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# Ciencia y Deporte



*Current trends toward addressing individual differences in physical  
education classes. A new approach from Ecuador*

*[Tendencias actuales hacia el tratamiento de las diferencias Individuales en la clase de  
Educación Física. Un enfoque desde el Ecuador]*

*[Tendências atuais no tratamento das diferenças individuais nas aulas de Educação Física. Uma  
abordagem do Equador]*

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## Abstract

This work aimed to systematize the most recent research results related to individual differences in Physical Education in order to achieve a more inclusive teaching. In a synthesized manner and based on critical thinking by the authors, topics such as differentiation and relevance of the class according to age, the degree of load in the effort in correspondence with health, energy expenditure of activities, error correction, motor and sports skills, dosage of loads and the characteristics of the Physical Education imaginary today, among other important elements, have been addressed. Multiple works that in some way address the issue of individual differences were taken into account. On the other hand, a brief overview was made of the Ecuadorian educational reality in relation to the pedagogical and didactic aspects that in some way or another are linked to the individual differences inherent in the educational processes by age and by teaching systems. This work has been prepared in order to create a bibliographic reference on individual differences, with the best intention of generating proposals that lead to achieving a more inclusive, integrative and sustainable education.

**Keywords:** individual differences, Physical Education.

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## Resumen

Este trabajo tuvo como objetivo realizar una sistematización sobre los resultados investigativos más recientes relacionados con las diferencias individuales en la Educación Física en función de lograr una enseñanza más inclusiva. De forma sintetizada y a partir de un pensamiento crítico de los autores se han abordado temas como la diferenciación y la pertinencia de la clase acorde a las edades, el grado de carga en el esfuerzo en correspondencia con la salud, el gasto energético de las actividades, la corrección de errores, las habilidades motrices y deportivas, la dosificación de las cargas y las características del imaginario de la Educación Física en la actualidad entre otros elementos importantes. Se tomaron en cuenta múltiples obras que de alguna forma abordan el tema de las diferencias individuales. Por otra parte, se realizó una breve

panorámica sobre la realidad educativa ecuatoriana en relación con los aspectos pedagógicos y didácticos que de alguna forma u otra se vinculan con las diferencias individuales inherentes de los procesos educativos por edades y por sistemas de enseñanza. Esta obra ha sido elaborada en función de crear un referente bibliográfico sobre las diferencias individuales, con el mejor ánimo de generar propuestas que conduzcan a lograr una educación más inclusiva, integradora y sostenible.

**Palabras clave:** diferencias Individuales, Educación Física.

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## Resumo

Este trabalho teve como objetivo sistematizar os resultados de pesquisas mais recentes relacionados às diferenças individuais na Educação Física, a fim de alcançar um ensino mais inclusivo. De forma resumida e com base no pensamento crítico dos autores, foram abordados temas como a diferenciação e relevância da aula de acordo com a idade, o grau de carga no esforço em correspondência com a saúde, o gasto energético das atividades, a correção de erros, as habilidades motoras e esportivas, a dosagem das cargas e as características do imaginário da Educação Física hoje, entre outros elementos importantes. Foram levados em consideração vários trabalhos que de alguma forma abordam a questão das diferenças individuais. Por outro lado, foi feito um breve panorama da realidade educacional equatoriana em relação aos aspectos pedagógicos e didáticos que de uma forma ou de outra estão ligados às diferenças individuais inerentes aos processos educativos por idade e por sistemas de ensino. Este trabalho foi elaborado com o objetivo de criar uma referência bibliográfica sobre as diferenças individuais, com o melhor intuito de gerar propostas que levem a alcançar uma educação mais inclusiva, integradora e sustentável.

**Palavras-chave:** diferenças individuais, Educação Física.

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## *Introduction*

The educational revolution taking place in all teaching, and especially in Basic General Education, demands a new style of work for teachers in schools, where the individuality of each student is taken to a higher level. The transformations must be fundamentally aimed at obtaining a student who is, within the teaching process and in all their school and social activities, an active, critical, reflective, independent, and leading agent in their performance.

It is true that man is a social being, who as such thinks and lives, formed in a family with similar ideas, but it is true that each one appropriates the social heritage in a peculiar way, here lies the difference and variety of his learning, each one has different ways and styles, it is up to the teacher to have the immense task of knowing how to differentiate and direct the appropriate attention to each one of his students, to enhance in them, knowledge, skills and appropriate behaviors Rosero and Santana (2014).

