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"The principles are good, but they need to be integrated in the right way": Experimenting with Creativity in Elite Youth Soccer

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The promotion of creativity in team ball sports has captured the interest of many researchers and practitioners, but no studies have explored how coaches perceive and apply creativity-nurturing activities. The purpose of this study was to examine the personal and cultural conditions that enable or obstruct the design and application of creativity exercises (CE) to facilitate elite youth soccer players' exploration of novel action potentials during soccer training. This examination was conducted in an action research (AR) process where a researcher and a soccer coach applied a selection of creativity concepts as tools to experiment with when designing new CEs. The data comprised audio recordings of design meetings and video observations of practice experiments during AR cycles. Further, the researcher used freewriting to reflect on the process and the coach participated in a semi-structured interview. Thematic analysis showed that facilitation of creativity was envisioned to foster curios, sovereign, de-robotized, playful and process-oriented players with unique trademarks. However, many ideas were rejected due to beliefs about quality coaching, demands for transferable situations and solutions, and the coach's conception of creativity. While some ideas were incompatible with established practice, others were rejected since they were perceived to involve unrealistic situations and match-irrelevant solutions. Moreover, the soccer-specific curriculum and match preparation in a tight tournament program left little time to diverge, and the pressure to perform intensified the demand for quality coaching when facing bad results. Avenues for future research are outlined by discussing conceptual, pedagogical, cultural, and political tensions in the results.

Keywords: *Coaching; Creative Activities; Applied Research; Association Football; Pragmatism;*

Lay summary

This study identifies several potentials for conducting creativity exercises during which the players solve novel challenges and explore solutions they do not usually try during training. However, result orientation and traditional views of quality coaching may limit what is seen as appropriate and therefore limit the exploitations of these potentials.

Implications for Practice:

- Portrays several creativity exercises and outlines principles for designing new ones.

- Provides resources to interrogate own and others' beliefs about creativity and its development.

- Offers key arguments and considerations for coaches who wish to promote creativity.

"The principles are good, but they need to be integrated in the right way":

Experimenting with Creativity in Elite Youth Soccer

An increasing amount of researchers advocate for creativity as a vital topic for coaches in team ball sports (e.g., Santos et al., 2016). Further, the promotion of players' creativity is a key interest among coach educators (Griffiths et al., 2016; Ross & Haskins, 2013), national youth soccer coaches (Glynn, 2013), and central figures in youth soccer development, such as Wiel Coerver. However, creativity is hard to grasp and apply in soccer, where implicit beliefs about creativity may limit the players' possibilities to be creative, with some unintended consequences for their future sport participation and performance (Rasmussen et al., 2020). Hence, the purposeful and contextualized application of creativity-nurturing approaches is positioned as a pivotal concern for the development of coaches. A key here is to avoid equating creative coaching with 'coaching for creativity' (Rasmussen et al., 2019). Although creative coaches often vary their practices and design new training to serve particular aims, they do not necessarily deliver activities that require, and thus nurture, creative abilities. In this paper, we offer novel insights into how coaches may focus their creativity on enabling player's creativity – and unpack the challenges they may face when doing so.

A growing number of frameworks offer particular ways in which coaches might grasp and facilitate creativity (e.g., Hristovski et al., 2012; Memmert, 2015; Muller, 2014; Rasmussen & Østergaard, 2016; M. Santos & Morgan, 2019). However, to our knowledge, no researchers have explored coaches' application of creativity frameworks. Instead, a body of intervention studies have measured changes in players' creative potential after predetermined programs (e.g., Greco et al., 2010; S. Santos et al., 2018). Consequently, there is a lack of research on how creativity-nurturing activities are perceived and applied by coaches and how this affects the creative process. Basically, what happens when designing and delivering the advised activities is left to anyone's imagination, except the coaches, who were not asked.

Thus, there is a need for detailed descriptions of particular kinds of activities that nurture creativity (Fardilha & Allen, 2019) and contextualized accounts of creativity in sports (Richard et al., 2017). Particularly, calls have been made for creativity studies involving the perspectives of coaches (Fardilha & Allen, 2019) and studies of challenges in implementing innovative approaches (Harvey & Jarrett, 2014). In response to these demands, the present study pursued an in-depth understanding of personal and cultural conditions that enable or obstruct creativity-nurturing practices in team ball sports. Enhanced awareness about the feasibility of creativity frameworks may further the impact of future projects to nurture creativity. This is a key issue since the cultivation of creative abilities can not only enhance players' chance to reach high performance levels (Kováč, 1996; Richard et al., 2017; Vestberg et al., 2012), but also help them thrive in their sport. Below, we elaborate on the latter aspect.

The neglected need for creative experiences

Based on our pragmatist position, we see individuals as evolving, generative actors, who both have a need for and capacity to shape and interfere with the social and physical environment and to alter the flow of their daily life (Shilling, 2005). Similarly, Hardes and Hogeveen (2016) see players as unique, singular beings always in flux and open to "other and new ways of being in the world" (p. 287). From this standpoint, it is unethical and possibly harmful (i.e., dogmatic and discouraging) to cut off the players' possibilities to act creatively by striving for repeatable and unchanging states of skillful coping. Players should be freed from mechanical routines and desires for efficiency and external perfection alone, and instead be provided with opportunities to exceed themselves and experience their body in different ways applicable to the practice.

Creativity was recently defined as a explorative process where (personally) novel action possibilities are perceived, exploited or invented during socially and materially situated

sport training activities (Rasmussen et al., 2019). At its very core is thus the surpassing of routine practices and the breaking of fixed habits. Further, the exploration of unusual actions requires a commitment to try imaginative ideas, entertain fresh perspectives and engage in unfamiliar tasks. This approach implies that creativity-nurturing practices may foster creative abilities such as active habits, that is, initiative and inventiveness when it comes to applying one's capacities to novel aims. This may sustain the players' growth; the continuous reorganization of experience by means of expanded perspectives and creation of new purposes and responses (Rasmussen et al., 2019), e.g., new ways to handle the environment. Coaches may be unaware of such potentials.

