

# Collaborative and Opposition Sports Teaching: Comparative Analysis between Comprehensive Methodologies and the Traditional Model

**Enseñanza de deportes de Colaboración y Oposición: Análisis comparativo entre Metodologías comprensivas y modelo tradicional**

**Ensino Colaborativo e de Oposição do Esporte: Análise Comparativa entre Metodologias Integradas e o Modelo Tradicional**

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## ABSTRACT

The purpose of the study was to determine the effect produced by the application of a teaching unit for collaborative and oppositional sports designed on the basis of two proposals of the comprehensive pedagogical model: Teaching Games for Understanding and Cognitive Didactics, compared to a traditional teaching model. The sample consisted of students from 5th to 8th grade (12 to 14 years old). By means of observational methodology, the main efficient game actions in the dimensions of attack and defense were evaluated, in test and retest moments, to a control group (CG) and an experimental group (EG). The analysis of variance (MANOVA) and pairwise comparisons with Bonferroni correction applied with an alpha of 0.05, showed significant differences between both groups in the motor actions of throwing in the effective zone (EG: 74.3% - CG: -16.7%) and simple passing (EG: -27.1% - CG: -3.1%), while descriptive analysis of the occurrence rates showed differences in the anticipation motor actions (EG: 211.1% - CG: 20%), efficient tackling (EG: 330.8% - CG: -7.1%) and untacking (EG: 400% - CG: 0%). The findings of both analyses show that the application of comprehensive methodologies in the teaching of collaborative and oppositional sports in the context of school physical education improves the quality of the game actions, compared to a traditional teaching model.

**Key words:** Comprehensive methodologies; TGfU; Cognitive didactics; Collaborative and oppositional sports.

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## RESUMEN

El propósito del estudio fue determinar el efecto que produce la aplicación de una unidad de enseñanza de los deportes de colaboración y oposición diseñada en base a dos propuestas del modelo pedagógico comprensivo: el Teaching Games for Understanding y la Didáctica Cognitiva, en comparación a un modelo tradicional de enseñanza. La muestra estuvo conformada por alumnos(as) de 5º a 8º básicos (12 a 14 años). Mediante metodología observacional, fueron evaluadas las principales acciones de juego eficientes en las dimensiones de ataque y defensa, en momentos de test y retest, a un grupo control (GC) y otro experimental (GE). El análisis de varianza (MANOVA) y las comparaciones por pares con corrección de Bonferroni aplicadas con un alfa de 0.05, evidenciaron diferencias significativas entre ambos grupos, de las acciones motoras de lanzamiento en zona eficaz (GE: 74,3% GC: -16,7%) y Pase simple (GE: -27,1% - GC: -3,1%). Mientras que, mediante el análisis descriptivo de las tasas de ocurrencia, se encontraron diferencias de las acciones motoras de Anticipación (GE:211,1% - GC:20%), marcación eficiente (GE: 330,8% - GC: -7,1%) y desmarcación (GE: 400% - GC: 0%). Los hallazgos de ambos análisis muestran que la aplicación de metodologías comprensivas en la enseñanza de los deportes de colaboración y oposición en el contexto de educación física escolar, mejoran la calidad de las acciones de juego, en comparación a un modelo tradicional de enseñanza.

**Palabras clave:** Deportes para Personas con Discapacidad, Juegos Paralímpicos, Paratletas.

## INTRODUCTION

The challenge for educators in the context of Collaborative and Oppositional Sports (COS) is to design learning tasks in preparation for the physical: achieving the execution of skills in open environments; for the cognitive: integrating the ability to use tactics and reflect on how to improve personal and team performance; in the social: achieving positive interactions with classmates; in the affective: obtaining that the

