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The improvement of a teaching competence in the baseball coach

[El perfeccionamiento de una competencia didáctica en el entrenador de béisbol]

[O aperfeiçoamento de uma competência didática no treinador de beisebol]

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ABSTRACT

Introduction: Improving the professional development of baseball coaches at the initial stages of sports training is essential to ensuring the quality of the training process. In this regard, developing teaching skills is crucial for planning, conducting, and evaluating sports training at the grassroots level.

Objective: To design a professional development methodology for improving the teaching competence of baseball coaches working in the under-12 age category.

Methodology: A mixed-methods study was conducted between September and June 2025, involving 50 baseball coaches. The study employed both theoretical and empirical methods, including a pre-experimental design, as well as descriptive and inferential statistical techniques for data analysis.

Results: A methodology is provided which is structured in four phases: diagnosis, planning, execution and evaluation, hence from its application favorable transformations were evidenced in the mastery of didactic resources by the coaches, which allowed improvement in the planning and management of the training process in the sports initiation stage.

Conclusions: It is concluded that the professional development methodology constitutes a viable alternative to contribute to the improvement of the didactic competence in baseball coaches of the under-12 age category.

Keywords: professional skills; teaching skills; professional development methodology; sports initiation; sports coach; baseball.

RESUMEN

Introducción: el perfeccionamiento de la preparación profesional del entrenador de béisbol en la etapa de iniciación deportiva constituye una necesidad para garantizar la calidad del proceso de entrenamiento. En este sentido, el desarrollo de la competencia didáctica resulta esencial para la planificación, conducción y evaluación del entrenamiento deportivo en las categorías de base.

Objetivo: diseñar una metodología de superación profesional para el perfeccionamiento de la competencia didáctica en entrenadores de béisbol que laboran en la categoría sub-12 años.

Metodología: se desarrolló un estudio con enfoque mixto entre septiembre y junio de 2025, en el que participaron 50 entrenadores de béisbol. En esta se emplearon métodos

del nivel teórico y empírico, entre los que destaca el preexperimento, así como técnicas de estadística descriptiva e inferencial para el análisis de los resultados.

Resultados: se aporta una metodología la cual se estructura en cuatro fases: diagnóstico, planeación, ejecución y evaluación, de ahí que a partir de su aplicación se evidenciaron transformaciones favorables en el dominio de los recursos didácticos por parte de los entrenadores, lo cual permitió mejorar la planificación y conducción del proceso de entrenamiento en la etapa de iniciación deportiva.

Conclusiones: se concluye que la metodología de superación profesional constituye una alternativa viable para contribuir al perfeccionamiento de la competencia didáctica en entrenadores de béisbol de la categoría sub-12 años.

Palabras clave: competencias profesionales; competencias didácticas; metodología de superación profesional; iniciación deportiva; entrenador deportivo; béisbol.

RESUMO

Introdução: o aperfeiçoamento da preparação profissional do treinador de basebol na fase de iniciação desportiva constitui uma necessidade para garantir a qualidade do processo de treino. Neste sentido, o desenvolvimento da competência didática é essencial para o planeamento, a condução e a avaliação do treino desportivo nas categorias de base.

Objetivo: conceber uma metodologia de aperfeiçoamento profissional para o aperfeiçoamento da competência didática em treinadores de basebol que trabalham na categoria sub-12 anos.

Metodologia: foi desenvolvido um estudo com enfoque misto entre setembro e junho de 2025, no qual participaram 50 treinadores de basebol. Neste estudo, foram utilizados métodos de nível teórico e empírico, entre os quais se destaca o pré-experimento, bem como técnicas de estatística descritiva e inferencial para a análise dos resultados.

Resultados: é apresentada uma metodologia estruturada em quatro fases: diagnóstico, planeamento, execução e avaliação; a partir da sua aplicação, evidenciaram-se

transformações favoráveis no domínio dos recursos didáticos por parte dos treinadores, o que permitiu melhorar o planeamento e a condução do processo de treino na fase de iniciação desportiva.

Conclusões: conclui-se que a metodologia de aperfeiçoamento profissional constitui uma alternativa viável para contribuir para o aperfeiçoamento da competência didática em treinadores de basebol da categoria sub-12 anos.

Palavras-chave: competências profissionais; competências pedagógicas; metodologia de aperfeiçoamento profissional; iniciação desportiva; treinador desportivo; basebol.

INTRODUCTION

Teaching baseball at the introductory stage is a complex process due to the diverse actions that define each of its areas of play. Therefore, it is essential to have committed professionals with extensive training. The National Baseball Commission (CNB) and the Cuban Baseball Federation (FCB) have prioritized creating policies that enhance coach training in developing teaching skills. These policies aim to improve the planning and delivery of baseball instruction at the introductory stage, thereby addressing the current limitations.

It is important to consider the criteria that currently govern competency-based professional training. In this regard, studies by Batista *et al.* (2016), Campos *et al.* (2016), Cejas *et al.* (2019), Bassachs *et al.* (2020), and Anderson *et al.* (2022) indicate that this category is associated with the teaching and learning process, which aims to equip individuals with the skills, knowledge, and abilities necessary to improve their performance and achieve the goals of the organization and/or institution. Its objectives are clear and defined with respect to the results of job performance, which involves the combination of three key factors: knowledge, skills (competencies), and attitudes (personal commitment).

It is worth noting that the competency-based training process is complex, has multiple dimensions, and has been valued from different disciplines, such as the sciences of Physical Culture, where this training is defined under the criterion of training professionals with a broad profile, to face the various general social problems that occur in the community from the context of physical activity and sport.

However, given the role baseball coaches assume in their professional careers, it is necessary to develop specific competencies related to assimilating knowledge about sports training and the criteria that define baseball instruction in the initial stages of sports development. Therefore, these are recurring aspects within the coach's domain, making it important to consider them from the perspective of refining pedagogical skills.