This has recently been put into sharp relief in a study of Danish elite soccer coaches in which Rasmussen et al. (2020) showed that cultural practice forms and coaching interests shape how creativity is conceived, valued and developed. Exploring different conceptions of creativity, the study revealed that the main rationales for creativity focused on winning. Targeting efficient, match-decisive creativities (e.g., *choreography, deception*) by means of prescriptive approaches, several coaches neglected how other creativities (e.g., *exploration*, *invention*) could enhance the players' learning and engagement. Hence, the study revealed that result-oriented coaches may tend to develop the team's capacity to perform objectively creative solutions (i.e., surprise opponents) by means of practices that do not involve any subjectively original actions. Consequently, this may "constrain how players think they ought to be experiencing playing soccer" (p. 13). Paraphrasing Muller (2014), some go home with the thrill of winning and some with the agony of losing, but all go home with the experiences created during the endeavor.

Sport coaching scholars agree that coaches exert a major impact on the players' sporting experiences and outcomes (Occhino et al., 2014). As exemplified above, creative practice forms may expand and enrich experiences (Campos, 2014; Muller, 2014; Rasmussen

et al., 2019) and thereby offer fruitful alternatives to traditional coaching with high amounts of if-then rules and knowledge transmission. Hence, there are several untapped potentials of creativity in team ball sport but breaking from tradition can be highly problematic. Drawing on Mark Windschitl's framework of practice dilemmas, Cushion (2013) highlighted that coaches may face a variety of political (e.g., power distribution), cultural (e.g., social expectations), pedagogical (e.g., low expertise) and conceptual (e.g., dogmatic ideologies) challenges when implementing game-based approaches. These dilemmas are parts of coaches' experiences that influence their practice and may lead to a fragmented or distorted application of new ideas (Cushion, 2013).

Purpose and pragmatist foundations

In light of the gaps apparent in the extant research on creativity in team ball sports, and the need to turn practitioners' focus towards the experiential benefits of creative activities, the aim of this study was to provide the first dedicated exploration of the implementation of creativity-nurturing training activities couched in the perspectives of an elite youth soccer coach and an action researcher collaborating to design and apply new creativity exercises (CE). Herein, the overall purpose of this study was to understand the personal and cultural conditions that enable or obstruct the design and application of CEs to facilitate elite youth soccer players' exploration of novel action potentials. To these ends, two research questions were asked: What are the new ways to facilitate creative actions during soccer training? What potentials and obstacles are envisioned when designing and applying new CEs based on academic creativity concepts?

This study is based on pragmatism, which is an action and future oriented philosophy aiming to advance practical affairs. Pragmatists value research that challenges limiting structures and expands future purposes and activities by offering new perspectives, thus liberating experience from dogmatic assumptions (Cornish & Gillespie, 2009). For

pragmatists our subjective world is contingent and changeable (Biesta & Burbules, 2003). The world is not already there when we encounter it, but constantly re-created by the transactional relationship between our personal capacities and environmental features. Thus, the potentials and obstacles of creativity should be understood as a function of the person-environment transactions.

Methods

When studying subjective, but socially shaped meanings, theme- and context specific as well as circular and flexible designs are required for sampling, data production and analysis (Smith & Caddick, 2012). An action research (AR) approach was chosen because it does not rely on fixed recipes (Greenwood & Levin, 2007) and an analysis of change processes can provide insights into contextual and personal aspects that impact practice (Casey, 2013; Cook, 2009). Before outlining the AR, we situate the researcher and the coach. From a pragmatist view, their unique dispositions and interests are shaped by their past, present and projected interplay with the social and cultural environments of soccer and research. These experiences influence their intentions in the AR, how the concept of creativity is understood, which ideas it affords, and whether CEs are seen as meaningful. A thorough description of the participants' circumstances of life also improves transcontextual credibility (Greenwood & Lewin, 2007), meaning that context bound results may be generalized to other situations by reflecting on personal, cultural and historical similarities and differences between the present and receiving context.

Access and participant selection

Guided by opportunistic and information-oriented case selection criteria (Smith & Caddick, 2012), the coach was found in Aalborg BK (AaB). The collaborative element of AR was vital to gain access since the talent director appreciated that the coach took part in designing the new exercises and was responsible for determining which ones to apply. The talent director

also preferred that the coach had a full-time position (i.e., only U17 and U19). We invited the U17 coach since he showed most interest in creativity. Informed consent was obtained from the coach, his assistants, players and their parents before the AR. The coach read and endorsed the manuscript of this paper without demanding any changes and appreciated not to be anonymized. The players' names will not appear to protect their identities.

The club

AaB endorsed a direct and dynamic kind of possession soccer, with fast combinations in gaps to create breakthroughs. The only formal coaching guideline was a flexible scheme with age-dependent themes. Within these boundaries, coaches were empowered to put their mark on the training. In addition, a flat hierarchy ensured a continuous dialogue to refine practices and ensure progression from the U13 to the U19 level, as described in our previous research in AaB (Rasmussen et al., 2020). The coaches often designed new exercises but, overall, focused on coaching creatively rather than coaching for creativity.