## RESUMO

O objetivo do estudo foi determinar o efeito produzido pela aplicação de uma unidade de ensino de esportes colaborativos e opostos projetada com base em 2 propostas do modelo pedagógico integral: Jogos de ensino para a compreensão e didática cognitiva, em comparação com um modelo de ensino tradicional. A amostra foi composta por alunos da 5ª à 8ª série (12 a 14 anos). Por meio de metodologia observacional, foram avaliadas as principais ações de jogo eficientes nas dimensões de ataque e defesa, nos momentos de teste e reteste, em um grupo controle (GC) e um grupo experimental (GE). A análise de variância (MANOVA) e as comparações por pares com correção de Bonferroni aplicada com alfa de 0,05, mostraram diferenças significativas entre ambos os grupos, das ações motoras de lançamento na zona efetiva (GE: 74,3% GC: -16,7%) e passe simples (GE: -27,1% - GC: -3,1%). Já pela análise descritiva das taxas de ocorrência, foram encontradas diferenças nas ações motoras de Antecipação (GE: 211,1% - GC: 20%), marcação eficiente (GE: 330,8% - GC: -7,1%) e desmarcação (GE: 400% - GC: 0%). Os resultados de ambas as análises mostram que a aplicação de metodologias abrangentes no ensino de esportes colaborativos e de oposição no contexto da educação física escolar melhora a qualidade das ações de jogo, em comparação com um modelo de ensino tradicional.

**Palavras chave:** Metodologias comprensivas; TGfU; Didáctica cognitiva; Esportes colaborativos e de oposição.

students achieve satisfaction and pleasure in carrying out the activity (Kirk, 2013).

When characterizing the COS, the predominance of open skills and a constant uncertainty in the game stands out, an environment that requires students to develop actions that involve cognitive capacity, fundamentally through the decision-making process (García-González et al., 2014). The above, without underestimating the influence that the level of sports experience exerts on the execution

of game skills (Práxedes et al., 2016). This environment has motivated the generation of new methodologies that respond to these characteristics of the COS.

The Technical-Traditional Teaching Model (TTM) is based on learning based on the continuous and analytical reproduction of physical-technical actions (passing, dribbling, throwing), most of the time far removed from real game situations. Thus, when learners are exposed to real game situations, the probability of making correct decisions decreases. This, when done repeatedly, generates demotivation and other maladaptive effects, such as boredom and even dropping out of sports activity (Abad et al., 2020; O'Neil & Hodge, 2020). The excessive use of threatening behaviors on Basic Psychological Needs (BPN) by teachers is related to frustration, generating levels of less self-determined motivation or simply demotivation (Diloy et al., 2022; O'Neil & Hodge, 2020; Pulido et al., 2019). The role of the coach on the motivational level of athletes must accompany a transmission of the meaning represented by the activities they carry out, supporting their freedom and autonomy, which transcend towards self-confidence and the decision-making processes of the learner (Castro & Camus, 2018).

Benavides et al. (2018), analyzed 14 articles related to decision-making in football, concluding that the implementation of an open model where the athlete must choose some technical and/or tactical actions, has an impact on greater responses from his teammates, generating greater brain plasticity and, therefore, a progress in the cognitive process associated with the development of correct decision-making. A second conclusion of their study suggests further investigation into the integration of these models in the sports

initiation stage, this being fundamental for the cognitive and motor development of children.

In both the field of physical education and sports, teaching based on Comprehensive Methodologies (CM) represents a learning based on the understanding of the game as a starting point. Being an expression of social constructivism, requiring group solutions, stimulating the creation of tactical solutions and the development of strategies in a collective manner (Light, 2008; Light & Tan, 2006; Pecci, 2016).

Bunker & Thorpe (1982) propose the Teaching Games for Understanding (TGfU) model, representing the beginning of CM over time, receiving a lot of acceptance from professionals and the research community alike, through the recognition as a pedagogical approach that can influence the different learnings, both in the quality of the game actions (Morales & Arias, 2020), physical literacy (Mandigo et al., 2019) and psychosocial variables (Harvey et al., 2017), which through Ryan & Deci's Self-Determination Theory (cited by Bouffard, 2017), supports the leading attitude that the student assumes in the TGfU model, regarding their participation in the sports game (Teixeira et al., 2018).

One of the significant actions of CM is the use of questioning by the teacher towards the student, understood as those verbal interventions that the teacher makes at key moments of classes or training, favoring the analysis of motivation and adequate decision-making in the game (Práxedes et al., 2021).

Table 1 summarizes the didactic orientations of the TGfU proposal on the three basic elements of the model: sport, the student and the teacher (Abad et al., 2013; Castro, 2022).

