

Developing Critical Reflection Skills in a Formal Coach Education Program

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Alongside knowledge and understanding of the sport (what to coach) and strategies to support learning (how to coach), critical reflection is an important feature of high-quality coaching practice. Accordingly, there is a clear need for evidence-based tools and frameworks for appreciating and developing coaches' critical reflection skills, through coach education programs. The purpose of this study is to share the results of an intervention intended to develop coaches' critical reflection skills through a formal gymnastics coach education program within the Flemish School for Coach Education (Belgium). A pre–post test design was used to compare the development of written critical reflection skills in 25 gymnastics coaches (14 intervention and 11 control). Statistical analysis of data revealed that the intervention had a significant ($p < .01$) impact on the quality of coaches' critical reflection. Coaches exhibited a positive, upward, trajectory from descriptive verbalizations to a deeper level of self-awareness, and greater criticality, along with demonstrating a willingness to adopt alternative ideas/approaches. Findings are discussed in relation to existing research on critical reflection as a feature of coach education. This study offers a unique critical reflection strategy that has the potential to meet the learning development needs of coaches in a formal coach education program.

Keywords: self-reflection, personal development plan, self-awareness, program evaluation, reflective prompts

Sport coaches are expected to possess a wide range of competences and expertise in order to fulfill their roles effectively in different contexts and with different participant populations. In recent years, a variety of stakeholders from around the world have produced coaching frameworks as part of a professionalization agenda (e.g., [International Council for Coaching Excellence, 2013](#); [Lara-Bercial et al., 2017](#); [United States Olympic Committee, 2017](#)). Within these frameworks, coach competences and expertise have been classified in different ways. Based on the work of Côté and Gilbert (2009), and Gilbert and Côté (2013), the International Sport Coaching Framework ([International Council for Coaching Excellence, 2013](#)) adopts the distinction made between (a) professional knowledge (i.e., about the sport, athletes, and coaching pedagogy); (b) interpersonal knowledge (i.e., about the social context of sport and relationships among participants and stakeholders); and (c) intrapersonal knowledge (i.e., about a coach's own beliefs, values, attitudes, and skills that shape and influence coaching practice; [International Council for Coaching Excellence, 2013](#)).

Increasingly, formal coach education programs are viewed as the dominant mechanism for supporting the professional development of sport coaches, and as a result are deemed important and valuable by sport coaching stakeholders ([North et al., 2019](#)). Most relevant to this study, research has illustrated that these programs can also contribute to the development of coaches' professional, interpersonal, and intrapersonal knowledge, better equipping them to advance athlete performance ([Piggott, 2012](#); [Stodter & Cushion, 2019](#)). Although each of these knowledge bases is important, the centrality of intrapersonal knowledge to effective and ethical coaching practice, plus the specific importance of reflection skills, is promoted by the International Council for Coaching Excellence (2013). Despite this, the vast majority of coach education programs

prioritizes and privileges the development of coaches' professional knowledge (e.g., sport-specific knowledge) and interpersonal knowledge (e.g., social relational aspects of coaching). Developing intrapersonal knowledge is still somewhat overlooked in formal coach education programs ([Lefebvre et al., 2016](#)).

One reason for this might be the lack of “space” available in learning experiences that are driven by increasingly “stuffed” curricula ([Cousin, 2006](#)) and lengthy sets of learning outcomes. For example, on the FA Level 3 (Union of European Football Associations [UEFA] B) coaching football program, designed for, and delivered to, both grassroots and performance football coaches in England, 64 intended learning outcomes are to be achieved through 18 workshops ([McCarthy, 2022](#)). According to Cornford (2002), the most significant barriers in addressing this lie in changing the attitudes of those designing and delivering educational programs, in order to reduce the volume of subject matter content; thus, ensuring intrapersonal skills “are well practiced and through practice, mastered” (p. 366).

Although not always embedded in the coach education curriculum, developing reflective skills is presently considered to be an essential aspect of coach learning ([Gilbert & Trudel, 2006](#); [Lyle & Cushion, 2010](#); [Swettenham & Whitehead, 2021](#)). In the context of coach education, a reflective approach to practice is now espoused as “a key tool for understanding and enhancing coach learning and raising the vocational standards of coaches” ([Stoszowski & Collins, 2014](#), p. 139). According to Nelson and Cushion (2006), reflection has the potential to provide “a bridge linking knowledge gained from professional experience, observations, coaching theory, and education” (p. 175). Moreover, the importance of reflection is captured by the witticism that “ten years of coaching without reflection is simply one year of coaching repeated ten times” ([Gilbert & Trudel, 2006](#), p. 114). However, although the need for reflection is well-accepted, its meaning tends to shift to accommodate the interpretation and interests of those using the term “reflection” ([Downham & Cushion, 2020](#)). For

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example, it is argued that deliberately engaging in reflection can promote critical thinking (Taylor et al., 2015), improve the quality of coaching practice (Blair, 2011; Whitehead et al., 2016), develop leadership capability (Patterson, 2015), improve learning (Moon, 2006), and increase self-awareness (Gilbert & Côté, 2013; Swettenham & Whitehead, 2021). To attain these goals, both Gilbert and Trudel (2013) and Trudel and Gilbert (2013) identify two specific approaches to reflection that are highly relevant and practical for developing expertise in sport coaching: reflective practice and critical reflection. Reflective practice can be described as (present focused) reflection-*in*-action or (delayed) reflection-*on*-action, both with the aim of improving athlete and coach outcomes. Critical reflection, on the other hand, refers to a deeper and more personal level of reflection. It requires coaches to “look beneath the surface” and reflect on their own values, beliefs, coaching philosophy, strengths, deficiencies, and motivation in order to question their thought processes, shift perspectives, and identify new ways of thinking (Trudel & Gilbert, 2013). According to Cushion et al. (2003), critical reflection can be seen as a tool to equip “coaches with a mirror in which they can see their own programs and practices” (p. 223). Critical reflection has the potential to provide a basis for emancipatory practice and empower coaches, allowing them to become more responsible for their actions (Stoszowski & Collins, 2014; Thompson & Pascal, 2012).

When these approaches to reflection are compared with each other within the context of formal coach education, the focus seems to be predominantly placed on (guided) reflective practice as a tool for developing coaching practice (Kuklick et al., 2015; Trudel et al., 2020). This is despite the fact that several scholars, across the past two decades, have argued in favor of integrating critical reflection into formal coach education programs (Cushion et al., 2003; Gilbert & Trudel, 2013; Knowles et al., 2006). While good progress has been made in offering practice-focused examples of how it might be done using a variety of approaches (e.g., Douglas & Carless, 2008; Stoszowski et al., 2021), we recognize an opportunity to further advance this work and offer evidence-based tools and instructional guidance for coaches, coach educators, and coach education program developers.

Drawing on the existing set of ideas, “structured written reflection” appears to be one tool that is used in coach education to enhance and assess critical reflection skills. This can take the form of reflective journaling (Moon, 2006), and web logs, or blogging (McCarthy & Stoszowski, 2018; Yang, 2009). In a study by Stoszowski and Collins (2014), 26 full-time sports coaching undergraduate students reflected on their coaching practice through the mechanism of blogging. Although many of the students exhibited a positive trajectory toward higher order reflective capability, some students struggled to develop critical reflection skills. Consistent with other studies, the authors concluded that “the mere provision of a tool does not guarantee that those using it will automatically reflect at higher levels” (Stoszowski & Collins, 2014, p. 146). This is congruent with more recent, similar, work by Stoszowski et al. (2021). Moreover, similar conclusions were reached by Lew and Schmidt (2011), who posit: “extended experience alone, as our study has demonstrated, is clearly not enough to affect change [. . .] further research should investigate if students’ self-reflection skills can be improved through formal training” (p. 541). Referring to the work of Mann et al. (2007) and Jacobs et al. (2016), it can be concluded that, similar to other skills (e.g., learning to learn skills), learners need a structure to guide the complex

process of critical reflection in their own learning experiences. Critical reflection is a skill that should be taught rather than assumed (Cropley et al., 2012; Gilbert & Trudel, 2006).