The coach

At the time of the study, Adam was 33 years old and had been a soccer coach for 13 years. He had no experience with the application of academic creativity frameworks but held an UEFA coaching A-license and was educated as a primary school teacher in physical education, Danish, home economics and math. His squad consisted of 30 males born in 2000 and 2001, who were divided in two teams playing at the highest national level in U16 and U17. In his previous seven years in AaB, Adam initially coached the club's U13, U14 and U15 teams and later supervised coaches for these age groups. Adam described himself as a diligent, detailed and conscientious coach with insight into the smallest nuances of the game. He had identified a range of universal "rules of thumb" (Adam, startup meeting, SM) to guide the U17s in particular parts of the game (e.g., good timing in overlaps, positioning). Accordingly, he wanted them to show an advanced understanding of the game, play with cleverness, and play

exuberant soccer, with "bewitching combinations" (SM) and hidden intentions to fool the opponents. As stated by a colleague,

> His soccer knowhow is unusually high. He has carefully distilled what he thinks would be optimal to do in every situation. This makes him a sparring partner for the players since he can nuance that there are these possibilities, but this is often the best. (Ken)

This soccer-professional knowledge was translated into training targeting different parts of the playing style and competence areas defined in a *talent profile scheme* covering approx. 40 capacities across physical (e.g., working zeal), technical (e.g., passing and receiving), tactical (e.g., forwardlookingness) and mental (e.g., initiative) areas. Clarifying that he was coaching for the sake of the game, the players' development and his enquiry of the game, Adam criticized the "parrots" who reproduce the practice set by those at the top of the hierarchy to advance in the system. Hence, he welcomed the AR as an opportunity for challenge and development.

The researcher

When initiating the AR, the researcher (Ludvig, our lead author) was 30 years old. He had worked as a lecturer at Sport Sciences at Aalborg University for two years. This education focus on problem-based learning and theory and practice couplings, both vital in AR (Greenwood & Levin, 2007). Here, Ludvig taught learning and psychology courses and supervised students who applied creativity frameworks in physical education. During his MSc in Sport Sciences, Ludvig completed a semester on creativity in theory and practice during which he led CEs in various sport and non-sport contexts and invented a new model for forming creative milieus in soccer (Rasmussen & Østergaard, 2016). Ludvig had played recreational soccer since he was six but had not received formal coaching education from the Danish soccer association. Nevertheless, his past education and present teaching involved

courses on cultural, tactical and pedagogical aspects of invasion games, among others. In addition, his previous research in AaB contributed to build rapport (Krane & Baird, 2005) and contextual understanding (Smith & Caddick, 2012). Insights in the club's ethos, normative practices and interactional procedures were keys to match the AR process to the context (Greenwood & Levin, 2007). For example, he could use a local terminology, argue why creativity could support extant purposes and be aware of the beliefs and conducts to be challenged. In this regard, not being a soccer expert helped Ludvig maintain an external perspective, which is important in AR to challenge local assumptions, routines and traditions that may block the discovery of vital resources for change and protect against the generation of new and different practices (Greenwood & Levin, 2007).

Action research

AR processes are typically depicted as recurring cycles of the interweaved stages of planning, acting, observing and reflecting. We adopted used Reason and Bradbury's (2001) definition of AR as "a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes" (p. 1). Resonating with pragmatism, this stresses the moral aspects of AR, which is basically conducted with people and for people, to enhance their capacity to act, and to enable them to flourish in their environment.

After a *startup meeting* where the purpose and scope and potential impacts of the project were envisioned, the AR comprised two recurring events; *design meetings* (DM) and *practice experiments* (PE). In the DMs, creativity frameworks and studies from sport and non-sport contexts were discussed, and a selection of creativity concepts were employed to design CEs. Ludvig and Adam contributed equally, but Adam decided which CEs to try. Lasting from 90 to 150 minutes, each DM led to two to four CEs and up to 60 minutes were spent on creativity in PEs. Adam conducted the PEs and Ludvig aided with inputs for ongoing activities, if they were needed and occasionally suggested rule changes. As a critical tool to

identify features that were taken for granted or key aspects that were unnoticed, Ludvig video-taped the PEs. Chosen sequences (e.g., ideas that failed, worked or surprised) were addressed to facilitate generation of new ideas when sharing and discussing experiences in the next DM, thus completing each AR cycle.

Design meetings

The DMs were inspired by two dimensions of Nielsen and Nielsen's (2016) model for critical utopian action research; *future creating workshops* and *research workshops*. The first intended to create experimental, free spaces for action-oriented imagination and generation of ideas and wishes for new social forms which could potentially engage practical initiatives. To outline an action plan and make the utopian horizons concrete and binding, the latter intended to expand and rectify these ideas with academic and practical perspectives.

Inspired by Dewey (1916), who views theories as tools to play with, tools that help us grasp the world, act in it and thereby change it, Ludvig introduced and exemplified a collection of creativity concepts (e.g., flexibility, spontaneity, originality, horizontal thinking) to design new exercises aiming to facilitate creative actions. This was based on Rasmussen et al. (2020), who defined creativity as the process of exploring unperceived, unexploited and uninvented action potentials. This definition mirrors the pragmatist notion of creativity as a curious and open-ended testing of different possibilities in unsettled situations that require new responses because habitual ways of acting are disturbed or interrupted. Hence, following Rasmussen et al., the tools were used to envision and examine novel tasks where the players' usual actions were inadequate, social norms were relaxed, alternate intentions were entertained, or unusual material conditions were offered. Facilitating the exploration of novel action possibilities, these CEs would help the U17 players exceed what they usually did during soccer training and nurture creative abilities such as open-mindedness and active habits (Rasmussen et al., 2020). In order to establish a shared understanding of creativity, this

novel approach was presented at the startup meeting, and further elaborated and discussed at each design meeting.

Progressively deviating from normal U17 practice, two or three creativity concepts were explored during each DM, considering how these could be operationalized to facilitate creative actions and thereby nurture creative abilities. Ludvig proposed a few pre-inventive ideas for the application of how the concepts (e.g., drafts for new CEs) and Adam brought extant exercises to be modified. In addition, Byrge and Hansen's (2014) creativity techniques were used to aid the design of alternative ideas, e.g., asking counterintuitive questions:, "What if one could only pass backwards?" or "What if the goals were movable?"