It is highlighted that didactic competence as a competence of the education professional allows the systemic and personalized direction of the teaching-learning process, flexible and independent performances, promotes the access of learners to the content, projective orientation and the assumption of commitments with the process and its results in accordance with the model of the socially desirable professional.

Thus, the refinement of the coach's didactic competence is considered, based on the direct involvement of general, specific, and baseball-specific didactics. These are identified as the main areas of knowledge that define this professional's actions in conceiving the teaching and learning process in this sport. From this perspective, it is necessary to develop professional skills that allow the coach to design, plan, and evaluate the practice associated with the particularities that define this sport in the initiation stage, starting with conceiving instruction by areas of play and subsequently the logical interrelation between each of these areas.

Currently, research on professional competencies is recurring, notably the work of Aguado & Rangel (2018); Bernate *et al.* (2021; 2023); Perea *et al.* (2022); García *et al.* (2022); Llamas *et al.* (2023); and Mulyana *et al.* (2025). These studies all emphasize the importance of addressing this topic based on the professional needs of sports coaches. However, these studies are expressed through systematic and narrative reviews,

focusing on digital competence, management and evaluation, personal athletic performance, and physical education. Furthermore, Moreno *et al.* (2019); Martínez & Páez (2022); Padilla & Trejo (2023); Martell *et al.* (2023); Duclos *et al.* (2023); Carranza & Valcárce (2024); Cardona (2024); and Bernate *et al.* (2024) have also contributed to this field. Yáñez *et al.* (2025) provide a treatment of the development of professional skills from the perspective of multimodality, citizen preparation, sports management, socio-emotional aspects and sports detraining.

In general, the analysis of these studies reveals a development of professional competencies in specific contexts that do not allow for their extrapolation to the needs of baseball coaches. Therefore, it is necessary to establish new lines of analysis that will allow for the refinement of this professional's teaching skills, taking into account the particularities that define their role.

Consequently, based on the above, diagnostic tools were applied that allowed for a deeper understanding of the manifestations that, in practice, undermine the process being investigated, thus enabling the detection of the following shortcomings:

- There is a lack of didactic logic during the preparation of the training unit in relation to the (objective-content-method) according to the particularities of the context for which it is planned.
- Insufficient relationship between the selection of training directions and the application of loads according to the characteristics that distinguish the sports initiation stage.
- There is a deficient correspondence between the general plan, the mesocycle, the microcycle and the class, in relation to the dosage of technical preparation by playing areas.
- There is insufficient use of alternatives to solve the didactic situations that arise during training.

The foregoing constitutes justification for formulating the following scientific problem: How can we contribute to the improvement of didactic competence in baseball coaches of the under-12 age group? Based on this problem, the research objective is defined as follows: To develop a professional development methodology that contributes to the improvement of didactic competence in baseball coaches of the under-12 age group, allowing for the harmonious integration of didactic aspects, as well as the assimilation of specific professional skills to guide the baseball teaching process within the context of sports initiation.

MATERIALS AND METHODS

Due to its characteristics, this research is defined as a mixed-methods study. It was conducted over a 10-month period, from September 2020 to June 2025, and involved 50 professionals, representing 32% of a population of 156 baseball coaches working with the under-12 age group in sports initiation programs. The sample was selected using stratified sampling to ensure equitable representation of coaches from each position (pitchers, catchers, infielders, and outfielders), as these positions share similar teaching objectives and the specific characteristics of sports training at this stage. Therefore, based on the characteristics that define this study, it is classified as probabilistic (Table 1).

Table 1. - Sample characteristics

Coaches	Play area	Professional experience	Degree	
			Graduate	Master
12	Pitchers	8 to 12 years	46	4
12	Receptors	7 to 10 years		
12	Infielders	7 to 15 years		
14	Gardeners	5 to 17 years		

The following methods and techniques were established for the development of the research:

Observation: A total of 90 observations were made to classes in different contexts throughout the investigative process, in which 30 indicators were evaluated that allowed the coach's actions in relation to the structuring of training in the sports initiation stage and the methodology used for planning, as well as considering other aspects that define the coach's professional skills in order to evaluate the quality of the process they lead.

Documentary analysis: This was applied to the professional development plans established by the provincial, municipal and grassroots directorate of the National Institute of Sports and Physical Education (INDER), designed for the preparation of baseball coaches. This analysis was conceived with the purpose of analyzing the main ways and forms of application of the development activities, as well as the main contents that are defined for the improvement of a didactic competence in the baseball coach.

Pre-experiment: This approach allowed for the assessment of the behavior of the research sample through a pre-test/post-test, in which four indicators were evaluated to reveal the teaching competencies of baseball coaches. The established procedure consisted of first administering a pre-test, then defining the professional development methodology intervention, and finally applying the post-test. This allowed for the evaluation of any changes observed in the baseball coaches as a result of the instrument's application.

Interview: A total of ten questions were applied to the baseball coaches who make up the sample in the research, in order to assess the level of knowledge, as well as the professional skills that they present from the use of the resources provided by the didactics during the development of their classes, hence this allowed to define criteria about the competencies that this professional presents.

Statistical methods:

Descriptive statistics: were used in the characterization of the sample and to establish an analysis and comparison in order to assess the results presented by the empirical

methods used in the research and thereby demonstrate the results obtained both in the diagnosis and in the application of the pre-experiment.

Inferential statistics: were defined by applying the Shapiro-Wilk statistical test to assess the normality of the data recorded in the research, as well as the use of the non-parametric Wilcoxon test, with the purpose of assessing possible significant differences between the results of the pre-test and post-test, in order to demonstrate transformations between two related samples from the application of the methodology as an element of change, which allowed revealing the feasibility of the contribution in the research.

