

12 Abstract

13 **Purpose:** To know whether an intervention using an adaptation of Teaching Games for
14 Understanding approach (i.e., TRfU) led the participants to improve on skill execution,
15 decision-making, race performance, race involvement, race knowledge, enjoyment, intention
16 to continue practicing sailing, current abandon ratio, after actual practice ratio, and perceived
17 competence. **Method:** Participants were 67 children from a randomly selected sailing school
18 (age: $M=9.32$, $SD=2.60$ years old) and two coaches. This study followed a mixed-methods
19 data approach. Quantitative data were evaluated using a quasi-experimental pretest-posttest
20 design with control group. The intervention consisted of teaching sailing with TRfU lessons.
21 Qualitative data were evaluated through an interview on completion of the study. Furthermore,
22 tras la intervención nosotros recogimos datos de current abandon y un año más tarde de after
23 practice. We designed and validated the TRfU lessons and one coach was trained in the
24 approach. The TRfU group participated in 11 lessons. Data were collected using an adaptation
25 of GPAI, an ad hoc knowledge questionnaire, two psychological scales, un registro de
26 abandon and after practice, and interviews of children and coaches. **Results:** The TRfU group
27 showed statistically significant improvements on skill execution, decision-making, race
28 performance, race involvement, race knowledge, and enjoyment. Furthermore, TRfU group
29 showed statistically significant improvements on skill execution, decision-making, race
30 performance, current abandon ratio and after actual practice ratio compared with the control
31 group. **Conclusion:** El TRfU puede ser un enfoque adecuado a los participantes y al contexto
32 de práctica en vela para mejorar la capacidad de reflexionar y conectar the theoretical
33 knowledge with the motor performance in the race.

34 *Keywords:* TGfU, GPAI, youth sport, sport pedagogy

35

36 A Teaching Games for Understanding Adaptation in Youth Sailing on Performance,
37 Knowledge, and Adherence

38 La sailing es un deporte muy practicado en todo el mundo, from small reservoirs of
39 water to the open ocean, por personas con diferentes objetivos, desde leisure hasta de high
40 performance. However, los entrenadores enseñan sailing with emphasis on performance and
41 en el adiestramiento de inflexible techniques, through a traditional way (Araújo et al., 2014).
42 That is, coaches first teach knowledge out of the water, the sailors then apply such knowledge
43 in a situation in which they seek to improve skill execution and, finally, the participants
44 practice in a race. Nevertheless, la sailing es un deporte con alto nivel de incertidumbre (Saury
45 & Durand, 1998), generado fundamentalmente por la presencia de adversarios, que comparten
46 el espacio de la race y las condiciones del medio (i.e., the wind and sea conditions). El
47 contexto de práctica en sailing exige que los participantes tengan que tomar decisiones con
48 respecto al uso del cuerpo, the centerboard, and the sail, relative to other boats, the wind, sea
49 conditions, and racing rules. Este es el motivo por el que varios autores evidencian la
50 necesidad de un cambio en la enseñanza de la sailing hacia approaches que contemplen las
51 necesidades, posibilidades y finalidades de los participantes y las características contextuales
52 de la propia sailing (e.g., Araújo et al., 2014; Manzanares, Segado, & Menayo, 2016). Bunker
53 and Thorpe (1982) indicaron que la adecuación de la enseñanza a los aspectos determinados
54 en la anterior frase es clave para que los youth mantengan el interés por ser físicamente activos
55 en el futuro.

56 El Teaching Games for Understanding (TGfU) surgió en el contexto escolar para
57 teaching and learning de games (Bunker & Thorpe, 1982). Desde sus orígenes, it fue adaptado
58 a diferentes traditional games, normalmente invasion games, obteniendo resultados positivos
59 (e.g., Jones, Marshall, & Peters, 2010; Olosová & Zapletalova, 2015; Yang, & Lu, 2013). Sin
60 embargo, el TGfU podría ser adaptado a otros deportes en los que el componente táctico ocupa

61 un papel relevante, como es el caso de la sailing, a pesar de no estar contemplada en la game
62 classification de Almond (1986). Dado que los estudios previos que implementaron el TGfU
63 en deportes con alto nivel de incertidumbre reportaron resultados positivos, es acertado pensar
64 su utilidad para la enseñanza de otros deportes en los que la toma de decisión es un
65 componente muy relevante para su performance. Es por esto que a partir de Memmert et al.
66 (2015) parece necesario extender la aplicación de TGfU y su estudio a otros non-game-like
67 sports. Comprobar si una adaptación del TGfU podría ser un enfoque adecuado para la
68 enseñanza de la sailing es necesario y está plenamente justificado.

69 El TGfU fue ideado para priorizar la meaningful learning de decision-making propias
70 del contextual nature of games, en lugar de la teaching of sistematics skill executions and not-
71 game contextualized (Bunker & Thorpe, 1982). El cambio en la way de teaching and learning
72 buscaba que los participantes should begin to see the need for, and relevance of, particular
73 techniques as they are requiered in the game situation. Esto es, understand el why antes del
74 how actuar in each game context. Este enfoque is supported by the constructivist theory of
75 learning (Rovegno & Bandhauer, 1997). Esta teoría promulga que el learning has to be
76 meaningful. Según Vygotsky (1978) meaningful learning ocurre como resultado de un
77 complejo proceso personal de construcción de nuevos conocimientos conscientes para el
78 aprendiz, mientras trata de comprender sus experiencias activamente, a partir de saberes
79 previos, pero inseparables del contexto en el cual se producen. Para que el aprendiz aprenda
80 significativamente, el profesor es responsable de asking questions, posing problems, setting
81 exploratory and discovery tasks, setting tasks in which children choose from and perform a
82 range of movement patterns, helping children be independent learners, insuring success for all
83 children, developing skillfulness, and fostering understanding (Rovegno & Bandhauer, 1997).

84 Studies in sailing reveal a gap in the research of teaching and learning. We only found
85 five studies related to the topic. McCulloch (2004), and McCulloch, McLaughlin, Allison,

110 The participants were 89 children from a sailing school. We randomly selected the
111 school using a systematic sampling. The participants' inclusion criteria were: (a) they only
112 could miss a maximum of two lessons; (b) they couldn't have practiced sailing before; (c) they
113 did not practice sailing out of the sailing school. Finalmente, 67 participants completed the
114 study (45 boys and 22 girls, $M_{age}=9.32$ years old, age range: 8–12 years). Two female sailing
115 coaches took part in the research. A coach was 24 years old, and the other coach was 26 years
116 old. They had 7 and 9 years' experience, respectively, teaching sailing in the same school
117 using a traditional approach. Indeed, the first coach was background of four years using TGfU
118 in traditional games. Participants' parents and the coaches completed informed consent forms,
119 and participants provided their assent. The University's Research Ethics Committee approved
120 the study.