In physical education (PE) classes, teachers must be certain that their students are different. These differences include sex, Somoto type, height, weight, maternal gestation, age at which the mother stopped breastfeeding, and cultural factors affecting their diet (Santos-Labrador, 2023).

Physical education has proven to be an ideal context for developing emotional intelligence, academic performance, motivation, and life satisfaction. However, these elements can be acquired with greater or lesser intensity depending on gender and age, and, of course, the system of educational influences within which this PE teaching process is carried out. (Suero *et al.*, 2019)

One of the missions of PE is undoubtedly to balance the physical and mental development of the child, especially considering that not everyone receives the same opportunities at home and in the community to strengthen their body muscles and mental agility. This is why PE aims to develop motor, social, cognitive and affective skills, through the transversality of inclusive, playful and corporality curricular

approaches; these are elements that are taken into account to establish a planning that guarantees the autonomy of the student and that these physical exercises serve as a regular practice for their entire life (Posso -Pacheco, 2020).

From an early age, one of the most successful strategies for addressing individual differences in students has been to enhance learning environments in PE. These environments have enabled not only the teacher to become the transmitter of knowledge and values, but also the interaction of students with their peers in the process of resolving problematic situations, which develops intelligence, creativity, and autonomy (Martínez *et al.*, 2020).

When it comes to learning environments, it is necessary to develop an effective approach to strengthening inclusion in PE. It is clear that recreational activities are an invaluable resource for integrating children with disabilities into school activities. However, studies show that not all PE curricula are flexible for inclusion, and not all types of teachers accept this concept equally in order to achieve good results. Sometimes novice teachers show higher levels of adjustment to inclusive education, while in other cases, rural teachers indicate greater adaptation to inclusive processes. In any case, success lies in understanding and leveraging students' individual differences to enhance the multiple skills they can develop (García, González, 2021; Castillo *et al.*, 2021).

That is why the authors of this work have set themselves the objective of: systematizing the most recent research results related to individual differences in Physical Education in order to achieve a more inclusive teaching.

## *Development*

### *Some reflections on the historical evolution of the treatment of Individual Differences in PE*

When preparing for PE classes, teachers must be prepared and up-to-date on the treatment of individual differences in their classrooms and, above all, be familiar with

the scientific and technical advances and the evolution of this topic through the various nuances of the times.

From the outset, some authors (Pastor, Sánchez, 2007) have recognized that PE classes should be more differentiated and relevant to the age and developmental conditions of the students. Among other characteristics, quantitative aspects such as the degree of effort and the focus on health rather than performance should be taken into account. Therefore, intense training or prolonged sessions should not be used to gain greater endurance or strength. This analysis should also consider the frequency of training sessions based on the energy expenditure used in the sports activities.

On the other hand, Infante, Revol, (2009) views this treatment of individual differences from the perspective of error correction; in their notes, these authors state that this corrective work must correspond to the personal characteristics of the students, their level of development of motor and athletic skills, and the treatment of physical capacities. They also align with these aspects: the volume and intensity of the motor action in the execution process. Furthermore, these authors refer to the dosage of loads in balance with optimal levels of physical capacities.

Núñez *et al.* (2018) give these concepts a practical meaning by conducting a diagnostic study that reveals that students do not perceive a differentiated class, since in the teaching activities carried out in PE, everyone is seen as equal. However, homogeneity is not the only mitigating factor that prevails in this experiment; constant competition and hetero-evaluation are also fundamental ways of assessing students' learning levels.

To achieve this educational endeavor, Calderón & Rincón (2018) start from the concept of a culture of peace and, among other specific objectives, promote:

- The implementation of unusual practices that provoke new situations and new knowledge and concepts for the PE class, thus generating self-regulation and self-education processes.

- The development of active individuals in society and the prevalence of conscious thought and participation in accordance with the policies governing the national and global context.
- The renewal of the existing social imaginary in PE, moving away from the mechanistic and sport-oriented approach.

Sports pedagogical research suggests that differentiated work in PE classes can be carried out based on the results of a diagnosis that highlights differences in age and gender. Such is the case of Baños *et al.* (2019), who reveal in their characterization that girls obtained higher average scores in the perception of PE teacher competencies and in aggression. However, in the case of boys, behaviors related to irresponsibility and low commitment were found to be more aggravating. They also highlighted disobedience to rules, disrupting the classroom environment, and low self-control towards girls.

