Original research

International Journal of Sports Science & Coaching

The effects of values and principles in sports coach education course designed to promote values-driven coaching styles

International Journal of Sports Science & Coaching
2024, Vol. 19(6) 2272–2285

DOI: 10.1177/17479541241266975
journals.sagepub.com/home/spo
Sage

Koon Teck Koh[1], John Komar[1], Newman Tarkington[2], and Eliza Shi Ru Tan[3]

Abstract

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

Keywords

coaching philosophy, positive youth development, systematic observation, team sport

Introduction

The ability to teach values (e.g., work ethic, honesty, and social responsibility) that support psychosocial development, promote social-emotional learning, and foster physical literacy through physical education and sport (PES) has been deemed a priority among positive youth development (PYD) scholars.[1] Values are defined as 'the principles and fundamental convictions that act as general guides to behaviour, the standard by which particular actions are judged to be good or desirable'.[2] Similarly, life skills are often recognised as behavioural, cognitive, intrapersonal, and interpersonal skills that enable youth to succeed in both sport and life.[3] Thus, like life skills, values are positioned as being transferable and enable youth to thrive within the parameters of society.[4,5] In fact, such PYD outcomes are recognised as important mechanisms that not only help promote positive long-term development but also mitigate the onset and/or adherence to behavioural health problems, such as antisocial behaviour (e.g., aggressive and violent behaviours). Values, however, differ from

Reviewer: Jim McKenna (Leeds Beckett University, UK)

[1]Nanyang Technological University, National Institute of Education, Physical Education & Sports Science, Singapore
[2]College of Social Work, University of Kentucky, Lexington, Kentucky, USA
[3]Singapore Sport Institute, Character & Leadership Programme, Sport Singapore, Singapore, Singapore

Corresponding author:
Koon Teck Koh, Physical Education & Sports Science, Nanyang Technological University, 1 Nanyang Walk, Singapore 637616
Email: koonteck.koh@nie.edu.sg

life skills in that they provide an ethical foundation upon which life skills can be applied, while life skills are the actions and behaviours that allow an individual to navigate challenges in life.[6]

Within PES contexts, coaches are recognised as being the most prevalent source of support as youth athletes develop values and learn how to transfer values to other life domains.[7–9] From an experiential learning theory perspective,[10] learning is believed to be an internal reflexive process of knowledge acquisition that results from reflecting upon first-hand experiences.[11] Within the theory of experiential learning, *facilitated experiential learning* emphasises the role of the trained facilitator and underscores the importance of transformative interactions that occur between facilitator (e.g., coach) and learner (e.g., athlete) throughout the learning process. The praxis of facilitated experiential learning is the use of *facilitated coaching practices*, which are strategies and approaches used intentionally to maximise learning opportunities by leveraging naturally occurring and designed experiences. By using facilitative coaching practices (e.g., directly teaching, modelling, discussing transfer), coaches are better equipped to promote the development and transfer of PYD outcomes, including values.

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

The influence of youth sport coaches

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

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

Values-driven coach education

Given the complex and dynamic socio-political settings in which athletes and coaches operate, explicit coaching practices may become essential. In fact, scholars have begun advocating for the need to design and deliver coach education programmes promoting value-oriented concepts such as social justice, diversity, equity, and inclusion.[19–21] As such, a value-driven approach acknowledges the importance of facilitating PYD, with a unique emphasis on promoting moral development by teaching youth values (e.g., honesty, inclusivity, social responsibility) through sport participation.[22] Although there are practical strategies available for coaches, instructional programmes and coach education courses have been created to help coaches acquire pedagogical approaches and explicit practices to teach values through PES. One such values training programme is the VPS, a coach education course designed for PES coaches in Singapore. The programme's contents were organised in four phases: (1) *Introductory*, which included participant reflections on the importance of teaching values;

(2) *Planning*, which included a demonstration of a training plan designed to teach sport skills and values simultaneously; (3) *Practical* in which participants implemented their values-driven teaching plan; and (4) *Review*, which gleaned insights and feedback from participants.[23]

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

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

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

1. How does the VPS course impact coaches' behaviours during training sessions at the end of the course?
2. What are the benefits perceived by coaches and their athletes concerning the VPS course?

Method

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

Context

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

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

Participants

Participants who have signed up for the VPS course were approached by Sport Singapore to participate in this study. The inclusion criteria were: (1) currently active in coaching and (2) have yet to attend the VPS course. A total of 27 sport coaches and 85 youth athletes from the coaches' respective teams participated in the study. Ten coaches were representative of team sports (e.g., soccer, handball, and rugby), while 17 coached individual sports (e.g., swimming, taekwondo, and squash). Further, athletes were representative of five different sports (soccer = 44, handball = 18, rugby = 8, dragon boat = 8, and floorball = 7).

Subsequently, 14 coaches who had already signed up for and attended the VPS course (and 40 athletes from their teams) were assigned to the intervention group. Most coaches in this group identified as male ($n = 12$), had an

average age of 37.8 years ($SD = 13.2$ years), and had an average of 5.6 years of experience in coaching. The remaining 13 coaches who had yet to attend the VPS course (and 45 athletes from their teams) were the control group. Similar to the intervention group, most coaches identified as male ($n = 10$), had an average age of 36.5 years ($SD = 12.1$) and an average of 7.5 years of coaching experience (see Figure 1).