121 **Design**

122 This study followed a mixed-methods data approach. Quantitative data were evaluated
123 using a quasi-experimental pretest-posttest design with control group. Between pre- and
124 posttest, an intervention consisting of teaching sailing with TRfU lessons was carried out. We
125 randomly assigned the participants in two groups. There was a TRfU group (40 participants
126 and the coach with experience in TGfU, inicialmente este grupo estaba formado por 45
127 participants), and a control group (27 participants and the other coach, inicialmente este grupo
128 estaba formado por 44 participants). El grupo control used traditional teaching mode. In the
129 assessment, data of SE, DM, RP, RI, race knowledge, enjoyment, intention to continue
130 practicing sailing, and perceived competence were collected. Qualitative data were evaluated
131 through an interview of the children and the coaches from each group on completion of the
132 study to record their perceptions about the variables we had previously evaluated
133 quantitatively. Además, tras la intervención nosotros recogimos datos de current abandon ratio
134 y un año más tarde de after actual practice ratio.

TGfU adaptation to TRfU for sailing

Nosotros realizamos la adaptación de TGfU a TRfU mediante los siguientes procedimientos: (a) coach' training in TGfU, (b) design of the intervention lessons according to TGfU, and (c) verifying the treatment in accordance with the approach.

Coach' training. As recommended by Metzler (2005), we trained the coach during 12 hours in TGfU. The training consisted of seven procedures. First, we explained the approach. Second, we showed the expected coach behaviour during the intervention. Third, we showed the expected participants behaviour. Fourth, we explained two example lessons and gave feedback. Fifth, we showed the results obtained in studies. Sixth, we clarified doubts. Seventh, together with the coach, we designed a pilot lesson that was conducted by her. We filmed this lesson, which she and we subsequently analyzed, identifying the aspects of her behavior that should be improved. We didn't train the control group coach. Like always, she carried out her intervention through the traditional approach.

Design of the intervention lessons. We designed nine lessons to the TRfU group using los mismos contenidos que el grupo control, pero con diferente orientación y organización. The TRfU group lessons were created following the lesson segments proposed by Metzler (2005): (a) the teacher set up the "race form" so that the participants would work on the tactical aspect similar to a real race; (b) "teaching for understanding" so that the children would reflect on what they had to do and why; (c) "drills for skill" development so that participants would improve their SE; (d) return to "race form" so that the participants would perform a lesson segment very similar to the initial lesson segment; (e) "review and closure" so that the participants would reflect on the integration and understanding of SE and DM. The control group lessons following the traditional segments in sailing: (a) the coach teaches the knowledge out of the water; (b) the sailors then apply such knowledge in a situation in which they seek to improve skill execution; (c) finally, the participants practice in

160 a race.

161 The coach of each group conducted a total of 11 lessons, of which two were pretest-
162 posttest assessment, and nine were intervention lessons (Figure 1). The coaches conducted the
163 lessons at summer from Monday to Saturday, for two weeks during two months. We randomly
164 divided el total de participants of each group in eight subgroups of five participants. Each
165 coach carried out the intervention lessons with su group. So that, each coach repeated the same
166 intervention (dos semanas cada una) eight times, una vez con cada uno de los ocho subgrupos.
167 Each lesson lasted 80 min. These lessons took place completely at sea. Each coach had a
168 monohull dinghy boat of 5 m of length. In each boat there were a coach and five children.
169 Each participant realized each lesson segment hasta que todos los completaron (“race form”,
170 “drills for skills”, “return to race form”). Each child had 4 min. to achieve the goal of the
171 lesson segments indicados en la anterior frase. Meanwhile the rest were the crew y estaban
172 sentados on the boat. Todos a la vez participaron en “teaching for understanding” (10 min.)
173 and “review and closure” (10 min.) segments lesson. In the races form segments, the
174 participants had to choose the best response to overcome a challenge. Nosotros
175 contextualizamos the challenge en el principio de race que implicaba to arrive at a particular
176 place en el menor tiempo possible. For this purpose, the coach limited or allowed the use of
177 the body, the centerboard, or the sail, relative to the wind and the sea conditions. For example,
178 in the second lesson, they had to go from one mark to another in the shortest possible time,
179 only adapting the sail to the direction of the wind. La distancia entre las marks dependió de la
180 intensidad del wind (aproximadamente: 2-7 knots of wind = 50-150 m; 8-13 knots of wind =
181 150-200 m).

182 During the control group lesson segments, the participants had to copy the actions of
183 the coach. The coach told and showed them what and how to do the tasks, and the participants
184 repeated the actions. For example, in the second lesson, the participants went from one mark

185 to another. The coach told and showed them when and how to adapt the sailing to the direction
186 of the wind before they started the lesson segment.

187 **Verifying the treatment.** We implemented two procedures to verify TRfU treatment.

188 First, we asked five TGfU experts to determine whether the lessons were designed in

189 accordance with approach. The selection criteria of these experts were having a Ph.D. related

190 to Physical Education and Sport, and being authors of renowned prestige of more than six

191 years at an international level in implementation and research with TGfU. The experts rated

192 the quantitative (on a scale from 0 to 5) and qualitative overall adequacy of the lessons to the

193 TGfU, as well as the feedback and goals, looking at the lesson plans. Second, nosotros

194 diseñamos an ad hoc checklist from Butler (2014) TGfU benchmarks and an evaluador externo

195 confirmed at the end of each lesson that the coach implemented the lessons according to.

196 Indeed, in order to verify the control group coach entrenó following the traditional approach,

197 we designed an ad hoc checklist according to, and another evaluador externo confirmed at the

198 end of each lesson that the coach implemented the lessons following that approach.

199 **Data Collection**

200 The children participated in a 75 min. race, performing an Olympic triangle race for the

201 pretest-posttest assessment. Both assessments were performed on Saturday in similar

202 conditions of wind (-13 knots of wind), and humidity (40%-60%).

203 **SE, DM, RP, and RI.** We adapted the Game Performance Assessment Instrument

204 (GPAI; Oslin, Mitchell, & Griffin, 1998) by Race Performance Assessment Instrument (RPAI)

205 to assess components related with sailing races. It was adapted by consulting 10 expert

206 coaches in youth sailing with more than 10 years' experience, and six researchers with more

207 than eight years' experience in the use of the GPAI in different games. The adaptation

208 consisted of defining the criteria that determined the correct SE and the appropriate DM for

209 each course. We organized five meetings for a total of 10 hours to reach a consensus.

210 Subsequently, the high reliability obtained by the observers and in the observation ratified the
211 validity of the adaptation.

212 Two observers used the RPAI to assess SE and DM. Assessment means that each
213 observer classified each children' SE and DM either as appropriate or inappropriate for each
214 content (close hauled, beam reach, broad reach, running, rudder, tack, gybe, and beat), as a
215 function of our definitions of appropriate for each component (SE and DM) in the contents
216 (Figure 2). They added the number of appropriate and inappropriate SE and DM. Correct SE
217 corresponded to an efficient performance of the selected skills. Adequate DM included making
218 appropriate choices about what to do during the race. We defined SE criteria according to how
219 the body, centerboard, and sail were used and DM criteria according to the positioning of the
220 boat with respect to the wind and sea conditions. The observers gathered the data while
221 watching the live race. Each observer observed 5 children, cada uno on completion the
222 Olympic triangle race (approximately 15 min.). Observation was systematic because the
223 observers assessed SE on the sailing boat at the beginning and the end of each course and DM
224 across the courses.