RESULTS AND DISCUSSION

The assessments presented are the results of the initial diagnosis obtained from the application of the instruments developed to analyze the criteria that define the teaching competencies of baseball coaches. Therefore, to highlight these shortcomings, the following analysis is presented (Figure 1):

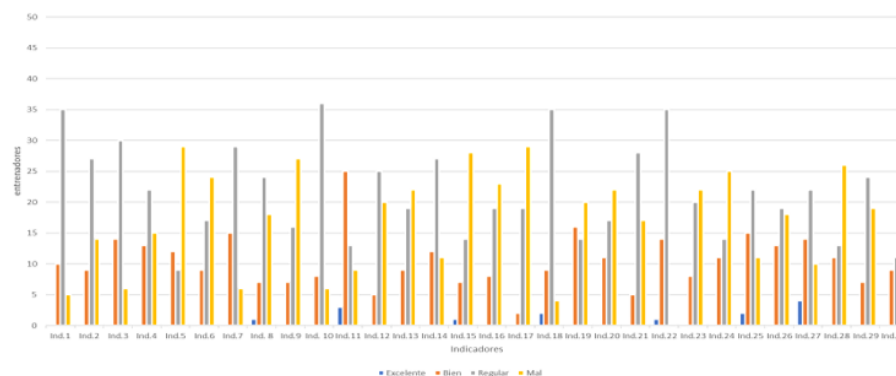


Fig. 1. - Result of the observation of classes

The application of the observation guide revealed the baseball coach's teaching skills in delivering lessons across different areas of the game. Based on the evaluation of the 30 indicators used, which are related to teaching aspects, it was found that 87% of the

coaches received ratings of "fair" or "poor." This highlights the shortcomings of these professionals, limiting their use of methods and techniques to identify, define, and solve professional problems. It also limits their ability to determine the appropriate technical and tactical elements for different game roles, demonstrates a limited application of methodological variations for teaching baseball, lacks training plans contextualized to the initial stages of sports development, and fails to align group tasks with the intended teaching objectives. These are some of the most recurring limitations that restrict the baseball coach's teaching competence (Figure 2).

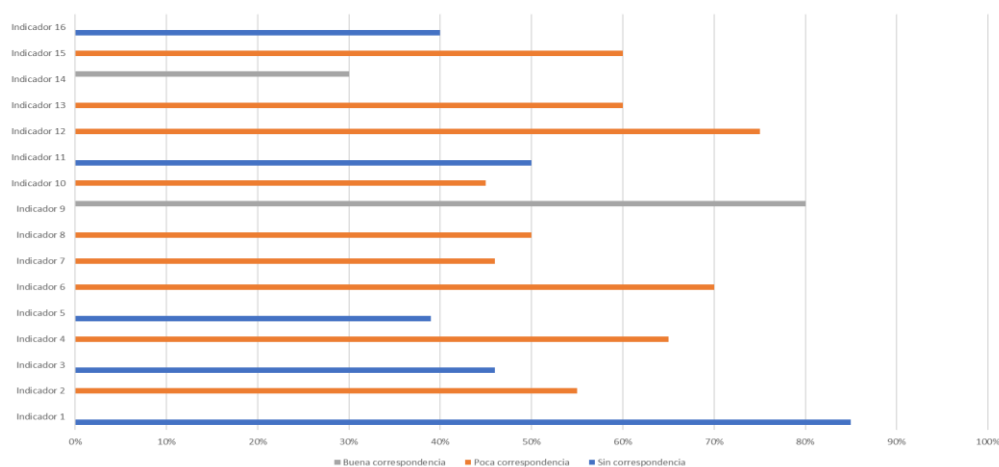


Fig. 2. - Result of the documentary analysis of the professional development plans

Based on the results shown in Figure 2, where 16 indicators are assessed to evaluate the correspondence between the professional needs of baseball coaches and the purposes of existing professional development plans, it can be seen that in most cases there is little or no correspondence, which reveals that, firstly, the planning of these activities does not satisfy the professional demands of those involved and does not fully promote the development of teaching skills in relation to the context in which the baseball coach participates (Figure 3).

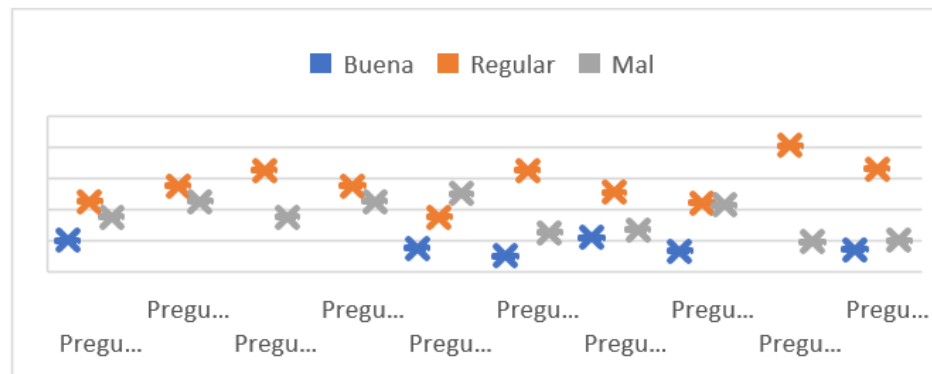


Fig. 3. - Result of the interview conducted with the baseball coaches

report presents an analysis of the results of interviews conducted with baseball coaches to understand their primary professional needs and their assessment of the development of their teaching skills through available professional development activities. The data reveals widespread dissatisfaction, with 100% of respondents rating the training as either fair or poor. This indicates that these professionals are not being provided with knowledge tailored to their specific needs, nor with the teaching tools necessary to facilitate their work. Consequently, this hinders their ability to develop the professional skills required to perform their duties successfully.

In general, the deficiencies identified through diagnostic tools regarding the development of teaching skills in baseball coaches are recurring, which undoubtedly limits their professional performance. Therefore, addressing these problems is effective in proposing solutions to eliminate them.

Methodology for professional development to improve teaching skills in baseball coaches

The proposed methodology defines, in its logic, a systemic, problem-based, developmental, contextualized, and transformative perspective. This perspective addresses existing professional challenges in teaching baseball during the initial stages of sports development and explores how to overcome these shortcomings by fostering didactic competence in baseball coaches, enabling them to transform the existing reality

through their actions. Furthermore, the methodology adopts the theoretical and practical framework established by Armas (2003), who defines the logic for its construction.