**Table 1**

*Teaching guidelines of the TGfU teaching model.*

Subject	Fundamentals
<b>Student</b>	<ul style="list-style-type: none"> <li>- Student-centered approach: with emphasis on student motivation and a meaningful relationship with the teacher.</li> <li>- Previous ideas: just like a research/action process, it starts from the previous/initial level of the students making sense of the new information.</li> <li>- Constant motivation: the practice of the game intrinsically represents motivation for the student, representing a fundamental didactic element.</li> </ul>
<b>Teacher</b>	<ul style="list-style-type: none"> <li>- Attitude as a guide and facilitator of active learning for students.</li> <li>- Use of methodology based on decision-making and problem solving: contents-purpose of the model.</li> <li>- Questioning: with interventions or questions that seek to stimulate students' analytical thinking and motivation.</li> </ul>
<b>Sport</b>	<ul style="list-style-type: none"> <li>- Use of modified games, adapted to learning progress.</li> <li>- Contextualized teaching: with a tactical approach that promotes understanding of the game in contexts similar to the real one.</li> <li>- Transfer of learning: through the diversified practice of sports with similar tactical skills.</li> <li>- Tactical-technical teaching: the advancement of tactical knowledge, that is, the level of execution of the game, will require the progressive advancement of the technique and not the other way around.</li> </ul>

A second proposal for a comprehensive methodology corresponds to the model proposed by Castro & Camus (2018), which uses four individual tactical actions in the attack and defense dimensions as a didactic basis for teaching (Table 2). Using the observational

methodology of Anguera et al. (2011) and the quantification of Efficient Game Actions (EGA) and Non-Efficient Game Actions (NEGA) (Table 2), the CD model demonstrated an improvement in the quality of play in talented sports players in the specialties of Roller Hockey and Handball.

**Table 2**

*Progressions of individual tactical actions and CD game actions.*

Dimension	Individual tactical progression	Game Actions	
		Efficient (EGA)	Not efficient (NEGA)
Offense	- Reading the game without the ball.	- Launch in an effective zone.	- Distance launch.
	- Reception in motion.	- Unmarking.	- Simple pass (even on equal terms).
	- Unmarking.	- Effective passing (goal/space pass).	
Defense	- Termination.		
	- Reading the game without the ball.	- Anticipation.	- Simple marking (positional only).
	- Anticipation/deterrence.	- Efficient marking (opponent loses/passes ball).	- Ball Blocking.
	- Active marking.	- Deterrence.	
	- Support/relocation.		

CD= cognitive didactics; EGA= efficient game actions; NEGA= non-efficient game actions.

Based on the didactic elements of both comprehensive models mentioned, the purpose of this study is to contrast the effectiveness of a model based on comprehensive teaching methodologies, compared to a traditional one, in the school context of teaching COS.

## METHODS

The study is quantitative, analytical, correlational in scope between two groups: one control group (CG) and one experimental group (EG), with a prospective longitudinal cut, applying an evaluation of the game actions to both groups in two stages: a diagnostic test prior to the practical intervention and a retest after the intervention. 46 students participated (M= 12.9; SD= .77; 6 women and 40 men), students from 5th to 8th grade, belonging to two educational establishments in Antofagasta, one municipal and one private (School D-85 and Antofagasta International School, respectively). All participants had previous basic experience in COS, received in previous school levels according to the program of the subject of physical education and health, through TTM methodologies.

An experimental stage was executed to both groups of 23 students randomly. On the one hand, the GC received the learning unit according to Traditional Methodology (TM), in accordance with the didactic planning proposed by the Ministry of Education [MINEDUC], (2023) (Table 3). On the other hand, the EG developed the learning unit based on Comprehensive Methodologies (CM) according to the TGfU and CD model (Table 4).