Research Context

The *Vlaamse Trainersschool* (VTS; Flemish School for Coach Education) is a cooperative association between the public government, sport federations, and universities/schools of higher education. VTS is responsible for developing, organizing, and certifying coach education within the Flemish community of Belgium (Vangrunderbeek & Ponnet, 2020). Each year 9,000 coaches follow one or more of the five-level coach education programs in 50 different sports (Ponnet et al., 2021). As in many coach education programs the world over, coaches are encouraged to reflect on their planning and practice as part of a process of ongoing improvement (International Council for Coaching Excellence, 2013).

Regarding critical reflection, the topic of this paper, a specific approach was adopted following a review of relevant research (e.g., Gilbert & Trudel, 2013) and stakeholder consultation (i.e., with subject experts and coach educators). Since 2020, 84 coach education programs between Levels 3 and 5 within VTS included a course titled “Personal Development Planning (PDP) for Sports Coaches.” At Level 3, the amount of contact hours for the course is four, while at Levels 4 and 5 this increases to 10 hr. The main goal for this course was to identify and make coaches familiar with relevant concepts, while supporting the development of appropriate knowledge, understanding, and application in context. Within this course, the process of critical reflection was structured, encouraged, and promoted using the research-based model known as “Flemish PDP” (De Cuyper et al., 2012); this consists of four consecutive phases, including analysis, planning, action, and evaluation (see Figure 1). The intended outcomes are that coaches become increasingly skilled at critical reflection and as such, become *more* effective sport coaches.

Regarding the approach to assessing coaches on the PDP course, a learning-oriented strategy was adopted; that is to say, assessment was deliberately designed to influence and encourage leaning (Carless, 2007). To demonstrate the development of critical reflection skills (and intrapersonal knowledge), coaches curated a portfolio throughout the full duration of the program. Across the entire course, coaches were autonomous in selecting exercises, generating content, and designing and developing personalized action plans based on their individual needs within their unique coaching context. Coach developers operated as a “guide by the side,” encouraging coaches to be fully immersed and active in the learning opportunity. This signifies a novel approach for VTS and represents a response to contemporary coach assessment research (McCarthy, 2022; McCarthy, Allanson, & Stoszowski, 2021; McCarthy, Vangrunderbeek, & Piggott, 2021; Vangrunderbeek & Ponnet, 2019).

Methodology

The purpose of this paper is to investigate whether coaches develop better critical reflection skills when they are deliberately promoted through formal coach education. Following an examination of the reflective practice and critical reflection literature and issues with coach education, the present section will deal with research methodology, design, and method. This study encompasses an experimental, two group, pre- and posttest research design to examine

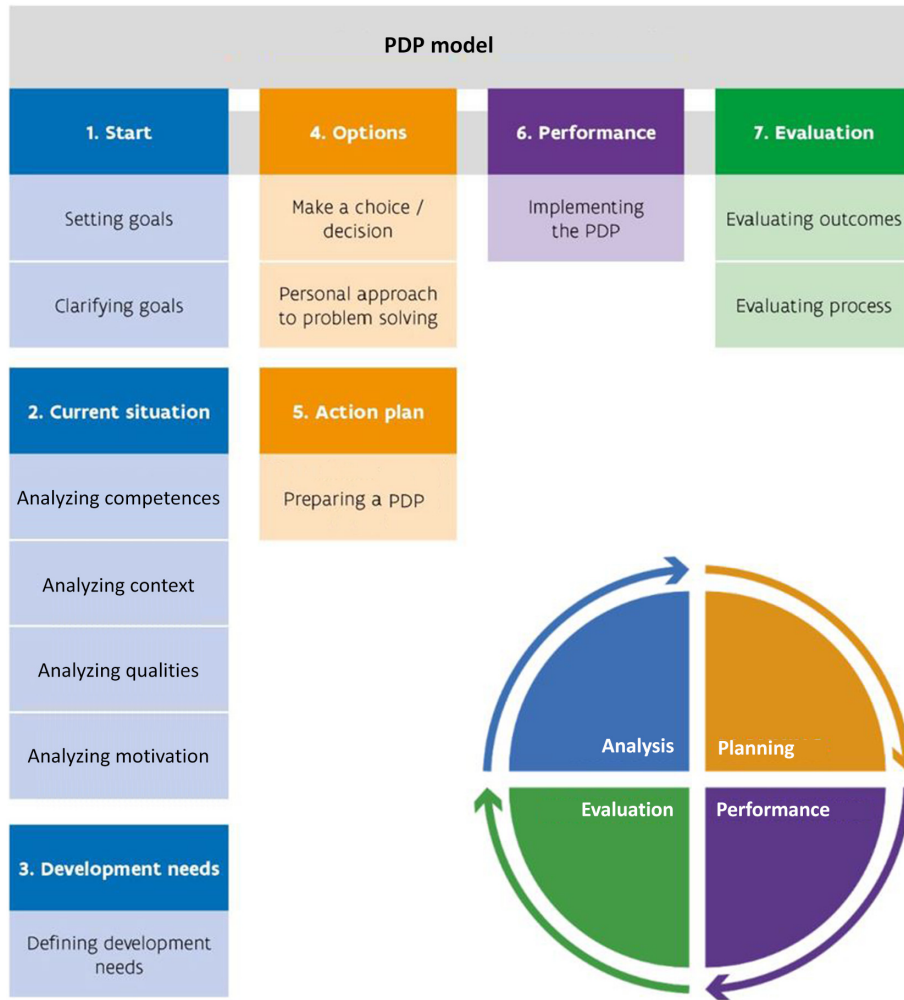


Figure 1 — Flemish PDP model. PDP = personal development planning.

gymnastics coaches' critical reflection skills before and after an intervention in a formal VTS Level 3 coach education program. Thus, we are seeking to establish causality through a positivist, data-driven approach to research. The following sections describe the research process in more detail; throughout, there is appropriate reference to the participants, procedures, data collection methods, and data analysis strategies.

Participants

Convenience sampling was used to identify 25 gymnastics coaches (23 females and two males), ranging in age from 19 to 40 years ($M_{\text{age}} = 23.4$, $SD = 4.53$), enrolled in a formal gymnastics Level 3 coach education program at VTS (see Table 1). The Level 3 program (118 hr) required coaches to have at least 1 year of coaching experience at a recreational gymnastics club level and to be in possession of the Level 2 certificate. In our sample, coaching experience averaged 6.6 years ($SD = 4.41$). The Level 3 program prepared coaches to teach more advanced gymnastics skills to recreational and beginner competitive gymnasts, to plan periodically, and to coordinate club activities. Most of the coaches who attended this program were coaching on a voluntary basis, combining their (evening or weekend) coaching activities with a full-time job or study. All 25 coaches took part in a common

weekend program, though 14 female gymnastics coaches in the "intervention group" ($M_{\text{age}} = 23.3$, $SD = 5.41$) were given an additional course: "PDP for sports coaches" (i.e., the intervention aimed at developing critical reflection skills), unlike the 11 gymnastics coaches of the "control group" (nine females and two males; $M_{\text{age}} = 23.5$, $SD = 3.36$).

