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ORIGINAL

VALIDATION OF TWO INTERVENTION PROGRAMS FOR TEACHING SCHOOL SOCCER

VALIDACIÓN DE DOS PROGRAMAS DE INTERVENCIÓN PARA LA ENSEÑANZA DEL FÚTBOL ESCOLAR

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ABSTRACT

The purpose of this study was to validate two intervention programs, corresponding to two didactic units, based in two different methodologies: *Direct Instruction* (*DI*) and *Tactical Games Approach* (*TGA*), for teaching school soccer. These two intervention programs were similar, with the same number of tasks, sessions, phases of play, specific contents and objectives. In the validation process participated 13 expert judges. Content validity was calculated by the coefficient of *Aiken's V* and its confidence intervals. Also, internal consistency was calculated using *Cronbach's α.* None of the 29 tasks of each intervention program was eliminated because they obtained values higher than the exact critical value ($V \geq .69$). The internal consistency of the tasks, that formed both intervention programs together, was excellent ($\alpha = .97$). For these reasons, both intervention programs are valid and reliable for teaching school soccer, as well as to compare the effects of these teaching methodologies.

KEY WORDS: Validation, soccer unit, method, expert judge, Aiken's V.

RESUMEN

El propósito del estudio fue validar dos programas de intervención, correspondientes a dos unidades didácticas realizadas cada una en base a dos metodologías diferentes: *Direct Instruction* (*ID*) y *Tactical Games Approach* (*TGA*), para la enseñanza del fútbol escolar. Se diseñaron dos programas de intervención semejantes con el mismo número de tareas, sesiones, fases de juego, contenidos y objetivos. En el proceso de validación participaron 13 jueces expertos. La validez de contenido se calculó mediante el coeficiente de *V de Aiken* y sus intervalos de confianza. Para la consistencia interna se empleó el coeficiente de *α de Cronbach.* Ninguna de las tareas que componen los programas de intervención fue eliminada al superar el valor crítico exacto ($V \geq .69$). La consistencia interna de las tareas fue excelente ($\alpha = .97$). Por tanto, ambos programas de intervención son válidos y fiables para la enseñanza del fútbol escolar, así como para comparar los efectos de ambas metodologías.

PALABRAS CLAVES: Validación, unidad didáctica, método, juez experto, V de Aiken.

INTRODUCTION

Pedagogy is the backbone on which sport practice must be sustained (Kirk, 2005). For this reason, one of the tasks of the Physical Education teacher when planning sport lessons is to consider the pedagogical method that will be used in order to help students learn in the most efficient and effective ways. Two different pedagogical approaches stand out: Teacher-Centered Approaches (TCAs) and Student-Centered Approaches (SCAs) (Zapatero, 2017). Blázquez (1999) differentiated between the two in relation to the way that students are involved and the type and degree of learning that is desired.

In Spain, the most frequently used teaching methods across time have been TCAs (Alarcón, Cárdenas, Miranda, Ureña, & Piñar, 2010). These methods center on the teaching of technical aspects, incorporating tactical awareness as a final step in the process after the technical aspects has been sufficiently developed (Abad, Benito, Giménez, & Robles, 2013). Within TCAs, the most commonly used teaching method is Direct Instruction (DI) (Metzler, 2011).

Subsequently, and with the goal of confronting the inconveniences of a technically-based design, as well as seeking to improve the teaching and learning experience, new contributions from different areas of Physical Education that support SCAs have emerged (Abad et al., 2013). SCAs is based on contextual learning that is grounded in learning the what, why, and when of content and in relation to the appropriate implementation of both technical and tactical behaviors (Launder & Piltz, 2006). The main goal of SCAs is achieve an understanding of the game through tactical awareness and through an appreciation of the game itself (Gray & Sproule, 2011). Within SCAs, the Tactical Games Approach (TGA) is the most popular (Mitchell, Oslin, & Griffin, 2013).

The instructor´s methodological stance will determine the design of the motor tasks to be conducted and their role regarding the implementation of learning activities and actual practice (Ibáñez, Feu, & Cañadas, 2016). Ibáñez (2008) defined class tasks as the tools employed by professors and coaches to develop students´ skills and abilities. Tasks designed under TCAs frameworks tend to be nonspecific and detached from real-life game contexts or are mostly global tasks that do not present individual variations. In many cases, the only modifications are quantitative and pertain to the number of students participating (Alarcón et al., 2010). On the other hand, SCAs employs modified or simplified games and replicates real-life competitive game situations with slight game modifications to allow students to analyze their activities and decisions on the technical and tactical behaviors that are most appropriate to skilled execution (Pérez-Muñoz, Yagüe, & Sánchez-Sánchez, 2015; Serra, García-López, & Sánchez-Mora, 2011).

The methodological aspect in sport pedagogy is one of the major areas of study in relation to sport initiation (Rodríguez, Mato, & Pereira, 2016). Regarding the improvements that each teaching method can generate, some authors affirm that there are no significant differences between TCAs and SCAs when it comes to technical aspects. However, in relation to overall game understanding, declarative knowledge and decision-making, SCAs have led to better results (Allison & Thorpe, 1997; García & Ruiz, 2003; Turner & Martinek, 1999). For this reason, the most recent recommendations identify SCAs as a preferred method to teach invasion-type sports (García-Ceberino, Gamero, Feu, & Ibáñez, 2020; González-Espinosa, Mancha-Triguero, García-Santos, Feu, e Ibáñez, 2019; Ibáñez et al., 2016). Nevertheless, many physical education teachers continue to have a preference for TCAs (Méndez, 2009). This preference can be explained by two factors: resistance to change and influence and pressure exerted by the national sport institutions (Devís & Peiró, 1992).

Specifically, in school-based contexts, there have been several studies aimed at the methodological aspects of soccer instruction that include: (1) efforts to analyze the levels of student activity after receiving the soccer didactic units structured around Game-Centered Approaches (GCAs) (Harvey, Song, Baek, & Van der Mars, 2016); (2) attempts to examine the impact of an instructional unit based on a hybrid model of the Sport Education-Invasion Games Competence Model (IGCM) on performance and game comprehension of soccer (Farias, Mesquita, & Hastie, 2015); or (3) in response to efforts to determine the levels of physical activity and self-determined motivation of students after the implemention 6-12 prolonged sessions of two combined methods: Direct Instruction and the Tactical Games Model (TGM) (Smith et al., 2015).

