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What are we being told about how to teach games? A three-dimensional analysis of comparative research into different instructional studies in Physical Education and School Sports.

¿Qué sabemos acerca de la enseñanza de los juegos deportivos? Un análisis tridimensional de la investigación comparativa de diferentes estudios de enseñanza en Educación Física Escolar.

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Abstract

Determining what pedagogical approach could be most effective in delivering the desired learning outcomes in teaching games has been one of the more relevant concerns for physical education teachers, coaches and researchers in the last few decades. Nevertheless, until recently, the research carried out in this field has been little profuse, has met with several difficulties and has been made from different perspectives, which has complicated its analysis altogether. The present study follows three main objectives: a) to analyse the nature of the interventions used in the comparative investigation directed to teaching sports, b) to determine the effects of the levels of treatment and, c) to outline some didactic consequences. Twenty comparative studies were selected for a systematic review. With regards to the instructional approaches the teaching of games three lines of analysis were contemplated: 1) Studies that compare interventions using the part- vs. whole-task teaching methods. 2) Studies that compare the teaching via direct vs. indirect instruction. 3) Studies that compare skills-based approach with alternative approaches, especially the direct instruction model versus the TGfU model. Based on the three paradigms, it was shown that the whole-task teaching method generates both greater satisfaction and security for children in their own performance. Indirect instructional techniques have a positive influence at an affective and social level, as well as on their decision making. The alternative approaches to the skills-based approach examined show that a greater degree of understanding of game play and more affective, and enjoyable behavior was obtained through tactics-based approach. The three-dimensional review reported in this paper could be used as complementary research to aid in future longitudinal studies such as the investigation that look at the integration of diverse instructional studies.

Key words: teaching methods; instructional techniques; instruction model; TGfU; physical education; sport.

Resumen

Determinar qué aproximación pedagógica puede ser más eficaz para conseguir los resultados de aprendizaje deseados en la enseñanza de los juegos deportivos ha sido una de las preocupaciones más relevantes de profesores de educación física, entrenadores e investigadores en las últimas décadas. Sin embargo, hasta hace poco la investigación realizada en este campo ha sido poco profusa, ha contado con varias dificultades y ha sido abordada desde diferentes perspectivas, lo que ha dificultado su análisis en conjunto. El presente estudio pretende conseguir tres objetivos: a) analizar la naturaleza de las intervenciones empleadas en la investigación comparativa dirigida a la enseñanza deportiva, b) determinar los efectos de cada uno de los niveles de tratamiento y, c) extraer posibles implicaciones didácticas. Se realizó una revisión sistemática de los 20 estudios comparativos seleccionados. Se contemplaron tres líneas de análisis de la enseñanza de juegos deportivos: 1) Estudios que comparan los métodos analíticos versus métodos globales. 2) Estudios que comparan la enseñanza mediante instrucción directa versus búsqueda (indirecta), y 3) Estudios que comparan modelos tradicionales con modelos alternativos, en especial, el modelo técnico versus el modelo comprensivo (TGfU). Basándonos en los tres paradigmas señalados, se encontró que el método de enseñanza global genera mayor satisfacción y seguridad para los niños en su propio rendimiento. Las técnicas de enseñanza indirectas tienen una influencia positiva a nivel afectivo y social, así como en su toma de decisión. La aproximación alternativa a la enseñanza técnica mostró que se obtenía un mayor grado de comprensión del juego y un comportamiento más afectivo y mayor diversión mediante la aproximación basada en la táctica. Creemos que la revisión tridimensional divulgada en este artículo podría utilizarse como investigación complementaria para ayudar en estudios longitudinales futuros, por ejemplo, en la investigación que analiza la integración de diversos enfoques de enseñanza.

Palabras clave: métodos de enseñanza; técnicas de enseñanza; modelo de enseñanza; TGfU ; educación física; deporte.

Since, as Holt, Streat, and García (2002, p.162) indicate, “games have been a major part of most physical education programs, often constituting a majority of time in physical education curricula” it is important that teachers and teacher educators have a good understanding of what makes for good practice in games teaching (see Hardman and Marshall, 2005; Metzler, 2005; Oslin and Mitchell, 1998). Curtner-Smith, Todorovich, McCaughy and Lacon (2001, p. 178) hypothesized that, in order to meet the requirements of new pedagogical demands of the national curriculum in the UK (which are similar to those of the United States) teachers would “need to shift from the exclusive use of direct, teacher-centred, or reproductive styles of teaching to employing more indirect, pupil-centred, or productive styles”. It is no longer appropriate to teach to the industry standards of teacher-centredness (Casey, 2006) and instead teachers need to answer the question recently asked by Tannehill and Lund (2005, p. 30) ‘how do we design instruction to facilitate learning?’.