**Table 3**

*Teaching unit applied to the CG (TTM).*

Session	Learning Objective	Methodological emphasis	Activity to be carried out
1	Diagnostic evaluation (test).		<u>Introduction:</u> explanation of the objective and the activity to be carried out. <u>Practical class:</u> Total game on a real court (video recording). <u>Closing:</u> dialogue and feedback.
2	- Play team games and sports that require making decisions and evaluating the strategies used to improve your game, for example, applying the guidelines given by the teacher during the time requested or regulated during the game.	Rules of the Game Throwing technique Kicking technique	<u>Introduction:</u> explanation of the class RA (BM/FB)+CP. <u>Practical class:</u> In a 10x20m space with goals, a mixed total game is played. 6x6 teams: rules of the game: pass the ball with 1 hand/foot depending on the sport, game without goalkeepers, goals are scored by only one woman. The team that scores 2 goals wins, then the teams rotate. <u>Closing:</u> Verbal feedback and personal hygiene control.
3	-Practice individual and team sports that apply specific rules and strategies of the game, for example, generating numerical superiority, changing the position or function of the players during the game.	Line defense	<u>Introduction:</u> explanation of class content (BM/FB)+CP. <u>Practical class:</u> 3x3 and 4x4 game in a small space (6-8 x10-12m), with specific game rules. <u>Closing:</u> Verbal feedback and personal hygiene check.
4		Line game	<u>Introduction:</u> explanation of class content (BM/FB)+CP. <u>Practical class:</u> 3 rows of students are formed. The first ones in each row go out and pass each other until they reach the goal zone/area and shoot/kick at the goal. Same exercise, but after attacking, they position themselves to defend. Total 4x4 game on ½ court. <u>Closing:</u> Verbal feedback and personal hygiene control.
5	Cross-sectional objective: Practice physical activities safely, demonstrating the acquisition of hygiene, postural and healthy living habits, such as showering after physical activity, wearing different clothes for class, maintaining correct posture, using sunscreen and hydrating beforehand. during and after the class.		<u>Introduction:</u> explanation of class content (BM/FB)+CP. <u>Practical class:</u> Teams of 6 students, spaces of 10-12x20-24m, with goals at each end. Rules of the game Same as session 2. - Team without the ball, deploys defense in 2 lines of 3 players, covering the entire width of the space. The first line is located in the center of the court, the second close to the goal area. <u>Closing:</u> Verbal feedback and personal hygiene control.
6			<u>Introduction:</u> explanation of class content (BM/FB)+CP. <u>Practical class:</u> In space (10-12x20-24m)+ arches at each end, 4x4 teams with at least 1 woman. They have to score the most goals with only women. The winner is the one who manages to score the most goals in 5 minutes, then the teams rotate. <u>Closing:</u> Verbal feedback and personal hygiene control.
7			<u>Introduction:</u> explanation of class contents (BM/FB)+CP. <u>Practical class:</u> Massive 7x7 BM and 9x9 FB tournament, 7' matches, with circular rotation. <u>Closing:</u> Verbal feedback and personal hygiene control.
8	Final evaluation (retest)		<u>Introduction:</u> explanation of the activity and objective of the class. <u>Practical class:</u> Total game on a real court (video recording). <u>Closing:</u> dialogue and feedback.

Both groups completed 8 intervention sessions (2 per week) lasting 1 hour and 15 minutes, administered by the physical education and sports teachers. The intervention was informed, reviewed and authorized by the school

management and the parents of the students. Informed consent was given to the participants, through which they became aware of the purpose of the study, their rights, confidentiality and anonymity of their participation.