The bulk of research focuses on the effects of implementing intervention programs based on technical and tactical instruction (Chatzopoulos, Tsormbatzoudis, & Drakou, 2006; Gray & Sproule, 2011; Mesquita, Farias, & Hastie, 2012). However, in relation to the current knowledge base, studies oriented towards the design of teaching processes and subsequent validation by experts have been scarce (González-Espinosa et al., 2017a, 2017b). It is necessary to diffuse knowledge on these studies so that the different pedagogic programs and tasks can be correspondingly adjusted and validated (Feu, Ibáñez, García-Rubio, & Antúnez, 2017). König & Singrün (2013) highlighted the importance of guaranteeing the effectiveness and sustainability of Physical Education through empirical testing of tactical and technical skills. The existence and subsequent application of validated programs will allow researchers to assess the knowledge acquired by students after the program's implementation, as well as to contrast the effects of diverse methods of teaching relative to invasion-type sports.

The purpose of the present study was to validate two different intervention programs comprised of two didactic units based on two different methods for the instruction of school level soccer. These methods were *Direct Instruction* (*DI*) and the *Tactical Games Approach* (*TGA*). An additional purpose was to compare the effects of instruction through the two programs. For the validation process, content analyses and internal consistency assessments of the tasks in each program were conducted with the assistance of individuals with considerable expertise in the subject matter.

METHODS

Study Design

The present study was framed as instrumental in nature (Ato, López, & Benavente, 2013). The purpose was to validate two intervention programs and didactic units to obtain valid and trustworthy information (Corral, 2009) regarding knowledge acquired by students through soccer instruction in a school context.

Participants

Participants for the study were selected through purposeful sampling techniques according to the inclusion criteria established by Rodríguez, Gil, & García (1996). A subject matter expert panel with vast experience on the research topic was sought out for assistance by the main researcher (Escobar-Pérez & Cuervo-Martínez, 2008).

Initially, 24 experts met the selection criteria to be considered as evaluators or judges for the intervention designs, however, only 13 experts completed the time and information requirements to validate the interventions, for a 54.17% rate of successful participation.

Inclusion criteria were established as: i) Having a Doctoral degree; ii) Being a Higher Education faculty member in the area of sport pedagogy and/or invasion type sports; iii) Possessing the highest federative certification level (Level III) in invasion-type sports; iv) Having 10 years of experience or more as an invasion-type sports coach; or v) Having authored publications on sport pedagogy and/or training methods.

Content validity and internal consistency estimates of the intervention programs

Content Validity

Content validity is defined as the extent to which selected measurement items adequately represent the intended measured construct (Chacón-Moscoso et al., 2018). To achieve an optimal level of content validity for this study, the method used was based upon agreement among the panel of expert judges (Cabero & Barroso, 2013). The expert judges rated the adequacy and elaboration sections of each of the tasks that made up the intervention programs using a “1-10” Likert scale. Additionally, a qualitative rating for each task was also provided by the panel of judges (García-Martín, Antúnez, & Ibáñez, 2016).

- *Level of adequacy:* Quantitative ratings provided by each expert on the panel regarding the pertinence of each task to its corresponding teaching method of DI or TGA.

- *Level of elaboration:* Quantitative ratings provided by each expert on the panel regarding the elaboration and refinement of the tasks that made up each intervention program.

- *Qualitative ratings.* All open-ended feedback and suggestions made by the expert judges regarding improvements for each task were collected and considered.

Internal Consistency Reliability

Internal consistency of the tasks that make up each intervention was assessed through Cronbach's alpha statistic (Cronbach, 1990). This coefficient is the most widely used method to assess reliability and indicates the degree to which item responses are correlated. This information helps to determine whether several items that propose to measure the same construct actually do so and can, therefore, be summed as a total score (Nunnally & Bernstein, 1994).

Instruments and materials

Instruments

The two intervention programs called *Direct Instruction Soccer* (*DIS*) and *Tactical Games Approach Soccer* (*TGAS*) (García-Ceberino, Feu, & Ibáñez, 2019) are both oriented towards the instruction of soccer in a school context. Both programs are directed towards 5th and 6th year students in elementary education.

A total of 58 tasks, 29 for each program, were designed. Each task was planned using the organizational and pedagogical criteria established by Ibáñez et al. (2016): time, organization and materials, graphic representation, brief description, game phase, objective (attacking and/or defending), method of teaching, specific content and game situation. These variables are supplemented with a feedback section to obtain information from the instructor to the students regarding the correct execution of the tasks (Piéron, 1999). Communication between the students and the instructor should be consistent with the methodology applied. Therefore, a descriptive and prescriptive feedback style was utilized for the DIS tasks and an inquiry-based feedback style was utilized for the TGAS tasks. Several studies have assumed a class-based communication even if this is not reflected, even though it a variable that can directly influence the task (Feu et al., 2017).

Both programs involve 12 practical sessions and follow a similar structure regarding the number of tasks, game phases, specific contents and objectives (attacking and/or defending) (García-Ceberino et al., 2019). The number of sessions was established according to López & Castejón (2005), who affirmed that studies should be conducted for longer periods of time in order to obtain more trustworthy data. The sessions do not follow the classic structure of a Physical Education class including warm-up, fundamental learning components and cool down (Sáenz-López, 1997). Each session consisted of a total of 4 tasks with a duration of 10 minutes per task. Sessions were structured progressively from greater simplicity (warm-up activities) to more complexity (culmination activities) (Ibáñez, 2009). González-Espinosa et al. (2017a) designed two intervention programs similar to those presented in this study, but geared towards basketball pedagogy.

