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Title	The effects of values and principles in sports coach education course designed to promote values-driven coaching styles
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The Effects of a *Values and Principles in Sports* Coach Education Course Designed to  
Promote Values-Driven Coaching Styles

10        **ABSTRACT**

11        The ability of youth sport coaches to intentionally teach athletes values is often  
12        recognized as a critical pursuit throughout youth sport research. However, as coach  
13        education programmes and coach development systems seek to enhance the knowledge  
14        and skills of coaches, there is a need to investigate the effects that these initiatives have  
15        on coaching practices. The purpose of this multi-methods study was to investigate the  
16        effectiveness and perceived benefits of the *Values and Principles in Sport* (VPS) coach  
17        education course, specifically regarding values-driven coaching practices. Twenty-seven  
18        coaches and athletes from their teams ( $n=85$ ) participated in the study. Fourteen coaches  
19        attended the VPS course, which aimed to equip coaches with knowledge and skills for  
20        promoting values-driven coaching practices. Among this group, quantitative data were  
21        collected using a coach-centric systematic observation tool and an athlete survey, while  
22        qualitative data were collected through individual interviews with coaches and focus  
23        groups with athletes. Additionally, the 13 coaches who did not attend the VPS course—  
24        as well as athletes from their teams—were included in a control group and completed  
25        the quantitative measures. Quantitative results that are related to teaching values suggest  
26        that coaches who attended the VPS course did not perform better than those in the  
27        control group. However, the course did impact coaching style, suggesting high inter-  
28        individual differences in coaching styles (i.e., Reserved, Average, Engaging, Purposeful,  
29        VPS-active). Qualitative results highlight that, among coaches who attended the VPS  
30        course, the course contributed to understanding and awareness related to teaching values  
31        in sport and the transfer of values outside of sport. Taken together, the study underscores  
32        the value of incorporating practical components in designing a VPS course, as well as  
33        the potential for individualizing coach development pathways based on coaching style.

34        **Keywords: Coaching behaviours, Coaching dilemmas, Coaching principles, Values**

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## 36 INTRODUCTION

37 The ability to teach values (e.g., work ethic, honesty, social responsibility) that support  
38 psychosocial development, promote social-emotional learning, and foster physical literacy  
39 through Physical Education and Sport (PES) has been deemed a priority among positive youth  
40 development (PYD) scholars[1]. Values are defined as ‘the principles and fundamental  
41 convictions that act as general guides to behaviour, the standard by which particular actions are  
42 judged to be good or desirable’[2]. Similarly, life skills are often recognized as behavioural,  
43 cognitive, intrapersonal, and interpersonal skills that enable youth to succeed in both sport and  
44 life[3]. Thus, like life skills, values are positioned as being transferable and enable youth to  
45 thrive within the parameters of society[4-5]. In fact, such PYD outcomes are recognized as  
46 important mechanisms that not only help promote positive long-term development but also  
47 mitigate the onset and/or adherence to behavioural health problems, such as antisocial  
48 behaviour (e.g., aggressive and violent behaviours). Values, however, differ from life skills in  
49 that they provide an ethical foundation upon which life skills can be applied, while life skills are  
50 the actions and behaviours that allow an individual to navigate challenges in life[6].

51 Within PES contexts, coaches are recognized as being the most prevalent source of  
52 support as youth athletes develop values and learn how to transfer values to other life  
53 domains[7-9]. From an experiential learning theory perspective[10], learning is believed to be  
54 an internal reflexive process of knowledge acquisition that results from reflecting upon first-  
55 hand experiences[11]. Within the theory of experiential learning, *facilitated experiential*  
56 *learning* emphasizes the role of the trained facilitator and underscores the importance of  
57 transformative interactions that occur between facilitator (e.g., coach) and learner (e.g., athlete)  
58 throughout the learning process. The praxis of facilitated experiential learning is the use of  
59 *facilitated coaching practices*, which are strategies and approaches used intentionally to  
60 maximize learning opportunities by leveraging naturally occurring and designed experiences.

61 By using facilitative coaching practices (e.g., directly teaching, modelling, discussing transfer),  
62 coaches are better equipped to promote the development and transfer of PYD outcomes,  
63 including values.

64 Thus, athletes may best be positioned to learn values when their sport coaches are aptly  
65 educated and trained to integrate sport skills with the teaching of values through their coaching  
66 sessions. However, many existing coach education programmes often lack pedagogy and  
67 content related to values-driven coaching practices[12]. The purpose of the current multi-  
68 methods study was to investigate the effectiveness and perceived benefits of the *Values and*  
69 *Principles in Sport* (VPS) coach education course, which was designed to equip coaches with  
70 the knowledge and skills to employ values-driven coaching practices.

#### 71 THE INFLUENCE OF YOUTH SPORT COACHES

72 From an ecological developmental systems perspective, learning is influenced by dynamic  
73 exchanges amongst micro, meso, and macro factors[13]. The micro-level often features  
74 individual characteristics, internal assets, autobiographical experiences, parents/family, and  
75 peers; whereas the macro-level often includes socio-political cultures and sociohistorical  
76 systems. Physical education and sport (PES) literature often focuses on social influences at the  
77 meso-level (e.g., youth sport systems), prioritizing the influence of coaches on youth  
78 development. A systematic review of social supports in youth sport found that coaches were  
79 identified as the most prevalent source of support, offering athletes unique forms of tangible,  
80 informational, emotional, and esteem support[8]. Additionally, support from coaches, mothers,  
81 and fathers, independently and interactively, significantly predicted the level of athlete self-  
82 determination motivation[14]. The unique influence of supportive coaches on the development  
83 and transfer of values was underscored[9]. Specifically, coach support had a relatively stronger  
84 independent effect than did parent/caregiver support on social responsibility and transfer of  
85 learning.

86           Although coaching styles and their influence on positive youth development (PYD)  
87 outcomes have been studied, there is limited research on values, as both a unique construct and  
88 PYD outcome. In fact, values and life skills have often been used interchangeably, making  
89 research distinguishing the two constructs challenging[15]. For instance, a recent scoping  
90 review reflecting Bean et al.[16] implicit-explicit continuum of teaching and transferring life  
91 skills illustrated that coaches utilize both implicit and explicit facilitative coaching practices to  
92 teach a variety of PYD outcomes, including both values and life skills. Implicit facilitative  
93 coaching practices included developing a PYD-focused coaching philosophy, using a strength-  
94 based approach, establishing a prosocial team culture, fostering positive relationships, and  
95 supporting youth autonomy. Explicit facilitative coaching practices included discussing and  
96 teaching targeted learning outcomes, creating opportunities to practice targeted learning  
97 outcomes in sport, supplying direct feedback related to using targeted learning outcomes,  
98 debriefing sport experiences to enhance transfer, and providing opportunities to transfer outside  
99 of sport. In fact, Newman et al.[9] indicated that youth learned both life skills (i.e., self-control,  
100 effort, teamwork) and values (i.e., social competence, social responsibility), simultaneously,  
101 when receiving support from sport coaches. In the end, although values and life skills may,  
102 themselves, differ as constructs, research has also suggested that the ways in which values and  
103 life skills are taught and learned may be similar. Thus, just as a collection of coaches will  
104 employ a variety of coaching approaches[17], individual coaches are also known to utilize  
105 multiple styles when working with youth[18].

#### 106 VALUES-DRIVEN COACH EDUCATION

107 Given the complex and dynamic socio-political settings in which athletes and coaches operate,  
108 explicit coaching practices may become essential. In fact, scholars have begun advocating for  
109 the need to design and deliver coach education programmes promoting value-oriented concepts  
110 such as social justice, diversity, equity, and inclusion[19-21]. As such, a value-driven approach

111 acknowledges the importance of facilitating PYD, with a unique emphasis on promoting moral  
112 development by teaching youth values (e.g., honesty, inclusivity, social responsibility) through  
113 sport participation[22]. Although there are practical strategies available for coaches,  
114 instructional programmes and coach education courses have been created to help coaches  
115 acquire pedagogical approaches and explicit practices to teach values through PES. One such  
116 values training programme is the Values and Principles in Sport (*VPS*), a coach education  
117 programme designed for PES coaches in Singapore. The programme's contents were organized  
118 in four phases: (1) *Introductory*, which included participant reflections on the importance of  
119 teaching values; (2) *Planning*, which included a demonstration of a training plan designed to  
120 teach sport skills and values simultaneously; (3) *Practical* in which participants implemented  
121 their values-driven teaching plan; and (4) *Review*, which gleaned insights and feedback from  
122 participants[23].