**Table 4**

*Teaching unit applied to EG (CM).*

Session	Learning Objective	Methodological emphasis (TGfU model)	Activity to be carried out
1	Identify and understand the main aspects of the TGfU and CD models.	Active participation of students.	<u>Introduction</u> (BRIEF lecture) Fundamentals of the COMPREHENSIVE model. <u>Practical class</u> (fundamental part): Modified games with special rules of play. <u>Closing</u> : dialogue/feedback.
2	Diagnostic evaluation (test)		<u>Introduction</u> : explanation of the objective and the activity to be carried out. <u>Practical class</u> : - Total game on a real court (video recording). <u>Closing</u> : dialogue and feedback.
3	Identify and apply game actions (CD),	- Precise explanations from the teacher.	<u>Introduction</u> : explain 1st and 2nd action of the CD in defense and attack. <u>Practical class</u> : Adapted games with rules of CD actions. <u>Closing</u> : dialogue and feedback.
4	Apply individual tactical progressions according to CD.	- Highlight significant actions. - Positive reinforcements for efficient actions.	<u>Introduction</u> : Display the CD phases throughout the practice (large text). <u>Practical Class</u> : 1st and 2nd CD action: - 1X1 in a small space (they repeat the same role, then they rotate). - 2X2 in a small space (they repeat the same role, then they rotate). - Real game (with 4 periods of play). <u>Closing</u> : dialogue/feedback.
5	Identify and apply game actions (CD),	- Stimulate the VARIABILITY of actions. - Apply questions that stimulate efficient reactions.	<u>Introduction</u> : explain 3rd and 4th action of the CD in defense and attack. <u>Practical class</u> : - 2X2 in a small space (they repeat the same role, then they rotate). - 3X3 in a small space (they repeat the same role, then they rotate). - Full court game (with 4 periods of play). <u>Closing</u> : dialogue/feedback.
6	Apply game actions (CD) under the concept of variability	- Mandatory use of vests during practice.	<u>Introduction</u> : characterize the progressions of the CD. <u>Practical Class</u> : - 3X3 in a small space (they repeat the same role, then they rotate). - Full court game (with 4 periods of play). <u>Closing</u> : dialogue/feedback.
7	Apply game actions (CD) under the concept of variability		<u>Introduction</u> : characterize the progressions of the CD. <u>Practical Class</u> : - Full court game (4 periods of play; halftimes with open discussion). - Individual scoring game for efficient actions: pass-goal, marking with the ball, defensive anticipation, active marking. <u>Closing</u> : dialogue/feedback.
8	Final evaluation (retest)		<u>Introduction</u> : explanation of the activity and objective of the class. <u>Practical class</u> : Total game on a real court (video recording). <u>Closing</u> : dialogue and feedback.

### Assessment instruments:

The EGA and NEGA actions were evaluated in a 15-minute game between both groups, using an observational methodology, defining their “nomothetic” criteria: regarding the study units (CG and EG), “follow-up” in time (Diagnostic test and Retest after application of learning units) and “multidimensional” on the 10 game actions evaluated in attack and defense (Table 5). Due to the nature of the data (EGA and NEGA), these were recorded according to their frequency. The evaluation did not consider the saving actions or the goals scored, since these game situations could distort the actions performed prior to the shot at goal.

### Statistical processing:

Data analysis was performed using SPSS v.21 (IBM Corp., Armonk, New York). Data distribution was treated using the Shapiro-Wilk test, while the homogeneity of variance was determined using the Levene test. A mixed model analysis of variance (MANOVA) was used to determine the effect of intra-subject factors (training program (pre- and post-test) and inter-subject factors (CG - EG) on game actions. In cases of significant effects on game actions, pairwise comparisons were applied with Bonferroni correction. An alpha of 0.05 was used for all statistical tests.

## RESULTS

A significant effect of the interventions in the EG ( $F(1,33) = 5.553$ ;  $p = 0.025$ ;  $2p = 0.144$ ) on the EGA and NEGA was evident. The quantification of the game actions, comparing the temporality of the Test versus Retest, showed significant differences between the CG and EG, in the game actions effective zone throw (EG: 74.3% CG: -16.7%;  $p < 0.001$ ) and simple pass (EG: -27.1% - CG: -3.1%;  $p < 0.001$ ). On the other hand, through the descriptive analysis of the occurrence rates, important, non-significant differences were obtained for the play actions of Anticipation (EG: 211.1% - CG: 20%;  $p < 0.001$ ), Efficient Marking (EG: 330.8% - CG: -7.1%;  $p < 0.001$ ) and Unmarking (EG: 400% - CG: 0%;  $p < 0.001$ ) (Table 5).

The analysis of the total play actions shows a significant difference between the EG (83) and the CG (-17). The percentage medians of the EGA show a significant increase in the EGA (EG: 205.6; CG: -3.6;  $p < 0.001$ ). Regarding NEGA, both groups decrease their occurrence rates, however, the EG presents significant differences compared to the CG (EG: -23.8; CG: -14.1;  $p < 0.001$ ) (Table 5).