Materials

Data was collected using *Microsoft Excel 2013 software*. To calculate the *Aiken's V* coefficient and its corresponding confidence intervals, *Visual Basic 6.0*, was utilized (Merino & Livia, 2009). Finally, data analyses for the assessment of the internal consistency of the tasks was conducted using *SPSS 21.0* (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21. Armonk, NY: IBM Corp) for each program, independently and jointly.

Procedures

For the development of this study, a series of steps were followed in specific order. To start, a review of the existing literature on teaching school soccer was conducted. Based on this review, a draft of the two intervention programs and didactic units were developed. Subsequently, inclusion criteria involving the expert judge panel were created and once the sample was selected, the participants were sent, via email, the necessary documents to conduct the program validation. Among the documents that were sent, a formal and institutional presentation of the study was included, along with explanation of the development of the tasks that comprised each program in addition to the evaluation sheets to be used for a quantitative evaluation. The experts had to rate the level of adequacy and elaboration of each task and to provide qualitative feedback to help improve the content. The documents sent also informed the expert judges on the ages of the students, the distribution of each task in each session and the communication strategy that was used.

The following steps were involved in the collection of the expert ratings and the analyses, which were conducted in two rounds. After analyzing the results obtained in Round One, the tasks that were rated as appropriate were retained and the tasks that needed some further elaboration or modification were revised according to the expert judges´ advice. Finally, those tasks that did not receive an adequate rating after the content validity analysis were redrafted (Ortega, Jiménez, Palao, & Sainz, 2008). The new tasks were sent back to the experts to be re-evaluated both using both quantitative and qualitative approaches.

In this way, the two intervention programs, DIS and TGAS, were established.

Data Analysis

The validation process for the intervention programs was conducted through the provision of evaluations provided by the expert judges and calculated through the reliability index known as *Aiken's V* coefficient (Aiken, 1985). This coefficient allows for an interpretation of the relevance of any given item using a group of experts. In order to obtain this value, the *Aiken's V* algebraic equation modified by Penfield & Giacobbi (2004) was utilized:

$$V=\frac{\bar{X}-l}{k}$$

The free program *Visual Basic 6.0* (Merino & Livia, 2009) was used for the calculation of this value. This program allows for the determination of three values (maximum value – minimum value), the *Aiken's V* value and the confidence intervals corresponding with the 90%, 95% y 99% level realized through the *method score* (Penfield & Giacobbi, 2004).

The exact critical value for acceptance using *Aiken's V* was calculated by means of the formula initially proposed by Aiken (1985), as applied through central limit theorem to large sample sizes ($m > 25$). The number (n) of judges in this case (13), the number of items ($m = 58$) and the range of response choices ($c = 10$) were thus established and the 95% and 99% confidence levels (z) were established by means of the formula:

$$V = \frac{z}{0.2\sqrt{\frac{3mn(c-1)}{(c+1)}}} + 0.5$$

In order to attain the critical value associated with the 95% confidence level, a value of .69 was necessary for the *Aiken's V* value. To reach the 99% confidence level, a corresponding *Aiken's V* value of .77 was necessary in this case.

As a consequence of these considerations, those tasks with values that did not reach the 95% confidence level ($V < .69$) were eliminated. Those tasks with values lying between the 95% and 99% confidence levels ($V = .69$ to .77) were modified and tasks whose values exceeded the 99% level of confidence ($V > .77$) were retained (*Table* 1).

Table 1. Criteria associated with the acceptance, modification or elimination of tasks

		Elaboration		
		> .77	[.69 -.77]	< .69
	> .77	Correct	Elaboration modification	Elaboration modification
Adequate	[.69 -.77]	Adequate modified	A + E modification	A+E modification
	< .69	Eliminated	Eliminated	Eliminated

The analysis of the internal consistency of the task that were conducted were assessed for both programs through the *Cronbach α* test of internal consistency (Cronbach, 1990; Field, 2013).

RESULTS

The results with *Aiken's V* coefficients are presented in *Tables 2* and *3* and in accordance with the 95% and 99% confidence intervals relative to the DIS and TGAS intervention programs, respectively.

Table 2. *Aiken's V* values and CI for the DIS intervention tasks

	Adequacy						Elaboration					
			95% CI		99% CI				95% CI		99% CI	
Task	*M±SD*	*V*	*Lower*	*Upper*	*Lower*	*Upper*	*M±SD*	*V*	*Lower*	*Upper*	*Lower*	*Upper*
1	9.92±.28	.99	.95	1.00	.93	1.00	8.85±2.27	.87	.80	.92	.77	.93
2	8.77±2.31	.86	.79	.91	.76	.92	8.15±2.51	.79	.71	.86	.68	.87
3	9.92±.28	.99	.95	1.00	.93	1.00	8.77±2.24	.86	.79	.91	.76	.92
4	7.77±2.01	.75*	.67	.82	.64	.84	8.15±1.95	.79	.71	.86	.68	.87
5	9.92±.28	.99	.95	1.00	.93	1.00	8.77±2.13	.86	.79	.91	.76	.92
6	9.77±.44	.97	.93	.99	.90	.99	8.46±2.60	.83	.75	.89	.72	.90
7	9.54±.97	.95	.89	.98	.87	.98	8.62±2.06	.85	.77	.90	.74	.91
8	9.31±.95	.92	.86	.96	.84	.97	9.00±1.08	.89	.82	.93	.79	.94
9	9.92±.28	.99	.95	1.00	.93	1.00	8.77±2.24	.86	.79	.91	.76	.92
10	9.62±.77	.96	.90	.98	.88	.98	8.46±2.57	.83	.75	.89	.72	.90
11	9.77±.60	.97	.93	.99	.90	.99	8.54±2.37	.84	.76	.89	.73	.91
12	9.46±.78	.94	.88	.97	.86	.98	9.00±1.00	.89	.82	.93	.79	.94
13	8.38±1.85	.82	.74	.88	.71	.89	8.08±2.75	.79	.70	.85	.68	.87
14	9.54±.88	.95	.89	.98	.87	.98	8.23±2.39	.80	.72	.86	.69	.88
15	9.69±.85	.96	.91	.99	.89	.99	8.54±1.76	.84	.76	.89	.73	.90
16	9.69±.63	.96	.91	.99	.89	.99	8.46±1.90	.83	.75	.89	.72	.90
17	9.69±.63	.96	.91	.99	.89	.99	8.69±1.70	.85	.78	.91	.75	.92
18	9.77±.60	.97	.93	.99	.90	.99	8.62±1.71	.85	.77	.90	.74	.91
19	9.77±.83	.97	.93	.99	.90	.99	8.31±2.46	.81	.73	.87	.70	.89
20	8.38±1.76	.82	.74	.88	.71	.89	8.23±1.59	.80	.72	.86	.69	.88
21	7.54±2.99	.73*	.64	.80	.61	.82	7.54±2.93	.73*	.64	.80	.61	.82
22	9.23±1.59	.91	.85	.95	.82	.96	7.38±3.23	.71*	.62	.78	.59	.80
23	8.54±1.94	.84	.76	.89	.73	.91	7.85±2.70	.76*	.68	.83	.65	.85
24	8.85±1.52	.87	.80	.92	.77	.93	8.46±2.26	.83	.75	.89	.72	.90
25	8.77±1.48	.86	.79	.91	.76	.92	8.77±1.30	.86	.79	.91	.76	.92
26	8.23±1.59	.80	.72	.86	.69	.88	8.62±1.45	.85	.77	.90	.74	.91
27	8.77±1.24	.86	.79	.91	.76	.92	8.62±1.19	.85	.77	.90	.74	.91
28	8.23±1.79	.80	.72	.86	.69	.88	8.46±1.56	.83	.75	.89	.72	.90
29	7.23±2.65	.69*	.60	.77	.57	.79	8.62±1.50	.85	.77	.90	.74	.91