Data Collection

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

Given the multi-layered responses to educational interventions and the unique sensitivities of respective research methods,[29] the current study employed several data collection methods. Systematic observations were conducted to examine coaching practices related to teaching of sports skills and values, while athlete survey data were collected to examine their use of values in sport. Additionally, individual interviews were conducted among coaches to explore the perceived usefulness of the VPS course. Focus groups were conducted with athletes to explore to what extent their coaches demonstrate values-driven coaching practices.

Coach systematic observation

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

Two coaching sessions of each coach involved in the study (i.e., intervention group, control group) were recorded. The first session was recorded before the VPS course was offered. The second session was recorded two months after the VPS course. The videos were subsequently coded using the modified ASUOI with automated functions (https://apps.apple.com/app/id1540244000) to categorise sports skills and values teaching behaviours observed during the lesson using interval coding (5-second observe and the next 5 second to decide an appropriate behaviour to be coded). The videos were coded by the two coders who were involved in the pilot study to ensure consistency.

Athlete survey

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

Coach interview and athlete focus group

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

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

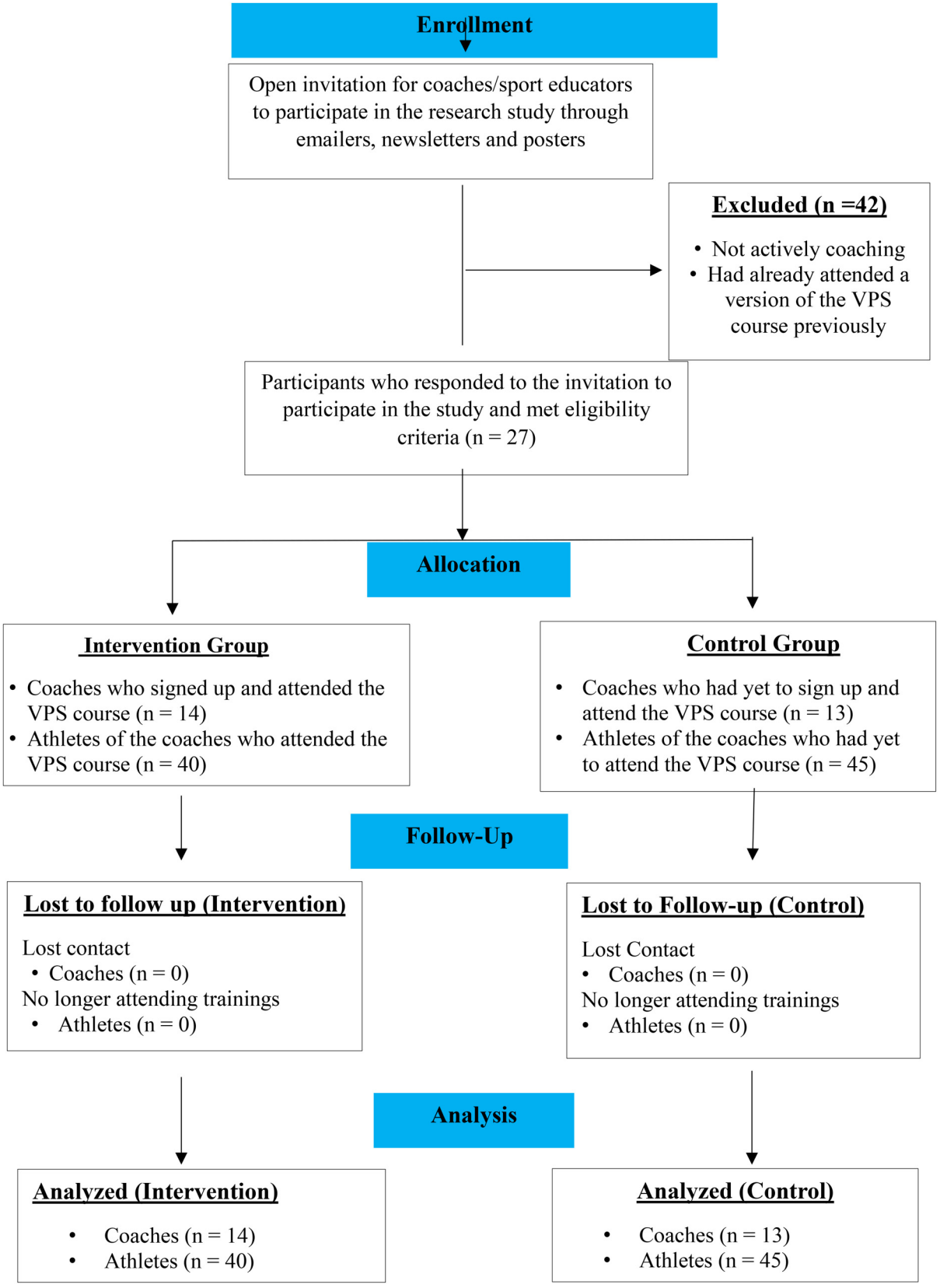

Figure 1. Recruitment and allocation of study samples.