Procedures and Data Collection

Prior to this program (in 2020–2021), VTS Level 3 gymnastics coach education programs did not include specific learning materials to enhance critical reflections skills. However, before the start of the 2020–2021 Level 3 program, during an orientation meeting held by the program director, all coaches were told that an extra course "PDP for sports coaches" would be embedded into the program for a limited number of coaches (i.e., the intervention group), selected at random by the program director who did not take part in this study as an investigator. Coaches were told that if they chose not to participate in this study, their status on the program would be unaffected. It was made clear that coaches' outcomes would in no way be impacted by their participation and no formal grades would be assigned for this extra course. All coaches were informed of the study procedure, reviewed the participant information sheet, and gave voluntary and informed

Table 1 Participant Information

Participant	Group	Age	Gender	Coaching experience (years)	Self-assessment of reflection ability (score 1–10)	Personal value attached to reflection (Likert scale 1–4)
1	Intervention	23	Female	8	8	4
2	Intervention	21	Female	4	8	4
3	Intervention	27	Female	11	7	3
4	Intervention	26	Female	12	7	3
5	Intervention	20	Female	2	7	4
6	Intervention	20	Female	0	6	3
7	Intervention	19	Female	1	8	3
8	Intervention	40	Female	18	7	3
9	Intervention	25	Female	9	7	4
10	Intervention	23	Female	7	8	4
11	Intervention	20	Female	4	8	3
12	Intervention	20	Female	5	6	3
13	Intervention	21	Female	5	8	4
14	Intervention	21	Female	7	7	4
15	Control	21	Female	7	7	3
16	Control	20	Female	2	8	4
17	Control	24	Female	3	8	3
18	Control	22	Female	10	8	4
19	Control	21	Male	4	7	3
20	Control	30	Female	15	8	3
21	Control	22	Female	7	7	3
22	Control	21	Female	4	7	4
23	Control	28	Female	3	7	3
24	Control	22	Male	5	8	4
25	Control	27	Female	11	7	3

Note. Likert scale 1–4: 1=no value, 2=low value, 3=moderate value, and 4=high value.

consent before taking part in the study. Next, all 25 coaches completed a general information form to obtain details related to age, gender, coaching experience, perceived reflection capabilities, and extent to which value was attached to reflective tasks. The principal investigator ensured that all personal information was kept confidential throughout the study.

Before the start of the program, all coaches were asked to confidentially submit online responses (by email using a basic Microsoft Word template) to a set of five reflective prompts (see Table 2), which were used by investigators as the pretest measurement to assess critical reflection skills of coaches at baseline. The technique of reflective prompts is commonly used in coach education to enhance and assess reflection skills (Kuklick et al., 2015; Trudel et al., 2020). To select the five prompt questions, we drew upon Joe Erhmann's personal coaching narrative activity, referred to by Gilbert and Trudel (2013), Gilbert (2015), U.K. Coaching's framework for critical reflection (U.K. Coaching, 2018), and U.K. Coaching's questions for effective reflection (U.K. Coaching, 2019). Face validity, to ensure that these prompts appeared to measure critical reflection skills, was established through a pilot test with coaches who participated in previous Level 3 coach education programs in other sports. Furthermore, the prompts were also reviewed by four expert coach developers. Expert coach developers are defined as having more than 10 years of experience as a coach developer, active involvement in coaching activities

Table 2 Reflective Prompts 1–5, Pre- and Posttest

1. What are my strengths as a gymnastics coach?
2. What are my areas for improvement as a gymnastics coach?
3. Which values and beliefs are important for me as a gymnastics coach?
4. Where do I want to be as a coach in 1 year?
5. How do I want my gymnasts to perceive me as a coach?

within multiple coach education programs per year, expertise in providing one-to-one mentoring, and completing the VTS blended training program for coach developers on developing critical reflection skills. This methodology is consistent with the work of Kuklick et al. (2015), where pilot testing for face validity was established in a similar way, based on the work of Hardesty and Bearden (2004) and Holden (2010).

A timeframe of 3 weeks was provided to participant-coaches to respond to the prompts. Participant-coaches received no specific guidelines related to the word count, no sight of peers' responses, and no feedback on their answers to control for any confounding effect. After this baseline pretest, the coach education program began as usual. Both control and intervention group members followed the same program during weekends provided by experienced coach developers. The Level 3 gymnastics coach education

program (118 hr) entailed courses including movement analysis, motor learning, regulation and judging, scouting and profiling, as well as an extensive internship (45 hr of situated learning experiences/learning in context) under the guidance of a more qualified coach. In addition, all participant-coaches within the intervention group were provided with the additional course “PDP for sports coaches,” aimed at developing critical reflection skills. This course encompassed an introductory class (3 hr), during which coaches collaboratively learned about the Flemish PDP model (see Figure 1). As a reminder, in line with the postulated syllabus for this course (see Table 3), the coach developer contextualized the course and its learning outcomes within the program, discussed learning and critical reflection concepts, explored the Flemish PDP model and related PDP reflection toolkit, guided critical reflection exercises, and introduced personal planning tools. Each participant-coach also had the opportunity to explore a personal reflection toolkit (A4-format, 80 pages, online available via <https://www.sport.vlaanderen/media/12824/trainer-b-trainer-a-reflectiemap.pdf>), which included several exercises and “tests” aimed at evoking critical self-reflection, such as the Ofman core quadrant reflection exercise (Ofman, 2000) and the coaching circumplex approach (Delrue et al., 2019).

Following this introductory class, participant-coaches were expected to progress with these course materials in a self-paced manner during a period of 2 months prior to submitting their personal portfolio to the coach developer (which all coaches did), inclusive of all critical reflection exercises connected with the analysis and planning phases of the PDP model. During this time, coaches had access to the online learning platform “VTS Connect” (accessible via <https://www.sport.vlaanderen/aanmelden?targetLogin=/trainers-en-sportbegeleiders/mijn-vts/>) and online tutorials, audio/video, and course materials. They were also all able to rely on one common coach developer for mentoring support; this is the same coach developer who also provided the introductory class (3 hr) at the start. All coaches engaged in a one-to-one mentoring session (1 hr) held after their portfolio submission to help them to critically reflect on their competency and expertise in different areas of

coaching, and gain insight into their personality and applied style(s) of coaching, leadership, motivation, learning, and teaching (i.e., to develop their intrapersonal knowledge). Due to the restrictions on face-to-face contact caused by the COVID-19 pandemic, mentoring sessions were organized as virtual meetings taking place online using the Microsoft Teams platform.

The assigned coach developer had 10 years of experience, through which they developed their mentoring skills as a result of different learning experiences such as on-the-job training, coach developer activities within VTS coach education programs, and ongoing continuous professional development. They also completed a blended training program that was created to support coach developers for this course. This program included more than 10 different courses (e.g., on PDP model, personality tests, conducting mentoring sessions, Ofman core quadrant [Ofman, 2000], and action planning). After completing the blended training program, coach developers were expected to present their portfolio (including their educational background, coach certification, and experience as a coach developer/mentor) to a panel of program directors to be officially recognized as a coach developer for the PDP course. As expected, and confirmed subsequently to the researchers, during the introductory class and one-to-one mentoring sessions, the coach developer adhered to the standardized guidelines available for this particular course. Their role was, therefore, not to formally assess the work undertaken by participant-coaches, but solely to encourage further critical reflection, raise self-awareness (i.e., provide coaches with a mirror in which they can see their own beliefs, values, and thought processes), promote adjustments in the coaches’ mental/working models (VanderVen, 2010), and help them to develop metacognitive skills (i.e., become more self-directed, drive inquiry independently, and self-monitor progress). To achieve this, questions used by the coach developer included: “What competencies should a coach who’s active in your daily context primarily master, and why do you think this is the case?” “What underlying assumptions or values are underpinning your thinking here?” “What can you learn from past experiences or literature to strengthen your argument?” “Are there any other

Table 3 Syllabus of the Introductory Class “PDP for Sports Coaches”

Introduction

- Situating the course within the coach education program
- Intended learning outcomes; overview of the syllabus; and approach on teaching, learning, and assessment