123         Prior research has investigated the implementation of the VPS programme from the  
124 perspectives of athletes and coaches. The study found that PES was an effective setting for  
125 athletes to learn values; and later apply them in non-sport settings (e.g., demonstrating integrity  
126 in school by not cheating on assignments)[23]. A follow-up study investigating how coaches  
127 taught values after completing the values training programme found that they felt more  
128 equipped to teach values through PES[24]. Specifically, coaches indicated developing a greater  
129 awareness of the importance of employing VPS-active coaching to promote the development  
130 and transfer of values – from lesson planning to the facilitation of values learned during and  
131 after lessons intentionally. However, to ensure the course achieves intended outcomes, both  
132 studies concluded there is a need to examine the impact of VPS on both facilitative coaching  
133 practices and values learned by athletes. This is to understand how the programme, being  
134 theory-based, affects coaches' ability to apply the knowledge learned into practice as evidenced

135 in the coaching literature that theory-based lessons have little impact and often limit a coach's  
136 learning[24].

137 Moreover, research investigating facets of values-driven training for PES coaches has  
138 been restrained by methodological and contextual limitations, limiting the potential  
139 generalisability of prior research. For instance, the sample size of previous studies was small  
140 and used interviews as the single source of data. To address such a methodological limitation, a  
141 randomized controlled trial evaluated the effectiveness of the *Coaching for Life Skills (CLS)*  
142 online training[25]. Although the results were not statistically significant, positive directional  
143 changes were observed for both the intervention and waitlist group (but not the control group)  
144 for measures of the coach-athlete relationship, coach interpersonal behaviours, and explicit  
145 teaching practices. Similarly, past research has mainly used a single research method to evaluate  
146 the effectiveness of coach training programmes rather than employing multiple methods (e.g.,  
147 surveys, interviews, observations). In addition to methodological constraints, much of the  
148 current research on coach education programmes is often limited to North American contexts  
149 and/or developed from Euro-centric perspectives[26-28]. The lack in diversity of cultural  
150 perspectives has been recognized to be a systemic issue that permeates the broader field of  
151 sport-based PYD[21]. Indeed, research and programming are from a diversity of cultural  
152 perspectives is needed, particularly related to PYD and coach education.

153 The following research questions were used to guide the present study:

154 1) How does the VPS course impact coaches' behaviours during training sessions at the  
155 end of the course?

156 2) What are the benefits perceived by coaches and their athletes concerning the VPS  
157 course?

158 **METHOD**



159 Epistemologically, a pragmatic perspective grounds the study design. To understand the  
160 effectiveness of the VPS course perceived by the participants coaches and their athletes, multi-  
161 methods approach. Systematic observation tool was used to examine whether the coaches have  
162 exhibited values or life skills behaviours during coaching sessions before and after the VPS  
163 course. An athlete survey was used to triangulate data to investigate whether they believed they  
164 have learned values (i.e., prosocial, antisocial) from their coaches. The interviews with the  
165 coaches and athletes provided meaningful insights on the perceived effectiveness of the VPS  
166 course and the impact on athletes' learning.

#### 167 CONTEXT

168 The VPS course investigated in the current study was developed by the National Sport  
169 Governance – Sport Singapore. It aimed to help coaches become aware of the ethical standards  
170 needed to abide by as coaches and to understand the importance of values-driven coaching  
171 practices. The course was open to the public, for anyone above 18 years old. Coach participants  
172 had to pay a fee to register for the course. Acquiring the VPS certification is a requirement for  
173 being a professional coach registered with the National Registry of Coaches (NROC) and to  
174 coach in Singapore schools.

175 The VPS course is a six-hour classroom-based course, that covers six main topics: 1)  
176 Vision for sporting Singapore, 2) Expectations and standards of a coach, 3) Coaching  
177 philosophy, 4) Olympism and sports values, 5) Game for Life Framework for intentional design,  
178 and 6) Anti-doping. It is based on the Game for Life framework. The delivery methods and  
179 materials include group discussions on case studies based on local contexts and examples for  
180 content relevance. Participants are required to write a training plan on a sport activity that  
181 integrates the teaching of sports skills and values.

#### 182 PARTICIPANTS

183 Coach participants who have signed up for the VPS course were approached by Sport Singapore  
184 to participate in this study. The inclusion criteria for coaches were: (1) currently active in  
185 coaching and (2) have yet to attend the VPS course. A total of 27 sport coaches and 85 youth  
186 athletes from the coaches' respective teams participated in the study. Ten coaches were  
187 representative of team sports (e.g., soccer, handball, rugby), while 17 coached individual sports  
188 (e.g., swimming, taekwondo, squash). Further, athletes were representative of five different  
189 sports (soccer = 44, handball = 18, rugby = 8, dragon boat = 8, and floorball = 7).  
190 Subsequently, 14 coaches who had already signed up for and attended the VPS course (and 40  
191 athletes from their teams) were assigned to the intervention group. Most coaches in this group  
192 identified as male ( $n = 12$ ), had an average age of 37.8 years ( $SD = 13.2$  years), and had an  
193 average of 5.6 years of experience coaching. The remaining 13 coaches who had yet to attend  
194 the VPS course (and 45 athletes from their teams) were the control group. Similar to the  
195 intervention group, most coaches identified as male ( $n = 10$ ), had an average age of 36.5 years  
196 ( $SD = 12.1$ ) and an average of 7.5 years of coaching experience (See Figure 1).

197 \* \* \* \* \*

198 **Insert Figure 1 Here**

199 \* \* \* \* \*

## 200 DATA COLLECTION

201 Before data collection, ethics clearance was provided by the first author's university ethical  
202 review board and all participants provided informed consent. For those below 21 years old,  
203 parental consent was also obtained.

204 Given the multi-layered responses to educational interventions and the unique  
205 sensitivities of respective research methods[29], the current study employed several data  
206 collection methods. Systematic observations were conducted to examine coaching practices  
207 related to teaching of sports skills and values, while athlete survey data were collected to

208 examine their use of values in sport. Additionally, individual interviews were conducted among  
209 coaches to explore the perceived usefulness of the VPS workshop. Focus groups were  
210 conducted with athletes to explore to what extent their coaches demonstrate values-driven  
211 coaching practices.

#### 212 *COACH SYSTEMATIC OBSERVATION*

213 The Arizona State University Observation Instrument (ASUOI)[30] is a systematic  
214 observational tool designed to collect information on the behaviours and practices of coaches.  
215 The tool has been used extensively to study coaching in a variety of sports, such as football and  
216 basketball[31]. Within the current study, minor modifications were made to seven items of the  
217 instrument (e.g., instruction, praise, modelling) to better reflect behaviours related to the  
218 teaching of values and sport skills during a practice session (i.e., facilitative coaching practices).  
219 For example, instead of solely praising sport skills observed, sport educators were also observed  
220 on the praises they provide to player(s) related to values or transfer. Additionally, two  
221 subcategories were added to the modified observation tool: (1) values and (2) transfer. The  
222 former was intended to identify the teaching of values during a sport session, while the latter  
223 was designed to capture the teaching of transfer (of values learned) beyond sport. For instance,  
224 former categories like *Pre-instruction* were modified to include *Pre-instruction (Values)* and  
225 *Pre-instruction (Transfer)* (see Appendix A). In total, the coaching behaviours were expanded  
226 from 14 to 28 behaviours. The modified ASUOI was validated with a panel of experts and pilot  
227 tested. The pilot test was used to establish intra-coder validity and inter-coder reliability, with a  
228 match of at least 85% of items being needed.

229 Two coaching sessions of each coach involved in the study (i.e., intervention group,  
230 control group) were recorded. The first session was recorded before the VPS course was  
231 offered. The second session was recorded two months after the VPS course. The videos were  
232 subsequently coded using the modified ASUOI with automated functions

233 (<https://apps.apple.com/app/id1540244000>) to categorize sports skills and values teaching  
234 behaviours observed during the lesson using interval coding (5-second observe and the next 5  
235 second to decide an appropriate behaviour to be coded). The videos were coded by the two  
236 coders who were involved in the pilot study to ensure consistency.

#### 237 *ATHLETE SURVEY*

238 The Prosocial and Antisocial Behaviour in Sport Scale (PABSS)[32] was used to measure the  
239 perceived moral behaviours demonstrated by the athletes. The data can be used as a proxy to  
240 verify whether they have learned values/life skills from their coaches. The scale measures four  
241 types of moral behaviours: (1) antisocial behaviours towards teammates (AT); (2) antisocial  
242 behaviours towards opponents (AO); (3) prosocial behaviours toward teammates (PT); and (4)  
243 prosocial behaviours towards opponents (PO). This scale has been validated in the Singaporean  
244 context<sup>33</sup> and used for numerous studies to examine the effect of coaching approaches in  
245 inculcating moral values/behaviours to athletes in sports programmes[23-24, 34]. The  
246 Cronbach's alphas of this scale for the intervention and control groups were .76 and .90,  
247 respectively. The PABSS survey was administered to athletes both before the VPS course and  
248 two months after the course. The survey took approximately 15 minutes to complete.