Note: M = Mean; SD = Standard deviation; V = Aiken's V value; CI = Confidence interval; Lower = Lower limit; Upper = Upper limit

Table 3. Results with *Aiken's V* values and CI for the TGAS intervention tasks

	Adequacy						Elaboration					
			95% IC		99% IC				95% IC		99% IC	
Task	*M±SD*	*V*	*Lower*	*Upper*	*Lower*	*Upper*	*M±SD*	*V*	*Lower*	*Upper*	*Lower*	*Upper*
1	8.54±1.39	.84	.76	.89	.73	.91	8.85±1.46	.87	.80	.92	.77	.93
2	8.69±1.84	.85	.78	.91	.75	.92	8.23±2.01	.80	.72	.86	.69	.88
3	8.77±1.83	.86	.79	.91	.76	.92	8.46±1.94	.83	.75	.89	.72	.90
4	9.31±1.03	.92	.86	.96	.84	.97	8.46±1.39	.83	.75	.89	.72	.90
5	8.46±2.54	.83	.75	.89	.72	.90	7.85±2.54	.76*	.68	.83	.65	.85
6	7.31±2.29	.70*	.61	.78	.58	.80	7.85±2.27	.76*	.68	.83	.65	.85
7	7.85±2.61	.76*	.68	.83	.65	.85	7.77±2.39	.75*	.67	.82	.64	.84
8	8.62±1.71	.85	.77	.90	.74	.91	8.08±1.98	.79	.70	.85	.68	.87
9	8.92±1.44	.88	.81	.93	.78	.94	8.15±.1.63	.79	.71	.86	.68	.87
10	8.77±2.45	.86	.79	.91	.76	.92	8.92±1.32	.88	.81	.93	.78	.94
11	8.31±1.70	.81	.73	.87	.70	.89	8.69±1.49	.85	.78	.91	.75	.92
12	7.46±2.18	.72*	.63	.79	.60	.81	7.38±2.26	.71*	.62	.78	.59	.80
13	8.00±1.53	.78	.69	.84	.67	.86	8.00±1.63	.78	.69	.84	.67	.86
14	8.08±1.61	.79	.70	.85	.68	.87	8.00±1.63	.78	.69	.84	.67	.86
15	8.00±1.53	.78	.69	.84	.67	.86	8.00±1.63	.78	.69	.84	.67	.86
16	7.92±1.61	.77*	.68	.83	.66	.85	8.08±1.71	.79	.70	.85	.68	.87
17	8.92±1.32	.88	.81	.93	.78	.94	8.38±2.18	.82	.74	.88	.71	.89
18	7.54±2.30	.73*	.64	.80	.61	.82	7.77±2.20	.75*	.67	.82	.64	.84
19	7.62±1.80	.73*	.65	.81	.62	.82	7.85±1.41	.76*	.68	.83	.65	.85
20	8.38±2.18	.82	.74	.88	.71	.89	8.85±1.77	.87	.80	.92	.77	.93
21	7.46±1.76	.72*	.63	.79	.60	.81	7.69±1.49	.74*	.66	.81	.63	.83
22	7.85±1.77	.76*	.68	.83	.65	.85	7.85±1.82	.76*	.68	.83	.65	.85
23	8.69±1.55	.85	.78	.91	.75	.92	7.92±1.80	.77*	.68	.83	.66	.85
24	8.69±.85	.85	.78	.91	.75	.92	8.08±1.19	.79	.70	.85	.68	.87
25	8.69±1.38	.85	.78	.91	.75	.92	8.38±1.76	.82	.74	.88	.71	.89
26	8.38±1.56	.82	.74	.88	.71	.89	8.08±1.85	.79	.70	.85	.68	.87
27	9.15±1.21	.90	.84	.95	.81	.95	8.46±1.71	.83	.75	.89	.72	.90
28	8.92±1.50	.88	.81	.93	.78	.94	8.46±1.76	.83	.75	.89	.72	.90
29	9.00±1.47	.89	.82	.93	.79	.94	8.38±1.71	.82	.74	.88	.71	.89

Note: M = Mean; SD = Standard deviation; V = Aiken V value; CI = Confidence interval; Lower = Lower limit; Upper = Upper limit

Table 4 provides an example of the qualitative values that the expert judges reached relative to the improvement in outcome quality of each of the two intervention programs.