225 The observers, who were coaches with more than ten years' experience in teaching
226 sailing, were trained for 25 hours in the use of the RPAI. We verified observer reliability in
227 RPAI use by measuring intra-rater reliability of the observation of a 30 min. race fragment,
228 other than the posttest research race. We verified observation reliability by measuring inter-
229 rater reliability from the research race, both pre- and posttest. We obtained the reliability of the
230 observation of appropriate/inappropriate SE and DM in the seven contents. That is, the
231 observers assessed the same SE and DM as appropriate or inappropriate. Observer reliability
232 was greater than 91%, with a Kappa coefficient of .91. Observation reliability was over 90%,
233 with a Kappa coefficient of .88.

234 From the sum of the appropriate and inappropriate SE and DM, we obtained the skill
235 execution index (SEI) and decision-making index (DMI) through the formula used in both
236 cases (Oslin et al., 1998): Number of appropriate SE or DM / number of inappropriate SE or
237 DM. We obtained the RP from the formula: $[\text{SEI} + \text{DMI}] / 2$, and the RI from the sum of the
238 appropriate and inappropriate SE and DM.

239 **Race knowledge.** We designed an ad hoc test from the contents addressed in the
240 lessons and in collaboration with the coaches, following the proposal of French and Thomas
241 (1987). The test consisted of 14 questions related to SE (7), and DM (7), with four response
242 options (e.g., “Is there anything in the sail to help you to go correctly in each course? (a) mast,
243 (b) boom, (c) sheet, or (d) luff and tell-tales”). The children required about 15 min. to
244 complete the questionnaire in writing.

245 **Enjoyment and perceived competence.** Participants responded to the scale validated
246 by Arias, Alonso, and Yuste (2013). This instrument had seven items, four items referring to
247 feeling good or considering oneself to be good at sailing (Cronbach's $\alpha=.95$): 1. After
248 sailing, I felt pretty competent; 3. I think I am pretty good at sailing; 5. I am satisfied with my
249 performance in this sport; 7. I am pretty skilled at sailing; and three items referring to
250 enjoyment of this sport (Cronbach's $\alpha=.98$): 2. I enjoyed sailing very much; 4. Sailing was
251 fun; 6. I would describe this sport as very interesting. The scale was 5-point Likert-type,
252 ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The participants responded durante 5
253 min.

254 **Intention to continue practicing sailing.** Participants completed the scale of intention
255 to be physically active (Arias, Castejón, & Yuste, 2013). This instrument had five items
256 referring to the practice of sailing and the intention to continue sailing (Cronbach's $\alpha=.95$):
257 1. I'm interested in developing my physical fitness by practicing sailing to feel good; 2.
258 Outside of the lessons, I like to sail; 3. After I finish the present intervention, I would like to

259 take part in sailing club training; 4. After I finish the present intervention, I would like to be
260 physically active practicing sailing; 5. I often sail in my free time. The scale was 5-point
261 Likert-type, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The participants
262 responded durante 5 min.

263 The participants completed the three above questionnaires individually and
264 anonymously at the pretest-posttest assessment. The children completed the questionnaire in
265 writing directly after sailing, in a classroom on the seashore. The principal investigator
266 explained that they were not tests and that the participants should complete them in the
267 coaches' absence, but in the presence of the principal investigator.

268 **Current abandon ratio and after actual practice ratio.** Al final de la intervención,
269 nosotros registramos el número de participantes de cada grupo que abandonaron la
270 intervención and calculated the ratio. Al año siguiente de la intervención, we phoned the
271 parents asking them si los children continuaron practicing sailing in this school or another. We
272 counted the participants of each group and calculated the ratio.

273 **Children and coaches' perception.** We conducted children and coaches semi-
274 structured interviews at the posttest assessment. The first researcher interviewed children in
275 the groups in which they had worked for the duration of the study (e.g., "Do you seem to have
276 fun in these lessons? Why?"). We targeted an individual interview to each coach (e.g., "Do
277 you think that they were competent practicing sailing? Why?"). Although all interviews
278 addressed the same variables, the focus of questions and the language differed depending on
279 the interviewee. The goal of the interviews was to corroborate the information obtained from
280 the SE, DM, RP, RI, race knowledge, enjoyment, intention to continue practicing sailing, and
281 perceived competence y profundizar en los posibles motivos de su percepción. The duration of
282 children' interview was 25 min., and of the coaches' interview 15 min. The interviews were
283 recorded on a tape recorder.

Data Analysis

285 **Treatment verification.** First, to determine whether the lessons were designed in
286 accordance with TGfU, we counted the experts' quantitative values to verify that (a) the item
287 received a mean rating of at least three or higher; and (b) at least four of the six judges ranked
288 the items as a three or higher. Thereafter, we read and contrasted the experts' suggestions
289 about the adequacy of the lessons, feedback, and goals of the TGfU. Second, we calculated the
290 percentage of TGfU premises achieved by the coach in each lesson according the evaluador
291 externo mediante la checklist to confirm that the coach implemented the lessons following the
292 approach. We did the same with the control group coach to know whether she implemented
293 the lessons using the traditional approach.

294 **Data assessment.** Statistical analysis of the quantitative data on SE, DM, RP, RI, race
295 knowledge, enjoyment, intention to continue practicing sailing, current abandon ratio, after
296 actual practice ratio, and perceived competence was conducted using SPSS v. 22.0 for
297 Windows (SPSS, Inc., Chicago, IL). Descriptive analyses, through means and standard
298 deviations, were calculated for each variable. We determined the normality of the data through
299 the Kolmogorov-Smirnov test. We used *T*-test: (a) to determine possible significant pre-
300 posttest differences in the means of the analyzed variables in each group (pre-posttest results),
301 and (b) to determine possible significant group differences in the means of the analyzed
302 variables (groups differences results). Indeed, effect sizes (*ES*) for significant differences of
303 each variable were also determined. We checked if the results were influenced by the effect of
304 randomization of the participants' distribution using the *T*-test with pretest data, and of the
305 intervention moment using ANOVA with the improvement data of participants' subgroups in
306 each group. The interviews were analyzed using the categories corresponding to: SE, DM, RP,
307 RI, race knowledge, enjoyment, intention to continue practicing sailing, and perceived
308 competence. All the interviews were transcribed, coded, and analyzed inductively, classifying

309 the response to each variable as positive or negative. We performed the analysis concurrently
310 with data transcription from tape recorder to paper. We read the transcriptions to get a sense of
311 their scope and to detect recurring topics for emerging themes. Data were coded numerically
312 in categories, which were applied to text segments.