Determining what pedagogical approach will be most effective in delivering the desired learning outcomes (technique, tactics, enjoyment, knowledge/understanding, social-affective and motivational) depends on both the context and the characteristics of the learners. Despite the diversity of both these facets of education such a choice has become a key question for educators and researchers in the field of PE. In fact, research aimed at comparing skills-based and tactics-based approaches of sports instruction has given rise to substantial interest in recent decades in such diverse geographical areas as the USA, Canada, the UK, France, Finland, Australia, Greece and Spain (see Allison & Thorpe, 1997; Blomqvist, Luhtanen & Laakso, 2001; Boutmans, 1983; French, Werner, Rink, Taylor & Hussey 1996; French, Werner, Taylor, Hussey & Jones, 1996; Gabriele & Maxwell, 1995; Griffin, Oslin & Mitchell, 1995; Lawton, 1989; McPherson & French, 1991; Méndez, 1999; Metzler, 1986; Turner & Martinek, 1992, 1999).

However, Rink, French and Tjeerdsma (1996) underlined the difficulty of carrying out valid comparisons of studies that analysed the effects of a skills-based and a tactics-based approach to the teaching of sports. They cited, among other reasons, the fact that the designs of the research studies employed have been individually distinct as the major limitation. Added to this difficulty, they also report other limitations, such as the variation in the games chosen, the age of the participants, the length and nature of the intervention, the diverse research variables chosen and their form of measurement. To this list, Kirk (2005) and Kirk and McPhail (2002) proposed that the equivocal nature of the findings may also be due to their treatment of Teaching Games for Understanding (TGfU) and technique-based approaches as alternative forms of practice.

Gréhaigne, Godbout and Bouthier (1999) acknowledged the existence of at least four facets that should form the basis of any discussion on the teaching and learning of team sports that might act as a focus for this debate: (a) the contribution concerning the approaches to and instruction technique employed in sports games; (b) the use of direct or indirect strategies in the light of the constructivist versus strictly cognitivist perspectives of the teaching-learning process; (c) pedagogical content knowledge; and finally, (d) the importance of clarifying a number of concepts associated with tactics and strategic aspects of games and sports.

A decade since the first review by Rink et al. (1996) of the six most relevant studies that compared the tactics-based approach with the skills-based approach (which led them to ambiguous conclusions derived from the difficulties to compare so different studies), we believe that the debate may justifiably be reopened in light of the extensive research carried out since then. In the same way, we agree with Butler, Griffin, Lombardi, Nastasi and Robson

(2003) that this debate can help us examine and clarify our values, and promoting healthy change, that is vital to our own growth as educators. In this paper, we make a number of considerations when analysing and setting out the research on sports approaches with the aim of determining the limits of the debate. Specifically, we suggest a closer examination of the different problematic dimensions that relate to the nature of the intervention that have been used in the research design (two of which coincide with the first two facets of the debate mentioned by Gréhaigne et al., 1999).

Method

The authors conducted a systematic review of the investigations that have compared different methodological interventions in school teaching sports, focusing the search towards the studies carried out from 1980 to 2005. To be including in the review, the papers had to fulfil the following criteria: a) to be investigations published in scientific journals specialized or in proceedings of national and international congresses, b) to have compared results between groups with experimental or cuasi-experimental designs, and c) to have been published in Spanish, Portuguese, English or French.

The search was carried out in the following data bases (EBSCO, MEDLINE, SPORTDiscus, Psychinfo, TESEO, as well as in proceedings of congresses). In addition, the references of the found studies were assessed and it was consulted with specialists in physical activity to identify other relevant researches. Once the difficulties to use appropriate and specific terms in English were overcome, the following descriptors were introduced in the search: method, teaching games/sports, comparative analysis, instructional technique, direct instruction, Teaching Games for Understanding, teaching models, instructional approach, technique approach/model, traditional model, tactical model, part-task teaching method, and whole-task teaching method.

Several documents were excluded for different reasons: lack of rigour, duplicity of a same investigation, irrelevant data, or isolated cases of comparison. For the revision of the analysis categories we selected those most frequently used in the studies. Finally, the variables were in depth analysed, displaying the data and results of greater relevance by means of a synthesis-table.

The Dimensions of the Debate: Towards a Conceptual Clarification

This paper is based upon an in-depth review of the most relevant research, to 2005, into the comparison of sports instructional approaches. This review revealed three major lines of analysis: 1) Studies that compare interventions using the *part- vs. whole-task teaching methods*, 2) studies that compare *instructional techniques* or ways of providing information, i.e. the teaching of technical and tactics aspects via direct instruction or indirect learning, and 3) studies that compare instructional approaches to sports initiation, that is, *skills-based approach* with *alternative approaches*, especially the direct instruction model *versus* the TGfU model (see Tables I-III).

Part-task vs. whole-task teaching methods

The first aspect revealed by the analysis was the type of activities that are presented to the learner, which range from analytical exercises, through simplified or modified games to the most comprehensive proposals akin to the full and internationally recognised game.

Part-task vs. whole-task teaching methods are two particular ways of addressing the different tasks that make up the progression of instruction of a particular motor skill nevertheless a continuum between both of them could be understood. The more analytical the task is, the more it approaches technical learning. On the other hand, the more the teacher seeks to give his or her students an understanding of the game then the more the proposal is orientated towards the complete sport. The debate focuses on what type of strategies to emphasize: part or whole strategies - in which part is analytical and whole encompasses the entire game - although it is understood that both options are necessary in the sports instruction-learning process.