#### 249 *COACH INTERVIEW AND ATHLETE FOCUS GROUP*

250 All coaches in the intervention group were individually interviewed two months after  
251 completion of the VPS course. Interviews were conducted following a semi-structured interview  
252 guide[15], which was designed to explore general perceptions of the course, practices to teach  
253 and promote the transference of values, and feedback for improvement of the VPS course.  
254 Specifically, interviews assessed the perceived usefulness of the VPS workshop in helping  
255 coaches: (1) learn how to establish a values-driven coaching philosophy; (2) create coaching  
256 sessions focusing on intentionally teaching values; and (3) teach values to athletes that can be  
257 transferred outside of sport contexts. Each interview lasted between 40 and 60 minutes.

258           At the same time, six to eight athletes (from teams with coaches involved in the  
259 intervention group) were invited to engage in a focus group[35] to explore to what extent their  
260 coaches demonstrated values-driven coaching practices. Focus group discussions explored how  
261 sport teaches values, the role of a coach in learning values, and how to transfer what they have  
262 learned through sports to their daily lives. A total of five focus groups were conducted, each  
263 lasting approximately 30 minutes.

264           With the permission from the participants, all interviews and focus groups were audio  
265 recorded and transcribed verbatim for data analysis later.

#### 266 DATA ANALYSIS

267           Given the multi-methods design of the study and the nature of the data, several analytical  
268 techniques were employed. Data collected from systematic observations and surveys were  
269 examined using quantitative analyses, whereas qualitative analyses were used to interpret the  
270 interview and focus group data.

#### 271 *COACH SYSTEMATIC OBSERVATION*

272           To examine quantitative data gleaned from the systematic observations, statistical analyses were  
273 conducted with *R* version 3.6.0[36] and JASP Statistics V0.11, with a level of statistical  
274 significance fixed at .05. Firstly, to determine whether coaching practices were different at the  
275 start of the project (before the intervention) among the coaches, the variables from the ASUOI  
276 containing a ‘without values’ and ‘with values’ version (the version ‘with transfer’ was not  
277 compared due to lack of occurrences) were compared using a *t*-test for repeated measures using  
278 the responses from both groups of coaches during the pre-test. As multiple *t*-test were  
279 performed (i.e., on 15 variables), each output has been corrected with a Holm-Šidák correction.  
280 Before running the test, independence of the measures between groups, as well as normality of  
281 the distribution of the differences between the two groups was tested, and in case of a normality  
282 assumption violation revealed by the Shapiro-Wilk test, the non-parametric equivalent

283 Wilcoxon signed-rank was used. Where the difference was significant, Cohen's  $d$  was computed  
284 as a measure of the size of the effect (or the matched rank biserial correlation when a  
285 nonparametric test was used), with  $d = 0.2$  representing a small effect,  $d = 0.5$  representing a  
286 medium effect and  $d = 0.8$  representing a large effect[37].

287 Secondly, in order to identify the changes in coaching practices due to the VPS course  
288 (i.e., to identify who and what changed after the coaches attended the course), a profiling of the  
289 coaching styles was performed using unsupervised cluster analysis both before and after the  
290 course. Based on the observed coaching activity from all the coaches, a K-means cluster  
291 analysis using the squared Euclidean distance dissimilarity measure was applied to determine  
292 the existing coaching profiles within this pool of coaches (i.e., coaches from both groups and  
293 during both pre- and post-course), using the *kmeans* function. Before computation, a pre-  
294 processing procedure was required and all variables were normalized between the interval [0, 1]  
295 to avoid errors and misrepresentation of behaviours due to the different scales of the  
296 measures[38]. In addition, as no real clustering was defined a priori, an internal estimator, the  
297 index of Calinski and Harabasz was used to estimate the number of clusters that best fitted the  
298 data, and the optimal number of clusters was identified with the maximum value of the Calinski  
299 and Harabasz criterion[39]. This criterion is a penalized ratio of the between-cluster dispersion  
300 and the within-cluster dispersion of the trials. It was computed for two to eight clusters with the  
301 *vegan* package and the *cascadeKM* function[40].

302 Lastly, based on the observed coaching styles and to identify the key differences  
303 between those coaching styles (i.e., the differences between the identified clusters), a one-way  
304 analysis of variance for independent samples (fixed factor: *Cluster* with 5 levels [1,2,3,4,5]) was  
305 conducted followed by post-hoc test with Bonferroni corrections. Prior to this analysis,  
306 independence of the samples, lack of statistical outliers, normality of the distributions and  
307 equality of variance of the distribution were checked. In case of violation of one or more of

308 those assumptions, the non-parametric equivalent of this ANOVA, the Kruskal-Wallis test was  
309 used.

#### 310 *ATHLETE SURVEY*

311 Athlete survey data were analysed using a mixed model repeated measure ANOVA to  
312 examine the effectiveness of the VPS course in impacting the inculcation of the values in the  
313 course between both groups. Prior to this analysis, lack of statistical outliers, normality of the  
314 distributions and lack of sphericity were checked. In case of violation of one or more of those  
315 assumptions, the non-parametric equivalent of this ANOVA, specifically the Mann-Whitney  
316 test and Wilcoxon Signed Rank test were used to examine any differences between the  
317 intervention and control groups during pre and post-test on prosocial and antisocial behaviours  
318 as reported by athletes.

#### 319 *COACH INTERVIEW AND ATHLETE FOCUS GROUP*

320 All interview and focus groups data were organized using NVivo software and analysed using  
321 an inductive thematic analysis[41] as it enabled the researchers to identify key themes  
322 developed across the data set related to the research questions, with a strong emphasis on  
323 interpretation of the data. The analysis was led by the research assistant (RA). The analytical  
324 approach consisted of four steps: (1) the RA familiarised themselves with the data; (2) codes were  
325 identified and grouped to form themes, which were reviewed to assess how they formed a  
326 logical structure to answer the research questions; (3) a thematic table was created to visually  
327 explore the relationships between the unique themes; and (4) quotes were selected to best  
328 illustrate the essential meaning of each theme. Trustworthiness was achieved by having the first  
329 author acted as a critical friend to the RA. He reviewed 30% of the codes and themes analysed  
330 by the RA and both were engaged in many rounds of discussion before reaching consensus.  
331 Creditability of the interviewer i.e. the RA was achieved as she has more than five years of  
332 experience in conducting interviews and qualitative research. All selected quotes were

333 anonymized, using letters and numbers to represent the participants, with coaches coded as C  
334 (C1 to C27) and athletes coded as A (A1 to A85).

335

## 336 **RESULTS**

### 337 **SYSTEMATIC OBSERVATION AND COACH PROFILING**

338 Regarding the comparison of variables ‘without values,’ ‘with values,’ and ‘with transfer,’ the  
339 first observation revealed that the coaching practices implying a transfer of values outside the  
340 sports context were not adopted by the coaches and occurred less than one observation per  
341 session, on average, for all coaches regardless their assigned group or testing time. As a result,  
342 those variables were not usable for comparison, and the following comparison only focused on  
343 the difference between coach behaviour ‘with values’ and ‘without values.’

344 The results showed that before the VPS course, coaches from both groups were already  
345 showing different profiles of utilizing value-driven coaching behaviours. Indeed, the repeated  
346 measures *t*-test or Wilcoxon signed-rank test performed on pre-test data showed that regardless  
347 the group, pre-instructions ( $t(26) = -3.40, p = .002, d = -.654$ ), concurrent instructions ( $W = 0, p$   
348  $< .001, d = -1.000$ ), post instructions ( $W = 3, p < .001, d = -.980$ ), and questioning ( $W = 4.5, p <$   
349  $.001, d = -.970$ ) are significantly more recurrent when inculcating values than without values,  
350 with large effect size (see Table 1 last column for the descriptive statistics). Conversely,  
351 positive modelling ( $W = 313, p < .001, d = .926$ ), negative modelling ( $W = 91, p = .001, d =$   
352  $1.000$ ), and praise ( $W = 351, p < .001, d = 1.00$ ) are significantly more recurrent without  
353 inculcating values than when inculcating values, with large effect size.

354 In terms of profiling of the coaching behaviours to identify the main coaching styles  
355 observed, the results showed that all the coaches could be classified into five different styles of  
356 coaching. The largest Calinski Harabasz criterion (CH) value was obtained for a model with 5  
357 clusters (CH from 2 to 8 potential clusters = [220.3, 248.1, 251.7, **264.1\***, 243.0, 226.5, 227.4]).



358 Thus, a K-means cluster analysis was performed to partition the trials into five groups. Table 1  
359 presents the average and standard deviation of each question for each cluster. The distribution of  
360 the clusters in the test (pre- versus post-course) and the group is displayed in Figure 2.