Objective: To contribute to the improvement of a didactic competence for the baseball coach of the under 12 years category, which allows for better preparation and performance of this professional, during the teaching of this sport discipline in the sports initiation stage.

Cognitive theoretical apparatus (Figure 4).

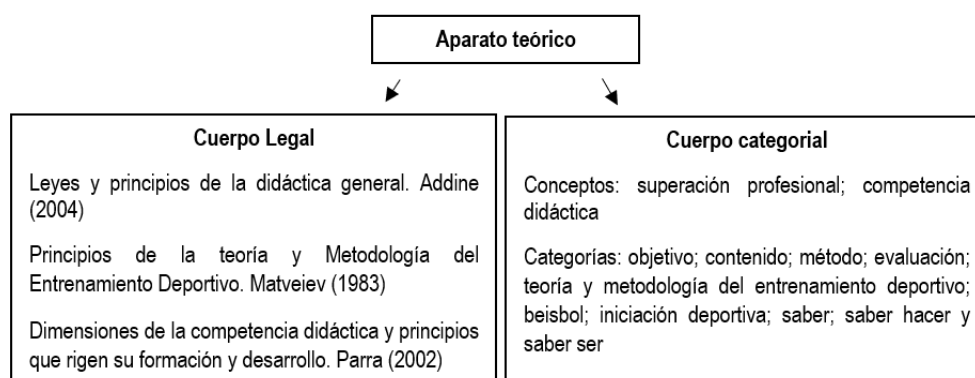


Fig. 4. - Theoretical cognitive apparatus of the methodology for the improvement of a didactic competence in the baseball coach

Legal body

The methodology, in its conception, assumes the principle of linking education with life, the social environment, and work in the process of personality development. This is based on the dependence of education on the economic, political, and social relations of the society in question, and on the need for its members not only to acquire a system of knowledge but also to be able to apply it to meet the demands imposed by society. Hence, this link is demonstrated by considering the improvement of the baseball coach's teaching skills, thus contributing to their becoming a transformative agent in their professional work.

For its part, the principle of the unity of the scientific and ideological character of the pedagogical process considers that every pedagogical process must be structured on the basis of the most advanced contemporary science and in complete accordance with ideological thought. This implies taking scientific truth as a starting point and applying it humanistically. Therefore, the methodology, from its very implementation, incorporates scientific advances related to baseball training in sports initiation as an essential aspect to consider.

As part of the special didactics, the general principles of sports training are identified; these principles constitute the theoretical and methodological bases of all sports processes, hence it is essential for coaches to master and apply them in order to achieve an adequate projection in the organization and control of the class.

Furthermore, the dimensions for the development of didactic competence are assumed and it alludes to the fact that these are basically focused on the establishment of the motivational aspect; the cognitive aspect; metacognition and personality qualities present in the professional.

In this sense, the motivational aspect is expressed in overall performance and, therefore, also in the didactic sphere. Motivation for the profession plays an essential role in didactic competence; it induces and sustains the professional's performance in guiding the teaching-learning process, their modes of action, the stances they adopt, and the volitional effort they exert to achieve goals within that process.

Cognitive competence is based not only on knowledge itself, but also on the system of actions and the quality of the processes employed in guiding the teaching and learning process. In didactic competence, given the general perspective from which it is analyzed, the knowledge, skills, and values that are developed play a fundamental role.

Metacognition encompasses both reflection and regulation. Metacognitive reflection involves analyzing and becoming aware of one's own processes and developing metacognitive knowledge. Metacognitive regulation entails developing skills and

strategies to regulate performance. This includes planning, monitoring, supervision, and appropriate adjustments to performance. In teaching competence, professionals reflect on and regulate their performance in the teaching-learning process, for which they must be able to identify their personal strengths and weaknesses.

Personality traits are shaped according to those outlined in the General Professional Model, which are closely related to teaching practices. These traits include flexibility, independence, a projective orientation, commitment, and facilitating student access to the content. Furthermore, this quality expresses the individual's self-determination in their actions, their ability to have their own criteria, and their personal capacity to self-regulate their performance.

Categorical body

As part of the categories that constitute an important basis for the design of the methodology, the first aspect identified is professional development, which provides important theoretical and methodological tools that make it possible to efficiently channel the professional development activities of baseball coaches, since it is conceived as a permanent process that guides and directs the preparation of the professionals involved with the purpose of achieving competent performance in their work activity.

In this regard, the components of didactics are established as essential aspects to consider within the legal framework of the methodology. This framework encompasses the relationship between objective, content, method, and evaluation. In this sense, the sporting objective finds its fullest realization when formulated in terms of actions and must be evaluated. The content is determined by identifying specific training directions according to age. Regarding methods, those best suited to the characteristics of practice in sports initiation should be considered. To measure the impact, the evaluation must address the stated objectives and the demands of baseball training in the under-12 age category.

Another important element to highlight is the theory and methodology of sports training, which is essential for successfully directing, organizing, and controlling the sports training process. Therefore, its application must be tailored to the characteristics of the sport and the context, aspects that set guidelines based on the application of training loads and their intended purpose, establishing the specific characteristics for directing and planning training during the initial stages of sports development.

Baseball reveals itself as a sport distinguished by its complex nature, developing from the combinations that occur between different areas of play, with a relative pause phase and dynamic phases of activity. It possesses a significantly diverse and dynamic character, demanding a high level of coordination and precision in its technical and tactical execution. This is because its actions are performed under constant unforeseen circumstances and are related to the experiences of its players. Therefore, the teaching of basic technical elements for each area of play must be aligned with the characteristics that distinguish the sports initiation stage, as well as with the didactic aspects that constitute the fundamental means for transmitting this knowledge to students.

Another important aspect to consider is the setting, hence the sports initiation stage constitutes the space in question, which according to Ramírez et al. (2020), has as its main purpose to contribute to improving the health of the students, work on the basic technical-tactical content, teach the basic rules of the sport, improve socialization and teamwork, promote educational values that contribute to their integral development and achieve habits of sports practice.