Instructional Techniques

The second aspect is the *Instructional Technique* (IT) employed, i.e. the way of transmitting the technical and tactical concepts of the game. The IT is defined as the way in which the instructor transmits the information and the skills to his or her pupils (Gréhaigne et al., 1999, Kirk, 2005; Metzler, 2005; Mosston & Ashworth, 1986). We differentiate between the following instructional techniques:

Direct instruction. By means of direct instruction, a model of correct execution is provided. The teacher decides practically everything as regards lesson organization, choice of programme, time allocation, and the degree of participation of each pupil in each activity. The same task is taught to all the children at the same time, and often repeated again and again over a number of years.

Indirect instruction or pupil-centred method. The indirect method is distinguished by the main role of the pupils who do not simply receive and carry out the teacher's decisions but share in decision taking with respect to the preparation and running of the lesson and its assessment.

Combined instruction technique. The third type of IT involves the *combined* use of the two previous methods. The teacher uses one technique or another to present the information in each session or teaching unit on the basis of number factors he or she identifies in the educational process, for example, motivation, pupil experience and comprehension, time of day, space and difficulty of the task.

Instructional approaches in sports initiation

The third aspect of this paper attempts to compare the dominant technical or skills-based approach of teaching which prioritises technique over tactics with alternative tactics-based approaches which prioritises the reverse. While current thinking focuses on when to introduce tactics or technical skills and how these should be combined rather than which approach is better (Holt et al., 2002; Hooper, 2002; McMorris, 1998) research has previously (and importantly from the teachers perspective) explored the relative strengths and weakness of different approaches to teaching sports.

The skills-based approach. This approach focuses first on the teaching of the skills of the game before going on to introduce tactical knowledge, once a skills base has been developed. The skills-based approach in its purest state suggests that the pupils repeat the most relevant techniques of the game and once they are capable of executing them, they move on to play modified forms and/or the adult game. This focuses on the content rather than the pupils.

The tactics-based approaches. These alternative approaches start by attempting to give the pupils a comprehension of the common principles of the games and of game play before refining pupil skills. The most pure approach sustains that the pupils do not move on to

refining their skills without having understood the essence of the game. One of these alternative approaches originated at Loughborough University when lecturers Rod Thorpe and David Bunker (Bunker & Thorpe, 1982) and subsequently Len Almond (Thorpe, Bunker, & Almond, 1986) developed an approach known as *Teaching Games for Understanding* (TGfU). Since the conception of this pioneering British approach, similar approaches have been developed in the USA, such as the *Tactical Games Model* (Griffin, Mitchell & Oslin, 1997), and in Australia, such as *Game Sense* (Australian Sports Commission, 1997).

The combined approaches. Combined approaches are driven by the belief that technique and tactics go hand in hand and should be tackled simultaneously in accordance with the development of the child. Furthermore pupils rarely develop technical and tactical knowledge at the same pace in the teaching-learning process. The results that follow suggest that some pupils cannot or do not want to understand by themselves the tactical requirements of the sport (in some cases due to a lack of receptivity of reflexive approaches). This may place a limit on the number of pedagogical approach that can be used with them and could ultimately curtail the number of 'real' experiences that they have of a given game.

The focus of this paper is on how pedagogues might proceed in order to make instruction more efficient, i.e. from *technique to tactics* or from *tactics to technique* and strives to focus on either the pupil or on the contents as we perceive these to be the key questions in this debate.

Analysis of Comparative Studies into Game Instruction

This article is an attempt to follow the research line initiated by Rink et al. (1996) that looked at the comparative studies in game instruction. Despite some critics to this sort of research (Holt et al., 2002; Rink, 2001) we consider that the three dimensional analysis at the centre of this revision could help to clarify what we are being *academically* told about how to teach games. After a systematic review of twenty studies published over recent decades that compared sports instructional studies in depth, we gathered together the most relevant data and results in three summary tables (see Tables I, II and III). These tables are modifications of the one proposed by Rink et al. (1996). To this original model we have added to, modified and adapted the content in an effort to summarise the twenty research studies that had been considered key works. We have then grouped them in each of the three lines of research or the predominant teaching intervention.

Part- vs. whole-task teaching method

Chronologically, comparative research into whole and analytical methods in sports instruction were the first to arouse interest in the academic community and focused on team and invasion sports (Boutmans, 1983; Durán & Lasierra, 1987; McMorris, 1988). This dimension of the analysis, is not especially profuse (see Table I), and it is restricted to the school setting and in particular to the initial stage of secondary education.

The teaching units were short or medium in duration (one a week, and between 6 to 15 lessons) and the number of subjects per group was lower than usual in Physical Education classes (approximately 25 per group in the Spanish context).

