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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. These units had been designed based on two different instructional methodologies: *Direct Instruction (DI)* and the *Tactical Games Approach (TGA)* as applied to teaching school soccer. These two

intervention programs were similar in structure, with the same number of tasks, sessions, phases of play, specific contents, and objectives. 13 expert judges participated in the validation process. Content validity was calculated through the use of *Aiken's V* coefficient and its corresponding confidence intervals. Internal consistency was calculated using *Cronbach's α* statistic. None of the 29 tasks on either of the intervention programs were eliminated because they exceeded the exact critical value ($V \geq .69$). The internal consistency of the tasks that formed both intervention programs together was found to be excellent ($\alpha = .97$). For these reasons both intervention programs were considered to be valid and reliable for teaching school soccer as suitable for the comparison of the effects of these differing 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 (TCA) and Student-Centered Approaches (SCA) (Alarcón, Cárdenas, Miranda, Ureña, & Piñar, 2010). 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 TCA (Alarcón, Cárdenas, Miranda, & Ureña, 2009). 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 TCA, the most commonly used teaching method is Direct Instruction (DI), (González-Espinosa, Ibáñez, & Feu, 2017a).

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 SCA have emerged (Abad et al., 2013). SCA 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 (Lauder & Piltz, 2006). The main goal of SCA is achieve an understanding of the game through tactical awareness and through an appreciation of the game itself (Gray & Sproule, 2011). Within SCA, the Tactical Games Approach (TGA) is the most popular (González-Espinosa et al., 2017a).

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 TCA 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, SCA 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 TCA and SCA when it comes to technical aspects. However, in relation to overall game understanding, declarative knowledge and decision-making, SCA have led to better results (Allison & Thorpe, 1997; García & Ruíz, 2003; Turner & Martinek, 1999). For this reason, the most recent recommendations identify SCA as a preferred method to teach invasion type sports (Ibáñez et al., 2016; López & Castejón, 2005; Sans & Frattarola, 2000). Nevertheless, many physical education teachers continue to have a preference for TCA (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 implementation 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, and García (1996). A subject matter expert panel with vast experience on the research topic was sought out for assistance by the main researcher (Escobar & Cuervo, 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, Pérez-Gil, Holgado, & Lara, 2001). 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.

- *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. 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)* 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 is 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). The number of sessions was established according to López and 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 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* (SPSS. Inc., Chicago IL, USA) 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 V* algebraic equation modified by Penfield and 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 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 ($n > 25$). 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. 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 a* test of internal consistency (Cronbach, 1990; Field, 2009).

RESULTS

The results with *Aiken 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 V values and CI for the DIS intervention tasks

Task	M±SD	V	Adequacy				Elaboration					
			95% CI		99% CI		95% CI		99% CI			
			Lower	Upper	Lower	Upper	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 V value; CI=Confidence interval; Lower=Lower limit; Upper=Upper limit

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Table 3. Results with Aiken V coefficients and confidence intervals (CI) for the TGAS intervention

Task	M±SD	V	Adequacy				Elaboration					
			95% IC		99% IC		95% IC		99% IC			
			Lower	Upper	Lower	Upper	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±1.85	.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 accommodate 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, in Table 5 the results of the study are presented in relation to the Cronbach internal consistency values relative to the tasks that comprise the DIS and TGAS intervention programs, as well as the overall values that were obtained. 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 two 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 & Cuervo, 2008) and these protocols were similar to those used in previous related research (García-Martín, Antúnez, & Ibáñez, 2016; Ortega et al., 2008; 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 (Gonzalez-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 and Giacobbi (2004) was used. This formula has been utilized in various studies intended to examine the quality of new instruments in the sport environment (García-Martín et al., 2016; García-Santos & Ibáñez, 2016; Ortega et al., 2008). 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 or 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 $V > 99\%$ 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 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). 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 SCA.

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 (2009), 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; González-Espinosa et al., 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 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.

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