313 **Results**

314 **Treatment Verification**

315 The six experts ranked each item more than three: Adequacy of the TGfU approach,
316 feedback, and goals. The evaluador externo reported the coach implemented the intervention
317 following 100% of TGfU approach premises in each lesson. That is, according to the experts,
318 the lessons were designed and implemented following the TGfU approach. The other
319 evaluador externo also confirmed the control group coach implemented the traditional
320 approach in each lesson (100%).

321 **Quantitative data**

322 **TRfU group pre-posttest results.** The results showed statistically significant
323 improvements to the posttest compared with the pretest assessment in SE, DM, RP, RI, race
324 knowledge, and enjoyment (Table 1). The great practical significance of the outcomes in
325 SE=1.41, DM=1.38, RP=1.50, RI=1.80, race knowledge=2.07, enjoyment=.64 ratified the
326 statistically significant differences. That is, there was strong evidence that, after the
327 intervention, the participants improved in SE, DM, RP, RI, race knowledge, and enjoyment
328 with TRfU approach.

329 **Control group pre-posttest results.** The results showed statistically significant
330 improvements to the posttest compared with the pretest assessment in RI, race knowledge,
331 enjoyment and perceived competence (Table 1). The great practical significance of the
332 outcomes in RI=1.46, race knowledge=4.08, enjoyment=.78, perceived competence=.63

333 ratified the statistically significant differences. That is, after the intervention, the participants
334 improved in RI, race knowledge, enjoyment, and perceived competence.

335 **Groups differences results.** The TRfU group showed statistically significant
336 improvements compared with the control group on SE, DM, and RP (Table 1). Also, there
337 were statistically significant differences in current abandon ratio $t_{89}=-3.38, p=.001$, and after
338 actual practice ratio $t_{89}=3.49, p=.001$. The current abandon ratio fue mayor en el control group
339 ($M=.40, SD=.50$) que en el TRfU group ($M=.11, SD=.32$). Por el contrario, the after actual
340 practice ratio fue mayor en el TRfU group ($M=.36, SD=.48$), en comparación con el control
341 group ($M=.06, SD=.25$). The great practical significance of the outcomes in $SE=1.13$,
342 $DM=1.11$, $RP=1.20$, current abandon ratio=.87, after actual practice ratio=.89 ratified the
343 statistically significant differences. This meant that the TRfU intervention was more effective
344 in SE, DM, RP, current abandon ratio, and after actual practice ratio, as we obtained values of
345 *ES* above 1.

346 **Qualitative data**

347 All children and coaches' interviews said improvements in SE, DM, RP, RI, race
348 knowledge, enjoyment, intention to continue practicing sailing, and perceived competence,
349 independently of the intervention group. However, el tipo de respuesta of each group
350 evidenció las diferencias encontradas en los resultados cuantitativos (Figure 3).

351 **Quality of data**

352 The randomization of the participant's distribution and intervention moment didn't
353 influence the results ($p>.05$), except to perceived competence comparing pretest data. TRfU
354 group reported more perceived competence in the pre-test than control group (Table 1).

355 **Discussion**

356 The purpose of the present work was to know whether an intervention using the TRfU
357 led the participants to improve on SE, DM, RP, RI, race knowledge, enjoyment, intention to

358 continue practicing sailing, current abandon ratio, after actual practice ratio, and perceived
359 competence. The results ratified the first hypothesis, as improvements in SE, DM, RP, and RI
360 were obtained. However, the second hypothesis was partial verified because results showed
361 significant improvement of race knowledge and enjoyment. Además, there were diferencias en
362 SE, DM, RP, current abandon ratio, and after actual practice ratio al comparar las mejoras con
363 el grupo control. Esto significó que el TRfU permitió una mejora evidente en las variables
364 relacionadas con el rendimiento. Los resultados en las variables DM and GP coincidieron con
365 los de intervenciones previas using TGfU (Allison & Thorpe, 1997; Balakrishnan,
366 Rengasamy, & Aman, 2011; Conte, Moreno-Murcia, Pérez, & Iglesias, 2013; Harvey,
367 Cushion, Wegis, & Massa-Gonzalez, 2010; Robinson & Foran, 2011; Turner, 1996; Turner &
368 Martinek, 1999; Yang & Lu, 2013). Indeed, in our study the participants improved in SE in
369 contrast to previous studies (Allison & Thorpe, 1997; Robinson & Foran, 2011; Turner, 1996).
370 Los resultados reportados ratificaron los encontrados by Morales-Belando and Arias-Estero (in
371 press) en sailing sin grupo control, salvo en cuanto al comportamiento de RI. De modo que los
372 improvements found followed the assumption defended by TGfU, que establece que el
373 enfoque posibilita que los participantes mejoren su rendimiento a partir de las mejoras en SE y
374 DM (Bunker & Thorpe, 1982). Según la teoría constructivista, esto pudo ocurrir como
375 consecuencia de que las race forms diseñadas en la intervención exigieran a los participantes
376 que activamente fueran construyendo su propio conocimiento como resultado de la
377 interpretación que hacían del contexto de la race en un ciclo en el que ellos adapt new
378 knowledge in order to fit it to what they already know (Rovegno & Kirk, 1995). La
379 entrenadora del TRfU group reconoció en la entrevista que tuvo que asistir a los participantes
380 para que aprendieran a través de la interpretación de la race in each lesson segment y no
381 directamente de ella, tal y como sugirieron Davis and Sumara (1997). Sin embargo, there
382 weren't improvements en todas las variables relacionadas con la adherencia por diversos

383 motivos ajenos a la intervención, como por ejemplo, la motivación previa de los participantes
384 por practicar sailing y/o por el comportamiento poco estable de estas variables en edades
385 tempranas (Wankel & Kreisel, 1985).

386 La mejora de los participantes del TRfU group en SE, DM and RP pudo ser debida a
387 que mediante el TGfU the participants understand the necessity to use the skill and when to
388 use it because they become tactically aware (Hopper, 2002), al igual que en el trabajo de
389 Turner and Martinek (1999). Tanto los participantes, como la entrenadora del TRfU group
390 ratificaron esta idea. Este hallazgo pudo deberse a que los participantes participaron en race
391 forms similares a real race durante los lessons segments primero y cuarto, practicaron la skill
392 execution en el tercer segmento y reflexionaron sobre sus decisiones en los segmentos
393 segundo y último (Metzler, 2005). Según Bunker and Thorpe (1982) practicar en race forms
394 similares a real race permite mejorar el RP, dado que éste último requiere skill proficienci as
395 well as tactical understanding en el contexto de práctica (Oslin et al., 1998). Además, el TRfU
396 group pudieron improve more in RP because the tactical component is determinant in sailing
397 performance due to the changeable environment of that sport (Manzanares, et al., 2016; Saury
398 & Durand, 1998). Por el contrario, la entrenadora del grupo control indicó que los
399 participantes también aprendieron conceptos, pero no mejoraron en la práctica, como
400 efectivamente demostraron los resultados cuantitativos. Esto es, los participantes aprendieron
401 la teoría, pero ellos didn't understand why they did the skill and it reduced the level of
402 achievement (Turner, 1996), porque ellos practicaron la skill execution in isolation (Hopper,
403 2002). Este pudo ser el principal motive por el que además, los participants of the control
404 group no mejoraron en DM and RP. En las entrevistas ellos reconocieron que la entrenadora
405 les decía lo que tenían que hacer y no mencionaron haber comprendido the lesson segments.
406 La entrenadora lo reconoció. Ella pensaba que era la mejor forma para que los alumnos
407 aprendieran a tomar decisiones, como ratificó en la entrevista, a pesar que no ocurriera