Table 4. Qualitative assessments provided by the expert evaluators

Task	Qualitative evaluation	Action Taken
4 (DIS)	J3: *"Playing with uncertainty in making decisions"*	Rules and strategies were developed to overcome decision-making issues
5 (DIS)	J11: *"Reduce waiting times"*	The number of lines were increased
7 (DIS)	J2: *"Establish an execution rhythm"*	The moments of attack for the students will be noted by the instructor
26 (DIS)	J8: *"Indicate the specific game area dimensions"*	The spatial dimensions of the playing area were set at 7x7 meters
27 (DIS)	J1: *"The defensive players drop behind"*	The initial position of the defenders has been moved back in relation to the attacking players
2 (TGAS)	J1: *"Improve the attack with a greater number of offensive players"*	A common attacking player was added for the team in possession of the ball
8 (TGAS)	J2: *"Try to include more real game play"*	The game was adapted to accomodate a more real circumstance
12 (TGAS)	J1: *"Excessive waiting time"*	Various 1x1 activities were developed
19 (TGAS)	J8: *"Indicate the specific game area dimensions"*	The spatial dimensions of the playing area were set at 9x9 meters
29 (TGAS)	J9: *"Play with two small goals at each end of the field"*	A second small goal was added to allow for play with two goals at each end of the field

Note: J = Expert judge

Finally, *Table 5* provides the internal consistency results for the tasks that conform to the DIS and TGAS intervention programs as reached through separate analyses, as well as the overall Cronbach alpha value relative to all tasks across both intervention programs.

Table 5. Internal consistency for the tasks that comprise the DIS and TGAS interventions

	DIS			TGAS			DIS and TGAS		
	A	E	Total	A	E	Total	A	E	Total
Cronbach α	.87	.96	.96	.93	.95	.97	.93	.96	.97
Valid	13	13	13	13	13	13	13	13	13
N	13	13	13	13	13	13	13	13	13

Note: A = Adequacy; E = Elaboration; N = Number of expert judges

DISCUSSION

The purpose of this study was validate two intervention programs with unique instructional components that had been designed and carried out in relation to the two methods of instruction: *DI* and *TGA*. In this case, ideal levels of validity and internal consistency were realized. To accomplish the intervention, the methodological procedures previously recommended in the scientific literature were followed (Anguera & Hernández-Mendo, 2013; Bulger & Housner, 2007; Escobar-Pérez & Cuervo-Martínez, 2008) and these protocols were similar to those used in previous related research (Ibáñez, Martínez-Fernández, González-Espinosa, García-Rubio, & Feu, 2019; Torres-Luque, Fernández-García, Cabello-Manrique, Giménez-Egido, & Ortega-Toro, 2018; Villarejo, Ortega, Gómez, & Palao, 2014).

In order to validate the intervention programs, a panel of experts was utilized which is common practice (Cabero & Barroso, 2013). This study utilized 13 expert judges, which was considered an adequate number to assess the content validity of the tasks comprising each of the two interventions. Previous

researchers (Barahona, 2004; Jiménez, Salazar, & Morera, 2013; Robles, Robles, Giménez, & Abad, 2016) have suggested that a minimum of ten participants is necessary to provide an acceptable estimate of the content validity of an instruments. The number of evaluators that collaborated in this study exceeds the minimum recommended in the scientific literature and yielded a success level of 54.17%. In order to select the expert judges, a set of inclusion criteria was established (Rodríguez et al., 1996). Previous research attempting to validate different measurement tools also has established standardized parameters for expert judges that includes assessments, for example, of: basic actions by blind soccer players during penalty-taking situations (Gamonales, León, Muñoz, González-Espinosa, & Ibáñez, 2018); referees' behavior during basketball games (García-Santos & Ibáñez, 2016); questionnaire development to understand the development of expertise among athletes in team sports (García-Martín et al., 2016).

The involvement of the expert judges was directed toward the evaluation of the adequacy and modification of the items and tasks that comprised the two intervention programs. This procedure is typical in studies that are designed for the purpose of instrument development such as questionnaires that assess the evaluation of preferences and satisfaction levels in young basketball players (Ortega et al., 2008); or in the assessment of tactical behaviors in rugby (Villarejo et al., 2014). A more specific example of this type of research would be demonstrated in the validation of intervention programs in the instruction of basketball in the school sport context (González-Espinosa et al., 2017b).

The validity of the content of the tasks that comprised each program of each intervention was assessed through *Aiken's V* coefficient. As such, the algebraic equation modified by Penfield & Giacobbi (2004) was used. This formula has been utilized in various studies intended to examine the quality of new instruments in the sport environment (Almonacid-Fierro, Feu, & Vizuete, 2018; Collet, Nascimento, Folle, & Ibáñez, 2018; Ibáñez et al., 2019). The exact critical value for task acceptance was calculated by means of the original equation proposed by Aiken (1985) and applied to central limit theorem for large sample sizes. In accordance with the practices of the previously cited studies, a 95% confidence level was also estimated. The modification of tasks to reach a 99% confidence level was also carried out. In this study, the level of demand necessary for the acceptance or elimination of an item or task is very high. To the best of our knowledge, this is the first study to establish a 99% level of confidence for the acceptance and modification of an item or task in the validation process. Standards for acceptance of instrument validity in some initial studies can be as low as .50 on the most liberal end (Aiken, 1985) and reach .70 on the more conservative standard for validity (Charter, 2003). The critical value employed in this study was developed in accordance with the number of items and tasks, the number of expert evaluators and the range of responses. Through these considerations a range was established (between 95% and 99% confidence values) or absolute acceptance of an item or task was determined (Aiken's V > 99% level). Irrespective of the values obtained, each of the suggestions provided by the judges was considered for the purpose of improving the intervention programs.

The results indicated that none of the 29 tasks that comprised each intervention program should be eliminated because *Aiken's V* coefficient values had surpassed exact critical levels. Only five tasks (4, 21, 22, 23 and 29) that were components of the DIS intervention were modified as a consequence of values falling in the range of .69 -.77 on the components of "adequacy" or "elaboration". In the same way, the tasks 5, 6, 7, 12, 16, 18, 19, 21, 22 and 23 that were components of the TGAS intervention program also were modified as they demonstrated values that fell within the range corresponding with "adequacy" or "elaboration". In order to make these modification, the qualitative assessments provided by the expert judges were utilized (Bulger & Housner, 2007; Ortega, Calderón, Palao, & Puigcerver, 2009; Ortega-Toro, García-Angulo, Giménez-Egido, García-Angulo, & Palao, 2019). The proposed improvements recommended by the expert judges were directed toward the space utilization of the games, the number of student participants, the rate of execution, etc. The control of the formal aspects that were defined in the basic guiding design of the activities for the students were followed based on the SCAs.