According to Tejeda & Sánchez (2013), knowledge refers to the diverse understanding that enables multireferentiality, expressed through concepts, definitions, theories, laws, principles, data, information, facts, phenomena, or processes learned throughout life as a result of the general and professional culture that characterizes the individual. Thus, know-how refers to the skills, habits, abilities, and capacities that allow the individual to possess and activate transferable procedures expressed in strategies, methods, techniques, or ways of carrying out specific activities within the context of professional practice.

Furthermore, "knowing how to be" is linked to the individual's behavioral component, which is congruent with their personal resources. This component integrates the psychological processes that stimulate, sustain, and guide performance, including intrinsic motivations toward professional activity aimed at improving the quality of performance and results, as well as self-assessment and self-regulation to ensure relevance in relation to professional competence. On the other hand, "knowing how to be" is linked to the values that have been internalized and subjectified by the individual. These values distinguish them in a transcendent way in their actions, giving a personal stamp and meaning to their performance, expressed in balance with principles, convictions, and attitudes based on ethical, moral, and professional standards.

The analysis presented, based on the aforementioned elements, constitutes an important reference within the fundamental categories that are defined to design the methodology for professional development, which defines the particularities of the present proposal in order to address the improvement of the didactic competence of the baseball coach from the context of sports initiation.

Methodological apparatus

The methodology for improving the teaching competence of baseball coaches should foster the exchange of experiences and reflective analysis in practice. Its structure and function design include actions aimed at acquiring skills and knowledge related to teaching methodology as a crucial domain for coaches. Therefore, the methodology is developed through four phases: diagnosis, planning, execution, and evaluation. Control measures were also established to assess the efficiency of the planned activities in practice. This approach aims to foster a transformative connection for baseball coaches of the under-12 age group, based on a proposal that contributes to solving the professional problems presented by the selected sample in this research.

Phase I. Diagnosis

This phase lasts three months and aims to determine the initial state of baseball coaches' teaching skills. Based on this assessment, actions will be taken to determine the level of knowledge and abilities of the professionals involved. These criteria will then be considered when planning activities to improve the baseball coach's teaching competence. Therefore, the following actions will be implemented:

Action 1. Workshop on the exchange of teaching experiences, established to determine the level of knowledge of baseball coaches, based on the presentation of teaching situations where coaches express their knowledge and skills to provide solutions, which will allow us to determine the level of teaching competencies that these professionals present.

Action 2. Evaluate in practice the implementation of the training unit; this action will allow determining the correspondence between what was planned and what was applied in reality, and the variations that the coach can apply.

Action 3. Documentary analysis on the professional development plan established for the baseball coach, which allows the analysis of the main activities established to achieve the improvement of a didactic competence.

Action 4. Design and apply the selected instruments for carrying out the diagnosis (survey, interview and observation) in order to determine and assess the knowledge, skills and motivations that distinguish the baseball coach based on criteria related to teaching and its use.

Action 5. Determine the main professional needs demanded by baseball coaches, in terms of the improvement of a didactic competence, which will allow the establishment of the main work guidelines that will serve as the foundation for the actions proposed in the methodology.

Phase II. Planning

This phase will last for three months, during which the fundamental actions to be considered in order to achieve the improvement of a didactic competence in the baseball coach will be determined, based on the development of methodological preparation as a fundamental way to achieve the objective of the methodology.

Action 1. Selection of the forms of improvement from which the didactic competence in the baseball coach will be perfected, this aspect allowed to determine the most effective and relevant way to develop the topics to be taught.

Action 2. Design a methodological preparation program for the baseball coach, through which the various topics that will promote an improvement of the didactic competence in the baseball coach are established (Table 2).

Table 2. - Methodological preparation plan

Plan de preparación metodológica									
Tema	Temática	Tipo de preparación	Formas de superación	Modalidad	Hora	Lugar	Participantes	Responsable	
Sistema de principios del entrenamiento	-principios didácticos -principios biológicos	Base	Conferencia	Presencial	9 am	Combinado deportivo	Entrenadores de Béisbol	Investigador y colaboradores	
Sistema de principios del entrenamiento	-principios del entrenamiento deportivo	Base	Conferencia	Presencial	9 am	Combinado deportivo	Entrenadores de Béisbol	Investigador y colaboradores	
El entrenamiento deportivo en la etapa de iniciación deportiva	-Introducción al entrenamiento deportivo. -Fases en el proceso de entrenamiento	Base	Conferencia	Presencial	9 am	Combinado deportivo	Entrenadores de Béisbol	Investigador y colaboradores	
El entrenamiento deportivo en la etapa de iniciación deportiva	-Los componentes del proceso de entrenamiento -La adaptación en el deporte	Base	Conferencia	Presencial	9 am	Combinado deportivo	Entrenadores de Béisbol	Investigador y colaboradores	
Los modelos de enseñanza en el Béisbol	-Modelo técnico. -Modelos de enseñanza del deporte y Educación Física	Base	Conferencia	Presencial	9 am	Combinado deportivo	Entrenadores de Béisbol	Investigador y colaboradores	
Los modelos de enseñanza en el Béisbol	- Modelos alternativos.	Base	Conferencia	Presencial	9 am	Combinado deportivo	Entrenadores de Béisbol	Investigador y colaboradores	
Características de la práctica deportiva por áreas de juego en el Béisbol	-Principios fundamentales en la acción de juego por áreas. -Estructura generalizada de los movimientos básicos por posiciones. -Características de los movimientos durante las diferentes acciones de juego	Municipal	Conferencia taller	Presencial	9 am	Estadio P. Carrillo	Entrenadores de Béisbol	Investigador y colaboradores	
Métodos de entrenamiento para el desarrollo del béisbol en la iniciación deportiva	-Métodos verbales -Métodos de enseñanza	Municipal	Conferencia taller	Presencial	9 am	Estadio P. Carrillo	Entrenadores de Béisbol	Investigador y colaboradores	
Métodos de entrenamiento para el desarrollo del béisbol en la iniciación deportiva	-Métodos para el perfeccionamiento -Métodos sensorioceptuales	Municipal	Conferencia taller	Presencial	9 am	Estadio P. Carrillo	Entrenadores de Béisbol	Investigador y colaboradores	
La didáctica y su implicación en el entrenamiento	-Aspectos fundamentales de la clase en la iniciación deportiva. -Medios para el trabajo de las habilidades motrices básicas en el Béisbol. -Categorías didácticas	Provincial	Conferencia taller	Semipresencial	9 am	Estadio G. Moncada	Entrenadores de Béisbol	Investigador y colaboradores	
Desarrollo y psicomotricidad del niño de 9 - 12 años	-Características del desarrollo psicológico, físico, motor, intelectual.	Provincial	Conferencia	Semipresencial	9 am	Estadio G. Moncada	Entrenadores de Béisbol	Investigador y colaboradores	
La planificación del entrenamiento deportivo en el Béisbol	-Carácter pedagógico del proceso de entrenamiento en la iniciación deportiva. -La planificación macro-estructural de la preparación técnica con énfasis en el principio de la unidad entre la preparación física especial y técnico-coordinativa	Provincial	Conferencia taller	Semipresencial	9 am	Estadio G. Moncada	Entrenadores de Béisbol	Investigador y colaboradores	