Conceptualization and methodology

- Defining and discussing concepts such as coach competencies, critical reflection, intrapersonal knowledge, effective coaching, coaching context, mediated, unmediated and internal learning methods (including references to literature)
- The Flemish PDP model (De Cuyper et al., 2012)
- Exploring the personal PDP reflection toolkit and online platform (*Vlaamse Trainersschool* Connect) with access to online tutorials, movies, and course materials and tools

Analysis tools for facilitating critical reflection (PDP, Phases 1–3)

- Exercise on my personal coaching context
- Exercise on my core values as a coach
- SWOT analysis
- Using 360° feedback tools
- Ofman core quadrant exercise
- Personality tests
- Exercise on my coaching profile using the coaching circumplex
- Identifying personal development needs being a sports coach

Planning tools (PDP, Phases 4–5)

- Making choices based on a competencies-motivation matrix
- My preferred learning methods and problem-solving approach
- Preparing a PDP (SMART goal setting, activities, desired result, planning, and needs)

Note. PDP = personal development planning; SWOT = strengths, weaknesses, opportunities, and threats.

broader perspectives (e.g., social, historical, or cultural) to be taken into account here?” and “What actions could help you to further develop yourself as a coach?”

At the end of the program, all coaches were asked a second time to confidentially submit online responses to the same set of five reflective prompts (see Table 2), which were now used by investigators as the posttest measurement to assess critical reflection skills of coaches at the end of the program. The same procedures as for the pretest were applied. A timeframe of 3 weeks was set for coaches to respond to the prompts. No specific guidelines about the word count were provided, coaches could not view peers’ responses, and no feedback on coaches’ reflections was provided. A chronological overview of all activities and test procedures for both control and intervention group members is provided in Table 4.

Measurements

To assess the quality of coaches’ critical reflection, all pre- and posttest prompts were read and coded in line with Hatton and Smith’s (1995) reflective writing framework (RWF), previously used by multiple authors to identify levels of reflection in student writing (Carlsson, 2021; Moon, 2006; Stoszowski & Collins, 2014; Stoszowski et al., 2021; Whipp, 2003). In this framework, the following four types of writing are identified, presented in ascending order of reflective quality: unreflective descriptive writing, descriptive reflection, dialogic reflection, and critical reflection. In essence, the first category signifies an account which is not reflective at all, and only provides basic descriptions of events without any rationale. The second form, descriptive reflection, is characterized by an attempt to provide rationale based often on personal judgment or literature; as the title suggests, this is done through heavy swathes of descriptive writing. The third, dialogic reflection, is a form of dialogue with oneself, in which possible reasons are explored and wider contexts and alternative points of view are taken into consideration. Finally, the fourth category, critical reflection, is identifiable by the high levels of sophisticated reasoning around decisions or events which takes account of the broader historical, social, and/or political contexts (Hatton & Smith, 1995). As proposed by Hatton and Smith (1995), the three researchers (in the present study) were asked to code every pre- and posttest prompt according to the highest level of reflection reached within that entry. So, if within a single unit of writing (i.e., a single pretest for example) both lower and higher levels of reflective writing were employed, this entry was coded according to the

highest level that was present (Stoszowski & Collins, 2014; Stoszowski et al., 2021). On the few occasions (4% of entries) when coding discrepancies emerged between the researchers, negotiation was pursued until a consensus was reached.

As per Hatton and Smith’s (1995) RWF, all entries were coded on a single 4-point scale. As a result, very little distinction or nuance can be determined between coaches’ reflective writing capability. Indeed, scales with a larger number of criteria for assessing written critical reflections are scarce within literature. One reason for this might be that identifying the different elements of critical reflection is a reductionist approach to understanding a holistic activity. However, within the field of social sciences, Fisher (2003) developed her own criteria to assess reflective capacity of university students in written work, arguing that “if we accept the position of those educators who contend that critical reflection is essential in fostering transformative learning, then developing such transparent criteria may prove very important” (p. 324). Following the argument of Fisher (2003), we also believe that to devise and deploy a more sensitive instrument to the analysis of reflective writing capability could add value for multiple reasons. First, results of this multi-criterion instrument could be benchmarked against the framework of Hatton and Smith (1995) for the purpose of seeking validation. Second, examining different criteria can illustrate where significant progress is or isn’t made as a result of the intervention. To devise such a scale, we drew upon the reflection toolkits and rubrics established at the University of Edinburgh (2020) and the Indiana University—Purdue University Indianapolis (Jones, 2014). Consistent with Fisher’s approach, we also used existing critical reflection portfolios of coaches in similar VTS Level 3 coach education programs in swimming and horse riding to pilot test our assessment rubric. As above, the purpose of this pilot testing was, again, to establish face validity and ensure that a correct interpretation of all criteria was perceived by each researcher when assigning a rating. This was done in consensus by all researchers. As a result, one criterion (“Appropriate answering to each of the questions”) was withdrawn and definitions of the different criteria were refined. This approach is consistent with the work of Kuklick et al. (2015), Hardesty and Bearden (2004), and Holden (2010). The resultant outcome was consistency among researchers when assigning ratings, as evidenced by high interrater reliability numbers (see below).

As a result, The Flemish Critical Reflection Measurement Scale (FCRMS; see Table 5) consists of eight criteria, which are valued in demonstrating critical reflection ability. Each of the criteria is assessed on a 4-point scale with following levels: unacceptable (score: 0), reflective novice (score: 1), aware

Table 4 Study Timeframe

Date	Action	For who?
August 24, 2020	Orientation meeting with program director	C + I
September 2020	Submission of pretest prompts	C + I
October 1, 2020	Start of Level 3 program (118 hr)	C + I
October 1, 2020	Three-hour introductory class of the course “PDP for sports coaches”	I
October–November 2020	Coaches are encouraged to reflect critically, at their own pace, and in response to their individual coaching/performance problems. Coaches are guided by course materials, access to online tutorials, and additional tools via the online learning platform.	I
December 1, 2020	Submission of personal portfolio (PDP phases 1–5)	I
December 2020	One-to-one online mentoring session with coach developer	I
January 2021	Submission of posttest prompts	C + I

Note. C = control group, I = intervention group; PDP = personal development planning.

Table 5 Flemish Critical Reflection Measurement Scale

Score criterion	Unacceptable (score: 0)	Reflective novice (score: 1)	Aware practitioner (score: 2)	Reflective practitioner (score: 3)
1. Appropriate description of context/experience (i.e., setting the scene for the reader)	No description of context or own experience. Purely descriptive.	Highly descriptive with little reference to context or own experience.	An appropriate level of detail is included.	A high level of detail is included, for the reader to understand the experience that is the stimulus for the reflection.
2. Clarity	Writing is unclear and incoherent. As a result, the reader is unable to picture the situation described. Situations and concepts are not easily understood by an uninformed audience.	Difficult for the reader to picture the situation described. Several situations or concepts are not easily understood by an uninformed audience.	Clear language. The reader is able to picture the situation described. Most situations or concepts are understandable by an uninformed audience.	Very clear language. Abstract concepts are explained accurately. Both the situation and the concepts are understandable by an uninformed audience.
3. Depth of reflection/self-awareness	No depth at all. Not evidence of self-awareness.	Surface level. Little self-awareness.	Sufficiently deep and self-aware.	Very deep and self-aware.
4. Relevance	Absence of past experiences, previous knowledge, and literature to develop the reflection.	Little reference to past experiences to develop the reflection.	Reference to past experiences and previous knowledge to develop the reflection.	Building on past experiences, previous knowledge, and literature to develop the reflection.
5. Personalized—authenticity (honest and genuine sharing of information)	No use of first person writing style.	Limited use of first person writing style—not genuine.	Written in first person—authentic.	Written in first person, very authentic (honest and genuine sharing of information).
6. Evidence of criticality (self-criticism)	Total absence of criticality.	Limited to one perspective and, therefore, is limited in criticality.	Takes into account several aspects in the reflection. Able to question own biases, stereotypes, assumptions, and uses these questions to form new approaches/learning.	Very critical of multiple aspects in the reflections. Very critical about own actions and assumptions. Recognition of competing perspectives.
7. Evidence of willingness to reverse/adapt ideas and approaches	No evidence of willingness to adapt and a defensiveness of his/her view.	Little evidence of willingness to adapt—rather defensive.	Willing to suggest that something could be improved, new ideas are embraced.	Very willing to reverse/adapt ideas and approaches.
8. Planned future actions	None to very limited future actions planned.	Limited future actions planned—less detail.	Several future actions are listed.	Clear action planning, based on the insight from the reflection.