It should also be noted that there are different methodology and treatment verification levels, which makes comparisons between studies difficult. For instance, the part-task teaching method (progressive analytical method) in the study by McMorris (1988) was initially based on the teaching of the key techniques of soccer without opposition, then moved gradually on to situations with opposition (eg. 3x1, 4x2) in which opposing and/or collaborating players

are gradually added, concluding with small-sided game situations. The small-sided games strategy consisted in a 6x6 game, using a “freeze-replay” teaching game and the teacher “freeze” the game when he wished to make a coaching point. After that, the play re-started with the players carrying out the correct decision or skill.

Nevertheless, the part-task teaching method in the study by Durán and Lasierra (1987) began with an explanation and a series of exercises to aid the assimilation and application of basic hockey skills before moving into a second phase to rule-based application in small-sided games (with numerical equality or superiority in attack) and then to attack and defense systems during formal play.

With respect to the pupil-related dependent variables (see Table I), it seems that only 6 treatment sessions (even with a minimum weekly frequency) would be sufficient to induce slight improvements in the development of technical skills, irrespective of the teaching method employed (Durán & Lasierra, 1987).

However, significant differences were not found between the two teaching interventions (whole versus part teaching method) except in the work of Durán and Lasierra (1987), in which the group that used a whole-task teaching method carried out the closed slalom test significantly better than the analytical group. At the same time the whole practice group obtained better results in an open test developed over a circuit that required a greater level of adaptation than the analytical group.

As far as performance in play situations is concerned, the results were ambiguous. In the basketball study by Boutmans (1983), the analytical group obtained improvements in game skills, while in the study by the same author on volleyball, the whole group was found to obtain improvements in this skill. The study by McMorris (1988), which was shorter in duration (six sessions), did not find differences between the interventions.

Finally, the research by Boutmans (1983) and Durán and Lasierra (1987) indicates that the whole practice sessions generated a greater degree of performance satisfaction and security in the pupils, than receive analytical instruction in which pupils presented a greater sense of insecurity or frustration due to not achieving the expected mastery of the sport.

In addition to the aforementioned differences between the studies, the designs employed presented other weaknesses. In the three studies, and especially in the work of McMorris (1988), the total number of subjects was low. In general, the reduced duration of the interventions may have prevented more conclusive results being obtained. Moreover, neither the pupil knowledge acquisition variable nor aspects related to the repercussions for the teacher was included when carrying out teaching from one teaching approach or another.

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Table I. Comparison of Research Studies as a Function of the Part- vs. whole-task teaching method.

Whole vs. part Strategy	Boutmans (1983)	Durán and Lasiera (1987)	McMorris (1988)
Nature of the research	Comparison of a whole method versus a part method	Comparison of a whole method versus a part instruction method	Comparison of a progressive analytical method versus the small-sided games method
Sport	Basketball	Volleyball	Soccer
Context	Physical Education	Physical Education	Physical Education
Age	13 year olds	15-16 year olds	11-12 year olds
Gender	Females	Males and females	Males and females
No. of sessions	7	Whole instruction: 15	6
Frequency	1 per week	Analytical instruction: 16	1 per week
Duration of the session	60 minutes	45 minutes	Not specified, though 60 minutes is understood
No. of groups and subjects per group	1 group: 11 subjects 1 group: 20 subjects	2 groups of 20 subjects (15 males and 5 females in each group)	2 groups of 12 subjects
Total no. of sessions	31	40	24
Technical skills	Both groups improved significantly. There were no significant differences between groups	The analytical group was better in the slalom test. The Whole practice group was better in the circuit	Both groups improved in passing and support techniques. There were no differences between groups
Knowledge acquisition	This variable was not contemplated in the research	This variable was not contemplated in the research	This variable was not contemplated in the research
Performance in the practice of the game	The analytical group improved more in their playing capacity Both groups improved significantly	This variable was not contemplated in the research	There were no differences between groups in game development
Affectivity, enjoyment and motivation	The analytical method may have provoked some lacks in motivation, though this was not shown empirically	Whole instruction generated greater security and satisfaction among the subjects	This variable was not contemplated in the research
Behavior of the instructor	Suggests using the whole-part-whole method. This variable was not contemplated in the research	The comprehensive instructor motivated more, while the other spent more time informing as to how to organize the class and the material and giving a greater amount of feedback to small groups or individuals	This variable was not contemplated in the research

Instructional techniques

Research into the efficacy of part-task vs. whole-task teaching methods in sports instruction led to the comparison of teaching techniques (Emmanouel, Zervas, & Vagenas, 1992; Gabriele & Maxwell, 1995; and Méndez, 1999). Unfortunately, we only have four studies at our disposal to establish comparisons, published in three different papers (see Table II). Moreover, the contents are disparate and one of these reports (Gabrielle & Maxwell, 1995) is an abstract, and hence is lacking in data. Nevertheless, both the number of subjects per study and the duration of the treatments are higher than in the previous section, and hence the results may be more conclusive.