Internal consistency values were calculated using the *Cronbach α* coefficient (Cronbach, 1990). The calculation of each of the values for internal consistency was assessed independently as well as through a collective assessment of the items comprising each intervention. The tasks that conformed to the DIS intervention program obtained a value of .96 and the set of tasks that comprised the TGAS program reached the .97 level. Finally, the overall internal consistency value across both intervention programs was at the .97 level. Typically, a level of .70 is considered acceptable when investigators seek to establish the reliability of instruments (Nunnally, 1978). Nonetheless, values greater than .80 are commonly preferred (Polit & Hungler, 2000) and values exceeding .90 are widely considered to be excellent (George & Mallery, 2003). According to Field (2013), any interpretation of instrument reliability that indicates a value close to 1.00 would reveal that the instrument is reliable. Accordingly, the reliability of the instrument assessing the two programs of intervention reached the level of "excellent".

Finally, among the considerations encountered in this study it is important to highlight the scarce number of previous intervention programs that have been conducted with the intention of comparing instructional methods in the school context (González-Espinosa et al., 2017a, 2017b). In addition, it is important to highlight the difficulties associated with obtaining an adequate number of expert evaluators (10), as recommended by previous researchers (Barahona, 2004; Jiménez et al., 2013; Robles et al., 2016).

CONCLUSIONS

The tasks that comprised the intervention programs DIS and TGAS reached optimal levels of validity and internal consistency; as such the two programs are considered to be valid and reliable for the instruction of soccer in the school context as taught by Physical Education teachers.

In this study, we have established modification and elimination standards for the items and tasks and in consideration of *Aiken's V* values at confidence intervals of 95% and 99%.

The validation of these types of intervention programs enables investigators to assess the level of learning reached by students when programs are put into practice, such as in the comparison of the effects of the instructional methods DI and TGA.

REFERENCES

Abad, M. T., Benito, P. J., Giménez, F. J., & Robles, J. (2013). Fundamentos pedagógicos de la enseñanza comprensiva del deporte: una revisión de la literatura. *Cultura, Ciencia y Deporte*, *23*(8), 137-146. doi:10.12800/ccd.v8i23.300

Aiken, L. R. (1985). Three coefficients for analyzing the reliability and validity of ratings. *Educational and Psychological Measurement, 45*(1), 131-142. doi:10.1177/0013164485451012

Alarcón, F., Cárdenas, D., Miranda, M. T., Ureña, N., & Piñar, M. I. (2010). La metodología de enseñanza en los deportes de equipo. *Revista de Investigación en Educación*, *7*, 91-103.

Allison, S., & Thorpe, R. (1997). A comparison of the effectiveness of two approaches to teaching games within physical education. A skills approach versus a games for understanding approach. *British Journal of Physical Education, 28*(3), 9-13.

Almonacid-Fierro, A., Feu, S., & Vizuete, M. (2018). Validación de un cuestionario para medir el Conocimiento Didáctico del Contenido en el profesorado de Educación Física. *Retos. Nuevas Tendencias en Educación Física, Deporte y Recreación*, *37*, 132-137.

Anguera, M. T., & Hernández-Mendo, A. H. (2013). Metodología observacional en el ámbito del deporte. *E-balonmano.com: Revista de Ciencias del Deporte, 9*(3), 135-160.

Ato, M., López, J. J., & Benavente, A. (2013). Un sistema de clasificación de los diseños de investigación en psicología. *Anales de Psicología, 29*(3), 1038-1059. doi:10.6018/analesps.29.3.178511

Barahona, E. (2004). Estudio de validez del Cuestionario de Prácticas Pedagógicas para la Creatividad (CPPC). *Psykhe*, *13*(1), 157-174. doi:10.4067/S0718-22282004000100013

Blázquez, D. (1995). *La iniciación deportiva y el deporte escolar*. Barcelona: Inde.

Bulger, S. M., & Housner, L. D. (2007). Modified Delphi investigation of exercise science in physical education teacher education. *Journal of Teaching in Physical Education, 26*(1)*,* 57-80. doi:10.1123/jtpe.26.1.57

Cabero, J., & Barroso, J. (2013). La utilización del juicio de experto para la evaluación de TIC: el coeficiente de competencia experta. *Bordón*, *65*(2), 25-38. doi:10.13042/brp.2013.65202

Chacón-Moscoso, S., Sanduvete-Chaves, S., Anguera, M. T., Losada, J. L., Portell, M., & Lozano-Lozano, J. A. (2018). Preliminary checklist for reporting observational studies in sports areas: content validity. *Frontiers in Psychology, 9*, 291. doi:10.3389/fpsyg.2018.00291

Charter, R. A. (2003). A breakdown of reliability coefficients by test type and reliability method, and the clinical implications of low reliability. *Journal of General Psychology, 130*(3), 290-304. doi:10.1080/00221300309601160

Chatzopoulos, D., Tsormbatzoudis, H., & Drakou, A. (2006). Combinations of technique and games approaches: Effects on game performance and motivation. *Journal of Human Movement Studies, 50*(3), 157-170.

Collet, C., Nascimento, J. V., Folle, A., & Ibáñez, S. J. (2018). Construcción y validación de un instrumento para el análisis de la formación deportiva en voleibol. *Cuadernos de Psicología del Deporte*, *19*(1), 76-89. doi:10.6018/cpd.326361

Corral, Y. (2009). Validez y confiabilidad de los instrumentos de investigación para la recolección de datos. *Revista de Ciencias de la Educación, 19*(33), 228-247.

Cronbach, L. J. (1990). *Essentials of psychological testing (5th Ed.)*. New York: Harper & Row.