361 \* \* \* \* \*

362 [Table 1 here]

363 [Figure 2 here]

364 \* \* \* \* \*

365 Based on facilitative coaching practices, each coaching style can be identified by key  
366 coaching characteristics (Table 1). The main characteristic of Style 1 (Reserved coach) resides  
367 in the high usage of silence during coaching and the high usage of management, post-instruction  
368 with values and positive modelling. Further, this coaching style implies a lower usage of praise  
369 than other styles. Style 2 (Average coach) represents a normal style of coaching, with the  
370 average number of observed value-driven coaching practices per session being close to the  
371 average of all coaches. Style 3 (Engaging coach) was similar to Style 2, except that the first  
372 name of athletes was used during the session, amounting to three times more usage of first name  
373 during a session than Style 2.

374 Style 4 (Purposeful coach) is a coach characterized by hyperactivity compared to the  
375 other profiles, with values as well as without values. This style showed higher usage of first  
376 name, as well as higher usage of hustle and scold than the average styles. There were also more  
377 frequent uses of values during pre-instructions, post-instructions, and questioning activities,  
378 higher usage of negative modelling, and higher usage of positive modelling and praise. Style 5  
379 (VPS-active coach) is characterized by the lesser uses of hustling, silence, and management than  
380 the other four styles but with higher usage of concurrent instructions with values. This style  
381 showed three times more usage of concurrent instructions with values than the average styles.

382 Moreover, for the intervention group, this coaching style was observed only after the VPS  
383 course.

384 Concerning the effect of the VPS course on teaching values when coaching, the control  
385 group showed stable distribution of coaching styles between pre- and post-course, which was  
386 expected as those coaches did not attend the VPS course. For the intervention group, the effect  
387 of the VPS course on coaches showed a decrease in the occurrence of the average coaching  
388 profiles (Average, Engaging) and the appearance of more coaches exhibiting Styles 4  
389 (Purposeful) and 5 (VPS-active). However, the VPS course also generated the appearance of  
390 one additional coach (Reserved).

#### 391 SURVEY

392 The results of the mixed repeated measure ANOVA (Table 2) showed that there was a  
393 significant main effect of the groups (i.e., intervention versus control) for antisocial behaviours  
394 towards opponents (AO) ( $F(1,83)=6.11, p=0.015, \eta^2=0.069$ ) and antisocial behaviours towards  
395 teammates (AT) ( $F(1,83)=12.592, p<0.001, \eta^2=0.132$ ), but no time or interaction effect (all  $p_s$   
396  $> 0.168$ ), showing that the intervention group had higher values for AO and AT regardless of  
397 the time of the test (i.e., pre versus post-test). No significant effect neither main nor interaction  
398 was found concerning prosocial behaviours toward teammates (PT) and prosocial behaviours  
399 towards opponents (PO) (all  $p_s > 0.254$ ).

400 \* \* \* \* \*

401 [Table 2 here]

402 \* \* \* \* \*

#### 403 INTERVIEWS AND FOCUS GROUPS

404 While the quantitative results indicated little evidence of the effect of the VPS course in  
405 promoting value-driven coaching practices, qualitative findings illustrated a contrasting picture.  
406 Qualitative findings suggests that fourteen coaches in the intervention group recognized the

407 usefulness and importance of the VPS course. Further, they reported that attending the VPS  
408 course raised their awareness and ability to recognize the importance of establishing values-  
409 driven coaching behaviours. They also believe that the course enhanced their ability to plan and  
410 teach values in sport and helped learning of transfer outside of sport.

#### 411 *IMPORTANCE OF TEACHING VALUES*

412 Fourteen coaches expressed that attending the VPS course helped increase their awareness of  
413 the importance of teaching values during their training sessions. For example, C4 described the  
414 VPS course as an ‘eye opener’ about his coaching practice. C8 reflected on his coaching  
415 approaches and acknowledged the need to change, saying, ‘It’s not about me, it’s about the kids;  
416 and if I don’t change what I’m doing, it will impact the kids [negatively] in the long term. They  
417 will end up blaming me and I don’t want that.’ Sharing on the learnings about the idea of  
418 transfer, C11 explained ‘...that the idea of transfer has led me realize that my athletes can apply  
419 the value of being responsible for possible decision-making moments, which they may face in  
420 the future or at any point in their lives.’

#### 421 *VALUES-DRIVEN COACHING PHILOSOPHY*

422 Parallel to recognizing the usefulness of the VPS course, 12 coaches explained that the course  
423 reinforced their understanding of the importance of values-driven coaching. For example, C12  
424 stated that before the course she had a good understanding of coaching and coaching practices.  
425 However, after attended the course, she noticed that it helped her to ‘put it into perspective’ and  
426 to know ‘the reasons why you’re doing it and how it helps you and it helps you to explain  
427 further’. Similarly, C5 said the course helped in providing a clearer ‘view of this path’ (i.e., the  
428 path they chose to take as a coach) in terms of upholding their value-driven philosophy.  
429 Ultimately, 12 coaches believed that they developed a deeper understanding of values-driven  
430 coaching.

#### 431 *CONFIDENCE TEACHING VALUES*

432 Thirteen coaches described their confidence in teaching values and supporting transfer. They  
433 attributed their confidence to coaching experiences, as well as the number of years they have  
434 been coaching. Specifically, their initial understanding of the importance of teaching values in  
435 sport was dependent upon their own unique lived experiences. For instance, C10, a Taekwondo  
436 instructor, saw the need to blend the Taekwondo culture code of ethics with the knowledge  
437 learned from the course. The coach would ‘make students meditate during the last two minutes  
438 of the taekwondo session and when they have a *calmer mind*,’ they would ‘find time to explain  
439 more about the ethics of taekwondo.’

#### 440 *COACHING PRACTICES TO TEACH VALUES*

441 Thirteen coaches described a variety of practices to not only teach values but also how transfer  
442 values can be applied to non-sport domains. C9 spoke about their desire to bridge sport skills  
443 and values to real-life situations (e.g., survival swimming). This coach described actively  
444 encouraging swimmers to maintain their focus during a swimming lesson, ‘which enables them  
445 to develop values (e.g., focus, resilience) in the process and become better swimmers and apply  
446 their swimming skills in different life situations’. Additionally, C8 believed that transfer can be  
447 taught in the ‘tiny things’ such as keeping their equipment after using them, making sure the  
448 place is clean and in order, and avoiding littering during and out of training. C13 further  
449 explained that they would, ‘discuss transferring values by sharing [my] own life experiences  
450 with athletes and whenever there is an opportunity to do so. This includes seizing opportunities  
451 to speak in schools about values when invited as an alumnus.’ In other words, this coach  
452 discussed sharing their own experiences—when they had to exhibit resilience and  
453 determination—to teach athletes about transferable values.

#### 454 *IMPACT ON YOUTH ATHLETES*

455 Twelve coaches also believed that the athletes on their teams learned specific values from their  
456 coaching. C7 specified that ‘honesty and perseverance are the key values that athletes have

457 learned from [my] coaching sessions and coaching behaviours.’ A18 provided a personal  
458 account on how she ‘...pushed (persevere) [myself] to complete the 2.4 km run after a high  
459 intensity training session...it was very tiring, but I learned from my coach that I must not give  
460 up but keep going for self-improvement...’ Moreover, 10 coaches expressed confidence that  
461 athletes transferred and applied such values throughout a variety of life domains. One athlete  
462 (A5) coached by C7 affirmed that they ‘learned these values - honesty, patience, and  
463 truthfulness from [my] coach during training, and used them in class discussions or tutorials,  
464 especially in group work.’ Similarly, C8 expressed that ‘one of the key lessons that athletes  
465 learned from my coaching is self-control, which I believed can be applied in family, workplace,  
466 general life domains’. A18 mentioned how their coach taught them to practice self-control when  
467 ‘dealing with intense situations which make them feel angry. I keep in mind what my coach  
468 taught me not to use my fighting skills outside training when it is not necessary just to express  
469 my anger.’

470

## 471 **DISCUSSION**

472 The purpose of this study was to investigate the effectiveness and perceived benefits of Values  
473 and Principles in Sport (VPS) coach education course related to values-driven coaching  
474 practice. The multiple methods employed in this may help to inform future design and  
475 implementation of the VPS course, potentially improving coach education programmes and  
476 coaching practice. Taken together, quantitative results suggest that attending the VPS course  
477 was not associated with values-driven coaching practices, nor athlete moral behaviours. These  
478 findings were consistent for both the intervention and control groups regarding an increase in  
479 the total percentage of values-related coaching practices. Further, findings from observed  
480 coaching practices of those who attended the VPS course did not show strong evidence of the  
481 application of their learning. This finding is consistent with what the coaches expressed during

482 the interviews that they have not yet deliberately planned or incorporated the teaching of values  
483 in their lessons and trainings, at the time of the study. However, some athletes observed that  
484 their coaches have emphasized values education during coaching session, which is a good sign,  
485 although it may not be due to the training effect. In that sense, offering a longer duration of  
486 practice for the coaches to experience the content of the course may be necessary to allow for  
487 salient events or contexts to activate the different values in coaching practice. In a similar vein,  
488 a more integrated course content i.e., “just-in-time” and “context-specific”, may help to deepen  
489 its effect on the coaches.