In this way, Ludvig took the role as a *friendly outsider* as he criticized local habits and perspectives in honest and appreciative rather than arrogant and domineering ways (Greenwood & Levin, 2007). This role requires the process skill of personal security, an ability to be oneself among local stakeholders, and "to admit ignorance and uncertainty and yet be able to advocate their own understandings and hopes" (p. 128). Ludvig was careful not to be swayed by local beliefs and practices (e.g., Adam's creativity definition), but approached the AR in an authentic, open-minded, responsive and playful way with respect for Adam's knowledge and experience.

Documentation

To capture the participants' interactions and perspectives in situ, the startup meeting (SM) and the DMs were recorded with a Dictaphone. The videos of the PEs helped grasping the lived consequences of change that impacted Adam's meaning making processes by enabling a repeated revisiting of events and situations affecting his perception of the CEs (Alrø & Dircknick-Holmfeld, 1997). After each DM and PE, Ludvig used freewriting (Elizabeth, 2008) to reflect on his field experiences, generate possible insight into the past events and what could be done in the future to create change (Greenwood & Levin, 2007). Silencing his

inner censor, he wrote about Adam's reception of ideas, concerns about his own delivery of the creativity concepts, ambiguities and challenges faced, decisions made and pathways taken. Parts of these entries and selected video clips were regularly shared with critical friends (Smith & McGannon, 2018), an experienced researcher and three peer PhD students, who provided productive advice and supported Ludvig in preserving a friendly perspective and seeking ways to create change. After the last DM, an evaluation interview (EI) was conducted, focusing on what Adam had learned in the AR. A semi-structured interview guide (Smith & Sparkes, 2016) was used to pursue insights into Adam's assessments regarding the potentials and limitations of applying creativity concepts. The interview inquired into Adam's perceptions and experiences of applied and rejected CEs, and expectations regarding his future work with creativity.

Analysis

Due to its flexibility and emphasis on the researcher's reflexivity and central role in knowledge production, thematic analysis (Braun et al., 2016) was used to guide the analytical process. This approach views qualitative analysis as a situated, context-bound and positioned process. The lead author was in charge of the iterative, to-and-fro analysis moving among the six phases of familiarization, coding, theme development, refinement, naming and writing up (Braun et al., 2016). In order to become familiar with the data, the lead author curiously read and reread the transcribed DMs, EI and freewritings (and watched the PE videos) while making notes on aspects that grabbed him. Engaging in inductive and abductive reasoning, the data coding involved adding pithy labels to analytically relevant segments of data (e.g., approvals or rejections of new ideas). At this stage, Ludvig went through the dataset twice focusing first on the semantic and descriptive and then on more latent and interpretive levels (Braun et al., 2016), to understand why Adam made sense of the CEs in the way he did. Reflecting the research questions, the analysis was organized in two overarching themes;

potentials and *obstacles* for the design and application of CEs. To develop themes, the codes were iteratively clustered in higher-level patterns of meaning organized around a central organizing concept (e.g., "beliefs about quality coaching"). These themes were continuously amended and revised by checking whether they embodied the data and addressed the purpose in a compelling way, with an overall but "necessarily partial and perspectival" story (Braun et al. 2016, p. 199). For example, themes regarding "reluctance towards unconventional tools" and "conventions about age-related training" were changed to examples of what was not seen as quality coaching. The phases of naming and writing of themes were continuously used to edit and refine the analytic narratives. Particularly, writing was used as a tool to reflect on the data. Throughout the analytic process, the constructive assessments of co-authors and critical friends helped reaching more nuanced interpretations rather than seeking consensus (Braun et al, 2016).

Results [table 1 and 2 near here]

In this study, we aimed to explore the implementation of creativity-nurturing training activities in elite youth soccer by means of AR. More specifically, we set out to understand the potentials and obstacles of designing and applying creativity exercises (CE) that could be used to facilitate the players' exploration of novel action potentials, as defined by Rasmussen et al. (2019).

The initial agreement was to design and apply new CEs every other week, if possible, but when terminating the AR process after 10 months, only five AR cycles had been completed. Towards the end of the AR, three meetings had even been held without finding any suitable occasions to conduct CEs, and during the process, more than 50 pre-inventive or inconclusive creativity exercises had been discarded. Hence, the AR led to the design of 11 CEs that were applied in practice. Nine of these are described in *table 1*. Based on the design and application of these CEs, six novel design principles were developed. As described in

table 2, these could serve as useful tools for practitioners. As summarized in *table 3* and *table 4* a range of potentials and obstacles were encountered and envisioned when designing and applying the CEs. Coaches aiming to implement creativity-nurturing activities would benefit from being aware of these potentials and obstacles. The structure of the following sections is based on these analytical categories. First, we elaborate and exemplify the six emancipative potentials, and then the eight obstacles, which will be divided in relation to 1) tournament interference and bad results, 2) issues of specificity, and 3) issues of conceptual clarity.

Emancipative potentials [table 3 near here]

When initiating the AR, the CEs were appreciated for *supporting autonomy and ownership*. The U17s were asked to create many different solutions and not merely undertake those endorsed or demonstrated. Normally, Adam initiated scenarios like those in CE2 and CE3 by instructing mandatory solutions, and then in a few rounds, the players could choose among the variants. Working with creativity turned his focus to involving players in providing proposals:

> This is like I usually do as a coach before our training sessions where I sit and draw some patterns for how to get through. I look forward to seeing what they come up with […] Taking ownership based on some prerequisites is fun and this aspect of being involved and getting some ideas themselves fits well with the age group. (DM1)

Moreover, it was conferred that embracing creativity in soccer practice had the potential to *revitalize curiosity* in terms of the players' desire to learn about particular nuances of the game, thereby enhancing their willingness to search for and try new solutions on their own. In Adam's view, the players' curiosity and idea generation abilities suffered at the U17 level.