Devís, J., & Peiró, C. (1992). *Nuevas perspectivas en Educación Física: la salud y los juegos modificados.* Barcelona: Inde.

Escobar-Pérez, J., & Cuervo-Martínez, A. (2008). Validez de contenido y juicio de expertos: una aproximación a su utilización. *Avances en Medición*, *6*, 27-36.

Farias, C. F., Mesquita, I. R., & Hastie, P. A. (2015). Game Performance and Understanding Within a Hybrid Sport Education Season. *Journal of Teaching in Physical Education, 34*(4), 725-729. doi:10.1123/jtpe.2015-0189

Feu, S., Ibáñez, S. J., García-Rubio, J., & Antúnez, A. (2017). La investigación sobre la enseñanza de los deportes de invasión y su transferencia al contexto escolar. *Revista Portuguesa de Ciências do Desporto, 17*, 50-58. doi:10.5628/rpcd.17.S1A.50

Field, A. (2013). *Discovering statistics using SPSS (4th Ed.)*. London: Sage publications Ltd.

Gamonales, J. M., León, K., Muñoz, J., González-Espinosa, S., & Ibáñez, S. J. (2018). Validación del IOLF5C para la eficacia del lanzamiento en fútbol para ciegos / Validation of IOLF5C for the Efficiency of the Launch in the Football for Blind. *Revista Internacional de Medicina y Ciencias de la Actividad Física y el Deporte, 18*(70), 361-381. doi:10.15366/rimcafd2018.70.010

García, J. A., y Ruiz, L. M. (2003). Análisis comparativo de dos modelos de intervención en el aprendizaje del balonmano. *Revista de Psicología del Deporte, 12*(1), 55-66.

García-Ceberino, J. M., Feu, S., & Ibáñez, S. J. (2019). Comparative Study of Two Intervention Programmes for Teaching Soccer to School-Age Students. *Sports*, *7*, 74, doi:10.3390/sports7030074

García-Ceberino, J. M., Gamero, M. G., Feu, S., Ibáñez, S. J. (2020). Experience as a Determinant of Declarative and Procedural Knowledge in School Football. *International Journal of Environmental Research and Public Health*, *17*, 1063, doi:10.3390/ijerph17031063

García-Martín, A., Antúnez, A., & Ibáñez, S. J. (2016). Análisis del proceso formativo en jugadores expertos: validación de instrumento / Analysis of Expert Players' Training Process: Validation of Tools. *Revista*

Internacional de Medicina y Ciencias de la Actividad Física y el Deporte, *16*(61), 157-182. doi:10.15366/rimcafd2016.61.012

García-Santos, D., & Ibáñez, S. J. (2016). Diseño y validación de un instrumento de observación de un árbitro de baloncesto (IOVAB). *Sport-TK: Revista Euroamericana de Ciencias del Deporte, 5*(2), 15-26. doi:10.6018/264601

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update (4th Ed.)*. Boston: Allyn & Bacon.

González-Espinosa, S., Ibáñez, S. J., & Feu, S. (2017a). Diseño de dos programas de enseñanza del baloncesto basados en métodos de enseñanza-aprendizaje diferentes. *E-balonmano: Revista de Ciencias del Deporte, 13*(2), 131-152.

González-Espinosa, S., Ibáñez, S. J., Feu, S., & Galatti, L. R. (2017b). Programas de intervención para la enseñanza deportiva en el contexto escolar, PETB y PEAB: Estudio preliminar. *Retos: Nuevas Tendencias en Educación Física, Deporte y Recreación, 31,* 107-113.

González-Espinosa, S., Mancha-Triguero, D., García-Santos, D., Feu, S., e Ibáñez, S. J. (2019). Diferencia en el aprendizaje del baloncesto según el género y metodología de enseñanza. *Revista de Psicología del Deporte*, *28*(Suppl 1), 86-92.

Gray, S., & Sproule, J. (2011). Developing pupils' performance in team invasion games. *Physical Education and Sport Pedagogy, 16*(1), 15-32. doi:10.1080/17408980903535792

Harvey, S., Song, Y., Baek, J. H., & Van der Mars, H. (2016). Two sides of the same coin: Student physical activity levels during a game-centred soccer unit. *European Physical Education Review, 22*(4), 411-429. doi:10.1177/1356336X15614783

Ibáñez, S. J. (2008). La planificación y el control del entrenamiento técnico-táctico en Baloncesto. En N. Terrados, & J. Calleja (Coords.), *Fisiología, entrenamiento y medicina del Baloncesto* (pp. 299-313). Barcelona: Paidotribo.

Ibáñez, S. J. (2009). Planificación de una temporada en la iniciación al baloncesto. En G. Ortega, & A. C. Jiménez (Coords.), *Táctica y técnica en la iniciación al baloncesto* (pp.69-99). Sevilla: Wanceulen.

Ibáñez, S. J., Feu, S., & Cañadas, M. (2016). Sistema integral para el análisis de las tareas de entrenamiento, SIATE, en deportes de invasión. *E-balonmano.com: Revista de Ciencias del Deporte, 12*(1), 3-30.

Ibáñez, S. J., Martínez-Fernández, S., González-Espinosa, S., García-Rubio, J., & Feu, S. (2019). Designing and Validating a Basketball Learning and Performance Assessment Instrument (BALPAI). *Frontiers in Psychology*, *10*, 1595. doi:10.3389/fpsyg.2019.01595

Jiménez, J., Salazar, W., & Morera, M. (2013). Diseño y validación de un instrumento para la evaluación de patrones básicos de movimiento. *Motricidad*. *European Journal of Human Movement, 31*, 87-97. doi:10.22579/20114680.48

Kirk, D. (2005). Model-based teaching and assessment in Physical Education: the Tactical Games Model. En K. Green, & K. Hardman (Eds.), *Physical Education: essential issues* (pp.128-142). London: Sage. doi:10.4135/9781446215876.n8

König, S., & Singrün, P. (2013). Wirkungen und Festigkeit von motorischen Lern- und Trainingsprozessen im Sportunterricht [Effect and consistency of motor learning and training processes in physical education]. *Spectrum der Sportwissenschaften*, *25*, 4-31.