490         However, quantitative analyses of the observational data indicated that five coaching  
491 styles existed among coaches: (1) Reserved; (2) Average; (3) Engaging; (4) Purposeful; and (5)  
492 VPS-active. Among these, only two (average, VPS-active) had values incorporated into their  
493 facilitative coaching practice. This finding aligns with the existing literature on effective  
494 coaching where coaches can exhibit consistent professional, interpersonal, and intrapersonal  
495 knowledge to improve athletes’ competence, confidence, connection, and character in their  
496 coaching contexts[42]. Results from the present study suggest that coaches who already  
497 emphasized values (i.e., Purposeful, VPS-active) may be more likely to integrate values into  
498 their coaching practice than the coaches who were less connected to values at entry into the  
499 study. At baseline, more than half of the coaches exhibited the average coaching style,  
500 characterized by high usage of coaching behaviours focusing on sport skills (e.g., pre-  
501 instructions, questioning) without values, as well as fewer behaviours related to facilitative  
502 coaching practices (e.g., positive modelling, negative modelling, praise). Only three coaches  
503 demonstrated facilitative coaching practices that explicitly included coaching sport skills and  
504 values. After the VPS course, few changes were found among the coaches in the intervention  
505 group: an increase in the styles with values (Purposeful, VPS-active) and a decrease in the  
506 Average and Engaging styles. Interestingly, there was one coach who switched to the Reserved

507 style. This could be that after the course, this coach became a little ‘lost’ and less confident  
508 about what to do, hence, became more silent.

509 Despite strong evidence highlighting that for athletes to learn and internalize values and other  
510 related positive youth development (PYD) outcomes learned from sports, coaches must  
511 ‘intentionally’ plan, deliver, and facilitate this process during training sessions[23,25].

512 Unfortunately, there are limited tools to address the ‘intentionality’ gap. The present study  
513 contributes to the literature by pioneering the development of a free mobile digital tool to  
514 support coaching – a call made by many scholars to advance sports coaching research,  
515 especially after the Covid-19 pandemic[43]. We believe the enhanced ASUOI can be a valuable  
516 tool to help coaches reflect on their coaching practice using objective assessments of time use in  
517 delivered sessions. While there may be concerns about time-based assessment of coaching  
518 behaviours, we argue that providing this information is helpful for increasing coaches’  
519 awareness of their own actions. Equally, it helps to support them in critically reflecting on  
520 achieving effective coaching outcomes and how to enhance future practice[44]. This applies  
521 both in sports skills and values development.

522         Based on the qualitative data, after experiencing the VPS course coaches reported  
523 increased awareness and placed a greater importance on inculcating values during sporting  
524 activities. However, despite the shift in several coaches’ coaching styles, the findings indicated  
525 that there was no change in athlete prosocial behaviours, suggesting the coaches neither  
526 deliberately nor intentionally teach/facilitate values during coaching lessons. This finding was  
527 also supported by coach interviews; coaches neither deliberately planned nor were they  
528 systematic in addressing values in their coaching. Triangulating these findings proposes that the  
529 VPS course was only effective for those were already effective coaches and intending to use the  
530 VPS course to improve their interaction. Indeed, coaching effectiveness is linked to higher  
531 levels of openness to learning and willingness to self-reflect critically[45]. Effective coaches are

532 also lifelong learners[46], and thus their learning is influenced by their coaching philosophy and  
533 knowledge, allowing them to be more likely to learn from the VPS course and apply more of its  
534 key messages.

535         In this study, there could have been a cognitive dissonance between the understanding of  
536 values-driven coaching and its implementation in practice[47]. As the current mainstream coach  
537 education focuses on technical skills and the VPS course is theory-based (i.e., focused on  
538 classroom activities that are not contextualized to a specific sport and setting), coaches may  
539 have had a superficial and/or unclear understanding of values-driven coaching. As a result, the  
540 athletes they coach may have been unable to learn and make sense of the values being taught.  
541 To this end, despite attending the VPS course, the coaches were not exposed to values-driven  
542 coaching in the past, which may have influenced their coaching behaviours. Adopting a new  
543 coaching alternative is complex and may suggest a fundamental shift in their coaching methods.  
544 Therefore, they may need more time to internalize the learning and change their coaching  
545 pedagogies and practices.

546         Traditional coaching culture revolves around authority, discipline, and technical and  
547 tactical skills, rather than on facilitating PYD[48]. Coaches might feel that deliberate and  
548 explicit teaching of values seemed too ‘unnatural’ for them; hence they were reluctant to  
549 incorporate them into their coaching. One pedagogical approach to actively engage coaches, as  
550 learners, is experiential learning. Just as with athletes, the transformative process of knowledge  
551 acquisition is grounded in first-hand experiences—and critical reflections of those  
552 experiences<sup>11</sup>. Coach education programmes should consider novel approaches to engage  
553 coaches as active participants in their learning. The 12 levers to facilitating transfer of learning,  
554 identified by Weinbauer-Heidel and Ibeschitz-Manderbach[49], e.g., trainee’s motivation,  
555 training design and organizational support, can guide coach developers and policy makers when  
556 designing and implementing effective training programmes.



## 557 LIMITATIONS, IMPLICATIONS, AND FUTURE DIRECTIONS

558 Although the present study contributed to the literature by using a multi-methods research  
559 design to provide greater insights into the impact of a VPS course, some limitations should be  
560 acknowledged. First, post-course data were collected two months after the VPS course, which  
561 may not have allowed all coaches—depending on the timing of their season—to implement  
562 novel pedagogical approaches. Future research may consider enhancing the study design by  
563 collecting post-course data both immediately following the course and six months after the  
564 course to allow coaches time to internalize and adopt their learning. To this end, a follow-up  
565 study would also be beneficial to determine the long-term effectiveness of the VPS course.  
566 Second, the coaching profile of the participants before the VPS course was not considered in  
567 this study. As shown in the results, coaches did exhibit diverse profiles, and years of coaching  
568 experience may potentially influence coaching practice. Future researchers may consider  
569 controlling for various aspects of initial coaches' coaching profiles when looking at the  
570 effectiveness of coach education and practices. Third, due to the pragmatic real-world nature of  
571 this program evaluation and the limitations of recruitment and sampling[42], we are unable to  
572 be conclusive about the effectiveness of the training related for equipping these participants  
573 with the elements needed to change their delivery of values-driven coaching. Moreover,  
574 although it is desirable, to overcome their motivational differences, blinding the coaches in the  
575 intervention group was not possible due to the nature of the course structure and administrative  
576 constraints. Indeed, this factor may help explain why the coaches' post-course interviews were  
577 so positive; they may have been affected by social desirability/conformity bias. Our work has  
578 confirmed the challenge of designing effective educational interventions and of attributing  
579 causality. Future study should adopt more comprehensive designs. For example, randomized  
580 control trials, with larger sample sizes and stricter conditional differences, will close this gap.

581 Considering its limitations, findings from this study offer several implications to enhance the  
582 transfer of learnings[49] from the VPS course to facilitative coaching practice. First, sport  
583 agencies should consider establishing a set of values-driven coaching competencies to provide  
584 clarity on the expectations and standards of what values-driven coaching practices look like.  
585 This would help employers differentiate and recruit coaches aiming to actively apply values-  
586 driven coaching practices. Second, much like athletes, coaches learn by doing[23]. Beyond  
587 being able to write a session plan with values, the VPS course should include a practical  
588 component, allowing the coaches to have first-hand experience and opportunity to intentionally  
589 deliver a planned sporting activity integrated with values, and receive immediate feedback on it.  
590 Thirdly, for transfer volition, encourage every participant to submit a post course action plan  
591 detailing how they will apply what they have learnt from their course into their coaching,  
592 including helping athletes transfer the values and life skills learned beyond sports. Lastly,  
593 provide post- course support for communities of practice to continue the learning from fellow  
594 peers in the implementation of values-driven coaching practices.