Source: Self-prepared to determine the methodological preparation plan for the baseball coach

Action 3. Develop activities on the baseball field, starting by generating situations by areas (pitchers; catchers; outfielders; infielders), where the skills achieved by the coaches can be assessed, in terms of solving various problems that may occur during training, according to the particularities that distinguish the under 12-year-old category.

Action 4. Establish short-, medium- and long-term goals, as criteria for achievements to be reached by the baseball coach, which allowed for assessments of the progress shown from the completion of the proposed activities.

Action 5. Determine the systematic and final evaluation of the baseball coach, based on his active and leading participation in the methodological preparation activities, where the criteria that they refer to regarding the various topics that are presented can be assessed.

Phase III. Implementation

This phase, which lasts six months, aims to improve the baseball coach's teaching skills by applying tools designed to transform the problem identified in the research. The following actions are proposed:

Action 1. Application of the methodological preparation plan for the improvement of the didactic competence in the baseball coach.

Action 2. To pre-situate the development of the activities by determining their objectives, using teaching and technological means to stimulate the motivation of the participants in carrying out actions as a way to improve the didactic competence.

Phase IV. Assessment

In this phase, the objective is to evaluate the level achieved by baseball coaches, based on the application of the actions taken to improve their teaching skills. In this regard, the evaluation will be carried out through systematic monitoring and visits to training

facilities, where the coaches' performance can be assessed using criteria such as those listed in Table 3:

Table 3. - Didactic competencies for the baseball coach

Teaching skills	Skills	Knowledge	Values
I. Didactic structuring for the design of the training unit in baseball	Apply the didactic components during the development of the training	1. Formulation of objectives according to the content and characteristics that distinguish the under 12 years category. 2. Selection of methods in accordance with the context of sports initiation and the development of training directions 3. Objective-content-method relationship 4. Selection of motor tasks for training. 5. Choosing the content to be developed at this stage 6. Methodological order of motor tasks according to the intended objective 7. Selection of forms and procedures in accordance with the nature of the tasks set in class	Creative Organized Persevering Farsighted Aim
II. Development of the training plan adapted to the context of sports initiation	Organize and design the sports training planning system	1. Gradual derivation of objectives in the plan 2. Selection of specific training directions for work dosage in accordance with the planned reality 3. Temporal structuring of training. Correspondence of the chosen temporal structure with the sport, and the context for which it is planned. 4. Sequencing of the period, stages or phases in correspondence with the reality being planned 5. Sequence of the content to be covered in accordance with the context for which it is planned 6. Correspondence between motor tasks and their dosage according to the context for which they are planned	Creative Organized Farsighted Aim

		7. Determining the duration of training time in relation to the total duration of the plan. 8. Correspondence between the general plan, the mesocycle and the microcycle to design the training. 9. Expression of load values in correspondence with the characteristics of the training directions. 10. Correspondence of the values assigned to the training volume with the training directions.	
III. Application of the baseball teaching methodology	Teach the elements Basic tactical techniques of baseball	1. Characterization of the game of baseball 2. Basic rules of the game 3. Classification of technical-tactical preparation exercises 4. Teaching system for technical-tactical actions by playing areas in baseball.	Creative Organized Farsighted Aim
IV- Conducting the training section	Develop the training unit logically based on the relationship of the aspects provided by the didactics	1. Didactic logic during the development of the training unit 2. Relationship between general, special, and particular didactics 3. Use of teaching tools to promote teaching 4. Design and provide solutions to didactic situations that arise during practice	Cooperation Enthusiasm Optimism Creative Organized Farsighted Aim

Source: Personal elaboration to establish the didactic competencies of the baseball coach

Assessment scale for teaching competencies:

Excellent: (5) meets all the requirements of the competition; very good (4): meets most of the requirements of the competition; good: (3): meets some of the requirements of the competition; fair: (2) meets few of the requirements of the competition; poor: (1), does not meet any of the requirements of the competition (Figure 5).



Fig. 5. - Professional development methodology for the baseball coach

Application of the professional development methodology for the improvement of the teaching competence in the baseball coach

To assess the feasibility of the applied methodology, a pre-experimental design was conducted (Sampieri *et al.*, 2010), consisting of two phases: a pre-test and a post-test. The indicators measured included the teaching competencies revealed during the methodology evaluation phase, as well as the existing evaluation system. The results obtained allowed for comparisons between the two tests administered to the participating group of coaches, enabling the evaluation of potential transformations resulting from the use of the methodology as a tool for change in the research.