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

Data analysis

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

Coach systematic observation

To examine quantitative data gleaned from the systematic observations, statistical analyses were conducted with *R* version 3.6.0[36] and JASP Statistics V0.11, with a level of statistical significance fixed at .05. Firstly, to determine whether coaching practices were different at the start of the project (before the intervention) among the coaches, the variables from the ASUOI containing a 'without values' and 'with values' version (the version 'with transfer' was not compared due to lack of occurrences) were compared using a *t*-test for repeated measures using the responses from both groups of coaches during the pre-test. As multiple *t*-test were performed (i.e., on 15 variables), each output has been corrected with a Holm-Šidák correction. Before running the test, independence of the measures between groups, as well as normality of the distribution of the differences between the two groups was tested, and in case of a normality assumption violation revealed by the Shapiro–Wilk test, the non-parametric equivalent Wilcoxon signed-rank was used. Where the difference was significant, Cohen's d was computed as a measure of the size of the effect (or the matched rank biserial correlation when a nonparametric test was used), with $d = 0.2$ representing a small effect, $d = 0.5$ representing a medium effect and $d = 0.8$ representing a large effect.[37]

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

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

Athlete survey

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

Coach interview and athlete focus group

All interview and focus groups data were organised using NVivo software and analysed using an inductive thematic analysis[41] as it enabled the researchers to identify key themes developed across the data set related to the research questions, with a strong emphasis on interpretation of the data. The analysis was led by the research assistant (RA). The analytical approach consisted of four steps: (1) the RA familiarised themself with the data; (2) codes were identified and grouped to form themes, which were reviewed to assess how they formed a logical structure to answer the research questions; (3) a thematic table was created to visually explore the relationships between the unique themes; and (4) quotes were selected to best illustrate the essential meaning of each theme. Trustworthiness was achieved by having the first author acted as a critical friend to the RA. He reviewed 30% of the codes and themes analysed by the RA and both were engaged in many rounds of discussion before reaching

consensus. Creditability of the interviewer, that is, the RA was achieved as she has more than five years of experience in conducting interviews and qualitative research. All selected quotes were anonymised, using letters and numbers to represent the participants, with coaches coded as C (C1–C27) and athletes coded as A (A1–A85).

Results

Systematic observation and coach profiling

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

The results showed that before the VPS course, coaches from both groups were already showing different profiles of utilising value-driven coaching behaviours. Indeed, the repeated measures *t*-test or Wilcoxon signed-rank test performed on pre-test data showed that regardless the group, pre-instructions, $t(26) = -3.40$, $p = .002$, $d = -0.654$, concurrent instructions ($W = 0$, $p < .001$, $d = -1.000$), post-instructions ($W = 3$, $p < .001$, $d = -0.980$), and questioning ($W = 4.5$, $p < .001$, $d = -0.970$) are significantly more recurrent when inculcating values than without values, with large effect size (see Table 1 last column for the descriptive statistics). Conversely, positive modelling ($W = 313$, $p < .001$, $d = 0.926$), negative modelling ($W = 91$, $p = .001$, $d = 1.000$), and praise ($W = 351$, $p < .001$, $d = 1.00$) are significantly more recurrent without inculcating values than when inculcating values, with large effect size.

In terms of profiling of the coaching behaviours to identify the main coaching styles observed, the results showed that all the coaches could be classified into five different styles of coaching. The largest Calinski–Harabasz criterion (CH) value was obtained for a model with five clusters (CH from 2–8 potential clusters = [220.3, 248.1, 251.7, **264.1***, 243.0, 226.5, 227.4]). Thus, a K-means cluster analysis was performed to partition the trials into five groups. Table 1 presents the average and standard deviation of each question for each cluster. The distribution of the clusters in the test (pre- versus post-course) and the group is displayed in Figure 2.

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

Style 4 (Purposeful coach) is a coach characterised by hyperactivity compared to the other profiles, with values as well as without values. This style showed higher usage of first name, as well as higher usage of hustle and scold than the average styles. There were also more frequent uses of values during pre-instructions, post-instructions, and questioning activities, higher usage of negative modelling, and higher usage of positive modelling and praise. Style 5 (VPS-active coach) is characterised by the lesser uses of hustling, silence, and management than the other four styles but with higher usage of concurrent instructions with values. This style showed three times more usage of concurrent instructions with values than the average styles. Moreover, for the intervention group, this coaching style was observed only after the VPS course.

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

Survey

The results of the mixed repeated measure ANOVA (Table 2) showed that there was a significant main effect of the groups (i.e., intervention versus control) for antisocial behaviours towards opponents (AO), $F(1, 83) = 6.11$, $p = .015$, $\eta_p^2 = .069$, and antisocial behaviours towards teammates (AT), $F(1, 83) = 12.592$, $p < .001$, $\eta_p^2 = .132$, but no time or interaction effect (all $p_s > .168$), showing that the intervention group had higher values for AO and AT regardless of the time of the test (i.e., pre versus post-test). No significant effect neither main nor interaction was found concerning prosocial behaviours toward teammates (PT) and prosocial behaviours towards opponents (PO) (all $p_s > .254$).

Interviews and focus groups

While the quantitative results indicated little evidence of the effect of the VPS course in promoting value-driven coaching practices, qualitative findings illustrated a contrasting picture. Qualitative findings suggest that fourteen coaches in the intervention group recognised the usefulness and importance of the VPS course. Further, they reported that attending the VPS course raised their awareness and ability to recognise the importance of establishing values-

Table 1. Descriptive statistics of the ASUOI observation tool.