**Table 5**

*Game actions between Groups (CG – EG) (Frequency and percentage of change).*

GAME DIMENSION	GAME ACTIONS	CG (Fr)		EG (Fr)		DIFFERENCE %		p	
		TEST	RETEST	TEST	RETEST	CG	EG		
Offense	EGA	Effective zone launch	12	10	35	61	-16,7	74,3	<0.001
		Unmarking	2	2	4	20	0,0	400,0	<0.001
		Effective pass	8	7	26	39	-12,5	50,0	<0.001
	NEGA	Simple pass	32	31	118	86	-3,1	-27,1	<0.001
		Throw at a distance	14	4	11	8	-71,4	-27,3	<0.001
Defense	EGA	Anticipation	5	6	9	28	20,0	211,1	<0.001
		Efficient marking	14	13	13	56	-7,1	330,8	<0.001
		Deterrence	2	2	4	12	0,0	200,0	<0.001
	NEGA	Simple marking	16	12	39	31	-25,0	-20,5	<0.001
		Ball Blocking	2	3	4	5	50,0	25,0	<0.001
		Total difference in game actions (Fr)				-17	83		
		Median of total actions (in %)				-5,1	62,1		
		EGA Action Median (%)				-3,6	205,6		
		NEGA Action Median (dif.%)				-14,1	-23,8		

CG= Control Group; EG= Experimental Group; Fr= number of actions performed; %= percentage difference in actions between each evaluation instance.

## DISCUSSION

The purpose of this study was to compare the effectiveness of a COS teaching model based on comprehensive methodologies compared to a traditional one, in the school context. Our main results (Table 5) indicate significant differences in the quantification of the game actions obtained after the interventions applied to the CG and EG groups ( $p < 0.001$ ), through the test and retest analysis applied to both groups ( $p < 0.001$ ).

The available evidence about the “multidimensional” analysis of the game (attack and defense), as well as the quantification of efficient and non-efficient game actions, basic elements of the comprehensive methodological proposal proposed by Castro & Camus (2018), allowed us to identify the direction of the changes observed in both groups, showing a significant increase in total game actions as well as EGA, and a decrease in NEGA by the EG, findings that were

very dissimilar in the case of the CG, which showed a general decrease in the three groups of actions evaluated.

Regarding the decision-making aspect of CM, the findings of Práxedes et al. (2021) about the improvement in decision-making using CM, coincide with our study in the use of “small games” and the so-called “questioning” by the teacher, both didactic elements of the comprehensive TGfU methodology used in our study. On the other hand, García-González et al. (2014), achieve significant improvements in the decision-making of their subjects when applying CM in Tennis, evidencing a selection of individual tactics more appropriate to the game situations. In this regard, in our study the findings are similar in Handball and Football, indicating that the positive effect of CM on decision-making is independent of the specialty in COS. The inclusion of the progressions of individual tactical

procedures proposed by Castro & Camus (2018) in the CD, beyond directly influencing the increase in EGA, also allowed a more rational and leading learning of the game in those evaluated in the EG. This coincides with the findings found by Bouffard (2017) in his study about the positive influence of CM on self-determined motivation, as also evidenced by Diloy et al. (2022) in their study on the variables of autonomy and satisfaction of the BPN where the “questioning” by the teacher, through instructions that stimulate analytical processing and critical thinking in the learners, influenced those evaluated in both studies.

It would be important to delve into new studies that evaluate the effect that the use of comprehensive methodologies may have on attitudinal aspects of students in the school stage.

#### Limitations of the Study

The study had some limitations in the number of participants, due to the pandemic situation that affected the in-person attendance of some students at educational establishments, thereby reducing the possibility of establishing causality between gender variables.

#### CONCLUSION

The findings of this study demonstrate that the application of comprehensive methodologies in the teaching of collaborative and opposition sports, in the context of school physical education, significantly improves the quality of game actions, representing a pedagogical tool of great value, highlighting the positive effect that the use of CM achieves on decision making, autonomy and the protagonism that the learner achieves.

The practical application of the study is oriented to the use of comprehensive methodologies in the context of COS learning units both in the school environment and in initial sports training, responding to the current pedagogical paradigms of physical education and sport, in which the protagonist of the student is emphasized as the center and manager of his/her learning, integrating his/her physical, intellectual and psychological dimension that transcends towards significant learning, through sports practice.

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