In this sense, from the initial application of the pre-test, the following results were revealed, which are the subject of analysis (Figure 6):

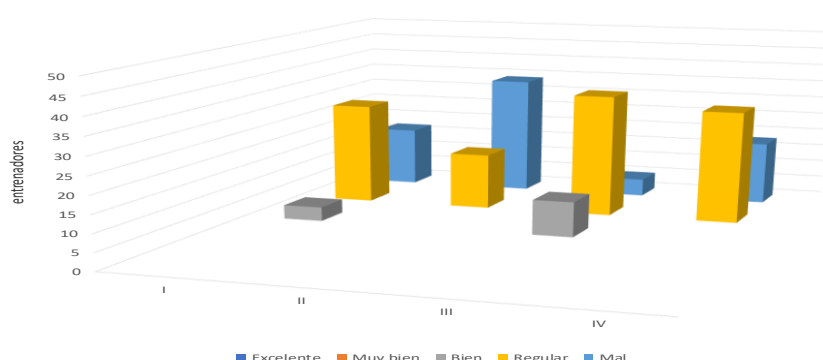


Fig 6. - Results of the evaluation of teaching competence in the pre-test

Upon reviewing the results obtained in the pre-test, it is evident that in Indicator I, 4 coaches (8%) were rated as good, while 29 (58%) were rated as fair, and the remaining 17 (34%) as poor. This reveals deficiencies among the coaches regarding their knowledge and application of the fundamental didactic categories for structuring training units. Meanwhile, Indicator II shows that 16 coaches (32%) were rated as fair and 34 (68%) as poor. This highlights deficiencies in their mastery and skills related to the theory and methodology of sports training, as well as their ability to contextualize this knowledge to design the training process during the sports initiation stage.

In indicator III, it is revealed that 10 (20%) are rated well; 35 (70%) are rated fairly; and 5 (10%) are rated poorly. The results in this area primarily reveal that the use of feasible strategies for teaching basic baseball techniques by playing area, and for integrating them into actions progressing from simple to complex, is not fully satisfied. Consequently, in indicator IV, it is observed that 32 coaches (64%) are rated fairly, and 18 (36%) are rated poorly. This demonstrates that the integrated resources of general, specialized, and specific baseball didactics are not being applied effectively in the practical design of training sessions.

In general, when evaluating the results obtained in the pre-test for each of the four indicators designed to assess the baseball coach's teaching skills, it can be seen that in more than 70% of cases, the evaluations were rated as fair or poor. This indicates

deficiencies in their knowledge and skills regarding the use of teaching resources, an essential aspect for guiding the teaching and learning process in this sport (Figure 7).

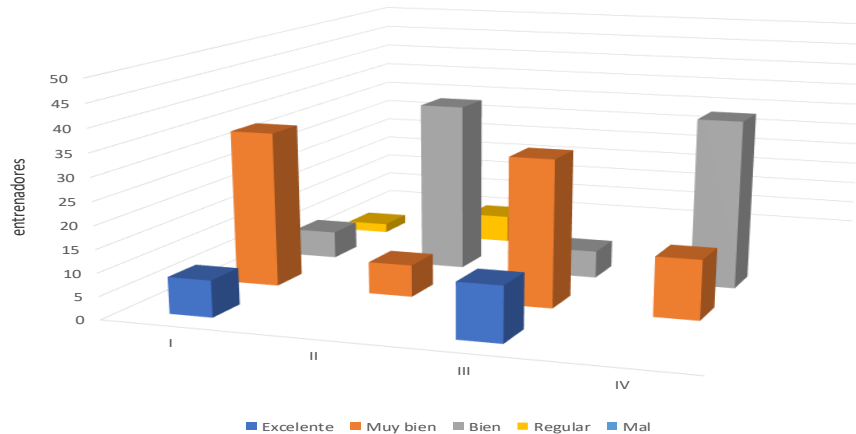


Fig. 7. - Results of the evaluation of teaching competence in the post-test

In the post-test, the performance of the indicators, specifically indicator I, revealed results such as: 8 coaches (16%) were rated as excellent; 34 (68%) as very good; 6 (12%) as good; and 2 (4%) as fair. In this regard, it is important to highlight the progress shown in objective formulation and the correct relationship between method and content, as well as the appropriate use of procedures in relation to the tasks set during the design and development of the training unit. Regarding indicator II, 7 (14%) achieved the very good rating; 37 (74%) were rated as good; and only 6 coaches (12%) were rated as fair. Therefore, when analyzing these results, it translates into a better correspondence between the aspects that define the general plan, the mesocycle, the microcycle and the training unit, a better determination of the training directions and their relationship with the motor task, as well as the development of specific load values for the dosage of training according to the characteristics of the sports initiation stage.

Indicator III shows that 12 coaches (24%) are rated as excellent; 32 (64%) as very good; and 6 (12%) as good. This reveals an improvement in the implementation of teaching strategies for technical and tactical elements by playing area, as well as greater precision regarding the objectives to be achieved in teaching baseball to the under-12 age group. In Indicator IV, 13 coaches (26%) are rated as very good, and the remaining 37 (74%) as

good. This highlights a better implementation of the teaching methodology for both the planning and the execution and development of the general training unit and by playing area. A harmonious relationship was observed between the general, specific, and particular aspects of the teaching methodology, and better attention was given to solving problems that arise in practice.

The results obtained in the post-test demonstrate an improvement in the baseball coach's teaching competence, as evidenced by a greater mastery and understanding of teaching methods, as well as the development of skills to adapt his knowledge to the context in which he works. This reflects the progress and transformations achieved by this professional, with over 70% receiving excellent, very good, or good ratings for each indicator.

In order to determine if the data for the mean values of the tests before and after follow a normal distribution, the following hypothesis is posed as a problem

H0: The values are normally distributed

H1: The values are not normally distributed

With a significance level or margin of error of (α) = 0.05 and a confidence level of 95%

The Shapiro Wilks test is selected as the statistical test according to the sample size for samples equal to or less than 50 (for $n \leq 50$) (Table 4).