595

## 596 **CONCLUSION**

597 The seed for developing values through sports coaching and making conscious and deliberate  
598 teaching of values part of coaching practice requires time, repetitive behaviours, reinforcement,  
599 and continued support. The present study suggests that even experienced coaches tend to be  
600 inconsistent in teaching values during training sessions or, much less, deliberate in planning  
601 how to incorporate these in their facilitative coaching practices. Nonetheless, while the findings  
602 suggest the VPS course impacted the coaching style (e.g., facilitative coaching practices), our  
603 results should be put in perspective of the relatively small sample size, specifically in regards of  
604 the high variability of styles between the coaches. Future research should seek to link the  
605 original coaching style of coaches at the entrance in the program to the outcome after the

606 intervention. Indeed, this kind of knowledge could help to adapt and individualize the coach  
607 education program to the very specific needs of the coaches based on their initial style. Finally,  
608 future improvements to the course are likely to better equip coaches, thereby helping youth  
609 athletes develop transferable values—such as work ethic, honesty, and social responsibility—  
610 that help youth become change agents in the 21<sup>st</sup> century and beyond.

611 **REFERENCES**

- 612 1. Camiré M. Reconciling competition and positive youth development in sport. *STAPS*  
613 2015; 109: 25-39.
- 614 2. Halstead JM and Taylor MJ. The development of values, attitudes, and personal  
615 qualities: a review of recent research. *National Foundation for Educational Research* 2000.
- 616 3. Camiré M, Kendellen K, Rathwell S, et al. Evaluation of the pilot implementation of the  
617 coaching for life skills programme. *Int Sport Coach J* 2018; 5: 227–236.
- 618 4. Gould D and Carson S. Life skills development through Sport: current status and future  
619 directions. *Int Rev Sport Exerc Psychol* 2008; 1: 58–78.
- 620 5. Newman TJ, Magier E, Kimiecik C, et al. The relationship between youth sport  
621 participation and aggressive and violent behaviours: a scoping review of the literature. *J Soc*  
622 *Social Work Res* 2021; 12: 371–389.
- 623 6. Schwartz SH. Universals in the content and structure of values: theoretical advances and  
624 empirical tests in 20 countries. *Adv Exp Soc Psychol* 1992; 25: 1–65.
- 625 7. Jacobs JM and Wright PM. Transfer of life skills in sport-based youth development  
626 programmes: a conceptual framework bridging learning to application. *Quest* 2018; 70: 81-99.
- 627 8. Sheridan D, Coffee P and Lavalley D. A systematic review of social support in youth  
628 sport. *Int Rev Sport Exerc Psychol* 2014; 7: 198-228.
- 629 9. Newman TJ, Anderson-Butcher D and Amorose AJ. Examining the influence of sport  
630 programme staff and parent/caregiver support on youth outcomes. *Appl Dev Sci* 2020; 24: 263-  
631 278.
- 632 10. Kolb D. *Experiential learning: experience as the source of learning and development*.  
633 New Jersey: Prentice Hall, 1984.

- 634 11. Newman T, Alvarez M and Kim M. An experiential approach to sport for youth  
635 development. *J Exp Educ* 2017; 40: 308-322.
- 636 12. Santos F, Rathwell S, Sabino B, et al. Analyzing continuous coach education courses in  
637 Portugal: implications for youth development. *Int J Sports Sci Coach* 2023; 18: 1036-1044.
- 638 13. Dorsch TE, Smith AL, Blazo JA, et al. Toward an integrated understanding of the youth  
639 sport system. *Res Q Exerc Sport* 2022; 93: 105-119.
- 640 14. Amorose A, Anderson-Butcher D, Newman T, et al. High school athletes' self-  
641 determined motivation: The independent and interactive effects of coach, father, and mother  
642 autonomy support. *Psychol Sport Exerc* 2016; 26: 1-8.
- 643 15. Xie FMF, Koh KT and Falcão W. Strategies and methods for teaching values  
644 transference from physical education to the classroom and home: a case study. *Asia Pacific  
645 Journal of Education* 2023; 43: 479–496.
- 646 16. Bean C, Kramers S, Forneris T, et al. The implicit/explicit continuum of life skills  
647 development and transfer. *Quest* 2018; 70: 456-470.
- 648 17. Kramers S, Camiré M and Bean C. Profiling patterns of congruence in youth golf  
649 coaches' life skills teaching. *J Appl Sport Psychol* 2021; 33: 218-237.
- 650 18. Coatsworth JD and Conroy DE. The effects of autonomy-supportive coaching, need  
651 satisfaction, and self-perceptions on initiative and identity in youth swimmers. *Dev Psychol*  
652 2009; 45: 320-328.
- 653 19. Camiré M, Newman T, Bean C, et al. Reimagining positive youth development and life  
654 skills in sport through a social justice lens. *J Appl Sport Psychol* 2022; 34:1058-1076.
- 655 20. Kochanek J and Erickson K. Interrogating positive youth development through sport  
656 using critical race theory. *Quest* 2020; 72: 224-240.
- 657 21. Newman TJ, Santos F, Pierce S, et al. Coach education and coach development within a

- 658 contemporary social justice society: implications for future research and potential pitfalls. *Quest*  
659 2022; 74: 234-250.
- 660 22. Crossan W and Bednář M. A critical evaluation of the development and use of values in  
661 coaching. *Auc Kinanthropologica* 2018; 54: 96-117.
- 662 23. Koh KT, Ong SW and Camiré M. Implementation of a values training programme in  
663 physical education and sport: perspectives from teachers, coaches, students, and athletes. *Phys*  
664 *Educ Sport Pedagogy* 2016; 21: 295-312.
- 665 24. Koh KT, Camiré M, Lim Regina SH, et al. Implementation of a values training  
666 programme in physical education and sport: a follow-up study. *Phys Educ Sport Pedagogy*  
667 2017; 22: 197-211.
- 668 25. Camiré M, Kendellen K, Rathwell S, et al. Evaluating the coaching for life skills online  
669 training programme: a randomized controlled trial. *Psychol Sport Exerc* 2020; 48: 101649.
- 670 26. Kramers S, Turgeon S, Bean C, et al. Examining the roles of coaching experience and  
671 coach training on coaches' perceived life skills teaching. *Int J Sports Sci Coach* 2020; 15: 576–  
672 583.
- 673 27. Camiré M and Trudel P. Using high school football to promote life skills and student  
674 engagement: perspectives from Canadian coaches and students. *World Journal of Education*  
675 2013; 3: 40-51.
- 676 28. MacDonald DJ, Côté J and Deakin J. The impact of informal coach training on the  
677 personal development of youth sport athletes. *Int J Sports Sci Coach* 2010; 5: 363–372.
- 678 29. Kaushik V, Walsh CA. Pragmatism as a research paradigm and its implications for  
679 social work research. *Soc Sci* 2019; 8: 255.
- 680 30. Lacy AC and Darst PW. Evolution of a systematic observation system: The Arizona

- 681 State University Observation Instrument. *J Teach Phys Educ* 1984; 3: 59-66.
- 682 31. Lacy AC and Goldston PD. Behaviour analysis of male and female coaches in high  
683 school girls' basketball. *J Sport Behav* 1990; 13: 29-39.
- 684 32. Kavussanu M and Boardley ID. The prosocial and antisocial behaviour in sport scale. *J*  
685 *Sport Exerc Psychol* 2009; 31: 97-117.
- 686 33. Li CX, Koh KT, Wang CKJ, et al. Sports participation and moral development  
687 outcomes: examination of validity and reliability of the prosocial and antisocial behaviour in  
688 sport scale. *Int J Sports Sci Coach* 2015; 10: 505-513.
- 689 34. Koh KT, Camiré M, Bloom GA, and Wang CKJ. Creation, implementation, and  
690 evaluation of a values-based training programme for sport coaches and physical education  
691 teachers in Singapore. *Int J Sports Sci Coach* 2017; 12: 795–806.
- 692 35. Krueger RA and Casey MA. *Focus groups: a practical guide for applied research*. 4<sup>th</sup>  
693 ed. London: Sage Publication, 2009.
- 694 36. Team RC. R: a language and environment for statistical computing. *Online Referencing*,  
695 <https://www.R-project.org> (2019, accessed 20 June 2024).
- 696 37. Cohen J. *Statistical power analysis for the behavioural sciences*. 2<sup>nd</sup> ed. New York:  
697 Routledge, 1988.
- 698 38. Komar J, Chow JY, Chollet D, et al. Neurobiological degeneracy: supporting stability,  
699 flexibility and pluripotentiality in complex motor skills. *Acta Psychol* 2015; 154: 26-35.
- 700 39. Caliński T and Harabasz J. A dendrite method for cluster analysis. *Commun Stat* 1974;  
701 3: 1-27.
- 702 40. Oksanen J, Blanchet FG, Friendly M, et al. Community ecology package. *R Package*

703 *Version* 2019; 2: 1-296.

704 41. Naeem M, Ozuem W, Howel, K, et al. A step-by-step process of thematic analysis to  
705 develop a conceptual model in qualitative research. *Int J Qual Methods* 2023; 22:  
706 16094069231205789.