In the work of Soto & Vargas (2019), individual differences are explained through the phenomenon of corporeality. According to these authors, PE teachers worldwide are called upon to change their perspective on this subject, which has traditionally focused on making students faster, more resilient, and more competitive. This call also involves valuing other qualities of the body that are more emotional, empathetic, and reasoning. It is in this dimension that we must look even more closely, and, of course, from the perspective of the personal characteristics that each child can offer.

Highlighted in this compilation of works on the treatment of individual differences is the research by Herrera & Almonacid (2019), which addresses, among the competencies that a PE teacher must develop, that of acting as a leader in the face of diversity in the educational community, recognizing and respecting others. Clearly, an effective way to recognize and respect the presence of others is to accept differences and collaborate to grow together.

Despite the topic of individual differences being a practically obligatory topic in educational research, it is interesting that this term is not explicitly mentioned in the work of Velasco *et al.* (2019), which investigated the motivations of PE teachers. However, a thorough reading of the article reveals that when the authors refer to the section on gender, they emphasize individual differences. Among males, most students see this PE program as a closer look at their motivations for sports, while among females, their inclination is more closely linked to their childhood recreational activities. This study provides a basis for curriculum planning, since by understanding these motivations in advance, teachers can strengthen their work to meet the expectations of future graduates.

Later, the criterion of individual differences contextualized in children with special educational needs takes on a new dimension and, as a result, is recognized in the academic world as Adapted Physical Education (Gómez *et al.*, 2019). This approach allows for a proposal tailored to the educational needs of PE, based on making adaptations so that everyone can participate. In this sense, the challenge for new PE teachers is to guarantee learning environments and transform the classroom into a process of inclusion through understanding and raising awareness among students and all those involved in these children.

It is clear that, when it comes to attracting and developing talent in sports, it is not enough to reveal an athlete's early potential; to achieve satisfactory results, it will be necessary to intervene from the first sporting contact with these children. An example of this approach can be seen in the study by Pereira *et al.* (2019), which shows the conception of a methodology for the teaching-learning process of Karate Do with an emphasis on early stimulation. Regarding the treatment of individual differences at these ages, the authors use the following components:

- Stimulation of the sensorimotor area.
- I work on learning ability.
- Use of the zone of proximal development.
- Arrangement of aid levels.

- Definition of developing teaching tasks by levels of assistance.

Instead, from Pastor- Vicedo 's perspective *et al.* (2019), these differences can be found in the manifestations of stereotypes. “The analysis of the stereotype related to body language and the difference in behavior between boys and girls shows different response percentages in the perception they have of it, since both boys, with 45% versus 18%, and girls, with 44% versus 27%, agree on the presence of these differences” (p. 28)

In relation to this trend in addressing individual differences from a gender perspective, results are presented that can serve as a reference for properly diagnosing an athlete's profile in the context of PE classes: Athletes showed significant differences in the identified methodology, with higher mean values among men. Regardless of gender, it is important to foster intrinsic motivation as a driving mechanism for developing strong motivation for conceiving sport as a beneficial tool for quality of life (Moral *et al.*, 2019, p. 287).

From this perspective, it is already a fact that researchers have focused their studies on the creation of active methodologies that are inclusive, contextualized in accurate diagnoses of the characteristics of children with athletic abilities according to the different sports modalities (Díaz *et al.*, 2020; Raposo *et al.*, 2020).

Sánchez *et al.* (2020) suggests that PE classes have traditionally been the context for testing the hegemony of masculinity over femininity. In particular, it can be noted that in soccer, girls do not play with the same consistency as boys. It is not just that girls cry or are weak in training, but that they have not been granted the same right to practice this sport as the opposite sex, with the exception of those who are labeled as tomboys.

According to Ruiz *et al.* (2020), girls are more interested in school, while boys are more motivated by physical activity. Surveys also show that children's interest in sports is not yet at the same level; it all depends on the influence of parents, family members, and friends. Considering this criterion, based on a difference transmitted over generations, it is the teacher's responsibility to reverse this data.

One of the contexts that most demands work on individual differences is the great challenge of inclusive education. Some authors have agreed that, even though this topic is one of the most prioritized today, there is still a significant lack of professionals, instructors, and technicians to achieve the desired inclusion, both globally and specifically in Ecuador's educational reality (Rojas-Avilés *et al.*, 2020; García & González, 2021).