The studies by Enmanouel et al. (1992) and Méndez (1999) report that, in contrast with what the traditional beliefs uphold, direct technique is not the most efficient way of improving the technical skills of children and teenagers. In the former study, the combined technique improved motor skills more than the other techniques. In the latter study carried out by Méndez (1999), which focused on the teaching of basketball, the combined and indirect techniques were also found to be more effective in a dribbling test. This finding might be explained by the passive attitude that the direct technique children adopted with respect to the teacher's explanations and demonstrations and by the repetition of a series of drills out of the context. The proposal of play activities to bring about motivation might be more in consonance with the interests of children and may even have provoked the improvement in technique without its explicit instruction (Méndez, 1999).

As regards performance in the practice of the game, the indirect technique (Gabrielle & Maxwell, 1995) and the combined technique (see the second study on basketball in Méndez, 1999) appeared to improve decision taking especially in defensive actions.

On the other hand, a certain degree of consensus exists in pointing out the advantages of the indirect or investigation technique versus the direct technique with respect to the affective-motivational and social variables, for example in the children's self-concept (Enmanouel et al., 1992), and in their assessment of the classes, of the subject and of enjoyment (Méndez, 1999).

In conclusion, these results support the notion that the adequate combination of both techniques (laying more emphasis on play activities that induce inquiry while lending momentary importance to information via direct instruction and to the repetition of exercises) may be advantageous, in general, for the teaching of sports games.

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Table II. Comparison of Research Studies as a Function of the Instructional Technique.

	Emmanouel et al. (1992)	Gabriele and Maxwell (1995)	Méndez (1999)
Direct vs. indirect instruction			
Measure of the research	Comparison of four instruction methods: direct, indirect, combined and focused on the playing of the sport	Comparison of a direct method versus an indirect method	Comparison of three instruction techniques: one, indirect instruction, another, search and a third based on the combination of both
Sport	Multi-sport initiation	Squash	Basketball
Context	Physical Education	University	Physical Education
Age	10 year olds	Over 18 year olds	13-14 year olds
Gender	Males and females	Males and females	Males and females
No. of sessions/ Frequency	60 3 per week	6 weeks Not specified	10 2 per week
Duration of the session	Not specified, though 60 minutes is understood	Not specified	50 minutes
No. of groups and subjects per group	4 experimental groups: 102 subjects 1 control group: 28 subjects	2 groups, the number is not specified	3 groups of 24 subjects
Total no. of sessions	130	Not specified	72
Technical skills	The combined method was the most effective in improving motor abilities	Both methods improved the subjects' skills and showed a similar capacity of execution	The direct group was not as effective in the dribbling test as the other two groups
Knowledge acquisition	This variable was not contemplated in the research	This variable was not contemplated in the research	The combined group obtained better results in declarative knowledge
Performance in the practice of the game	This variable was not contemplated in the research	The indirect method led to a greater number of correct decisions, as well as a better selection of skills	The combined group improved in decision taking and execution of defending the player without the ball
Activity, enjoyment and motivation	The direct method was the most effective in improving the subjects' self-concept, while the method focused on the playing of the sport was the one that obtained the best results in social attitudes	This variable was not contemplated in the research	The search group afforded more value to Physical Education, the degree of enjoyment and the classes received
Behavior of the instructor	This variable was not contemplated in the research	This variable was not contemplated in the research	The time devoted to the task was greater in the search and combined groups

Instructional approaches in sports initiation

It is within this dimension that the majority of research is to be found, which focuses on discerning which approach is the most effective in the child's initiation to sport, especially in the learning of a series of skills, in the acquisition of a certain knowledge of tactics and its application to the real game situation (see Table III).

In contrast to the studies carried out and reported in the previous two sections, here we find that the context of application is not purely educational in training centers such as Primary, Secondary or even University Education, but extends to Sports Schools (French, Werner, Rink et al., 1996; French, Werner, Taylor et al., 1996; McPherson & French, 1991; Rink, French, & Werner, 1991; Turner, 1992; Turner & Martinek, 1992, 1999). The sports dealt with range from a divided court (volleyball) and racket (badminton and tennis) games to invasion sports such as field hockey, soccer, basketball and handball.

The age range that the majority of studies on sports instructional approaches have focused on is situated between 11 and 13 years of age, although other authors employed samples of 8 to 9 year olds (Allison & Thorpe, 1997), secondary school pupils from 14 to 15 years of age (French, Werner, Rink et al., 1996; French, Werner, Taylor et al., 1996; Rink et al. 1991), and university students of between 19 and 22 years of age (McPherson & French, 1991; Romero, 2001). The number of sessions employed in the treatment of the studies varies from one study to another, the minimum duration being six sessions (Allison & Thorpe, 1997; Lawton, 1989; Turner, 1992; Turner & Martinek, 1992), the maximum 38-40 (García, 2001; McPherson & French, 1991), with an average duration of sessions of between 9 and 16 sessions. Differences may be established in the weekly frequency of sports instruction, distinguishing between one and two weekly sessions in the subject of Physical Education within the school context and one to five sessions a week in Sports Schools, which indicates that there is greater divergence in the latter. Likewise, we also find differences with regards to sample size. The size of the groups in the studies conducted during school time (the subject of Physical Education) ranging between 16 subjects per group in Lawton (1989) and 29 in Mitchell, Griffin and Oslin (1995), whereas in extramural instruction (Sports Schools), the number ranged between 12 in Rink et al. (1991) and French, Werner, Rink et al. (1996), to 30 subjects per group in Turner (1992) or Turner and Martinek (1992).