707 42. Smith B and McGannon KR. Developing rigor in qualitative research: problems and  
708 opportunities within sport and exercise psychology. *Int Rev Sport Exerc Psychol* 2018; 11: 101-  
709 121.

710 43. Côté J and Gilbert W. An integrative definition of coaching effectiveness and expertise.  
711 *Int J Sports Sci Coach* 2009; 4: 307-323.

712 44. Maiden N, Lockerbie J, Zachos K, et al. Designing new digital tools to augment human  
713 creative thinking at work: an application in elite sports coaching. *Expert Syst* 2023; 40: e13194.

714 45. Koh KT, Mallett CJ, Camire M, et al. A guided reflection intervention for high  
715 performance basketball coaches. *Int Sport Coach J* 2015; 2: 273-284

716 46. Light R. Complex learning theory - its epistemology and its assumptions about learning:  
717 implications for physical education. *J Teach Phys Educ* 2008; 27: 21-37.

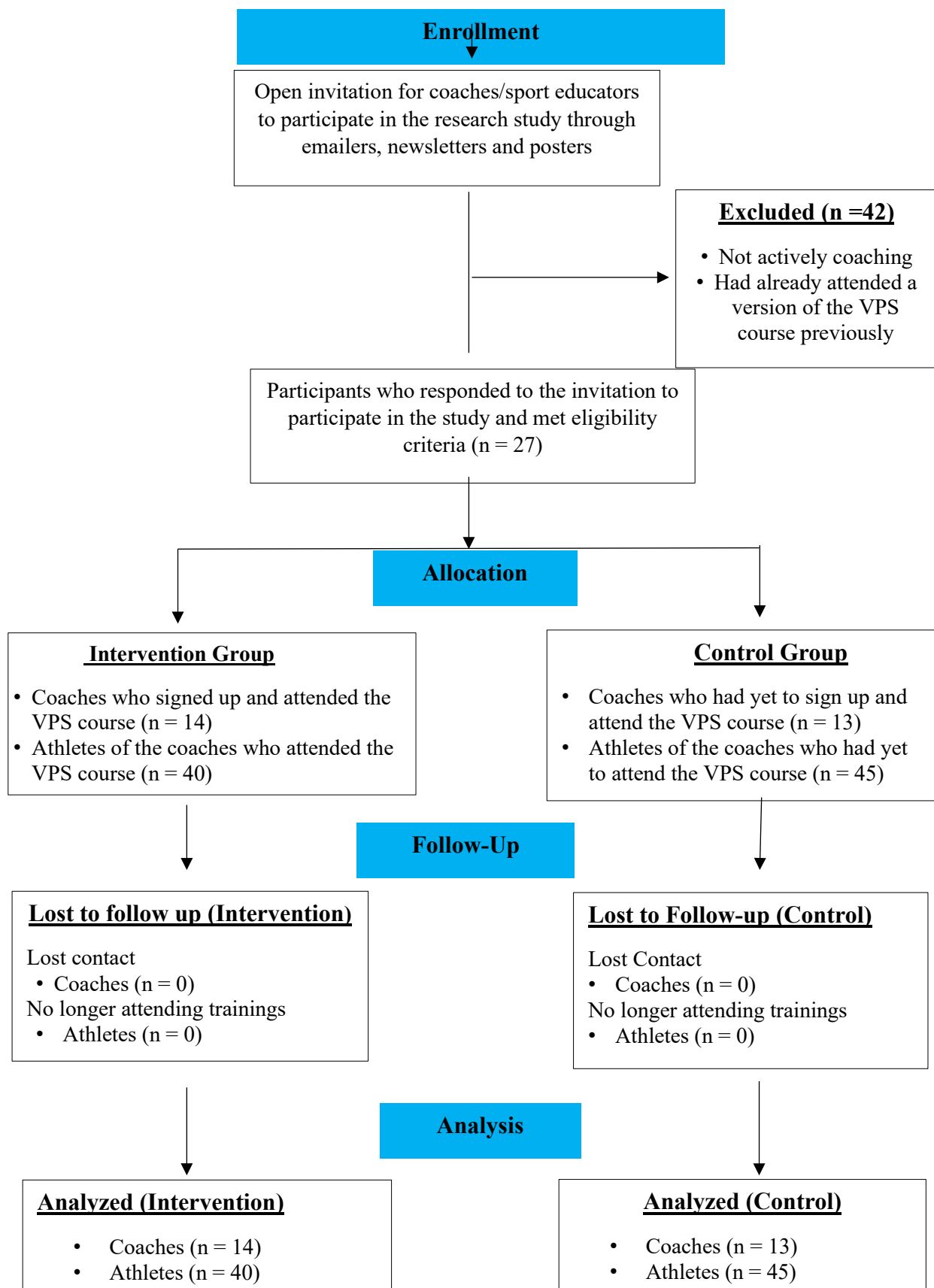
718 47. Watts DW, Cushion CJ and Cale L. Exploring professional coach educators' journeys  
719 and perceptions and understandings of learning. *Sport Educ Soc* 2022; 27: 632-646.

720 48. Cushion CJ. Applying game-centered approaches in coaching: a critical analysis of the  
721 'dilemmas of practice' impacting change. *Sports Coaching Review* 2013; 2: 61-76.

722 49. Weinbauer-Heidel I and Ibeschitz-Manderbach M. What makes training really work: 12  
723 levers of transfer effectiveness. *Tredition*, 2018.

724



**Figure 1***Recruitment and Allocation of Study Samples*

775 **Appendix A**776 *Modified ASUOI Codes*

777

- 778 1. Use of first name: Using the first name or nickname when speaking directly to a player.
- 779 2. Pre-instruction (S): Initial information given to player(s) preceding the desired action to  
780 be executed.
- 781 3. Pre-instruction(V): Initial information given to player(s) preceding the desired  
782 action/behaviour related to values.
- 783 4. Pre-instruction transfer (T) – Initial information given to player(s) preceding the desired  
784 action/behaviour related to values transfer.
- 785 5. Concurrent instruction (S): Cues or reminders given during the actual execution of the  
786 skill or play.
- 787 6. Concurrent instruction (V): Cues or reminders given during the actual demonstration of  
788 the action/behaviour related to values.
- 789 7. Concurrent instruction transfer (T): Cues or reminders given during the actual  
790 demonstration of the action/behaviour related to values transfer.
- 791 8. Post-instruction (S): Correction, re-explanation, or instructional feedback given after the  
792 execution of the skill or play.
- 793 9. Post-instruction (V): Correction, re-explanation, or instructional feedback given after the  
794 demonstration of action/behaviour related to values.
- 795 10. Post-instruction transfer (T): Correction, re-explanation, or instructional feedback given  
796 after the demonstration of action/behaviour related to values transfer.
- 797 11. Questioning (S): Any question to player(s) concerning strategies, techniques,  
798 assignments, and so forth associated with the sport.
- 799 12. Questioning (V): Any question to player(s) concerning values associated with the sport.
- 800 13. Questioning (T): Any question to player(s) concerning values transfer associated with the  
801 sport.
- 802 14. Physical assistance: Physically moving the player's body to the proper position or through  
803 the correct range of motion of a skill.
- 804 15. Positive modelling (S): A demonstration of the correct performance of a skill or playing  
805 technique.
- 806 16. Positive modelling (V): A demonstration of the desired behaviour/action related to values.
- 807 17. Positive modelling Transfer (T): A demonstration of the desired behaviour/action related  
808 to values transfer.
- 809 18. Negative modelling (S): A demonstration of the incorrect performance of a skill or playing  
810 technique.
- 811 19. Negative modelling (V): A demonstration of the non-desired behaviour/action related to  
812 values.
- 813 20. Negative modelling (T): A demonstration of the non-desired behaviour/action related to  
814 values transfer.
- 815 21. Hustle: Verbal statement intended to intensify the efforts of the player(s).
- 816 22. Praise (S): Verbal or non-verbal compliments, statements, or signs of acceptance related  
817 to skill.
- 818 23. Praise (V): Verbal or non-verbal compliments, statements, or signs of acceptance related  
819 to values.
- 820 24. Praise (T): Verbal or non-verbal compliments, statements, or signs of acceptance related  
821 to values transfer.
- 822 25. Scold: Verbal or non-verbal behaviours of displeasure.
- 823 26. Management: Verbal statements related to organizational details of practice sessions not  
824 referring to strategies or fundamentals of the sport.

825 27. Silence: Periods of time when the subject is not talking.

826 28. Uncodable: Any behaviour that cannot be seen or heard or does not fit into the categories  
827 above.

828

829 **Note:** *Value* refers to behaviour/action that is judged to be good or desirable. For example,  
830 respect, integrity, or resilience.