408 atendiendo a los resultados cuantitativos. For that, the participants del control group didn't
409 increase significativamente in RP. Ellos declararon haber tenido dificultades para finalizar la
410 race. De modo que parece que la estructura de lesson propuesta para TRfU fue mucho más
411 apropiada que la tradicional, incluso para que mejoraran the SE.

412 En teoría, las mejoras del TRfU group en RI pudieron ser por una mejora en SE, DM y
413 RP (French & Thomas, 1987). La implicación en la práctica es una actitud relevante para tener
414 mayor predisposición hacia construir nuevos aprendizajes (Rovegno & Bandhauer, 1997).
415 However, el control group también obtuvo mejoras significativas aunque presentó valores de
416 RI inferiores a las del TRfU group. Indeed, comparando los resultados de ambos grupos no
417 hubieron diferencias significativas. La ausencia de diferencias entre grupos pudo ser debido a
418 que the RI surge como consecuencia de sumar todas las acciones realizadas por los
419 participantes, tanto correctas como incorrectas (Oslin, et al., 1998). El grupo control no mejoró
420 en SE and DM, pero realizaron muchas SE incorrectas y DM inadecuadas. La entrenadora del
421 grupo control indicó que no había observado mejoras en la práctica. Los participantes sabían
422 to execute lo que les enseñó la entrenadora, pero tuvieron problemas al enfrentarse a la race
423 sin la ayuda de la entrenadora, tal y como ellos evidenciaron en la entrevista.

424 Los resultados mostraron mejoras para el TRfU group in race knowledge because
425 according to Turner and Martinek (1999), el TGfU es un adecuado approach para el desarrollo
426 cognitivo de los niños. However, our study no mostró diferencias en el conocimiento entre
427 ambos grupos. According la teoría constructivista, the learners learn to the adaptation of the
428 previous knowledge with the new (Rovegno & Bandhauer, 1997). Dado que en el present
429 work none of the participants had previous knowledge in sailing and the experience was new
430 for all of them, en las sesiones ambas entrenadoras enseñaron basic concepts that the children
431 must learn. Therefore, a high knowledge in both groups could be normal. A pesar de esto, las
432 entrevistas evidenciaron diferencias. Tanto la entrenadora como los participantes del TRfU

433 group hicieron referencia a un aprendizaje útil para saber navegar porque entendieron lo que
434 tenían que hacer y dedicaron tiempo a la reflexión. Por el contrario, la entrenadora del grupo
435 control sólo se refirió a conceptos teóricos que los participantes no supieron aplicar en la race.

436 Ambos grupos mejoraron en enjoyment, pero no en intention to continue practicing
437 sailing, porque como los participantes indicaron en las entrevistas, ellos practicaron
438 voluntariamente este nuevo deporte. Tener la posibilidad de elegir la actividad a realizar es un
439 indicador relacionado con el aumento de la motivación (Deci & Ryan, 1985). Por ello, los
440 participantes de ambos grupos presentaron altos valores en el pretest del cuestionario de
441 intention to continue practicing sailing. Este también pudo ser el motivo por el que no
442 hubieron diferencias estadísticamente significativas entre ambos grupos. De modo que, los
443 resultados obtenidos en enjoyment and intention to continue practicing sailing deben ser
444 atribuidos a otros factores externos y no al tipo de intervención. Ellos hicieron referencia en la
445 entrevista a que sailing es un deporte extraescolar (Robinson & Foran, 2011), que decidieron
446 practicar voluntariamente durante las vacaciones de verano (Deci & Ryan, 1985), era un
447 outdoor and adventure education program in the sea, en un unconventional educational
448 context. Sin embargo, los resultados sobre current abandon ratio, and after actual practice
449 ratio, evidenciaron una mayor adherencia en el caso del TRfU group. Este resultado fue muy
450 importante considerando que uno de los objetivos fundamentales para cualquier youth sport
451 program or school es que los mismos desarrollen afiliación al deporte. El TGfU podría ser en
452 sailing un teaching approach clave para favorecer dicha adherencia (Memmert et al., 2015).

453 El grupo TRfU no mejoró en competencia percibida al contrario que el grupo control
454 and as the theoretical proposal highlight (Bunker & Thorpe, 1982), aunque no existieron
455 diferencias entre ambos grupos. Esto es, los participantes del TRfU group no percibieron un
456 incremento en la satisfacción de sus expectativas relacionadas con su competencia porque
457 inicialmente fueron elevadas (Álvarez, Balaguer, Castillo, & Duda, 2009). Los participantes

458 del TRfU grupo manifestaron unos valores muy altos en el pretest en comparación con los del
459 grupo control. Por este motivo, los grupos no fueron homogéneos inicialmente en cuanto a
460 competencia percibida, aunque la medida post en el grupo TRfU fue mayor que la del grupo
461 control. La entrenadora manifestó que ahora veía a los participantes con más competencia
462 percibida porque habían aprendido mediante race forms que imitaban las condiciones de las
463 races. Por el contrario, el grupo control mejoró significativamente en perceived competence,
464 pero su entrenadora evidenció, que a pesar que vio que los participantes tenían un mayor
465 sentimiento de competencia percibida que al principio, ellos tenían mucho que mejorar en la
466 race. Según la literatura consultada, la competencia percibida resulta a partir, no sólo de la
467 puesta en escena de conocimientos y procedimientos, sino también de actitudes, sentimientos
468 y el contexto (Ulrich, 1987). Factores que pudieron influir en los resultados.