As regards the dependent variables, the majority of studies coincide in not finding differences in the efficacy of technical skills between groups, either due to the fact that both groups improved similarly (Allison & Thorpe, 1997; French, Werner, Taylor et al., 1996), or that a significant progression was not found in either group (French, Werner, Rink et al., 1996; García, 2001; Griffin et al., 1995; Lawton, 1989; Mitchell et al., 1995; Rink et al., 1991; Romero, 2001; Turner, 1992; Turner & Martinek, 1992; Turner, 1996). The remaining studies present contradictory results, as is the case of McPherson and French (1991), who state that the tactics-based group achieved an improvement with respect to the skills-based group, while Turner and Martinek (1999) report that the skills-based group improved with respect to the control group in the skills test.

The acquisition of knowledge is one of the dependent variables that acquires more importance with the new methodological approaches. There are numerous studies that corroborate that a greater degree of comprehension is acquired through the tactics-based approaches, as is the case of Allison and Thorpe (1997), García (2001), Griffin et al. (1995), McPherson and French (1991), Mitchell et al. (1995), Turner (1996) and Turner and Martinek (1999). However, clear-cut results were not obtained with regards to the application of this knowledge

to game situations and especially during decision taking. Half the studies that took this variable into consideration conclude that advances are produced with the tactics-based approaches, versus the other half that suggest the contrary.

Other variables considered in the analyses, though not in all the studies, were motivation, enjoyment and affectivity. The majority of the research studies confirmed that the tactics-based approaches generates more affective behavior and declarations and leads to more enjoyable practice sessions (Allison & Thorpe, 1997; Griffin et al., 1995; Mitchell et al., 1995; Romero, 2001; Turner, 1996). These findings were explained by Holt et al. (2002) in the sense that games are more fun than drills for children in organized sport practice environments.

Finally the only variable that we found that was not pupil-centred, and which we have called 'the behavior of the teacher' was only taken into account in 2 of the 12 studies. Allison and Thorpe (1997) found that the teacher has more opportunities to observe and evaluate with the tactics-based approaches. In other study, Wright, McNeill, Fry & Wang (2005) concluded that tactics-based participants (physical education teacher education students) were unanimous in their choice of tactical lesson plans for their module assignment, whereas 80% (n = 15) of the skills-based group also chose tactical lesson plans. When providing their rationale(s) for choosing tactical plans, the most popular reasons were: engaging pupils cognitively; stimulating pupil interest; allowing for more game play; and providing pupils the opportunity to transfer concepts from one game to another.

Table III. Comparison of Research Studies as a Function of the Sports Instructional Approaches (Table continues).

Technical vs. alternative	Lawton (1989)	McPherson and French (1991)	Rink et al. (1991) French, Werner, Rink et al. (1996)
Nature of the research	Comparison of the tactics-based approach versus a skills-based approach	Comparison of technical instruction with strategic elements versus tactics instruction with technical elements	Comparison of tactics-based instruction, skills-based instruction and instruction based on the combination of both
Sport	Badminton	Tennis	Badminton
Context	Physical Education	Sports School	Sports School
Age	12-13 year olds	19-22 year olds	14-15 year olds
Gender	Males and females	Males and females	Males and females
No. of sessions/ Frequency	6	38	13
Duration of the session	60 minutes	3 per week 50 minutes	5 per week 50 minutes
No. of groups and subjects per group	1 tactics-based group: 16 subjects 1 skills-based group: 16 subjects 1 control group: 16 subjects	1 technical instruction group: 16 subjects 1 tactics instruction group: 13 subjects	3 experimental groups of 12 subjects 1 control group of 12 subjects
Total no. of sessions	48	29	48
Technical skills	There were no differences in the results obtained with respect to efficacy in technical skills	The strategic group achieved a slight improvement in skills compared to the technical group	The combined group presented worse registers compared to the tactics-based and the skills-based groups in technical components
Knowledge acquisition	There were no significant differences in the level of improvement of the subjects in understanding of the tactics bases	The strategic group focused attention more on decision-taking (declarative and procedural knowledge)	No differences were found between groups
Performance in the practice of the game	This variable was not contemplated in the research	The execution component was improved by both forms of instruction, although the tactics-based group only improved when the skill was integrated	The three groups obtained improved performances in the components of decision taking compared to the control group
Effectivity, enjoyment and motivation	Significant differences were not found among the results for affectivity after practice	This variable was not contemplated in the research	The control group made more affective declarations and were more cooperative than the experimental groups
Behavior of the instructor	This variable was not contemplated in the research	This variable was not contemplated in the research	This variable was not contemplated in the research

Table III. Comparison of Research Studies as a Function of the Sports Instructional Approaches (Table continues).