> It becomes more remote as they get older. They are more aware about not being too creative, making too many mistakes, looking stupid and so on. We need to dissolve

this. It's an interesting age group in relation to the blockages that come with age. (DM2)

The PEs confirmed that creativity was pertinent. In CE1, the U17s were free come up with all kinds of solutions, but initially everyone only used the inside or outside of their foot to circle the cones. Limited by social expectations, they performed the task with many accelerations and efficient touches. After Adam teased them for only doing standard solutions and reminded them that "we train the ability to find new variants, there's thousands of ways to get around it" (PE2), they started doing more demanding ideas and exploring different moves. As Adam expressed it,

[…] we legalized to break the normative, and then the locks were suddenly opened. Got them on slippery ice and legalized looking stupid and doing some other things. There is a yoke on the entire soccer culture in terms of doing as expected. (DM3)

In this regard, facilitation of creative actions was envisioned to *contribute to de-robotization*, that is, preventing the transition to the U17 level, with augmented result orientation and performance pressure, to foster stereotypical players, who only use customary solutions and are unable to deviate from game plans. The CEs posed novel challenges to relational competencies and situational decision-making skills and required the U17s to face the game in novel ways, which could help them "seek out of their comfort zone" and "expand their horizons" (DM4).

Enhanced creativity was also envisioned to *support the evolution of trademarks*, that is, enhance the players' chance to discover personally unique ways to use their abilities; thereby gaining more noticeable styles. For example, tasks like CE4 and CE9 required the U17s to explore different ways to create game situations where rare solutions could be utilized. The emphasis on creativity also underpinned extant efforts to "make room for disparities" (DM3).

Unfamiliar tasks like CE6 were advantageous in terms of *forming a playful atmosphere* with a large leeway and focus on tasks rather than on exterior aspects since they required the players to do actions that seemed senseless under normal conditions. Similarly, the cues in CE4 (i.e., number of touches) did not always fit the situation and the players had to keep an open mind and act spontaneously. This contributed to building a humorous atmosphere, relaxed attitudes towards mistakes and downplayed the usual focus on efficiency. Indeed, the CEs involved many failed attempts but only few complaints and no coach reprimands. Instead, Adam supported this by energetically praising new initiatives and wittily addressing odd situations.

Finally, the emphasis on creative actions was as a desirable possibility to *facilitate rare (inter)actions*. Ludvig's ideas were recognized when Adam could imagine that they could lead to unaccustomed (but realistic) situations or original solutions. This desire for meaningful "wow" moments was evident in CE2 where Adam started to rate the solutions "like springboard diving" by giving 1 to 10 points for aesthetics. A maximum score was awarded for "flipper combinations, with loads of ideas, overlaps, third man runs and good timing" (Adam, PE1). CE2 continued 15 minutes longer than planned due to chasing extraordinary solutions. As stated by Adam when evaluating the PE, "I was in flow and I think the players were too. We were searching to catch a high fruit. We didn't really catch it, but in that hunt, you lose track of time" (DM2). Although it was an exciting initiative, the U17s might have been limited since Adam only rated successful ideas. As clarified below, where we describe the obstacles, Adam would not pursue ideas imagined to involve inappropriate actions.

Tournament interference and bad results [table 4 near here]

After the two first AR cycles, where most potentials were envisioned, *the soccer-specific curriculum* limited the time to explore new possibilities. Adam had a hard time finding

suitable occasions to diverge since the CEs had to fit the week schedule (e.g., high-intensity Tuesdays) and relevant aspects of the talent profile. As Adam stated, "we need to find a balance, because there's a lot they have to learn" (DM7). In this regard, *the tight tournament program* started to interfere. A tight match-schedule, much time required to analyze previous matches and future opponents as well as demands for match-preparing training, left little room to do exercises that could compromise the training quality and jeopardize team performance.

> We could binge in this period without important matches. Now we re-enter the match rhythm, so it has to make sense. Otherwise the players feel they waste time and get bad results because of it and I would too. Unfortunately, the tournament is a teammate. I would not be worried about daring to do it if we just trained to develop. (DM6)

Further, *result- and performance pressure* limited the AR. For example, when looking for a date to apply two CEs designed in DM8, Adam stated that it depended on the weekend; "it becomes much easier when we win". This obstacle was intensified when bad results made it impossible to conduct CEs. Lacking momentum affected the way in which unfamiliar activities were received and stressed the need for training that clearly improved the chance of winning.

> In the last match we cramped up and lacked creativity on the last third. When not getting results, one starts to doubt and then a win gets even more vital. Everything we do now has to make sense because they are wounded prey. We must focus on basic things such as mood, competitions and hard work. It would be inapt to work with creativity. (DM7)

Rather than risking to harm performance and getting more bad results by doing alternative exercises, confidence was preferably rebuilt by doing things known to work. The recurrent

statement that "it has to make sense now" implies that Adam abandoned any efforts to make his players understand how the CEs could enhance performance. While being open to them in earlier stages of the AR, under pressure in a system that demands results, he opted for the belief that the most kinds of CEs did not help the team get better results. To keep his job, respect and reputation, he preferred doing the well-known and efficient rather the new and unknown. As clarified next, some kinds of CEs could entail actions that were inappropriate at the U17 level.

Issues of specificity

Next, we show how *beliefs about quality coaching* limited the design of CEs. Being in an elite environment calls for high quality and, in Adam's view, good coaching makes the players better in relation to learning goals based on the team's playing style. Having dissected the game, he had clear ideas about which kinds of solutions were useful in soccer. Thus, he usually designed conditioned games activities where specific kinds of solutions were required and rewarded. Creativity did not fit this system. Hence, Adam rejected several pre-inventive ideas since he believed they did not involve any tactical elements and would lead to unrealistic situations (e.g., play with more balls), artificial solutions (e.g., a rule to only pass backwards), or uncontrollable elements (e.g., do 'the opposite' of what is planned when a whistle is blown).