Launder, A. G., & Piltz, W. (2006). Beyond «Understanding» to skilful play in games, through Play practice. *Journal of Physical Education New Zealand, 39*(1), 47-57.

López, V., & Castejón, F. J. (2005). La enseñanza integrada técnico-táctica de los deportes en edad escolar. Explicación y bases de un modelo. *Apunts: Educación Física y Deportes, 79*(1), 40-48.

Méndez, A. (2009). *Modelos actuales de iniciación deportiva: unidades didácticas sobre deportes de invasión*. Sevilla: Wanceulen.

Merino, C., & Livia, J. (2009). Intervalos de confianza asimétricos para el índice la validez de contenido: Un programa Visual Basic para la V de Aiken. *Anales de Psicología, 25*(1), 169-171.

Mesquita, I., Farias, C., & Hastie, P. (2012). The impact of a hybrid Sport Education-Invasion Games Competence Model soccer unit on students' decision making, skill execution and overall game performance. *European Physical Education Review, 18*(2), 205-219. doi:10.1177/1356336x12440027

Metzler, M. W. (2011). *Instructional Models for Physical Education (3rd Ed.)*. Scottsdale, AZ, USA: Holocomb Hathaway.

Mitchell, S. A., Oslin, J. L., & Griffin, L. L. (2013). *Teaching Sport Concepts and Skills: A Tactical Games Approach for Ages 7 to 18 (3rd Ed.)*. Champaign, IL: Human Kinetics.

Nunnally, J. C. (1978). *Psychometric methods*. New York: McGraw-Hill.

Nunnally, J. C., & Bernstein, I. H. (1994). *Pychometric theory (3rd Ed.)*. New York: McGraw-Hill.

Ortega, E., Calderón, A., Palao, J., & Puigcerver, M. (2009). Diseño y validación de contenido de un cuestionario sobre la satisfacción, participación y opinión de mejora en las clases de educación física en secundaria. *Wanceulen E.F. Digital, 5,* 14-26.

Ortega, E., Jiménez, J., Palao, J., & Sainz, P. (2008). Diseño y validación de un cuestionario para valorar las preferencias y satisfacciones en jóvenes jugadores de baloncesto. *Cuadernos de Psicología del Deporte, 8*(2), 39-58.

Ortega-Toro, E., García-Angulo, A., Giménez-Egido, J. M., García-Angulo, F. J., & Palao, J. M. (2019). Design, Validation, and Reliability of an Observation Instrument for Technical and Tactical Actions of the Offense Phase in Soccer. *Frontiers in Psychology*, *10*, 22. doi:10.3389/fpsyg.2019.00022

Penfield, R., & Giacobbi, P. (2004). Applying a score confidence interval to Aiken's item content-relevance index. *Measurement in Physical Education and Exercise Science, 8*(4), 213-225. doi:10.1207/s15327841mpee0804_3

Pérez-Muñoz, J., Yagüe, S., & Sánchez-Sánchez, J. M. (2015). *El proceso de enseñanza-aprendizaje a los deportes colectivos*. Sevilla: Wanceulen.

Piéron, M. (1999). *Para una enseñanza eficaz de las actividades físico-deportivas.* Barcelona: Inde.

Polit, D., & Hungler, B. (2000). *Investigación científica en Ciencias de la Salud (6ª Ed.)*. México: McGraw-Hill.

Robles, A., Robles, J., Giménez, F. J., & Abad, M. T. (2016). Validación de una entrevista para estudiar el proceso formativo de judokas de élite / Validation Of An Interview For Study The Process Of Formation Of Elite Judokas. *Revista Internacional de Medicina y Ciencias de la Actividad Física y el Deporte*, *16*(64), 723-738. doi:10.15366/rimcafd2016.64.007

Rodríguez, G., Gil, J., & García, E. (1996). *Métodos de investigación cualitativa*. Málaga: Aljibe.

Rodríguez, J. E., Mato, J. A., & Pereira, M. C. (2016). Análisis de los métodos tradicionales de enseñanza-aprendizaje de los deportes colectivos en Educación Primaria y propuestas didácticas innovadoras. *Sportis Sci J, 2*(2), 254-267. doi:10.17979/sportis.2016.2.2.1426

Saénz-López, P. (1997). *La Educación Física y su Didáctica. Manual para el profesor*. Sevilla: Wanceulen.

Serra, J., García-López, L. M., & Sánchez-Mora, D. (2011). El juego modificado, recurso metodológico en el fútbol de iniciación. *Retos: Nuevas Tendencias en Educación Física, Deporte y Recreación*, *20*, 37-42.

Smith, L., Harvey, S., Savory, L., Fairclough, S., Kozub, S., & Kerr, C. (2015). Physical activity levels and motivational responses of boys and girls: a comparison of direct instruction and tactical games models of games teaching in physical education. *European Physical Education Review, 21*(1), 93-113. doi:10.1177/1356336X14555293

Torres-Luque, G., Fernández-García, A. I., Cabello-Manrique, D., Giménez-Egido, J. M., & Ortega-Toro, E. (2018). Design and Validation of an Observational Instrument for the Technical-Tactical Actions in Singles Tennis. *Frontiers in Psychology*, *9*, 2418. doi:10.3389/fpsyg.2018.02418

Turner, A. P., & Martinek, T. J. (1999). An investigation into teaching games for understanding: Effects on skill, knowledge, and game play. *Research Quarterly for Exercise and Sport, 70*(3), 286-296. doi:10.1080/02701367.1999.10608047

Villarejo, D., Ortega, E., Gómez, M. A., & Palao, J. (2014). Design, validation and reliability of an observational instrument for ball possessions in rugby union. *International Journal of Performance Analysis in Sport*, *14*, 957-969. doi:10.1080/24748668.2014.11868771

Zapatero, J. A. (2017). Beneficios de los estilos de enseñanza y las metodologías centradas en el alumno en educación física. *E-balonmano.com: Revista de Ciencias del Deporte*, *13*(3), 237-250.

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