	Cluster 1: Reserved (pre/post $n = 4/5$)		Cluster 2: Average (pre/post $n = 15/10$)		Cluster 3: Engaging (pre/post $n = 5/3$)		Cluster 4: Purposeful (pre/post $n = 3/5$)		Cluster 5: VPS-active (pre/post $n = 0/4$)		Total		Total (pre-test only)	
Variables	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
Use of first name	3.56	3.47	3.13	3.27	19.25*	3.77	10.56*	9.17	0.25	0.5	6.61	7.61	/	/
Hustle	11.67	20.89	7.83	7.59	11.75	9.87	24.22*	26.59	3.5*	5.07	11.46	15.82	/	/
Scold	0.11	0.33	0.79	1.5	0.38	0.74	9.67*	7.4	0.25	0.5	2.06	4.61	/	/
Silence	74.22*	21.76	36.38	19.51	38.25	17.24	20*	17.25	20.25*	13.43	39.04	25.15	/	/
Management	28.44*	24.74	25.29	29.48	21.88	15.04	13.78*	17.3	11.5*	11.15	22.37	24.15	/	/
Physical assistance	25.33	12.92	37.04	35.53	40.5	22.05	42.78	33.88	24	35.09	35.59	30.36	/	/
Pre-instruction	5.78	8.81	8.75	14.04	2.75	3.11	8.22	12.29	3	3.83	6.85	11.31	6.48**	12.9
Pre-instruction Values	17.56	15.22	14.08	7.49	17.75	6.92	28.44*	20.9	7.75	14.2	17.13	13.26	17.33	12.11
Concurrent instructions	0.22	0.44	0.71	1.55	0.13	0.35	1.33	2.92	0.5	1	0.63	1.61	0.7**	1.79
Concurrent instructions values	16.78	20.45	26.29	24.2	20.25	11.95	31.78	12.21	89.75*	39.82	29.43	27.72	25.26	22.28
Post-instructions	0	0	0.26	0.92	0.13	0.35	0.22	0.44	3.25	2.87	0.42	1.25	0.12**	0.43
Post-instruction values	19.22*	11.64	3.5	3.41	4.5	4.17	20.67*	14.86	2.5	3.79	9.06	11.08	8.78	10.73
Questioning	0.22	0.67	0.33	1.09	0	0	1.56	4.67	0	0	0.44	2.03	0.19**	0.56
Questioning values	4.67	4.42	11.58	14.8	7.63	8.47	16.22*	11.53	1.75	1.5	9.89	12.09	11.33	15.17
Positive modelling	23.67*	32.49	9.71	11.68	6.75	5.85	28.11*	12.57	10.75	6.65	14.74	17.76	12.33**	13.94
Positive modelling values	0.25	0.71	0.38	1.44	0.13	0.35	0	0	0	0	0.23	1.02	0.3	1.35
Negative modelling	0.44	0.53	0.58	1.25	1.13	1.13	4.56*	3.71	0.25	0.5	1.28	2.29	1.15**	1.73
Negative modelling values	0	0	0.04	0.2	0	0	0	0	0	0	0.02	0.14	0.04	0.19
Praise	4.89*	4.57	11.79	10.4	9.5	7.87	24.89*	12.84	12.5	14.34	12.54	11.5	13.15**	12.89
Praise values	0	0	0.17	0.38	0	0	0.33	0.5	1.5	1.29	0.24	0.58	0.15	0.36
Uncodable	0	0	0.04	0.2	0	0	0.56	1.33	0	0	0.11	0.57	/	/
Positive modelling transfer	0	0	0.04	0.2	0	0	0.11	0.33	0	0	0.04	0.19	/	/
Pre-instruction transfer	0	0	0.04	0.2	0	0	0.11	0.33	0	0	0.04	0.19	/	/
Post-instruction transfer	0.11	0.33	0	0	0	0	0	0	0	0	0.02	0.14	/	/
Concurrent instruction transfer	0	0	0	0	0	0	0.11	0.33	0	0	0.02	0.14	/	/
Questioning transfer	0	0	0	0	0	0	0	0	0	0	0	0	/	/
Negative modelling transfer	0	0	0	0	0	0	0	0	0	0	0	0	/	/
Praise transfer	0.11	0.33	0	0	0	0	0.11	0.33	0	0	0.04	0.19	/	/

Note. All values are in a number of observations per session. ASUOI = Arizona State University Observation Instrument; VPS = Values and Principles in Sport.

*This cluster showed significantly lower (light grey)/higher (dark grey) value than the others for this variable ($p_{Bonf} < .05$).

**The number of observations with values is significantly different than the number of observations without values for this variable ($p_{Holm} < .05$).