Understanding the need to train professionals to address individual differences is only the first step toward success in this endeavor. This is followed by the pedagogical proposal. Among these works, the following is of great value: a model for applying cooperative learning in the field of PE. This initiative, generated by Martín & Martín (2021), consists of four phases: 1) trust-group cohesion, 2) familiarization, 3) consolidation, and 4) performance. This program contains the five domains of motor action established for PE and the variables to be taken into account in the design of the activity. These variables are: timing, number of sessions and activities, rules, group dynamics, roles, practice spaces, cooperative learning principles, teamwork skills, cooperative techniques and structures.

When it comes to making a contribution, we must not overlook the work of Guillén & Sandoval (2022), who propose a pedagogical model for PE classes to address individual differences. In this model, they assume the following requirements: there must be direct contact between participants; they are only successful if their groupmates are also successful; each group member must have a role to play; good communication within a group and active listening, respecting the turns of others. This is a high-quality proposal that greatly organizes the work of teachers and researchers; it is very guiding; however, this path is not the only one.

Ortiz *et al.* (2022) aims to improve the motivational climate of students in order to enhance individual differences. This climate generates conditions for this improvement and is based on three demographic variables (sex, nature of the physical activity, and sports experience).

Based on a periodization of studies, Arenas *et al.* (2022) decided to summarize various aspects that may be useful in developing a strategy, a method for addressing individual differences in PE classes. These suggestions are presented as follows:

1. Prevalence of gender stereotypes in curricula; the impact of this phenomenon on students is evident, although this has been improving toward more noticeable equality recently.
2. There is a need to restructure and demand better training for PE teachers in the area of valuing the female gender in relation to the practice of various sports, which do not necessarily have to be promoted solely by the male gender.
3. The call for a more inclusive PE where there is no room for segregation but rather for opportunities where students feel free to decide which sports to practice and in which sport to participate.
4. Ensure a motivational climate where there is no room for ego or undisciplined or discriminatory behavior.
5. Combat stereotypical behaviors and attitudes in both boys and girls; education toward developing critical thinking.
6. Avoid stereotypical associations, ensuring that PE class content is appealing to both boys and girls.

*Brief reference on the situation related to individual differences in the Ecuadorian educational system*

According to the Council of Nationalities and Peoples of Ecuador (CODENPE), there are 14 nationalities and 18 indigenous peoples in the country, resulting in a heterogeneous student population in schools. These constitute unavoidable realities in the classroom, such as disparity or variability, which are essentially the individual differences among human beings.

For this reason, considering the origin of Ecuadorian students as a reference, we understand the great variability of students in Physical Education classes, across different educational levels, and especially in Basic General Education; hence, the strict demands placed on the teacher.

In Ecuador, the fundamental objective is to form a population with a Comprehensive General Culture, from this we can deduce the need for the entire population to improve in all possible ways, from the training of the intellect to the training and exercise of the body (Abad, 2013).

The process of updating and strengthening the curriculum of Basic General Education in Ecuador aims to develop the human condition and prepare for an understanding of the pressing problems of the world and the nation. To achieve this, it is essential to properly guide citizens toward the development and practice of values that allow them to interact with society with respect, responsibility, honesty, and solidarity, applying the principles of good living.

The Constitution of the Republic of Ecuador, in its Article 26, stipulates that "Education is a right of individuals throughout their lives and an unavoidable and inexcusable duty of the State" and, in its Article 343, recognizes that the learning process is at the center of the educational process. Furthermore, this same article establishes that "the national education system will integrate an intercultural vision in accordance with the geographic, cultural, and linguistic diversity of the country, and respect for the rights of communities, peoples, and nationalities" (Almeida, 2019, p. 25).

To achieve this, it is necessary to address the individual differences of each Ecuadorian.

Currently, the Third Educational Revolution in history is underway. This has led to a series of educational transformations, of which Physical Education has not been immune, as it is an integral part of the education system for the training of younger generations. This has enabled the harmonious and multifaceted development of

individuals, along with basic motor skills and physical abilities that prepare them for life and for the supreme duty of every Ecuadorian (Chiriboga *et al.*, 2024).

Before contextualizing the teaching-learning process of Physical Education in Basic General Education, it is necessary to define Basic Education in Ecuador.

Article 27 of the Regulation of the Organic Law on Intercultural Education (LOEI) of the Ministry of Education of Ecuador defines Basic General Education as follows (Table 1).