> We need to be efficient and get the most possible soccer out of it when we are on the pitch. The clientele in an elite environment is determined, dedicated and know what they have to and want to. They should not waste their time. It has to feel natural. (EI)

Evidently, the AR resulted in activities that Adam did not perceive as soccer. For example, in PE5 the U17s took part in CE7 and 8. Adam expected that these CEs would be fun but, during CE7, he told Ludvig that "this is too far from reality, too far from soccer". Afterwards, he argued that both CEs were "lacking transfer value" (PE5), involving no tactical aspects and

too many actions that were inappropriate in matches. This was elaborated when evaluating the session:

> The caveat of the project was that one was worried if it would be a burden rather than an integrated element. We have tested this limit twice now where it has been way off the soccer context. This is not well received by the players and not by coaches, those I talk to and so on. We need to find a balance so the players can stay motivated. (DM6)

Hence, *demands for a high transfer-value* limited the range of ideas tested by avoiding match-irrelevant actions and situations. Stressing that training should mirror match situations, Adam would not use CEs where his players might act in ways (or end up in situations) that were inappropriate in matches. Arguing that U17 players already mastered all skills required to succeed and just needed to learn to make the right decisions, Adam discarded ideas for CEs with invention of techniques, combinations or set pieces. Further, a belief that players rehearse the specific solutions they use in training kept him from understanding how exploration of unusual action possibilities could develop the players' creative abilities (e.g., open-mindedness, inventiveness and adaptability) and why these are important for enjoyment, development and performance. In Adam's opinion, CE7 and 8 did not develop better or more creative players.

> I can see that I can use the ideas, but I get more and more convinced that drills with cards, other balls and so on don't move players on creativity parameters. One feels that it wastes one's time. It is good otherness, but elite players come here to learn something, and it's not something you feel move anything as a player or coach. (DM6)

As expressed, Adam was reluctant to use unconventional tools. For example, a sketch for a game where each team used a foam ball to eliminate opponents with (or without) a soccer ball was not regarded as appropriate "since it involves a foam ball" (Adam, DM6). In this regard,

Adam feared that too odd tasks could disengage players, "I have always used the rule of thumb that if the coach doesn't think it's fun, then the players don't think it's fun either" (DM6). In a few CEs, some U17s exhibited disengaged behavior and poor attitudes (others engaged in the creativity challenges). Due to fixed mindsets, they might have felt insecure in the unfamiliar situations, e.g., feared losing control or appearing foolish. In this regard, Adam's *perception of the players' preferences* also limited the AR process. Adam stressed that it was senseless for them since the CEs did not feel as soccer. These experiences made him object to strange activities. In his opinion, CEs requiring playful, match-irrelevant actions did not suit the players' "competitive mindsets" (DM5) or their usual approach to training, e.g., focusing on good decisions. Such monotone intentionality was exactly why Ludvig aspired to help them face and experience the game in other ways. In Adam's view, this was not necessary. Before PE1, he told the U17s that "we have implemented some creativity, but this does not change the fact that we have an ordinary session. It's some small nuances and the drills are not unfamiliar to you" (PE1). This exhibits reluctance to help players (and himself) adapt the way they participate in training by doing uncommon activities and exploring other perspectives. Indeed, creativity was secondary and could not change the training. As Adam demanded towards the end of the AR,

> We should strive for that it doesn't seem radically different, so they almost don't notice it. We should adapt existing things, so it looks a lot like normal soccer; so not creativity exercises where we add soccer, but soccer where we add creativity. (DM7)

Rather than seizing the opportunity to challenge assumptions about efficient training, the AR was limited by *requirements to integrate creativity in established practice*. For Adam, "integration" implied an adaptation of creativity to soccer, not an amalgamation of the two. Hence, the learning goals need not be reformed, the training would maintain its quality and he would not need to justify it to the players or his peers. Further, the request for integration led

to primarily design CEs with competing teams. Here, the players' habitual intentionality to keep possession, score goals and collect points seemed to reduce their focus on solving the tasks in unusual ways. Rather than challenging themselves by exploring new possibilities, some tended to choose safe, known solutions likely to efficiently meet the desired ends.

The obstacles of conceptual clarity

The application of creativity was also limited by *soccer-specific views about creativity and its development*. Initially, Adam wondered whether creativity regarded those actions we experience as surprising ourselves or those actions that surprise our surroundings. Reflecting his strong beliefs about efficiency and transfer, the exchange of theoretical and professional ideas during the AR led him to seal his understanding with the notion of "appearing creative".

> I would describe creative actions as something that appears creative to the recipient. It can be things they don't see coming, virtuoso acts in some way. Some cunning and elegant technical things. A good relational combination, a nice feint, or a visionary pass that breaks five players. It appears creative to those who see it for the first time, but might be banal to those who do it since it can be rehearsed. Our structures appear creative to the opponent and the level audience, but it's just agreements. (EI)

After becoming more conscious about his personal beliefs, ideas were rejected if not helping players appear creative. In Adam's view, the chance to do so would be the greatest if he provided the tactical principles to guide the players' (inter)action patterns such as "no-look pass", "third man runs" and "pass and sprint" (EI). Serving the team's game concept, these principles specify situations where certain solutions are useful. Adam had classified different solutions that his U17s never (or rarely) used and situations they had "a hard time bringing themselves in" (DM8). Like in CE9, he would employ exercises where extra points were given for solutions that may appear creative in matches, such as making a deep first touch pass after a layoff. This kind of interplay often overwhelms the opponents because a defense

rarely falls when the ball moves backwards. In his opinion, the players would not discover this nuance on their own.