469 Los resultados reportados en el estudio de Morales-Belando and Arias-Estero (in press)
470 y los del presente trabajo corroboran, hasta la fecha, que una adaptación del TGfU (i.e., TRfU)
471 puede ser utilizada para la enseñanza de youth sailing, dado que los participantes
472 pertenecientes al TRfU group mejoraron tras la intervención y en comparación con el control
473 group. A partir de los resultados y en relación con la teoría constructivista, la adaptación del
474 TGfU puede ser un enfoque adecuado a los participantes y el contexto de práctica para mejorar
475 la capacidad de reflexionar y conexionar the theoretical knowledge with the motor
476 performance in the race (Rovegno & Bandhauer, 1997). El presente trabajo invita a
477 responsables de youth sailing, universidades y centros de formación de entrenadores de sailing
478 para que el TGfU pueda ser un modelo de enseñanza para los entrenadores. Igualmente, it
479 incita a la comunidad científica con interés en TGfU a que reconozca su aplicación a nuevos
480 non-game-like sports, como la sailing. Este trabajo sienta las bases para la aplicación del
481 TGfU a nuevos non-game-like sports, tal y como demandaron Memmert et al. (2015).
482 Además, los resultados pueden sentar un precedente a la hora de revisar la clasificación de

483 Almond (1986) en base a la complejidad táctica de los non-game-like sports, atendiendo a las
484 características de compañeros, adversarios y contexto. No obstante, los resultados deben
485 analizarse con precaución, dado que la intervención sólo fue realizada in a sailing school y los
486 efectos de las variables relacionadas con la adherencia no fueron evidentes. Son necesarios
487 nuevos estudios que corroboren los resultados del presente trabajo y utilicen nuevos
488 procedimientos para recoger información sobre la intención de práctica futura de los
489 participants.

490 **What does this article add?**

491 This study contributes to the literature in five ways. First, it provides the first
492 investigation of TGfU que: (a) fue una intervención repetida en el tiempo con eight groups
493 randomly assigned, (b) the coach tuvo background of four years using TGfU in traditional
494 games, (c) no sólo evaluó variables relacionadas con race performance, and (d) tuvo en cuenta
495 the current abandon ratio and the after actual practice ratio. Second, este es el primer quasi-
496 experimental with control group study que adaptó el TGfU a un non-game-like sport,
497 demonstrating the efficacy of the intervention on the children performance, learning, and
498 adherence in youth sailing. Third, el article podría sentar un precedente para la adaptación del
499 TGfU a otros non-game-like sports similares, donde el DM component es tan relevante como
500 en youth sailing. Fourth, los resultados podrían beneficiar a los learners, coaches, and sailing
501 schools por los siguientes motivos: (a) los participantes disponen de un enfoque que permite
502 adecuar la enseñanza a sus necesidades, posibilidades y finalidades, considerando las
503 características contextuales de la propia sailing; (b) desde un punto de vista práctico, los
504 coaches disponen de un enfoque que establece pautas concretas para organizar las sailing
505 lessons con respecto a los tactical and technical goals, the feedback and modificaciones a
506 introducir en las race forms (Figure 1); and (c) las sailing schools disponen de un enfoque para
507 reorientar sus teaching-learning syllabus, que posibilite el aprendizaje e implicación de los

508 participantes. Fifth, el trabajo demostró que el TGfU puede favorecer el aumento del interés de
509 los usuarios por continuar practicando sailing en el future.
510

511 References

- 512 Allison, S., & Thorpe, R. (1997). A comparison of the effectiveness of two approaches to
513 teaching games within physical education. A skills approach versus a games for
514 understanding approach. *The British Journal of Physical Education*, 28, 9-13.
- 515 Almond, L. (1986). Asking teachers to research. In R. Thorpe, D. Bunker, & L. Almond
516 (Eds.), *Rethinking Games Teaching* (pp. 35-44). Loughborough, UK: University of
517 Technology.
- 518 Álvarez, M.S., Balaguer, I., Castillo, I., & Duda, J. (2009). Coach autonomy support and
519 quality of sport engagement in young soccer players. *The Spanish Journal of*
520 *Psychology*, 12, 138-148. doi:10.1017/S1138741600001554
- 521 Araújo, D., Davids, K., Diniz, A., Rocha, L., Santos, J.C., Dias, G., & Fernandes, O. (2014).
522 Ecological dynamics of continuous and categorical decision-making: The regatta start
523 in sailing. *European Journal of Sport Science*, 15, 195-202.
524 doi:10.1080/17461391.2014.928749
- 525 Arias, J.L., Alonso, J.I., & Yuste, J.L. (2013). Psychometric properties and results of
526 enjoyment and perceived competence scale in youth basketball. *Universitas*
527 *Psychologica*, 12, 945-956. doi:10.11144/Javeriana.UPSY12-3.ppra
- 528 Arias, J.L., Castejón, F.J., & Yuste, J.L. (2013). Psychometric properties of the intention to be
529 physically active scale in primary education. *Revista de Educación*, 362, 485-505.
530 doi:10.4438/1988-592X-RE-2013-362-239
- 531 Balakrishnan, M., Rengasamy, S., & Aman, M.S. (2011). Effect of teaching games for
532 understanding approach on student's cognitive learning outcome. *World Academy of*
533 *Science, Engineering and Technology*, 77, 961-963.
- 534 Bunker, D., & Thorpe, R. (1982). A model for the teaching of games in secondary schools.
535 *Bulletin of Physical Education*, 18, 5-8.

- 536 Butler, J. (2014). TGfU - Would you know it if you saw it? Benchmarks from the tacit
537 knowledge of the founders. *European Physical Education Review*, 20, 465-488.
538 doi:10.1177/1356336X14534356
- 539 Conte, L., Moreno-Murcia, J.A., Pérez, G., & Iglesias, D. (2013). Traditional and
540 comprehensive comparison methodology in practice basketball. *Revista Internacional
541 de Medicina y Ciencias de la Actividad Física y el Deporte*, 13, 507-523.
- 542 Davis, A., & Sumara, J. (1997). Cognition, complexity and teacher education. *Harvard
543 Educational Review*, 67, 105-125. doi:10.17763/haer.67.1.160w00j113t78042
- 544 Deci, E.L., & Ryan, R.M. (1985). The general causality orientations scale: Self-determination
545 in personality. *Journal of Research in Personality*, 19, 109-134. doi:10.1016/0092-
546 6566(85)90023-6
- 547 French, K.E., & Thomas, J.R. (1987). The relation of knowledge development to children's
548 basketball performance. *Journal of Sport Psychology*, 9, 15-32. doi:10.1123/jsp.9.1.15
- 549 Harvey, S., Cushion, C.J., Wegis, H.M., & Massa-Gonzalez, A.N. (2010). Teaching games for
550 understanding in american high-school soccer: A quantitative data analysis using the
551 game performance assessment instrument. *Physical Education and Sport Pedagogy*,
552 15, 29-54. doi:10.1080/17408980902729354
- 553 Hopper, T. (2002). Teaching games for understanding: The importance of student emphasis
554 over content emphasis. *Journal of Physical Education, Recreation, & Dance*, 73, 44-
555 48. doi:10.1080/07303084.2002.10607847
- 556 Jones, R., Marshall, S., & Peters, D. (2010). Can we play a game now? The intrinsic benefits
557 of TGfU. *European Journal of Physical & Health Education*, 4, 57-63.
- 558 Manzanares, A., Segado, F., & Menayo, R. (2016). A protocol for recording visual and motor
559 behaviour for scientific support in the teaching and training of sailing in a simulator.
560 *Journal of Navigation*, 69, 582-592. doi:10.1017/S0373463315000855

