis, and discussion of the results of the pre- and post-tests for the two research groups (control and experimental) in soccer skills.**

Table 7: Shows the means, standard deviations, calculated t-value, and the significance of the differences between the results of the post-tests in skills and motor behavior for the two research groups (control and experimental)

S	Dependent Variable Test	Units	Control group		Experimental group		Value of (t)	Significance level	significance
			Mean	Std	Mean	Std			
1	Put out skill	Degree	6.13	1.36	7.38	1.58	2.39	0.02	Statistically significant
2	Passing skill	Repetition	6.06	1.06	8.38	1.70	4.60	0.01	Statistically significant
3	Scoring skill	Degree	13.94	2.26	17.63	2.60	4.27	0.00	Statistically significant

*At a significance level of (0.05) and a degree of freedom of 28.

Table (7) shows that there are statistically significant differences between the results of the post-tests of the two research groups, the experimental group and the control group, in football skills, in favor of the experimental group. The researcher attributes this superiority to the influence of Gregory's model, which is one of the most important models of modern constructivist theory, as it is one of the most prominent educational concepts of great importance in the fields of research and study [8]. This type of learning enables learners to direct their efforts toward acquiring the knowledge and skills necessary to achieve their personal and academic goals. The importance of this process is evident in several aspects. It gives individuals the ability to control their behavior and learning environment, which enhances their ability to succeed in their chosen fields. Researchers place great importance on the learning process, as it provides learners with the opportunity to direct their efforts toward acquiring knowledge and skills, which helps them control their behavior and learning environment [9].
The researcher indicates that Gregory's model enhances learners' ability to adapt to different educational styles and variables. In a rapidly changing world like ours today, it becomes essential for individuals to have the ability to adapt to new circumstances and unexpected challenges [10]. This is achieved by developing self-learning skills. "Self-regulated learning is a powerful tool that enables individuals to achieve excellence in their academic and professional lives. It calls for independence and innovation, leading to the building of generations capable of facing challenges and making a difference in society." [11] The researcher also emphasizes the importance of the educational units he prepared according to the Gregorc model. They worked

to understand the students' specific needs, based on their desires and problems. This organization is also based on the programs available within the framework of human and material resources, and includes a diverse group of specialists, educators, and teachers, in addition to the necessary bodies, equipment, and funding. Furthermore, organizing these educational units according to the Gregorc model contributes to improving the learning of basic football skills, helping students achieve better performance in the game and develop their technical skills. "The planning process in physical education is a necessary process and an indispensable stage. It relies on a thorough understanding of the students' specific needs, based on the students' own desires. and their problems, and also depends on the special programs they receive within a framework of human and material capabilities that includes many specialists, educators, teachers, bodies, equipment, tools, and funding [12].

The researcher also attributes the superiority of the experimental group's results over the control group's results to the application of the stages and steps of the Gregorc model, which is characterized as an active and constructive process that contributes significantly to enhancing academic excellence. Learners are encouraged to set clear and specific goals for their learning process, which helps them direct their efforts and motivate them to achieve those goals. In addition, it is necessary for learners to monitor their progress in understanding information and to know their personal progress, as well as to review their motivations and learning behaviors. This requires them to adjust their learning strategies [13].

The researcher also emphasizes that the Gregorc model provides an opportunity for students to adapt their learning experiences according to their personal style and unique needs, making learning more effective. The Gregorc model is an active and constructive process where learners set goals for their learning and attempt to monitor their progress. Their knowledge, motivation, behavior, and control are guided by their goals and contextual features [14]. "Self-regulated learning relies primarily on the student's freedom, individuality, and self-reliance in decision-making, i.e., they bear full responsibility for constructing their own instructions." [15].

The researcher also confirms that the superiority of the experimental group's results over the control group's results in soccer skills is due to the use of soccer instructional exercises that improved motor paths and reduced errors in learning soccer skills. "A set of physical capabilities that take various shapes and sizes, serve diverse purposes, and their contribution to developing motor skills ranges from simple to complex, and they are incorporated into the components, subtleties, and details of motor skills, both in form and content" [16].

Conclusions

1. Gregorc's model, supported by educational devices, clearly demonstrated its effectiveness in improving the learning of basic soccer skills among secondary school students, compared to the traditional method.
2. The experimental group demonstrated a significant improvement in skill performance (passing, scoring, and blocking), demonstrating the positive impact of instruction according to Gregorc's learning style, which takes individual differences into account.
3. The use of educational devices contributed to raising the level of interaction and motor and visual attention among students, and facilitated a better understanding of the required motor skills.
4. Traditional methods of teaching sports skills appear less effective in motivating learners and developing their motor abilities, especially in the basic learning stages.
5. Designing educational units based on Gregorc's model enabled learning objectives to be achieved in a flexible and interactive manner, adapting to students' different thinking styles.

Recommendations:

1. Adopt Gregorc's model as one of the methods adopted in teaching sports skills in secondary schools, particularly in physical education.
2. The necessity of training physical education teachers to use modern Gregorian educational models and integrate them with appropriate educational tools and devices.
3. Encourage educational institutions to equip training grounds with smart tools and various educational devices, in line with the nature of the targeted sports activity.
4. Design specific training programs for each of the four learning styles in the Gregorian model, to enhance personalized learning and expand the base of benefit from the model.
5. Conduct future studies on the effectiveness of the Gregorian model in teaching other sports skills, at various educational levels, such as intermediate and university education.

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