> This is a little niche I try to get into the players to make them appear more creative. The game is culturally determined. You play as you see, so if it doesn't happen, then it's hard to acquire. Coaches have to be able to provide some ideas for what to do in different situations. Be catalysts to bring forward some elements that they are not used to. (DM7)

Providing experience with these team-specific tools helps the players anticipate the game, make action plans and "think the same as one another" (Adam, DM6) so rare combinations may occur when "the principles suddenly fit together" (Adam, DM4). Accordingly, CE2, 3 and 9 remained Adam's preferred ways to cultivate exploration of rare solutions and situations. Here, match-relevant actions could be targeted in a controllable manner. Adam argued that many other ideas did not improve his way to maximise the U17 capacity to appear creative. He was not convinced that creative abilities were relevant in matches and argued that they primarily relied on traits such as character and unselfconsciousness that could not be affected much at the U17 level. Though initially envisioning potentials such as de-robotization, trademarks and curiosity, he argued that U17 players' personality could not be changed. He still desired creative traits which made players resilient to bad performances, norms, judgment, conventions and adversity.

Discussion

The overall purpose of this paper was to understand the personal and cultural conditions that enable or obstruct the design and application of CEs to facilitate elite youth soccer players' exploration of novel action potentials. Clearly, an array of possible areas for future inquiries emerges from the results, but it is beyond the scope of this paper to address all of them in depth. In order to pave the way for more fruitful applications of creativity in team ball sport

contexts, and inspired by Cushion's (2013) analysis of challenges in the application of game-based approach across the coaching literature, we use Windschitl's (2002) four categories of practice dilemmas (see *introduction*) as a heuristic guide to grasp key tensions encountered during the AR. Moving from personal conceptions and practices to cultural and structural features obtruding the application of creativity, this account recognizes that the interrelation between the coach, players, and context shapes the coach's beliefs and actions and, in turn, determines the players' outcomes and preferences (Occhino et al., 2014).

Which creativity?

Conceptual tensions are embedded in coaches' beliefs and assumptions about creativity and its development. As suggested by the results, coaches' understanding of creativity may lead to the distorted and fragmented application of creativity-nurturing frameworks. For example, Adam's self-referenced theory of appearing creative (e.g., efficient surprises based on known interaction patterns) opposed the experiential perspective offered by Ludvig (e.g., experimenting with novel solutions and situations). As argued by Rasmussen et al. (2019), the discovery and invention of unusual action potentials may enrich and expand experiences and cultivate creative abilities, thus sustaining the players' development. For Adam, all conceivable match-relevant actions were already invented and U17s mastered the tools required to succeed but not the ability to make the right decision, and the latter was best developed with a high transfer value. Yet, research shows that creative abilities improve decision-making (Memmert, 2015).

Adapted to soccer, Amabile (2013) argues that an individual's possibility to be creative (i.e., produce novel and appropriate ideas to a goal) requires a confluence of soccer-relevant skills, intrinsic motivation (e.g., challenging tasks), a creative environment (e.g., procedures to develop and share ideas, absence of external motivation factors) and creative abilities (e.g., idea generation skills, openness to experiences). When evaluating CEs, Adam

was guided not by creativity concepts but more by familiar images of what was proper on the pitch, emphasizing soccer-relevant skills. Nonetheless, with more openness towards ideas such as those leading to the potentials, the other components may also be satisfied. Still, the conceptual tension regarded the basic disagreement over whether creative abilities were relevant for players in and beyond soccer and whether they could be developed. While Adam recognized the potentials of creativity, many ideas did not align with his views of quality coaching and lacked soccer relevance.

It may be argued that the applicability of creativity concepts depended on Adam and Ludvig's co-creative abilities to visit each other's perspectives, as well as the environment in which the AR was conducted. Drawing on Weick's (1988) notion of *capacity*, they could only perceive what they understood or had the competencies do something about. Familiar concepts define our repertoire of responses and make us extract and interpret cues in certain ways. For example, Adam had never worked with creativity concepts and little time was spent signposting creativity-nurturing behavior. In future research, more time, effort and frequent application of creativity exercises may be vital to reinforce coaches' understanding of the underpinnings and potentials of creativity. Also, when Adam reviewed the manuscript for this paper, he suggested a coach education program focusing on how to nurture creativity should be established.

How is creativity delivered?

Pedagogical tensions concern the design and fashioning of creative experiences where players' exploration of open-ended tasks is the crucial focus (Rasmussen et al., 2019). Undeniably, coaching for creativity is an ambiguous task which may require doing the opposite of what is normally done to enhance performance. Among others, coaches need to lose control of coaching situations, suspend judgment and encourage alternative intentions

and solutions, even failed and non-functional ones (Rasmussen & Østergaard, 2016; S. Santos et al., 2016).

An inherent aim of AR is to enhance *workability*, that is, internally credible solutions to practical concerns and an improved ability to define and control one's situation (Greenwood & Levin, 2007). Besides enhancing Adam's awareness about his views about creativity, the present AR spawned new tools to manipulate exercises (table 1 and 2). Inspired by concepts such as fluidity, flexibility, originality (Rasmussen & Østergaard, 2016), spontaneity (Campos, 2014) and task relaxation (Hristovski et al., 2012), six creativity principles were developed. This outcome satisfied both Ludvig and Adam's interests at the time of application. Conversely, CE7 and CE8 did not lead to any principles since Adam believed they had a low transfer value. In addition, bad results and requirements for integration often blocked the design and application of CEs based on the first five design principles. Opposed to his initial thoughts, Adam argued that "we have reached an age where the players should not break habits, explore and experiment a lot, but need refinement of some competencies we know they will need as seniors" (DM6).

Rather than designing for exploration and targeting creative abilities to discover, exploit or invent personally novel possibilities at a personal level, it was deemed most efficient to prescribe adaptation of contextually (even nationally) rare solutions which could make players appear creative. Adam's favored principle, *secret missions* (table 2)*,* reflects the notion of co-adaptive reorganization of task and environmental constraints (Hristovski et al., 2012), that is, the ability to keep a desired action within the range of affordances by creating time-space windows that can be explored and utilized in purposeful ways. Further, the unfamiliar missions challenged routine interaction patterns and could be solved in many soccer-specific ways. Yet, this coach-led rarity boost did not change the material conditions, intentional action orientation, or normative expectations of appropriate solutions (Rasmussen

et al., 2019). Future research should continue to help coaches push boundaries for what is regarded as quality coaching.