- 561 McCulloch, K., McLaughlin, P., Allison, P., Edwards, V., & Tett, L. (2010). Sail training as
562 education: More than mere adventure. *Oxford Review of Education*, 36, 661-676.
563 doi:10.1080/03054985.2010.495466
- 564 McCulloch, K. (2004). Ideologies of adventure: Authority and decision making in sail
565 training. *Journal of Adventure, Education and Outdoor Learning*, 4, 185-197.
566 doi:10.1080/14729670485200531
- 567 Memmert, D., Almond, L., Bunker, D., Butler, J., Fasold, F., Griffin, L., ... Furley, P. (2015).
568 Top 10 research questions related to teaching games for understanding. *Research*
569 *Quarterly for Exercise and Sport*, 86, 347-359. doi:10.1080/02701367.2015.1087294
- 570 Metzler, M.W. (2005). Tactical games: Teaching games for understanding. In M.W. Metzler
571 (Ed.), *Instructional models for physical education* (pp. 401-438). Scottsdale, AZ:
572 Holcomb Hathaway.
- 573 Morales-Belando, M.T., & Arias-Estero, J.L. (in press). Influence of teaching games for
574 understanding on game performance, knowledge, and variables related to adherence in
575 youth sailing. *Journal of Teaching in Physical Education*.
- 576 Olosová, G., & Zapletalova, L. (2015). School basketball: Teaching games for understanding
577 or technical approach? *Fiep Bulletin on-line*, 85, 309-311. doi:10.16887/85.a1.74
- 578 Oslin, J., Mitchell, S., & Griffin, L. (1998). The game performance assessment instrument
579 (GPAI): Development and preliminary validation. *Journal of Teaching in Physical*
580 *Education*, 17, 231-243. doi:10.1123/jtpe.17.2.231
- 581 Robinson, D., & Foran, A. (2011). Pre-service physical education teachers' implementation of
582 TGfU tennis assessing elementary students' game play using the GPAI. *Phenex*
583 *Journal/Revue Phéneps*, 3, 1-19.

- 584 Rovegno, I. y Bandhauer, D. (1997). Psychological dispositions that facilitated and sustained
585 the development of knowledge of a constructivist approach to physical education.
586 *Journal of Teaching in Physical Education, 16*, 136-154. doi:10.1123/jtpe.16.2.136
- 587 Rovegno, I., & Kirk, D. (1995). Articulations and silences in socially critical work on physical
588 education: Toward a broader agenda. *Quest, 47*, 447-474.
589 doi:10.1080/00336297.1995.10484169
- 590 Saury, J., & Durand, M. (1998). Practical knowledge in expert coaches: On-site study of
591 coaching in sailing. *Research Quarterly for Exercise and Sport, 69*, 254-266.
592 doi:10.1080/02701367.1998.10607692
- 593 Turner, A. (1996). Teaching for understanding: Myth or reality. *Journal of Physical*
594 *Education, Recreation, & Dance, 67*, 46-55. doi:10.1080/07303084.1996.10607374
- 595 Turner, A., & Martinek, T. (1999). An investigation into teaching games for understanding:
596 Effects on skill, knowledge, and game play. *Research Quarterly for Exercise and*
597 *Sport, 70*, 286-296. doi:10.1080/02701367.1999.10608047
- 598 Ulrich, B. (1987). Perceptions of physical competence, motor competence, and participation in
599 organized sport: Their interrelationships in young children. *Research Quarterly for*
600 *Exercise and Sport, 58*, 57-67. doi:10.1080/02701367.1987.10605421
- 601 Vygotsky, L. (1978). Interaction between learning and development. *Readings on the*
602 *Development of Children, 23*, 34-41.
- 603 Wankel, L.M., & Kreisel, P.S. (1985). Factors underlying enjoyment in youth sports: Sport
604 and age group comparisons. *Journal of Sport Psychology, 7*, 51-64.
605 doi:10.1123/jsp.7.1.51
- 606 Yang, C., & Lu, P. (2013). The experimental study of teaching games for understanding in
607 college football teaching. In H. Tan (Ed.), *International Workshop on Computer*
608 *Science in Sports* (pp. 94-98). Wuhan, China: Atlantis Press.

609 Table 1

610 *Means, Standard Deviations, and Significant Differences of the Variables in the TRfU and control groups*

Variable	Intra-group differences												Inter-group differences	
	TRfU group						Control group							
	Pretest		Posttest		<i>t</i>	<i>p</i>	Pretest		Posttest		<i>t</i>	<i>p</i>		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
SE	.02	.08	3.30	.30	3.92	.00**	.03	.08	1.00	3.47	1.46	.16	2.16	.03*
DM	.01	.05	1.67	.71	3.86	.00**	.05	.17	.30	.63	1.97	.06	3.18	.00**
RP	.02	.05	2.48	.75	4.19	.00**	.04	.09	.66	1.81	1.78	.09	2.72	.01*
RI	.05	.17	7.80	.74	5.02	.00**	.14	.42	4.56	6.58	3.55	.00**	1.66	.10
Race knowledge	3.86	2.67	9.86	.02	3.20	.02*	4.17	.98	9.83	2.23	4.95	.00**	.15	.88
Enjoyment	4.45	.48	4.70	.41	2.97	.00**	4.16	.56	4.52	.49	3.26	.00**	-.83	.41
Intention to continue practicing sailing	3.87	.47	4.01	.65	1.29	.20	3.47	.98	3.67	.93	1.40	.17	-.35	.73
Perceived competence	4.49	.35	4.64	.43	1.80	.08	4.12	.63	4.43	.54	2.47	.02*	-1.11	.27

611 *Note.* SE: Skill execution. DM: Decision-making. RP: Race performance. RI: Race involvement. Statistical significant differences: * $p < .05$.612 ** $p < .00$.