*Table 1. - Levels and sublevels of Basic General Education in Ecuador*

Levels	Sublevels
Initial	Initial 1, up to three (3) years of age; Initial 2, which includes infants from three (3) to five (5) years of age
Basic General Education	Preparatory, which corresponds to 1st grade, up to five years; Elementary Basic, which corresponds to 2nd, 3rd and 4th grades, up to 8 years; Middle Basic, which corresponds to 5th, 6th and 7th grades, up to 11 years.
Higher Basic	8th, 9th and 10th grade students aged 12 to 14.

*Source: Cobeña et al. (2018)*

The teaching-learning process constitutes a dynamic and complex set of closely related and interdependent activities carried out by the teacher and the student, all with the aim of influencing the development of the student's personality. It is a consciously organized and directed process, based on objective, internal, and external regularities derived from the essential conditions and relationships within the framework of the student's development and the social relations prevailing in the society in which they live.

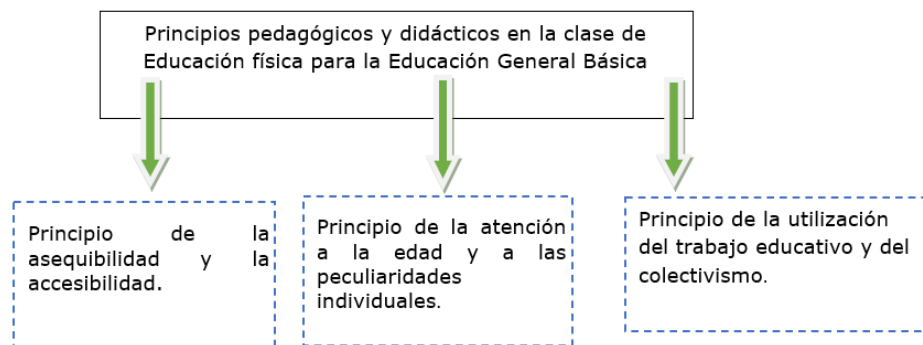
The PEA teaching-learning process for Physical Education in Ecuador has gone through several stages, undergoing countless transformations due to the country's political changes. In its initial phase, the programs were characterized by a traditional pedagogy, where the same classroom teacher taught Physical Education. Today, there is a specialist teacher in the subject who, within their class schedule, completes 25 teaching hours, divided into two weekly sessions per class group.

The teaching-learning process takes place within the educational institution and within the hours included in the curriculum, responding to the skills that appear in the current national curriculum.

The PEA of Physical Education is mainly oriented in three fundamental aspects, methods, procedures and organizational forms, this process is aimed at the morphological and functional improvement of the student, the improvement of habits, skills and physical capacities (Holguín *et al.*, 2019).

In Basic General Education, work is carried out in two frequencies: classes are a process organized within educational institutions, planning a variety of activities for the development of children's and adolescents' skills.

The PEA for Physical Education in Basic General Education has its peculiarities in correspondence with the age and sex of the students: gymnastics, games, and sports as the main medium. We can state that, as in the other subjects of the curriculum for a type or level of education, three fundamental pedagogical and didactic principles govern Physical Education (Gjuillén, 2020) (Figure 1).



**Fig. 1. -** Diagram of representation of the pedagogical and didactic principles in the Physical Education class

*Source:* Rugel, Herrera, (2022)

Physical education teachers need to address new challenges. How can the didactic components of the PEA be linked, taking into account the students' specific needs, the teacher's level of preparation, and the existing material conditions? How can the process be organized?

In response to these questions, the pedagogical process of Physical Education is developed on the basis of laws and regularities that encompass the sphere of pedagogical sciences and sports sciences, taking into account that activities are carried out where the student develops his or her skills.

By engaging in physical activity, students overcome their egocentric phase, which makes them more sociable and accessible to the group and more of a companion. Physical activity builds a person's responsible character (Arias *et al.*, 2020).

The issue of physical fitness in basic general education refers to the different characteristics that boys, girls, and adolescents present in physical education classes. This difference depends to a certain degree on personal characteristics, as well as their social factors.

Teaching adapted to the individual differences of each student exceeds the expectations of educational theory, with few explicit and systematic procedures to carry out this theory (Larruzea-Urkixo & Ramírez, 2020).

In Physical Education class, in relation to other subjects, individual differences are determined mainly by the result of the initial diagnosis that each teacher makes at the beginning of a given unit, combined with genetic or biological factors such as height, body weight, flexibility, and agility, which are recognized by visual diagnosis.