practitioner (score: 2), and reflective practitioner (score: 3). Concrete descriptors for each level of competence are provided for each criterion (see Table 5). To clarify the use of the FCRMS, we provide descriptions for each of the assessment criteria and offer some additional examples. The first criterion concerns an appropriate description and analysis of the context and experience that is the foundation for the reflection (i.e., setting the stage for the assessor). For example (Score 3):

To me, time management is a point of improvement. I'm often running out of time because I have difficulties with estimating how much time is required to complete featured exercises. I really need to be more flexible. I often focus too much on completing all components of my training preparation. Therefore, a "rushed attitude" is my part, since I often provide too many exercises as well. After stepping back and reflecting on my past training sessions at home, I decided I'd better go for quality over quantity as a coach. It seems now more effective to me that my gymnasts complete a limited number of exercises in a high-quality way instead of rushing through a large set of exercises with lower quality.

For the second criterion, clarity, it is determined whether both concepts and situation are accessible to an uninformed audience. A Score 0 equals writing that is very unclear, so the assessor is not able to picture the situation described, while a Score 3 is assigned to coaches who succeed in explaining abstract concepts accurately. For example (Score 1):

My areas for improvement as a gymnastics coach are my technical knowledge and helper skills (i.e., more difficult than level I9), my self-confidence and fault analysis can be improved as well as positive stimulation.

The third criterion reflects the depth of reflection/self-awareness; by this we mean, providing evidence of explicitly knowing and understanding one's own strengths, weaknesses, feelings, motives, and desires, or the way others perceive you. The fourth criterion, relevance, considers the extent to which reference is made to past experiences, previous knowledge, and literature, to construct the reflective account. The fifth criterion, authenticity, assesses whether information is shared in a genuine and honest way. For example (Score 3):

It is challenging for me to be aware of everything that is happening during a group practice. For example, there is this young gymnast in my group who is inclined to exclude certain other gymnasts. During training practice, he hasn't much opportunity, but in the dressing room, etc., I can't witness what is happening. That frustrates me a lot. I'm not sure how to cope with this.

The sixth criterion, evidence of criticality, examines how critical coaches are about their own assumptions and actions. At best, competing perspectives are taken into consideration in a highly critical manner (score: 3), or in the worst case, reflection is limited to just one perspective (score: 1). Criterion seven identifies evidence of willingness to reverse or adapt ideas and approaches; thus, appreciating to what extent new ideas are embraced. For example (Score 3):

I can definitely make further progress as a coach in different areas [. . .] For example, I would like to gain more insight in how I can support my gymnasts mentally and how I can foresee more intermediate steps to learn specific elements like a backflip.

The final criterion refers to planned future actions. A score of 3 would suggest there is detailed action planning present, based on

the insights from the reflection. Or, to the contrary, only very limited actions are proposed without the necessary thought and planning (score: 1). It is important to note that the newly established FCRMS was not shared with participants throughout the study to control for any confounding effect.

By means of the FCRMS, all pre- and posttest prompts were scored individually by the same three investigators. Similar to the Hatton and Smith (1995) methodology, all entries were coded by researchers against the highest level of reflective writing for each criterion. As a result, coaches' response to each received a score out of 24 points which was then converted into a score out of 10 for ease of interpretation. There was no interaction between the investigators during this assessment process. Pretest prompts were immediately assessed by every investigator in the week after the submission by participant-coaches. Four months later, posttest prompts were submitted and reviewed, with the time lag designed to reduce researcher recall of the first reflective accounts. To provide a final score for each prompt, the mean of three individual investigators' scores was computed (see Table 6 and Figure 2). To calculate the interrater reliability, we calculated the intraclass correlation. The intraclass correlation for the pretest (2, k) was .973, with a 95% confidence interval [.86, .96], the intraclass correlation for the posttest (2, k) was .987, with a 95% confidence interval [.98, .99].

Table 6 Participant Pre- and Posttest Scores (RWF/FCRMS) and Word Count

Participants	Pretest RWF (/4)	Posttest RWF (/4)	Pretest FCRMS (/10)	Posttest FCRMS (/10)	Pretest word count	Posttest word count
1 ^a	1	2	2.9	3.3	148	223
2 ^a	2	2	5.0	6.3	254	622
3 ^a	1	2	1.7	3.8	126	276
4 ^a	1	2	2.6	4.6	139	322
5 ^a	3	4	7.9	8.9	591	1,199
6 ^a	1	2	2.6	6.7	141	718
7 ^a	2	3	4.0	6.0	195	741
8 ^a	2	1	5.4	4.0	226	179
9 ^a	2	3	5.1	6.9	235	756
10 ^a	1	2	1.8	4.9	99	529
11 ^a	1	1	2.5	2.6	88	154
12 ^a	1	1	1.9	1.9	141	125
13 ^a	1	3	3.5	7.4	187	871
14 ^a	2	3	5.3	8.5	214	739
15	2	2	3.8	3.8	142	166
16	1	2	1.7	2.9	122	247
17	2	2	3.1	3.1	188	188
18	2	1	4.4	3.2	201	131
19	1	1	4.6	4.6	194	194
20	1	1	1.9	2.6	84	144
21	1	1	1.7	1.8	82	90
22	1	1	2.2	2.2	85	128
23	1	1	2.1	2.6	109	241
24	1	1	2.5	2.5	164	164
25	1	1	1.8	1.9	135	155

Note. RWF=reflective writing framework; FCRMS=Flemish Critical Reflection Measurement Scale.

^aIntervention group.

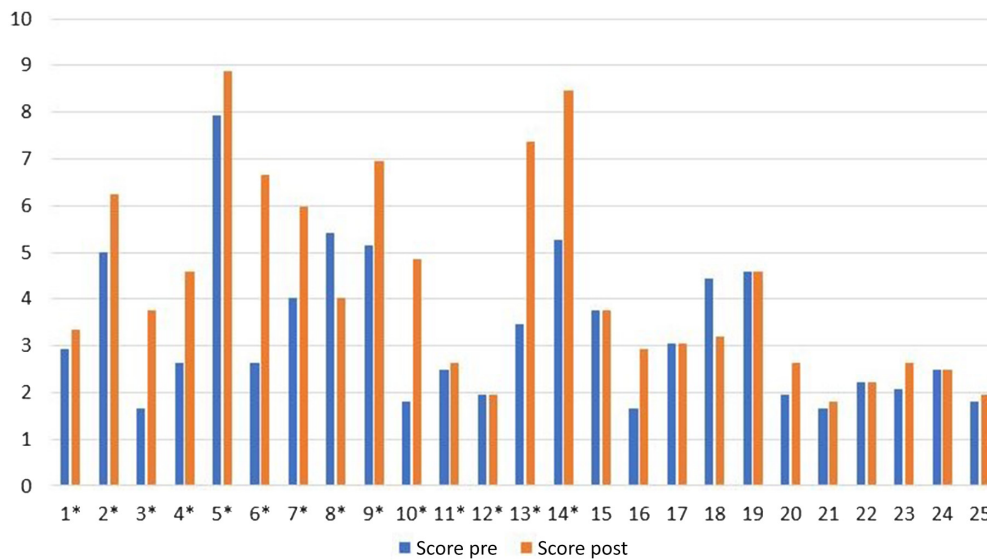


Figure 2 — Participants' pre- and posttest results on the Flemish Critical Reflection Measurement Scale. *Intervention group.