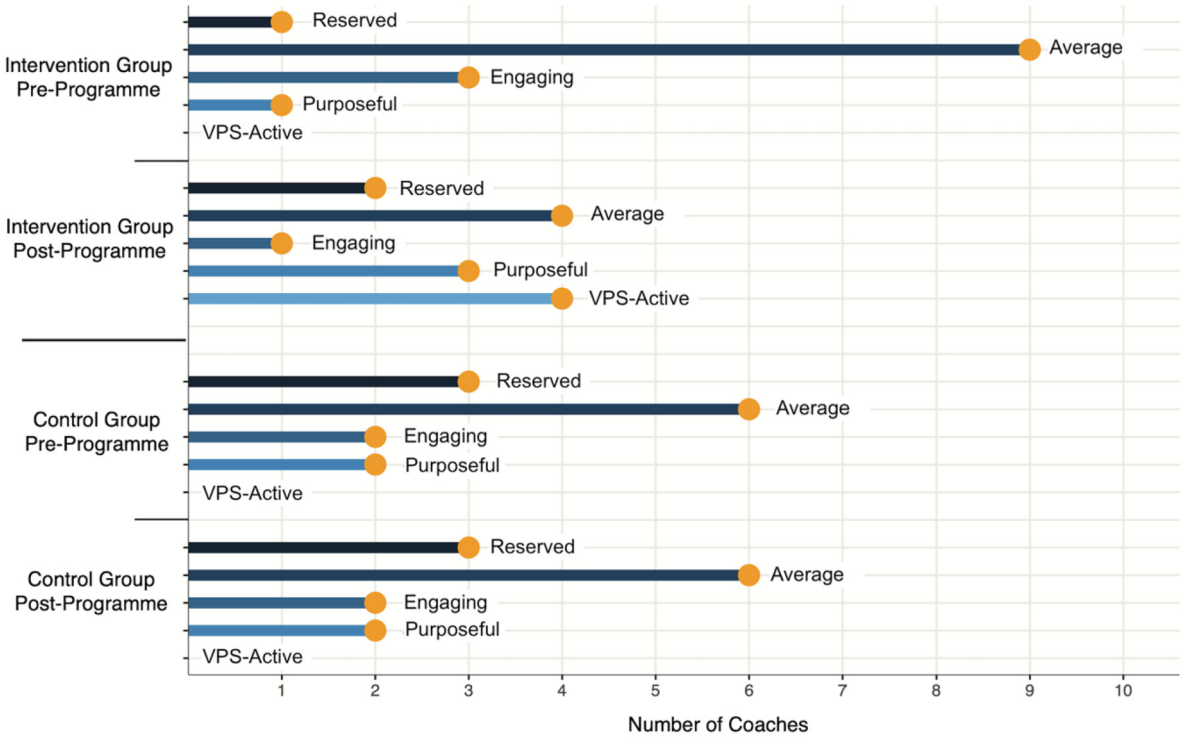

Figure 2. Distributions of the different emerging coaching profiles with reference to time (pre- or post-programme) and the respective group (control or intervention).

Table 2. Descriptive statistics and comparisons between the two groups for PABSS.

	Intervention		Control	
Variables	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	1.97 (0.76)*	2.07 (0.78)*	1.50 (0.54)*	1.53 (0.66)*
towards teammates (AT)	2.00 (0.60)*	2.01 (0.62)*	1.63 (0.83)*	1.63 (0.84)*
towards opponents (AO)				

*$p < .05$ between the groups, with the intervention group showing higher values during both pre and post-test condition. PABSS = Prosocial and Antisocial Behaviour in Sport Scale; AT = antisocial behaviours towards teammates; AO = antisocial behaviours towards opponents; PT = prosocial behaviours toward teammates; PO = prosocial behaviours towards opponents.

driven coaching behaviours. They also believe that the course enhanced their ability to plan and teach values in sport and helped learning of transfer outside of sport.

Importance of teaching values

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

Values-driven coaching philosophy

Parallel to recognising the usefulness of the VPS course, 12 coaches explained that the course reinforced their

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

Confidence teaching values

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

Coaching practices to teach values

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

Impact on youth athletes

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

Discussion

The purpose of this study was to investigate the effectiveness and perceived benefits of VPS coach education course related to values-driven coaching practice. The multiple methods employed in this may help to inform future design and implementation of the VPS course, potentially improving coach education programmes and coaching practice. Taken together, quantitative results suggest that attending the VPS course was not associated with values-driven coaching practices, nor athlete moral behaviours. These findings were consistent for both the intervention and control groups regarding an increase in the total percentage of values-related coaching practices. Further, findings from observed coaching practices of those who attended the VPS course did not show strong evidence of the application of their learning. This finding is consistent with what the coaches expressed during the interviews that they have not yet deliberately planned or incorporated the teaching of values in their lessons and trainings, at the time of the study. However, some athletes observed that their coaches have emphasised values education during coaching session, which is a good sign, although it may not be due to the training effect. In that sense, offering a longer duration of practice for the coaches to experience the content of the course may be necessary to allow for salient events or contexts to activate the different values in coaching practice. In a similar vein, a more integrated course content, that is, 'just-in-time' and 'context-specific', may help to deepen its effect on the coaches.

However, quantitative analyses of the observational data indicated that five coaching styles existed among coaches: (1) reserved; (2) average; (3) engaging; (4) purposeful; and (5) VPS-active. Among these, only two (average,

VPS-active) had values incorporated into their facilitative coaching practice. This finding aligns with the existing literature on effective coaching where coaches can exhibit consistent professional, interpersonal, and intrapersonal knowledge to improve athletes' competence, confidence, connection, and character in their coaching contexts.[42] Results from the present study suggest that coaches who already emphasised values (i.e., purposeful, VPS-active) may be more likely to integrate values into their coaching practice than the coaches who were less connected to values at entry into the study. At baseline, more than half of the coaches exhibited the average coaching style, characterised by high usage of coaching behaviours focusing on sport skills (e.g., pre-instructions, questioning) without values, as well as fewer behaviours related to facilitative coaching practices (e.g., positive modelling, negative modelling, praise). Only three coaches demonstrated facilitative coaching practices that explicitly included coaching sport skills and values. After the VPS course, few changes were found among the coaches in the intervention group: an increase in the styles with values (purposeful, VPS-active) and a decrease in the average and engaging styles. Interestingly, there was one coach who switched to the reserved style. This could be that after the course, this coach became a little 'lost' and less confident about what to do, hence, became more silent.