The fundamental premise of the comprehensive model of the Physical Education class is to give great importance to the student's activity, with subjects, so that they develop and develop all their potential, under the sound guidance of the teacher, in a bilateral process that takes place in a collective environment.

In physical education classes, the teacher serves to guide, direct, and correct technical errors in activities, taking into account the individual characteristics of each student and using appropriate methods, procedures, and organizational forms to ensure that all students meet the objectives.

Physical education teachers in basic general education must constantly prepare themselves to serve their students equally, taking into account that they are going through an age cycle and a transition from children to adolescents, paying close attention to the changes that generally occur at these ages. To do so, they must develop several actions, which should include the following:

- Plan an initial diagnosis that allows you to discover both talented and less gifted students.
- Plan a follow-up strategy for the initial diagnosis.
- Strengthen preventive work by correcting technical errors.
- Giving students a greater role in activities where they can use their creativity (López *et al.* 2022)

It is considered necessary to declare that the teaching-learning process of individual differences in Physical Education is a component of a pedagogical process, due to the need for the problem to address or treat the differences of each individual student.

In summary, it must be considered that one of the issues that has most hampered the quality of the teaching-learning process in Physical Education is the treatment of individual differences. These differences have been a set of limitations for the development of children and adolescents at this stage of Basic General Education.

Based on the students' assessments, a teaching-learning process design is developed for addressing individual differences in Physical Education, revealing the projections for addressing the individualities of girls, boys, and adolescents in Basic General Education.

Once this design is developed, differentiated care is formulated. This is nothing more than a subprocess in which an anticipated representation of the outcome is developed, taking into account the elements of the diagnosis and the intervention capacity that can be achieved by implementing the design. This forecast, in its prospective function, specifies a pattern of achievements in the content of Physical Education—a set of indicators in terms of knowledge, skills, habits, abilities, modes of action, and professional values that the student must develop after developing the process.

To prepare the research results, according to Norman-Acevedo *et al.* (2021), a series of elaborate steps are obtained:

1. Topic selection.
2. Bibliographic review.
3. Problem statement.
4. Define the objective.
5. Justification and delimitation.
6. Carry out the theoretical framework.
7. Design of the methodology.
8. Research techniques and instruments.
9. Data collection.
10. Analysis of the results.
11. Conclusions.

Attention to individual differences demands that diagnostic strategies be unique in nature, and that efforts be made to ensure the availability, accessibility, and optionality of differentiated educational offerings for students.”

In relation to this principle, diagnosis is defined as the prognosis intended to be reached in the conception phase. It must be acknowledged that the initial diagnosis is an aspect that teachers must not overlook when addressing individual differences in children and adolescents. This is characterized by being a scientific developmental activity for teachers. Scientific diagnosis allows for the direction of the teaching-learning process

and, in turn, provides prioritized attention to individual differences in Basic General Education.

For the reasons stated above, the following methodological requirements are proposed to address the individual differences of students in Physical Education (Larruzea Urkixo & Ramírez, 2020).

1. Perform an initial diagnosis at the beginning of each unit.
2. Biological development of the child or adolescent.
3. Rules of conduct.
4. Identify the ethnicity (**indigenous** or Afro-Ecuadorian).
5. Work based on the correction of technical errors.
6. Evaluate the teaching and learning process.
7. Identify whether the class objectives were achieved.
8. Determine the reasons why the child reaches the group average.
9. Design the teaching-learning process taking into account the students' potential and limitations.

### *Conclusions*

Individual differences in the PE class have been a topic that has eventually evolved over time and through the theoretical and practical contributions of researchers and academics who have enriched its science at a global level and specifically in the Ecuadorian educational reality.

The Ecuadorian education system responds to the emerging demands of Ecuador's four regions, both socially and educationally, involving all members of the educational community: schools, families, and all participants in the educational process. Therefore, it is essential to address students' individual differences throughout the teaching-learning process.

Achieving proper attention to individual differences in the teaching-learning process of Physical Education must be based on the comprehensiveness and differentiation of teaching, methods, procedures, and organizational form in the classroom, as well as the fundamental conception of theoretical and methodological organization based on teacher development.

Differentiated attention is a methodological aspect proposed for the development of Physical Education teachers, based on the ongoing diagnosis of the teaching-learning process.

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