In addition to the quality of coaches' reflective writing, we also used the word count function of Microsoft Word to measure the quantity of text in each response to a prompt (see Table 6); this is not dissimilar to other studies which measured critical reflection ability (e.g., Kuklick et al., 2015; Stoszowski & Collins, 2014). Although, we recognize, a greater volume of writing is not simply an indication of increased quality of reflection. Nevertheless, a significant increase in the length of written reflective accounts might be interpreted as a high level of autonomous motivation toward reflective tasks. It should be noted that no instructions on word count were provided to participants in this study.

Data Analysis

All statistical analyses were performed using IBM SPSS (version 27). First, means, *SDs*, and correlations were calculated. Furthermore, we conducted multiple regressions and multivariate analyses of variance to test for systematic difference between (a) coaches and (b) conditions in the background variables. This is a common practice in intervention studies (e.g., Reynders et al., 2019) and since we found no systematic differences, we may consider our randomization procedure successful. Since we had a small sample size, we performed a Shapiro–Wilk test to determine the distribution of the dependant variables (i.e., score on RWF, score on FCRMS, and word count). Based on the results of the normality testing, nonparametric tests were used to ascertain the effect of the intervention program on participant–coaches' self-reflection. First, Mann–Whitney *U* tests were performed to examine the differences in scores between the control and the intervention group at Time 1 and Time 2 separately. Consequently, a Wilcoxon signed-rank test was conducted to examine the differences in scores between Time 1 and Time 2 within the control group and the intervention group separately. *Z* scores, *p* values, and effect sizes (*r*) are provided for the main analyses. Effect sizes were calculated using the formula of Rosenthal (1994), $r = Z/\sqrt{N}$. An effect size less than 0.3 is considered a small effect, one

between 0.3 and 0.5 a medium effect, and an effect size greater than 0.5 is considered a large effect.

Results

Descriptive Statistics and Correlations

Means, *SDs* and difference scores between pre- and posttest (Δ) for the variables are provided in Table 7, while correlations can be found in Table 8.

Preliminary Analyses

Testing for Differences Between Coaches

First, associations between baseline measures of the quality (i.e., achieved scores) and the quantity (i.e., word count) of the self-reflection and participant–coach characteristics (sex, age, and years of experience) were tested. Two multiple regressions were run to predict coaches' quality (RWF and FCRMS scores) and quantity of writing (word counting) with sex, age, and years of experience serving as predictors. These variables did not relate to the RWF scores of self-reflection, $F(3, 21) = 0.37$, $p = .78$, $R^2 = .05$, the FCRMS scores of self-reflection, $F(3, 21) = 0.03$, $p = .99$, $R^2 = .00$, nor the quantity of writing, $F(3, 21) = 0.22$, $p = .88$, $R^2 = .03$.

Testing for Differences Between Conditions

We examined whether the intervention and control group differed in their demographics (i.e., age and years of experience) and baseline measures (self-reflection quality and quantity of writing). A one-way multivariate analysis of variance with the baseline measures of self-reflection quality (RWF and FCRMS scores), quantity of writing (word count), age, and years of experience as dependent variables and condition as a fixed factor was performed. The results showed no statistically significant differences in the dependant variables based on the condition, $F(5, 19) = 0.68$, $p = .64$, Wilk's $\Lambda = 0.85$, partial $\eta^2 = .15$. As a result, we may

Table 7 Means, SDs, and Deltas Between All the Included Variables

	Descriptives		
	Pretest <i>M (SD)</i>	Posttest <i>M (SD)</i>	Δ
Score self-reflection RWF (/4)			
Control group	1.27 (0.47)	1.27 (0.47)	0.00
Intervention group	1.50 (0.65)	2.21 (0.89)	0.71**
Total	1.40 (0.58)	1.80 (0.87)	0.40*
Score self-reflection FCRMS (/10)			
Control group	2.70 (1.09)	2.84 (0.81)	0.14
Intervention group	3.74 (1.80)	5.41 (2.15)	1.67**
Total	3.28 (1.59)	4.28 (2.11)	1.00**
Quantity of writing			
Control group	136.91 (45.00)	168.00 (47.40)	31.09
Intervention group	198.86 (123.96)	532.43 (325.52)	333.57**
Total	171.60 (100.74)	372.08 (304.00)	200.78**

Note. RWF=reflective writing framework; FCRMS=Flemish Critical Reflection Measurement Scale.

* $p < .05$. ** $p < .01$.

Table 8 Spearman Rank Correlations Between All the Included Variables

	1	2	3	4	5
1. Score self-reflection RWF pretest					
2. Score self-reflection RWF posttest	.47*				
3. Score self-reflection FCRMS pretest	.79**	.42*			
4. Score self-reflection FCRMS posttest	.52**	.82**	.70**		
5. Quantity of writing pretest	.79**	.50*	.89**	.67**	
6. Quantity of writing posttest	.35	.88**	.46*	.89**	.53**

Note. RWF=reflective writing framework; FCRMS=Flemish Critical Reflection Measurement Scale.

* $p < .05$. ** $p < .01$.

assume that the baseline measures of RWF scores, FCRMS scores, word count, age, and years of experience do not differ significantly between the intervention and the control group.

Main Analyses

Hatton and Smith's (1995) RWF

A Mann–Whitney U test was performed to compare the RWF scores between the control and the intervention group at Time 1 and Time 2 separately. The results showed no significant differences at Time 1 ($Z = -.88$, $p = .47$, $r = .18$); however at Time 2, the scores differed significantly ($Z = -2.77$, $p < .01$, $r = .55$). Consequently, a Wilcoxon signed-rank test was conducted. It confirmed that in the intervention group the scores based on the RWF increased from Time 1 to Time 2 ($Z = -2.67$, $p < .01$, $r = .53$), while in the control group the scores did not differ between Time 2 and Time 1 ($Z = 0$, $p = 1$, $r = 0$; see Figure 3).

Flemish Critical Reflection Measurement Scale

First, we performed a Mann–Whitney U test to examine the differences in scores on the FCRMS between the control and the intervention group at Time 1 and Time 2, separately. The results showed no significant differences in the scores on the FCRMS at Time 1 ($Z = -1.62$, $p = .11$, $r = .32$), while we found a

significant difference at Time 2 ($Z = -3.10$, $p < .01$, $r = .62$). Consequently, a Wilcoxon signed-rank test was conducted. It confirmed that in the intervention group the quality of self-reflection increased from Time 1 to Time 2 ($Z = -2.83$, $p < .01$, $r = .57$), while in the control group the scores did not differ between Time 1 and Time 2 ($Z = -1.05$, $p = .29$, $r = .21$; see Figure 4).

Furthermore, we examined whether the participants improved more on some criteria of the FCRMS than on others. Means and SDs of the eight criteria separately can be found in Appendix 1. Mann–Whitney U tests showed no significant differences between the control and the intervention group for the eight criteria separately at Time 1, while significant differences were found for all eight criteria at Time 2. Finally, Wilcoxon signed-rank tests confirmed that in the intervention group the quality of self-reflection increased from Time 1 to Time 2 for all eight criteria, while in the control group scores in none of the eight criteria differed between Time 1 and Time 2 (see Appendix 2 for the Z scores, p values, and effect sizes).