Despite strong evidence highlighting that for athletes to learn and internalise values and other related PYD outcomes learned from sport, coaches must 'intentionally' plan, deliver, and facilitate this process during training sessions.[23,25] Unfortunately, there are limited tools to address the 'intentionality' gap. The present study contributes to the literature by pioneering the development of a free mobile digital tool to support coaching – a call made by many scholars to advance sports coaching research, especially after the COVID-19 pandemic.[43] We believe the enhanced ASUOI can be a valuable tool to help coaches reflect on their coaching practice using objective assessments of time use in delivered sessions. While there may be concerns about time-based assessment of coaching behaviours, we argue that providing this information is helpful for increasing coaches' awareness of their own actions. Equally, it helps to support them in critically reflecting on achieving effective coaching outcomes and how to enhance future practice.[44] This applies both in sports skills and values development.

Based on the qualitative data, after experiencing the VPS course, coaches reported increased awareness and placed a greater importance on inculcating values during sporting activities. However, despite the shift in several coaches' coaching styles, the findings indicated that there was no change in athlete prosocial behaviours, suggesting the coaches neither deliberately nor intentionally teach/facilitate values during coaching lessons. This finding was also supported by coach interviews; coaches neither deliberately planned nor were they systematic in addressing values in their coaching. Triangulating these findings proposes that the VPS course was only effective for those were already effective coaches and intending to use the VPS course to improve their interaction. Indeed, coaching effectiveness is linked to higher levels of openness to learning and willingness to self-reflect critically.[45] Effective coaches are also lifelong learners,[46] and thus their learning is influenced by their coaching philosophy and knowledge, allowing them to be more likely to learn from the VPS course and apply more of its key messages.

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

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

Limitations, implications, and future directions

Although the present study contributed to the literature by using a multi-methods research design to provide greater insights into the impact of a VPS course, some limitations should be acknowledged. First, post-course data were collected two months after the VPS course, which may not have allowed all coaches – depending on the timing of their season – to implement novel pedagogical approaches. Future research may consider enhancing the study design by collecting post-course data both immediately following the course and six months after the course to allow coaches time to internalise and adopt their learning. To

this end, a follow-up study would also be beneficial to determine the long-term effectiveness of the VPS course.

Second, the coaching profile of the participants before the VPS course was not considered in this study. As shown in the results, coaches did exhibit diverse profiles, and years of coaching experience may potentially influence coaching practice. Future researchers may consider controlling for various aspects of initial coaches' coaching profiles when looking at the effectiveness of coach education and practices. Third, due to the pragmatic real-world nature of this course evaluation and the limitations of recruitment and sampling,[42] we are unable to be conclusive about the effectiveness of the training related for equipping these participants with the elements needed to change their delivery of values-driven coaching. Moreover, although it is desirable, to overcome their motivational differences, blinding the coaches in the intervention group was not possible due to the nature of the course structure and administrative constraints. Indeed, this factor may help explain why the coaches' post-course interviews were so positive; they may have been affected by social desirability/conformity bias. Our work has confirmed the challenge of designing effective educational interventions and of attributing causality. Future study should adopt more comprehensive designs. For example, randomised control trials, with larger sample sizes and stricter conditional differences, will close this gap.

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

Conclusion

The seed for developing values through sport coaching and making conscious and deliberate teaching of values as part of coaching practice requires time, repetitive behaviours, reinforcement, and continued support. The present study suggests that even experienced coaches tend to be inconsistent in teaching values during training sessions or, much less, deliberate in planning how to incorporate these in their facilitative coaching practices. Nonetheless, while the findings suggest the VPS course impacted the coaching style (e.g., facilitative coaching practices), our results should be put in perspective of the relatively small sample size, specifically in regards of the high variability of styles between the coaches. Future research should seek to link the original coaching style of coaches at the entrance of the programme to the outcome after the intervention. Indeed, this kind of knowledge could help to adapt and individualise the coach education programme to the very specific needs of the coaches based on their initial style. Finally, future improvements to the course are likely to better equip coaches, thereby helping youth athletes develop transferable values – such as work ethic, honesty, and social responsibility – that help youth become change agents in the twenty-first century and beyond.

Declaration of conflicting interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

This project is funded by Sport Singapore (project reference number: SS-Perception from Coaches).

ORCID iDs

Koon Teck Koh https://orcid.org/0000-0001-6356-7408
John Komar https://orcid.org/0000-0002-2063-4065

References

1. Camiré M. Reconciling competition and positive youth development in sport. *STAPS* 2015; 109: 25–39.
2. Halstead JM and Taylor MJ. *The development of values, attitudes, and personal qualities: a review of recent research*. Slough: NFER, 2000.
3. Camiré M, Kendellen K, Rathwell S, et al. Evaluation of the pilot implementation of the coaching for life skills programme. *Int Sport Coach J* 2018; 5: 227–236.
4. Gould D and Carson S. Life skills development through sport: current status and future directions. *Int Rev Sport Exerc Psychol* 2008; 1: 58–78.
5. Newman TJ, Magier E, Kimiecik C, et al. The relationship between youth sport participation and aggressive and violent behaviours: a scoping review of the literature. *J Soc Social Work Res* 2021; 12: 371–389.
6. Schwartz SH. Universals in the content and structure of values: theoretical advances and empirical tests in 20 countries. *Adv Exp Soc Psychol* 1992; 25: 1–65.
7. Jacobs JM and Wright PM. Transfer of life skills in sport-based youth development programmes: a conceptual framework bridging learning to application. *Quest* 2018; 70: 81–99.