Technical vs. alternative	Turner (1992) Turner and Martinek (1992)	Turner and Martinek (1995) Turner and Martinek (1999)	Griffin et al. (1995)
Nature of the research	Comparison of a technical approach versus a game-based approach	Comparison of the game-based approach versus a skills-based approach	Comparison of a tactics-based approach versus a skills-based approach
Sport	Field hockey	Field hockey	Volleyball
Context	Sports School	Sports School	Physical Education
Age	12-13 year olds	12-13 year olds	11-12 year olds
Gender	Males and females	Males and females	Males and females
No. of sessions/ Frequency	6 1 per week	15	9
Duration of the session	35 minutes	45 minutes	Not specified, though 60 minutes is understood
No. of sessions and subjects per group	4 experimental groups of 11 subjects	3 game-based groups 3 technical groups 1 control group	1 tactics-based group: 22 subjects 1 skills group: 21 subjects
Total no. of sessions	44	71	43
Technical skills	No differences were found between groups	The technical group was faster than the control group in the skills test	There was no significant improvement in skills in any group
Knowledge acquisition	Differences were not found among groups in the acquisition of both declarative and procedural knowledge	The game-based group presented greater declarative and procedural knowledge than the control group	Both groups improved their knowledge with respect to skills and tactics, the tactics-based approach being significantly better than the skills-based approach
Performance in the practice of the game	Differences were not found in capacity when practicing the game	The game-based group showed better decision taking in passing, as well as better execution in controlling and passing the ball than the other two groups	The tactics-based group was more efficient with respect to position on the court and decision making
Effectivity, enjoyment and motivation	This variable was not contemplated in the research	This variable was not contemplated in the research	The tactical approach provided greater interest and enjoyment
Behavior of the instructor	This variable was not contemplated in the research	This variable was not contemplated in the research	This variable was not contemplated in the research

Table III. Comparison of the Research as a Function of the Sports Instructional Approaches (Table continues).

Technical vs. alternative	Mitchell et al. (1995)	French, Werner, Taylor et al. (1996)	Turner (1993) Turner (1996)
Nature of the research	Comparison of the efficacy of tactics-based versus skills-based approaches	Comparison of tactics-based instruction, skill-based instruction and instruction based on the combination of both	Comparison of a game-based approach versus a technical approach to instruction
Sport	Soccer	Badminton	Field hockey
Context	Physical Education	Sports School	Physical Education
Age	11-12 year olds	14-15 year olds	12-13 year olds
Gender	Males and females	Males and females	Males and females
No. of sessions/ Frequency	8	30 5 per week	16
Duration of the session	Not specified, though 60 minutes is understood	45 minutes	45 minutes
No. of groups and subjects per group	1 tactical group of 24 subjects 1 skills-based group of 29 subjects	3 experimental groups of 13 subjects 1 control group of 13 subjects	4 groups of 12 subjects 2 technical groups of 12 subjects 2 game-based groups of 12 subjects
Total no. of sessions	53	52	48
Technical skills	No group improved with time	All the groups acquired greater technical skills compared to a control group	There were no differences between groups
Knowledge acquisition	Both groups improved their knowledge with respect to skills, although only the tactical group improved significantly in tactical knowledge	All the experimental groups improved with respect to the control group	The game-based group improved in declarative knowledge significantly more than the technical group; such differences were not found in procedural knowledge
Performance in the practice of the game	The tactical group was more efficient during practice of the game, especially in movements without the ball and in decision taking	All the experimental groups improved, although the tactics-based and skills-based groups performed better than the combined group	The game-based group improved significantly in control and decision taking with respect to the technical group, but not in execution
Affectivity, enjoyment and motivation	There were no differences between groups	According to Tjeerdsma, Rink and Graham (1996), a slight improvement in affectivity was observed in the combined group with respect to the other two groups	The game-based approach provided greater satisfaction and enjoyment than the technical approach
Behavior of the instructor	This variable was not contemplated in the research	This variable was not contemplated in the research	This variable was not contemplated in the research

Méndez, A.; Valero, A.; Ashley, C. (2010). What are we being told about how to teach games? A three-dimensional analysis of comparative research into different instructional studies in Physical Education and School Sports. *Revista Internacional de Ciencias del Deporte*, 18(6), 37-56. <http://www.cafyd.com/REVISTA/01803.pdf>

Table III. Comparison of the Research as a Function of the Sports Instructional Approaches (Table continues).