Quantity of Writing (Word Count)

A Mann–Whitney U test was performed to compare the number of words between the control and the intervention group at Time 1 and Time 2, separately. The results showed no significant differences at

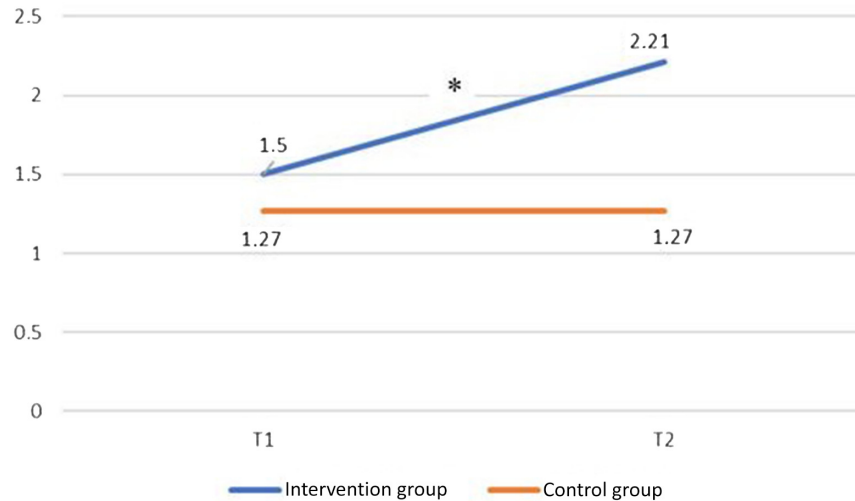


Figure 3 — Self-reflection score reflective writing framework on T1 and T2. * $p < .01$.

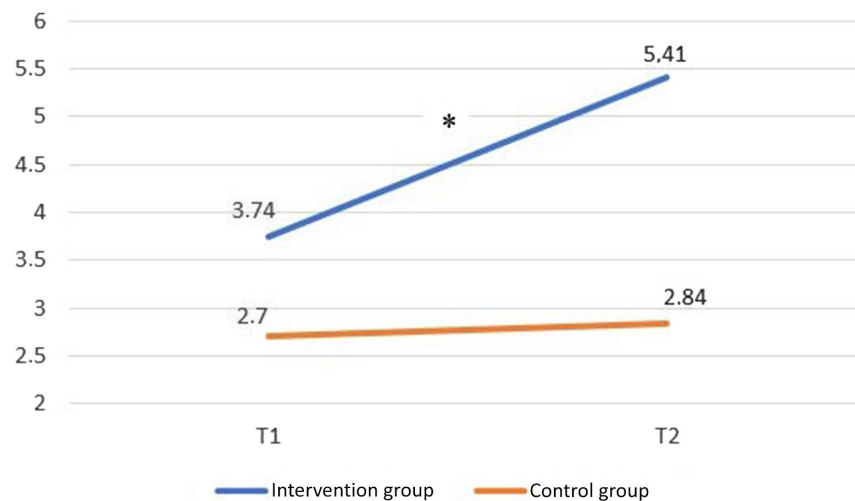


Figure 4 — Self-reflection score Flemish Critical Reflection Measurement Scale on T1 and T2. * $p < .01$.

Time 1 ($Z = -1.75$, $p = .09$, $r = .35$); however at Time 2, the scores differed significantly ($Z = -2.96$, $p < .01$, $r = .59$). Consequently, a Wilcoxon signed-rank test was conducted. It confirmed that in the intervention group coaches wrote significantly more words at Time 2 than on Time 1 ($Z = -3.11$, $p < .01$, $r = .62$), in the control group the number of words did not differ between Time 2 and Time 1 ($Z = -1.68$, $p = .09$, $r = .34$; see Figure 5).

Discussion

Considering these results in full, we argue that there is a case to be made concerning the positive impact of the intervention on coaches' critical reflection skills and capabilities; this is demonstrated by using *both* the RWF *and* FCRMS tools. Coaches in the intervention group produced significantly improved posttest responses to prompts, in contrast to both their own pretest responses

and the posttest responses of the control group. Furthermore, although all participants had the opportunity to provide brief answers (even bullet points), participants within the intervention group deliberately chose, at the time of posttest, to elaborate on their thoughts more extensively and to offer significantly more text when responding to prompts. This could be interpreted as an indication of increased autonomous motivation toward reflective writing tasks. While the length of answers more than doubled in the intervention group, no significant time-related increase was present for the control group (status quo). The increased capacity to critically reflect *and* a higher autonomous motivation toward reflective writing tasks thus went hand in hand in this particular study. These findings are consistent with the work of Stoszkowski and Collins (2014).

Hence, the current study provides evidence to suggest that coaches' critical reflection (intrapersonal) skills improve when the

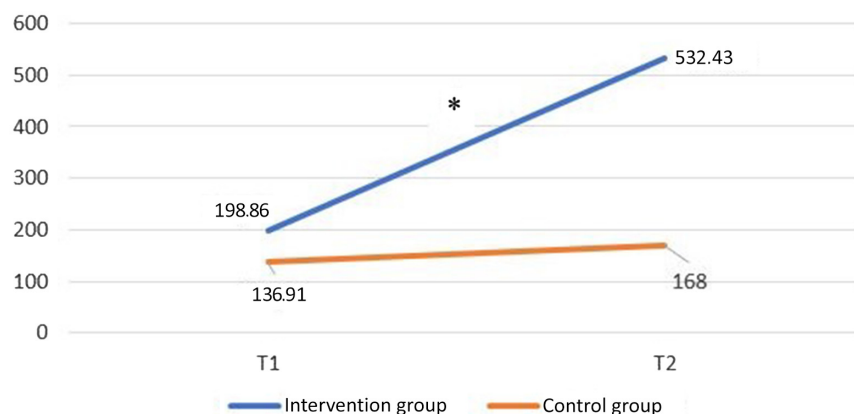


Figure 5 — Quantity of writing on T1 and T2. * $p < .01$.

development of these skills is deliberately prioritized, promoted, and encouraged through formal coach education. This is an important finding for several reasons. First, despite suggestions in the peer-reviewed literature that formal coach education often fails to contribute to coach learning and/or significantly impact on coaching practice (Sherwin et al., 2017; Williams & Bush, 2019), this study offers an argument to the contrary. Based on the data, we posit that well-considered formal coach education has an important role to play in the professional development of sport coaches. Second, although critical reflection is commonly acknowledged as important (by organizations and individuals responsible for coach development), there is often limited deliberate and direct action to develop the critical reflection capabilities of sport coaches. This study presents one practice-focused tool to be used and further advanced, as the development of coaches' critical reflection capabilities is prioritized in coach education programs.

Finally, while it may appear banal to suggest, a universal goal of formal coach education programs is to improve the quality of coaching practice. This is largely attempted through the development of interpersonal and professional *knowledge* and promoting effective and ethical coach *behaviors*. However, an emerging body of work has begun to focus on the extent to which formal coach education can contribute to the development of more *skilled* learners with positive *attitudes* toward learning (McCarthy, 2022; McCarthy, Allanson, & Stoszkowski, 2021; McCarthy, Vangrunderbeek, & Piggott, 2021; Stoszkowski & McCarthy, 2018). We believe that this study contributes to those arguments made within the cited research.

While it has been demonstrated that progress can be made (regarding the development of coaches' critical reflection skills) in a limited timeframe, we propose that certain preconditions should first be met. First, we speculate that an expert/well-trained (as defined in the context of this study, within the "Methodology" section) coach developer appears to be an important mechanism in facilitating this progress. Indeed, investing organizational resources such as time, finance, and personnel, in the training of coach developers appears to be important. As the role of the coach developer in the delivery of formal coach education is becoming increasingly recognized within the research (e.g., Dohme et al., 2019; McCarthy, 2022; North et al., 2020), we contend that this work should remain a priority. In the present study, it is perhaps worth reiterating how the coach developer can be considered an integral feature of the intervention. There is little doubt that factors contributing to the development of coaches' critical reflection skills

included the high-trust, learning-oriented environment which the coach developer promoted.