8. Sheridan D, Coffee P and Lavallee D. A systematic review of social support in youth sport. *Int Rev Sport Exerc Psychol* 2014; 7: 198–228.
9. Newman TJ, Anderson-Butcher D and Amorose AJ. Examining the influence of sport programme staff and parent/caregiver support on youth outcomes. *Appl Dev Sci* 2020; 24: 263–278.
10. Kolb D. *Experiential learning: experience as the source of learning and development*. New Jersey: Prentice Hall, 1984.
11. Newman T, Alvarez M and Kim M. An experiential approach to sport for youth development. *J Exp Educ* 2017; 40: 308–322.
12. Santos F, Rathwell S, Sabino B, et al. Analyzing continuous coach education courses in Portugal: implications for youth development. *Int J Sports Sci Coach* 2023; 18: 1036–1044.
13. Dorsch TE, Smith AL, Blazo JA, et al. Toward an integrated understanding of the youth sport system. *Res Q Exerc Sport* 2022; 93: 105–119.
14. Amorose A, Anderson-Butcher D, Newman T, et al. High school athletes' self-determined motivation: the independent and interactive effects of coach, father, and mother autonomy support. *Psychol Sport Exerc* 2016; 26: 1–8.
15. Xie FMF, Koh KT and Falcão W. Strategies and methods for teaching values transference from physical education to the classroom and home: a case study. *Asia Pacific J of Educ* 2023; 43: 479–496.
16. Bean C, Kramers S, Forneris T, et al. The implicit/explicit continuum of life skills development and transfer. *Quest* 2018; 70: 456–470.
17. Kramers S, Camiré M and Bean C. Profiling patterns of congruence in youth golf coaches' life skills teaching. *J Appl Sport Psychol* 2021; 33: 218–237.
18. Coatsworth JD and DE C. The effects of autonomy-supportive coaching, need satisfaction, and self-perceptions on initiative and identity in youth swimmers. *Dev Psychol* 2009; 45: 320–328.
19. Camiré M, Newman T, Bean C, et al. Reimagining positive youth development and life skills in sport through a social justice lens. *J Appl Sport Psychol* 2022; 34: 1058–1076.
20. Kochanek J and Erickson K. Interrogating positive youth development through sport using critical race theory. *Quest* 2020; 72: 224–240.
21. Newman TJ, Santos F, Pierce S, et al. Coach education and coach development within a contemporary social justice society: implications for future research and potential pitfalls. *Quest* 2022; 74: 234–250.
22. Crossan W and Bednář M. A critical evaluation of the development and use of values in coaching. *Auc Kinanthropologica* 2018; 54: 96–117.
23. Koh KT, Ong SW and Camiré M. Implementation of a values training programme in physical education and sport: perspectives from teachers, coaches, students, and athletes. *Phys Educ Sport Pedagogy* 2016; 21: 295–312.
24. Koh KT, Camiré M, Regina L, et al. Implementation of a values training programme in physical education and sport: a follow-up study. *Phys Educ Sport Pedagogy* 2017; 22: 197–211.
25. Camiré M, Kendellen K, Rathwell S, et al. Evaluating the coaching for life skills online training programme: a randomized controlled trial. *Psychol Sport Exerc* 2020; 48: 101649.
26. Kramers S, Turgeon S, Bean C, et al. Examining the roles of coaching experience and coach training on coaches' perceived life skills teaching. *Int J Sports Sci Coach* 2020; 15: 576–583.
27. Camiré M and Trudel P. Using high school football to promote life skills and student engagement: perspectives from Canadian coaches and students. *World J of Educ* 2013; 3: 40–51.
28. MacDonald DJ, Côté J and Deakin J. The impact of informal coach training on the personal development of youth sport athletes. *Int J Sports Sci Coach* 2010; 5: 363–372.
29. Kaushik V and Walsh CA. Pragmatism as a research paradigm and its implications for social work research. *Soc Sci* 2019; 8: 255.
30. Lacy AC and Darst PW. Evolution of a systematic observation system: the Arizona State University Observation Instrument. *J Teach Phys Educ* 1984; 3: 59–66.
31. Lacy AC and Goldston PD. Behaviour analysis of male and female coaches in high school girls' basketball. *J Sport Behav* 1990; 13: 29–39.
32. Kavussanu M and Boardley ID. The prosocial and antisocial behaviour in sport scale. *J Sport Exerc Psychol* 2009; 31: 97–117.
33. Li CX, Koh KT, Wang CKJ, et al. Sports participation and moral development outcomes: examination of validity and reliability of the prosocial and antisocial behaviour in sport scale. *Int J Sports Sci Coach* 2015; 10: 505–513.
34. Koh KT, Camiré M, Bloom GA, et al. Creation, implementation, and evaluation of a values-based training programme for sport coaches and physical education teachers in Singapore. *Int J Sports Sci Coach* 2017; 12: 795–806.
35. Krueger RA and Casey MA. *Focus groups: a practical guide for applied research*. 4th ed. London: Sage Publication, 2009.
36. Team RC. R: a language and environment for statistical computing. *Online Referencing*, https://www.R-project.org (2019, accessed 20 June 2024).
37. Cohen J. *Statistical power analysis for the behavioural sciences*. 2nd ed. New York: Routledge, 1988.
38. Komar J, Chow JY, Chollet D, et al. Neurobiological degeneracy: supporting stability, flexibility and pluripotentiality in complex motor skills. *Acta Psychol* 2015; 154: 26–35.
39. Caliński T and Harabasz J. A dendrite method for cluster analysis. *Commun Stat* 1974; 3: 1–27.
40. Oksanen J, Blanchet FG, Friendly M, et al. Community ecology package. *R Package Version* 2019; 2: 1–296.
41. Naeem M, Ozuem W, Howel K, et al. A step-by-step process of thematic analysis to develop a conceptual model in qualitative research. *Int J Qual Methods* 2023; 22: 16094069231205789.
42. Smith B and McGannon KR. Developing rigor in qualitative research: problems and opportunities within sport and exercise psychology. *Int Rev Sport Exerc Psychol* 2018; 11: 101–121.
43. Côté J and Gilbert W. An integrative definition of coaching effectiveness and expertise. *Int J Sports Sci Coach* 2009; 4: 307–323.
44. Maiden N, Lockerbie J, Zachos K, et al. Designing new digital tools to augment human creative thinking at work: an application in elite sports coaching. *Expert Syst* 2023; 40: e13194.
45. Koh KT, Mallett CJ, Camire M, et al. A guided reflection intervention for high performance basketball coaches. *Int Sport Coach J* 2015; 2: 273–284.
46. Light R. Complex learning theory – its epistemology and its assumptions about learning: implications for physical education. *J Teach Phys Educ* 2008; 27: 21–37.
47. Watts DW, Cushion CJ and Cale L. Exploring professional coach educators' journeys and perceptions and understandings of learning. *Sport Educ Soc* 2022; 27: 632–646.