	Allison and Thorpe (1997)	Romero (2001)	García (2001) García and Ruiz (2003)
Technical vs. alternative			
Signature of the research	Comparison of the efficacy of skill-based instruction and TGfU approach in the teaching of sports games	Comparison of the skills-based and tactics-based approaches	Comparison of the skills-based approach with the tactics-based approach
Sport	Basketball	Volleyball	Handball
Context	Physical Education	Physical Education (2 nd Year at Teacher Training College)	Sports School
Age	9 year olds	20-22 year olds	10-11 year olds
Gender	Males	Males and females	Males
No. of sessions	6	10	40 plus 15 games
Frequency	1 per week	2 per week	2 per week
Duration of the session	60 minutes	90 minutes	60 minutos
No. of groups and subjects per group	2 groups of 20 subjects	2 groups, 48 subjects in the skills-based group and 42 in the tactics-based group	2 groups, 13 subjects in the skills-based group and 14 in the tactics-based group
Total no. of sessions	40	90	27
Technical skill	The skills level of all the groups improved	The tactics-based group were better in all techniques skills except in receiving	Significant differences were not found
Knowledge acquisition	The TGfU group showed a better appreciation of when to pass, shoot or dribble	No differences were found except between the explanation-description of the skills-based approach and the discussion work of the tactics-based approach	The tactics-based group showed better declarative knowledge
Performance in the practice of the game	The TGfU group were better in decision taking when executing skills	The tactics-based group were better in individual and group efficacy and in decision taking	The tactics-based group progressed more in execution and in decision taking, although the differences were not significant
Affectivity, enjoyment and motivation	The skills-based approach generated low levels of enjoyment, playing capacity and feelings towards physical education in the less skilful, in contrast to the TGfU approach	Play was more fluid, creative and free in the tactics-based group	This variable was not contemplated in the research
Behavior of the instructor	More opportunities to observe and evaluate with the TGfU approach. The child becomes the focus of the teaching-learning process	The skills-based approach was characterized by a lack of group work and scant participation. The tactics-based approach was characterized by reflection, poor warming-up and scant physical work	This variable was not contemplated in the research

Conclusions

Although there exist numerous studies on sports instruction aimed at comparing different methodologies in order to test which is the most appropriate in diverse contexts of application: physical education, extramural, club or sports school, it's not easy to compare them, and therefore we attempted to group them together according to the nature of the intervention and to analyze the three key methodological dimensions in the debate as identified by Gréhaigne et al. (1999): the part-task vs. whole-task teaching method, the instructional technique and the sports instructional model.

On the basis of the part-task vs. whole-task teaching method, it can be seen that whole sessions generate greater performance, satisfaction and security in pupils, in contrast to part-task learning, which present a greater sense of pupil frustration due to them not achieving the expected mastery of the sport. The remainder of the results obtained are inconclusive, possibly due to the reduced number of sessions employed in the interventions.

Focusing attention on the instructional technique, it appears that direct instruction is not necessarily the most effective way of improving technical skills, owing to the passive attitude generated in children as a result of both repeating a series of exercises without understanding their real meaning and the explanations and demonstrations of the teacher. The indirect and combined instruction have a positive influence in decision-taking and in the assessment that the subjects make of the activity at an affective and social level.

Finally, the majority of research studies have focused on comparing different approaches to sports instruction without there being consensus in the results obtained as regards the level of efficacy in technical skills or in the application of knowledge to real practice of the game. In contrast, for the variables of acquisition of knowledge and affectivity, enjoyment and motivation, many studies have coincided in reporting that greater understanding is acquired and more affective behavior and declarations are generated, thus leading to more enjoyable practice, via the tactics-based approaches.

These findings lead us to reconsider the use of the part-task teaching method, direct instruction and skills-based approach in sports instruction, and especially in the compulsory setting of physical education. Special attention needs to be paid to the relation that may exist between the positive effects at a social-affective and motivational level of the alternative models and the children's prolonged and healthy involvement in the practicing of sports. Nevertheless, we believe that further longitudinal studies comparing both approaches are needed that focus on the transference between diverse sports modalities belonging the same tactics family, employing research designs and variables that enable comparison of the results obtained with those existing at the present time.

Since Rink et al's (1996) review, a great deal has been written about comparing technical and tactical approaches to teaching games, or examine each approach independently. Holt et al. (2002) and Rink (2001) argued that research should move beyond the debate about which is better and focus on that which occurs in the teaching/learning processes of these approaches. Nevertheless, in spite of the recent writings in journals and three international conferences devoted to TGfU related approaches to date, there remains some resistance among field teachers and practitioners (McNeill, Fry, Wright, Tan, Tan & Schempp, 2004). Thus, as Curtner-Smith et al., (2005), Kirk (2005) and Metzler (2005) observe, despite several significant changes to physical education, teachers continue to use only one or two ways to teach, the most common of which is the direct instruction. Thus, these studies reveal that

teachers use the same limited number of teaching methods irrespective of the content, the learning outcomes they hope to achieve, and an analysis of their students' readiness to learn.

In our opinion, if we are looking for a change in teachers' practices, research evidence of comparative studies must give them good reasons for making this effort of change or diversify their practice. Results from early research studies have not been as conclusive as they might due to conceptual and methodological problems that are now beginning to be resolved (Kirk, 2001). The three-dimensional review reported in this paper could be used as complementary research to aid in future longitudinal studies such as the investigation that look at the integration of diverse instructional studies (Hastie & Curtner-Smith, 2006); →sustituir por coma the more programmatic research suggested by Griffin, Brooker and Patton (2005) which could be grounded in three theoretical frameworks: achievement goal theory, information processing and situated learning theory. Of course, as Griffin & Patton (2005) suggest, the research on games teaching must evolve and explore new avenues of study, but in our opinion this could be better achieved without excluding comparative studies.

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