Second, a clear framework (including materials and activities) on how to deliberately promote, encourage, and assess critical reflection skills is required. Sharing this framework with coaches in advance and being clear about intentions is consistent with approaches to formal coach education which contribute to coach learning (McCarthy, 2022; McCarthy, Allanson, & Stoszkowski, 2021; McCarthy, Vangrunderbeek, & Piggott, 2021). Indeed, specific to the development of critical reflection skills, Fisher (2003) argues:

. . . it is possible for students in the social sciences to improve their capacities for critical reflection. This requires teachers offering clear guidance about what is required for critical reflection, giving feedback on how reflective capacities can be improved, and modeling critical reflection throughout the course . . . I suggest they may prove beneficial in guiding those teachers who not only wish to demystify critical reflection to their students, but who also wish to employ clear and transparent criteria for assessment. (p. 324)

However, as we make the claims outlined within this section, we also offer some notes of caution and acknowledge the limitations of this research. First, the mean posttest score on the FCRMS of the intervention group was 5.41 out of a maximum of 10. Indeed, it is evident more progress could have been made in further enhancing the critical reflection skills of the participant-coaches. As such, we present this work as a place to begin and encourage interested others to develop the robust but embryonic tools offered so far. Moreover, we also encourage the sustained use of the ideas offered and recognize the short-term nature of our intervention. For example, prioritizing and revisiting critical reflection activities on an ongoing basis, across individual programs and entire pathways (in this case, VTS Levels 1, 2, 4, and 5). As the present study fails to test for retention (as a longitudinal study might), we have little understanding of how sustained the improvements in critical reflection will be or how they might taper off. As such, we encourage future research to investigate the issue of fallback (i.e., below, to, or above baseline). For instance, since critical reflection within this intervention was strongly structured and scaffolded, we are curious about the extent to which this type of reflective activity might become more spontaneous in the future

(Knowles et al., 2006; Trudel et al., 2020). Finally, we are aware that our rather small sample size is a limitation and intend to explore the use of these tools with a greater breadth of coaches. Further to this issue, we also recognize the make-up of our near all-female participant pool and unique nature of gymnastics as a sport; we are curious to understand the effect (if any) this may have had on the results of this study and extent to which they might be more widely generalizable (or not).

Conclusion

The present study demonstrates the potential for formal coach education programs to contribute to the development of coaches' critical reflection skills. This is against a backdrop where these skills are argued to be important but are often ill-considered/unlikely to be prioritized within formal coach education settings (for the variety of reasons outlined earlier). As such, we hope that this study can be viewed as a stimulus for the development of frameworks and evidence-based tools to do this work, which we appreciate, can be challenging (Hatton & Smith, 1995). We note too that the role of the coach developer appears to be significant in the implementation of any such framework/tool. They are the intermediary between ideas and action, their personal resources will determine (to some varying degree) the nature of outcomes associated with attempts to develop coaches' critical reflection skills. Accordingly, we compel organizations and individuals responsible for coach education to consider this alongside researchers who should continue to examine this phenomenon.

Author Biographies

Dr. Hans Vangrunderbeek is coach education manager at the Flemish School for Coach Education (Sport Vlaanderen), which is responsible for developing, organizing and recognizing coach education in Flanders. In his doctoral work, he focused on the scientific development of physical education and sports in Belgium. In 2011, he obtained a grant for a research stay at Harvard University, Cambridge. He published more than 40 papers within the fields of sports (coaching, history, and ethics) and gave lectures at several international congresses. Hans is an alumni of the Nippon Sport Science University Coach Developer Academy. He is currently involved in an International Council for Excellence (International Council for Coaching Excellence) global working group, exploring monitoring and evaluation of coach education programs.

Dr. Maarten De Backer currently works as the liaison between the Flemish School for Coach Education (Sport Vlaanderen) and the Faculty of Movement Sciences (KU Leuven, Belgium). His academic work focuses on the link between coach behavior and group dynamics. More specifically, he examined the impact of coach leadership on team athletes' motivation, engagement, cooperation, and performance. He published several high-quality papers within the field of sport coaching and group dynamics, and presented his work at several international congresses. Since 2008, Maarten has also been involved as a lecturer in the Bachelor and Master Physical Education and Movement Sciences contributing to the professional development of Flemish sports coaches and coach developers.

Dr. Liam McCarthy currently works at Leeds Beckett University (United Kingdom) as a Senior Lecturer in Sport Coaching in the Carnegie School of Sport. Liam has a broad and inclusive interest in coach education, development, and support, which has led him to work many national and international sport organizations (e.g., Sport Vlaanderen, the Premier League, the English Football Association, and U.S. Soccer). Liam is an alumni of the Nippon Sport Science University Coach Developer Academy.

Dr. Evi Buelens works at the Flemish School for Coach Education (Sport Vlaanderen), which is responsible for developing, organizing, and recognizing coach education in Flanders. She is currently involved as the coordinator of the Start 2 Coach-project, a low-threshold coach education program for sport coaches in Flanders. Evi achieved her PhD (2016) by focusing on the developmental role of volunteering in sport for youngsters in socially vulnerable situations. Evi was a member of the executive board of the Doctoral School of Human Sciences of the Vrije Universiteit Brussel for several years. She published several papers within the field of sport and society and gave several presentations at international and national scientific conferences.

Hans Ponnet is Head of the Coach Education Department (Sport Vlaanderen, Flemish Government) that subsidizes the Flemish School for Coach Education, which is responsible for developing, organizing, and recognizing coach education in Flanders. As project manager of the Sport Vlaanderen Datawarehouse, he is responsible for managing and analyzing data of sports organizations, sports infrastructures, sports coaches, and the Coach Education System in Flanders. He published more than 20 papers within the field of sports management and gave lectures at several international congresses and seminars.

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Appendix 1: Means and SDs for the Eight Categories

Category	Control group				Intervention group			
	Pretest		Posttest		Pretest		Posttest	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Context	0.55	0.40	0.64	0.35	1.02	0.65	1.60	0.82
Clarity	0.97	0.55	0.94	0.44	1.14	0.64	1.74	0.64
Depth	1.03	0.31	1.03	0.28	1.36	0.69	1.86	0.86
Relevance	0.39	0.29	0.52	0.27	0.71	0.55	1.33	0.67
Authenticity	0.88	0.56	1.00	0.33	1.33	0.72	1.90	0.81
Criticality	1.03	0.18	1.00	0.15	1.31	0.50	1.62	0.54
Willingness	1.12	0.43	1.21	0.31	1.38	0.49	1.86	0.65
Future actions	0.52	0.38	0.48	0.43	0.71	0.54	1.07	0.64

Appendix 2: Wilcoxon Signed-Rank Test on the Differences Between T1 and T2 for the Eight Categories

Category	Control group			Intervention group		
	<i>Z</i>	<i>p</i>	<i>r</i>	<i>Z</i>	<i>p</i>	<i>r</i>
Context	-1.00	.317	.20	-2.47	.013	.50
Clarity	-0.38	.705	.08	-2.61	.009	.52
Depth	-0.00	1.00	.00	-2.63	.009	.53
Relevance	-1.41	.157	.28	-2.68	.007	.54
Authenticity	-0.74	.459	.15	-2.28	.022	.46
Criticality	-1.00	.317	.20	-2.36	.025	.45
Willingness	-1.13	.257	.23	-2.77	.006	.55
Future actions	-0.58	.564	.12	-2.28	.022	.46