831 *Transfer* refers to individual internalizes value/life skill learned in sport and be able to  
832 apply them to other life domain.

**Table 1***Descriptive Statistics of the A.S.U.O.I Observation Tool*

Variables	Cluster 1: <i>Reserved</i> (pre/post n=4/5)		Cluster 2: <i>Average</i> (pre/post n=15/10)		Cluster 3: <i>Engaging</i> (pre/post n=5/3)		Cluster 4: <i>Purposeful</i> (pre/post n=3/5)		Cluster 5: <i>VPS-Active</i> (pre/post n=0/4)		Total		Total (pre-test only)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Use of first name	<b>3.56</b>	3.47	<b>3.13</b>	3.27	<b>19.25*</b>	3.77	<b>10.56*</b>	9.17	<b>0.25</b>	0.5	<b>6.61</b>	7.61	/	/
Hustle	<b>11.67</b>	20.8 9	<b>7.83</b>	7.59	<b>11.75</b>	9.87	<b>24.22*</b>	26.5 9	<b>3.5*</b>	5.07	<b>11.46</b>	15.8 2	/	/
Scold	<b>0.11</b>	0.33	<b>0.79</b>	1.5	<b>0.38</b>	0.74	<b>9.67*</b>	7.4	<b>0.25</b>	0.5	<b>2.06</b>	4.61	/	/
Silence	<b>74.22*</b>	21.7 6	<b>36.38</b>	19.51	<b>38.25</b>	17.2 4	<b>20*</b>	17.2 5	<b>20.25*</b>	13.4 3	<b>39.04</b>	25.1 5	/	/
Management	<b>28.44*</b>	24.7 4	<b>25.29</b>	29.48	<b>21.88</b>	15.0 4	<b>13.78*</b>	17.3	<b>11.5*</b>	11.1 5	<b>22.37</b>	24.1 5	/	/
Physical assistance	<b>25.33</b>	12.9 2	<b>37.04</b>	35.53	<b>40.5</b>	22.0 5	<b>42.78</b>	33.8 8	<b>24</b>	35.0 9	<b>35.59</b>	30.3 6	/	/
Pre-instruction	<b>5.78</b>	8.81	<b>8.75</b>	14.04	<b>2.75</b>	3.11	<b>8.22</b>	12.2 9	<b>3</b>	3.83	<b>6.85</b>	11.3 1	<b>6.48**</b>	12.9
Pre-instruction Values	<b>17.56</b>	15.2 2	<b>14.08</b>	7.49	<b>17.75</b>	6.92	<b>28.44*</b>	20.9	<b>7.75</b>	14.2	<b>17.13</b>	13.2 6	<b>17.33</b>	12.1 1
Concurrent instructions	<b>0.22</b>	0.44	<b>0.71</b>	1.55	<b>0.13</b>	0.35	<b>1.33</b>	2.92	<b>0.5</b>	1	<b>0.63</b>	1.61	<b>0.7**</b>	1.79
Concurrent instructions values	<b>16.78</b>	20.4 5	<b>26.29</b>	24.2	<b>20.25</b>	11.9 5	<b>31.78</b>	12.2 1	<b>89.75*</b>	39.8 2	<b>29.43</b>	27.7 2	<b>25.26</b>	22.2 8
Post-instructions	<b>0</b>	0	<b>0.26</b>	0.92	<b>0.13</b>	0.35	<b>0.22</b>	0.44	<b>3.25</b>	2.87	<b>0.42</b>	1.25	<b>0.12**</b>	0.43
Post-instruction values	<b>19.22*</b>	11.6 4	<b>3.5</b>	3.41	<b>4.5</b>	4.17	<b>20.67*</b>	14.8 6	<b>2.5</b>	3.79	<b>9.06</b>	11.0 8	<b>8.78</b>	10.7 3
Questioning	<b>0.22</b>	0.67	<b>0.33</b>	1.09	<b>0</b>	0	<b>1.56</b>	4.67	<b>0</b>	0	<b>0.44</b>	2.03	<b>0.19**</b>	0.56
Questioning values	<b>4.67</b>	4.42	<b>11.58</b>	14.8	<b>7.63</b>	8.47	<b>16.22*</b>	11.5 3	<b>1.75</b>	1.5	<b>9.89</b>	12.0 9	<b>11.33</b>	15.1 7

Positive modelling	<b>23.67</b> *	32.4 9	<b>9.71</b>	11.68	<b>6.75</b>	5.85	<b>28.11</b> *	12.5 7	<b>10.75</b>	6.65	<b>14.74</b>	17.7 6	<b>12.33*</b> *	13.9 4
Positive modelling values	<b>0.25</b>	0.71	<b>0.38</b>	1.44	<b>0.13</b>	0.35	<b>0</b>	0	<b>0</b>	0	<b>0.23</b>	1.02	<b>0.3</b>	1.35
Negative modelling	<b>0.44</b>	0.53	<b>0.58</b>	1.25	<b>1.13</b>	1.13	<b>4.56*</b>	3.71	<b>0.25</b>	0.5	<b>1.28</b>	2.29	<b>1.15**</b>	1.73
Negative modelling values	<b>0</b>	0	<b>0.04</b>	0.2	<b>0</b>	0	<b>0</b>	0	<b>0</b>	0	<b>0.02</b>	0.14	<b>0.04</b>	0.19
Praise	<b>4.89*</b>	4.57	<b>11.79</b>	10.4	<b>9.5</b>	7.87	<b>24.89</b> *	12.8 4	<b>12.5</b>	14.3 4	<b>12.54</b>	11.5	<b>13.15*</b> *	12.8 9
Praise values	<b>0</b>	0	<b>0.17</b>	0.38	<b>0</b>	0	<b>0.33</b>	0.5	<b>1.5</b>	1.29	<b>0.24</b>	0.58	<b>0.15</b>	0.36
Uncodable	<b>0</b>	0	<b>0.04</b>	0.2	<b>0</b>	0	<b>0.56</b>	1.33	<b>0</b>	0	<b>0.11</b>	0.57	/	/
Positive modelling transfer	<b>0</b>	0	<b>0.04</b>	0.2	<b>0</b>	0	<b>0.11</b>	0.33	<b>0</b>	0	<b>0.04</b>	0.19	/	/
Pre-instruction transfer	<b>0</b>	0	<b>0.04</b>	0.2	<b>0</b>	0	<b>0.11</b>	0.33	<b>0</b>	0	<b>0.04</b>	0.19	/	/
Post-instruction transfer	<b>0.11</b>	0.33	<b>0</b>	0	<b>0</b>	0	<b>0</b>	0	<b>0</b>	0	<b>0.02</b>	0.14	/	/
Concurrent instruction transfer	<b>0</b>	0	<b>0</b>	0	<b>0</b>	0	<b>0.11</b>	0.33	<b>0</b>	0	<b>0.02</b>	0.14	/	/
Questioning transfer	<b>0</b>	0	<b>0</b>	0	<b>0</b>	0	<b>0</b>	0	<b>0</b>	0	<b>0</b>	0	/	/
Negative modelling transfer	<b>0</b>	0	<b>0</b>	0	<b>0</b>	0	<b>0</b>	0	<b>0</b>	0	<b>0</b>	0	/	/
Praise transfer	<b>0.11</b>	0.33	<b>0</b>	0	<b>0</b>	0	<b>0.11</b>	0.33	<b>0</b>	0	<b>0.04</b>	0.19	/	/

*Note.* All values are in a number of observations per session. \*This cluster showed significantly lower (light grey) / higher (dark grey) value than the others for this variable ( $p_{\text{Bonf}} < .05$ ). \*\*The number of observations with values is significantly different than the number of observations without values for this variable ( $p_{\text{Holm}} < .05$ ).

**Table 2***Descriptive Statistics and Comparisons between the Two Groups for PABSS*

Variables	Intervention		Control	
	Pre Mean (SD)	Post Mean (SD)	Pre Mean (SD)	Post Mean (SD)
Prosocial behaviour				
Towards teammates (PT)	3.85 (0.68)	3.92 (0.63)	3.98 (0.80)	3.96 (0.79)
Towards opponent (PO)	3.27 (0.84)	3.35 (0.94)	3.18 (1.06)	3.27 (1.09)
Antisocial behaviour				
Towards teammates (AT)	1.97 (0.76)*	2.07 (0.78)*	1.50 (0.54)*	1.53 (0.66)*
Towards opponents (AO)	2.00 (0.60)*	2.01 (0.62)*	1.63 (0.83)*	1.63 (0.84)*

*Note:* \* indicates a significant difference at  $p < .05$  between the groups, with the intervention group showing higher values during both pre and post-test condition.

**Figure 2**  
*Distributions of the Different Emerging Coaching Profiles with Reference to Time (Pre- or Post-Program) and the Respective Group (Control or Intervention)*