613

Lesson	Tactical goal	Technical goal	Teaching for understanding	Modification
1. Pretest	-	-	-	-
2. The rudder	To adjust the rudder according to the wind and sea conditions para navegar más rápido.	- To sit opposite the sail. - Coger la tiller sólo con una mano por su extremo.	¿Qué puede influir sobre el rudder para ir más rápido? ¿Por qué? ¿Cómo podéis ajustar el rudder según el wind?	Two big marks in perpendicular to the wind para que les sea más fácil point to it.
3. Course: beam reach	Decidir el course a adoptar cuando el wind come over an abeam.	- To sit opposite the sail. - To get the luff deje de flapping.	¿Qué habéis hecho para llegar a la mark en el menor tiempo? ¿Por qué? ¿En qué os podéis fijar para ir más rápidos? ¿Qué podéis modificar?	Two marks in perpendicular to the wind.
4. Turn the mark tack	Elegir la forma de turn the mark para hacerlo en el menor tiempo according to the wind direction.	- To move fuerte the tiller towards the main sail. - Cambiar de lado cuando la sail cambie. - Mirar hacia delante. No soltar the tiller.	¿En qué mark habéis dado la vuelta más rápidamente? ¿Por qué? ¿Qué habéis hecho para turn the mark?	Two marks in perpendicular to the wind one nearer to the wind.
5. Turn the mark gybe.	Elegir la forma de turn the mark para hacerlo en el menor tiempo according to the wind direction.	- To move slowly the tiller closer to the skipper. - Cambiar de lado antes de que la sail cambie. Mirar hacia delante. No soltar la tiller.	¿En qué mark habéis dado la vuelta más rápidamente? ¿Por qué? ¿Qué habéis hecho para turn the mark?	Two marks in perpendicular to the wind one farer to the wind.
6. Course: Close hauled	Decidir el course a adoptar cuando el wind come over a lateral bow.	- To sit opposite the sail. - The sail as close to an upwind direction as possible.	¿Qué habéis hecho para llegar a la mark en el menor tiempo? ¿Por qué? ¿En qué os podéis fijar para ir más rápidos? ¿Qué podéis modificar?.	Two marks, una windward y otra en diagonal leeward.
7. Course: Broad reach	Decidir el course a adoptar cuando el wind come over a quarter stern.	- To sit opposite the sail. - To get the luff deje de flapping.	¿Qué habéis hecho para llegar a la mark en el menor tiempo? ¿Por qué? ¿En qué os podéis fijar para ir más rápidos? ¿Qué podéis modificar?	Two marks, una windward y otra en diagonal leeward.
8. Course: Running	Decidir el course a adoptar cuando el wind come over the stern.	- To sit opposite the sail. - To put the sail at 90° to the boat.	¿Qué habéis hecho para llegar a la mark en el menor tiempo? ¿Por qué? ¿En qué os podéis fijar para ir más rápidos? ¿Qué podéis modificar?	Two marks, alineadas windward and leeward.
9. Beat	To decide cuantos beats do according to the wind para navegar más rápido	- To sit opposite the sail. The sail as close to an upwind direction as possible. - Empujar fuerte el timón hacia el lado de la sail. Cambiar de lado cuando la sail cambie. Mirar hacia delante. No soltar la tiller.	¿Por dónde venía el wind? ¿En qué course ibais? ¿Cómo podíais llegar a la mark en el menor tiempo? ¿Por qué?	Two marks, alineadas windward and leeward.
10. Centerboard	To adjust the centerboard according to the wind direction para navegar más rápido.	- To put the centerboard: Raised 1/3 according to beam reach. Fully draft according to close hauled. Raised 2/3 according to broad reach. Raised 3/3 according to running.	¿Es necesario subir o bajar la centerboard? ¿Podría afectar en algo? ¿Por qué la podéis modificar? ¿Cómo la podéis modificar para llegar a la mark en el menor tiempo?	Three marks forming a triangle que permita realizar los cuatro courses.
11. Posttest	-	-	-	-

614 *Figure 1.* Schedule, contents, goals, questions, and modification of lessons.

615

Component	Content	Criteria
DM	Close hauled	- Decidir ir en close hauled cuando el wind come over a lateral bow del boat.
	Beam reach	- Decidir ir en beam reach cuando el wind come over an abeam del boat.
	Broad reach	- Decidir ir en broad reach cuando el wind come over a stern quarter del boat.
	Running	- Decidir ir en running cuando el wind come over the stern del boat.
	Rudder	- Si hace más wind y current ajustar más el rudder. - Si hace menos wind y current ajustar menos el rudder.
	Tack and gybe	- Tack: Cuando el boat está en courses más cercanos al wind. - Gybe: Cuando el boat está en courses alejados al wind.
SE	Beat	- Con el wind cambiante, realizar más beats. - Con wind estable, realizar menos beats.
	Close hauled	- The sail as close to an upwind direction as possible. - Centerboard fully draft.
	Beam reach	- Luff stop flapping. - Centerboard raised 1/3.
	Running	- The sail at 90° to the boat. - Centerboard raised 3/3.
	Broad reach	- Luff stop flapping. - Centerboard raised 2/3.
	Rudder	- Sitting opposite the sail. - Coger the tiller sólo con una mano por su extremo.
	Tack	- To move fuerte the tiller towards the main sail - Cambiar de lado cuando la sail cambie. - Mirar hacia delante. No soltar the tiller.
	Gybe	- To move slowly the tiller closer to the skipper. - Cambiar de lado antes de que la sail cambie. Mirar hacia delante. No soltar the tiller.

616 *Note.* DM: Decision-making. SE: Skill execution.

617 *Figure 2.* Criteria used to assess DM and SE on the RPAI.

618

619

Performance (DM, SE, RP, and RI)	<p>TRfU group children: “Now we know what course we have to choose and why”. “We hemos logrado terminar la race sin ningún problema y por delante del otro grupo”. “We have done a lot of sailing”.</p> <p>Control group children: “After the intervention we known how to take the rudder and the sheet”. “Now we knew what are the characteristics of each course”. “The coach always showed us when to choose each course”. “No sabíamos muy bien qué course teníamos que to choose en cada momento y nuestro boat no iba rápido”. “I would like to practice more, because I am boring listening the coach”.</p> <p>TRfU group coach: “The children understood the lesson segments y por qué hicieron las cosas, and for that reason they learned and enjoyed more”. “Yo he intentado que aprendan a partir de las modificaciones que hicimos en la race, tal y como me enseñasteis”.</p> <p>Control group coach: “I observed improvements in theory concepts, but they didn’t improve a lot at practice”. “Yo les decía lo que tenían que hacer pero no me prestaban atención”.</p>
Race knowledge	<p>TRfU group children: “Yo sé qué cosas tengo que hacer durante la race, por ejemplo, mirar a the tell-tales para decidir el course a tomar”.</p> <p>Control group children: “Yo me he aprendido los courses”. “Ahora conozco el nombre de las partes del boat”.</p> <p>TRfU group coach: “The children have started to think by themselves”. “Este approach requiere más tiempo que en el traditional porque los children tenían que reflexionar en “teaching for understanding” lesson segment.</p> <p>Control group coach: “Me preguntaban qué course tenían que utilizar en cada momento”.</p>
Adherence: enjoyment, intention to continue practicing sailing, and perceived competence	<p>Both children groups: “Es un nuevo deporte que se hace en the sea”. “Yo decidí apuntarme a esta sailing school”. “Es diferente al colegio y son vacaciones”.</p> <p>TRfU group coach: “The children had a great time because they participated and collaborated, they were active practicing sailing”. “Ellos se ven mejores porque logran los challenges de las race forms”.</p> <p>Control group coach: “Necesitarían más tiempo de entrenamiento para navegar solos, pero se lo pasaban muy bien cuando les tocaba navegar”. “Ellos se aburrían con las explicaciones largas”. “No veo que they feel self-competent to navegar solos”.</p>

621 Note: DM: Decision-making. SE: Skill execution. RP: Race performance. RI: Race

622 involvement.

623 *Figure 3.* Example of children and coaches’ responses on each variable in the interviews.

624