Table 4. - Normality test

	Shapiro-Wilk		
	Statistical	gl	Next.
average1	,911	50	,001
average2	,164	50	,000

Take the significance of the test (α) and compare

$$\alpha = 0,001 \leq \alpha = 0.05$$

$$\alpha_o = ,000 \leq \alpha = 0.05$$

Since the significance level $\alpha = 0.05$ is greater than $\alpha_o = 0.001$ and $\alpha_o = 0.000$, then it is accepted

H0 or Null Hypothesis which states that the data are normally distributed

According to the classification of the variable and the result of the normality analysis, the statistical test to be applied will be determined. In this case, since the variable is continuous and normally distributed, the Wilcoxon parametric test will be used for a vertical analysis, that is, the sample, at two times and under identical conditions.

Wilcoxon signed-rank test to determine if there is a significant difference between the times before and after, under identical conditions for the same group.

Hypothesis:

$$H0: \alpha_o = 0$$

The group does not evolve from one moment to the next. There is no significant difference between the tests administered.

$$H1: \alpha \text{ or } \neq 0$$

The group is progressing satisfactorily from one moment to the next. There is a significant difference between the tests administered.

Assuming a significance level or margin of error of $(\alpha) = 0.05$ and a confidence level of 95% (Table 5).

Table 5. - Contrast statistics ^b

	average2 - average1
Z	-6,204 ^a
Asymptotic sign (bilateral)	,000

a) Based on negative ranges.

b) Wilcoxon signed-rank test

Significance: $\alpha = 0,000$.

$\alpha = 0,000 < \alpha = 0.05$

Comparison: $\alpha = 0 < \alpha$.

Decision: H_0 is rejected.

Conclusion: There is a significant difference between the tests. The group is progressing satisfactorily from one point to the next. The variant applied to the coaches is effective.

Competence, as a professional attribute, is linked to the professional role (tasks and functions) that encompasses the set of achievements, results, courses of action, and accomplishments required of the holder of a given profession or occupation. Competence refers to the functions, tasks, and roles of a professional—their responsibilities—to adequately and effectively perform their job, demonstrating sufficiency. These are the result and object of a qualification process, primarily related to the training necessary to obtain the desired professional competence.

In this regard, the undergraduate professional competency-based training for future graduates in Physical Culture, according to the criteria defined by the current curriculum E, aims to develop a competent, well-rounded, qualified, and committed social actor with strong professional motivations, enabling them to interact within the community by promoting and implementing preventative, therapeutic, sports, and recreational activities. The current model is based on a broad, open, and outreach-

oriented competency-based training that allows professionals to perform various functions according to existing social needs. However, graduates of this program, once they enter their professional roles, as is the case with baseball coaches, often encounter difficulties in utilizing the resources provided by didactics and how to apply them according to the characteristics of the sports initiation stage.

Hence, the improvement of teaching competence is currently shown as a demand of the baseball coach, because it is associated with the ability to acquire specific knowledge according to the demands of the required professional profile, and also contributes to the solution of practical problems in an autonomous and creative way.

In this sense, research has been carried out such as that of Ojeda *et al.* (2022); Guerrero *et al.* (2022); Garduño (2023); Gil *et al.* (2023); Maldybayev *et al.* (2024); Molina *et al.* (2024); Flores *et al.* (2024); Ramos *et al.* (2024), who assume the training and development of professional competence, from the particularities that define the functions of the physical education teacher.

Meanwhile, Ale *et al.* (2021), González *et al.* (2021), Quijano (2022), and Quinaud *et al.* (2026) define competency development from the perspectives of inclusion, adapted sports, training practices with people with disabilities, and the development of functional competencies. Analysis of these studies reveals that they address realities distinct from the specific characteristics of a baseball coach. Therefore, there is a need to harmoniously integrate the criteria that distinguish general, general, and specific baseball didactics as a foundation for knowledge that will contribute to the improvement of didactic competence in this professional.

Caveda (2020), Campos (2020), Gómez (2021), Martínez *et al.* (2022), Corral *et al.* (2022), Pereira *et al.* (2023), Pérez *et al.* (2025), and Herrera *et al.* (2025) highlight the importance of developing professional competence based on the shortcomings identified in coaches of team sports, tennis, taekwondo, swimming, and weightlifting, and within the context of professional development. These criteria underscore the need for transformations through the integration of competencies; however, these transformations are general in

nature and fail to consider the specific relationship dynamics that baseball coaches must navigate.

In general, the various limitations currently affecting the treatment of professional competencies are evident. Existing criteria place them in terms of satisfying defined needs. Therefore, it is necessary to approach them for baseball coaches within a specific context, according to the needs they demand. Contributing to the improvement of didactic competence is thus shown to be the aspect that allows for the logical and integrated articulation of elements related to general didactics, the theory and methodology of sports training, and the methodology of baseball instruction. This constitutes the valid knowledge system for acquiring the professional skills that enable the efficient organization and planning of baseball instruction by playing area, based on the demands defined by the sports initiation stage.

CONCLUSIONS

The didactic competence of the baseball coach acquires great importance, because it expresses the existing link between general, special and particular didactics, which exposes the necessary implication of these knowledge in the domains for these professionals, this knowledge is revealing in its use to conceive the training, from the establishment of specific planning systems that are related in an appropriate way, with the determination of objectives and methods, in correspondence with the features that characterize the sports context.

The professional development methodology, designed based on its four stages, assumes as its fundamental purpose the improvement of the baseball coach's teaching competence. Therefore, through the application of all the conceived actions, a favorable transformation is fostered in those involved, since its structure and function satisfy the requirements set forth, which demonstrates the quality in the construction of the actions planned in the methodology.

The application of the pre-experimental design demonstrates the feasibility of the methodology by revealing satisfactory results in the post-test compared to the pre-test, which was corroborated by the hypothesis test performed, which shows a favorable transformation in the evaluated indicators, hence this is an expression of the progress achieved by baseball coaches in the improvement of didactic competence.

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Conflict of interest:

The authors declare no conflicts of interest.

Authors' contribution:

The authors have participated in the writing of the work and analysis of the documents.



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