48. Cushion CJ. Applying game-centered approaches in coaching: a critical analysis of the 'dilemmas of practice' impacting change. *Sports Coaching Review* 2013; 2: 61–76.
49. Weinbauer-Heidel I and Ibeschitz-Manderbach M. *What makes training really work: 12 levers of transfer effectiveness*. London: Tredition, 2018.

Appendix A

Modified ASUOI Codes

1. Use of first name: Using the first name or nickname when speaking directly to a player.
2. Pre-instruction (S): Initial information given to player(s) preceding the desired action to be executed.
3. Pre-instruction (V): Initial information given to player(s) preceding the desired action/behaviour related to values.
4. Pre-instruction transfer (T) – Initial information given to player(s) preceding the desired action/behaviour related to values transfer.
5. Concurrent instruction (S): Cues or reminders given during the actual execution of the skill or play.
6. Concurrent instruction (V): Cues or reminders given during the actual demonstration of the action/behaviour related to values.
7. Concurrent instruction transfer (T): Cues or reminders given during the actual demonstration of the action/behaviour related to values transfer.
8. Post-instruction (S): Correction, re-explanation, or instructional feedback given after the execution of the skill or play.
9. Post-instruction (V): Correction, re-explanation, or instructional feedback given after the demonstration of action/behaviour related to values.
10. Post-instruction transfer (T): Correction, re-explanation, or instructional feedback given after the demonstration of action/behaviour related to values transfer.
11. Questioning (S): Any question to player(s) concerning strategies, techniques, assignments, and so forth associated with the sport.
12. Questioning (V): Any question to player(s) concerning values associated with the sport.
13. Questioning (T): Any question to player(s) concerning values transfer associated with the sport.
14. Physical assistance: Physically moving the player's body to the proper position or through the correct range of motion of a skill.
15. Positive modelling (S): A demonstration of the correct performance of a skill or playing technique.
16. Positive modelling (V): A demonstration of the desired behaviour/action related to values.
17. Positive modelling Transfer (T): A demonstration of the desired behaviour/action related to values transfer.
18. Negative modelling (S): A demonstration of the incorrect performance of a skill or playing technique.
19. Negative modelling (V): A demonstration of the non-desired behaviour/action related to values.
20. Negative modelling (T): A demonstration of the non-desired behaviour/action related to values transfer.
21. Hustle: Verbal statement intended to intensify the efforts of the player(s).
22. Praise (S): Verbal or non-verbal compliments, statements, or signs of acceptance related to skill.
23. Praise (V): Verbal or non-verbal compliments, statements, or signs of acceptance related to values.
24. Praise (T): Verbal or non-verbal compliments, statements, or signs of acceptance related to values transfer.
25. Scold: Verbal or non-verbal behaviours of displeasure.
26. Management: Verbal statements related to organisational details of practice sessions not referring to strategies or fundamentals of the sport.
27. Silence: Periods of time when the subject is not talking.
28. Uncodable: Any behaviour that cannot be seen or heard or does not fit into the categories above.

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

*Transfe*r refers to individual internalises value/life skill learned in sport and be able to apply them to other life domain.