What is quality coaching?

Day-to-day coaching is interrelated with broader contextual norms, assumptions and values. Adapted from Windschitl (2002), cultural tensions emerge between coaches and players – and in this case, researcher and coach – during the "radical reorientation" (p. 132) of expectations and roles in the context. In this regard, Adam was exposed to a range of alternative practice forms, carrying with them unusual orientations about which actions and intentions should be valued. The results support extant research in that a) coaches tend to reject innovative and challenging ideas and prefer to stick with safe, tested coaching methods or superficially adopt those fitting their beliefs and verifying their knowledge and expertise (Harvey et al., 2010) and b) it is difficult to maintain the assumptions and orientations congruent to the principles of a new approach (Roberts, 2011). Consequently, and as exposed by competitive mindsets and bad receptions of alternative exercises, the increasingly socialized players may resist alternative approaches, both expecting and preferring traditional coaching behaviors (Potrac et al., 2007). However, established practices are believed to most efficiently enhance performance since they do not have any experiences with other approaches.

In this study, a clear boundary appeared for what was accepted as appropriate actions in soccer. Adam's main objective was to produce players for the U19 team and, finally, professional soccer. Thus, he focused on helping the U17s reduce weaknesses that may block their chances to progress; "They are very close to the full game, so they need to be provided with small layers and nuances" (DM6). For Adam, most tools offered in the AR did not serve the soccer-specific curriculum. Further, Weick (1988) argues that *commitment* in certain projects may prefigure our perceptions and actions, lead us to selectively extract self-confirming cues and disregard events that do not support the desired direction. Adam and

Ludvig had voluntarily committed to differing kinds of public and irrevocable actions (i.e., Adam's desire to win by helping players appear creative; Ludvig's view of creativity as a means of enjoyment and development). These were hard to disown. Such commitments are more likely to produce blind spots when the opinions are shared with others since we feel obligated to do certain actions (Weick, 1988).

As argued by Occhino et al. (2014), coaching ideologies "have the potential to shape an athlete's view of their sport participation – psychologically, emotionally, and physically" (p. 404). In turn, this affects their learning preferences and the subsequent outcomes of their sport participation. In order to make the CEs more meaningful for the U17s and give them a sense of what had to be learned, Ludvig often encouraged Adam to clarify benefits of creative abilities and to provide a rationale for why engaging in atypical tasks, entertaining other perspectives and doing irregular actions could enhance their development and performance. However, Adam rarely chose to do so. In future research aiming to foster creativity, it may not be sufficient to design and deliver creative tasks if players do not know why to engage in atypical activities or how to handle unusual tasks. Dissolving the obstacles encountered in this study may require education of the wider community and even reorganization of the soccer system. This study also supports extant research in that clubs should preferably start to nurture creativity at younger ages (S. Santos et al., 2016) to ensure that players experience the impact of creative activities.

How to handle opposition?

Restructuring soccer training as a creativity-nurturing environment is a risk-taking endeavor with political implications. Based on Windschitl (2002), political tensions concern the exercise and redistribution of power in the community (coaches, leaders, parents, players, etc.) when "norms are questioned and routines of privilege and authority are disturbed" (p. 132). Several ideas in the AR challenged Adam's authority in terms of providing the solutions

to be explored and utilized, giving him another role than that of a diligent, detailed and knowledgeable coach. Further, the non-transferable and non-soccer aspects were not well received, neither by Adam's players nor his peers. As indicated by the results, he may have felt pressure to attune his coaching to their expectations rather than doing atypical activities, and he stated that the feeling of being surveilled could eliminate the creativity of both coaches and players. At any rate, he rejected Ludvig's proposals "to avoid that the players roll their eyes when they see you since you have become a symbol of creativity" (DM6). *Would they perceive him as a bad coach if diverging? What would they tell at home?* Further, after the session with card game (CE7) and ball-roulette (CE8), Adam had a bad conscience since a guest player "got nothing soccer-relevant out of it" (DM6). *What would he tell his own coaches?*

As Roberts (2011) argues, coach educators should help coaches clarify what they are doing and argue why they are distancing from commonly accepted modes of coaching. In this AR process, more arguments were needed to convince Adam about the impact of doing actions that were not directly transferable to matches. Several studies published after the AR process might have convinced him to deviate more. Recently, Vaughan et al. (2019) argued for the design of micro environments for creative moments by dampening or amplifying sociocultural constraints. Further, Santos and Morgan (2019) found that pre-planned creative strategies collaboratively set by volleyballers enhanced their awareness of the game's complexities and evolved the team's communication channels. Research also suggests that the age from 15 to 18 is vital for refining and discriminating sport-specific creative abilities (Hendry et al., 2018) and that the cultivation of creative abilities may help players resolve everyday challenges (Richard et al., 2017). Finally, creative abilities (e.g., attempts, fluency, versatility) may be improved by doing small sided games based on differential learning (Coutinho et al., 2018; S. Santos et al., 2018). This approach resembles several rejected ideas

from the AR, e.g., varying the type of ball, target and pitch, and manipulating body positions. Still, future research should continue to develop compelling arguments for the implementation of creative activities.

Conclusion

In order to understand the personal and cultural conditions that enable or obstruct the design and application of CEs to facilitate elite youth soccer players' exploration of novel action potentials, this paper traced an action research process where an elite U17 soccer coach and a researcher used a selection of creativity concepts as tools for experimentation. Providing the first exploration of a coach's perspective on the implementation of creativity-nurturing training activities in elite team ball sport, this study exposed a complex variety of time, person and context-bound potentials and obstacles. These novel insights suggest that cultural conventions of quality coaching and personal conceptions of creativity impact the perceived usefulness of creativity exercises based on the idea that creativity concerns exploration of unusual action possibilities. Rather than investing in an unpredictable strategy of promoting creativity, cultural and political aspects led the coach to focus on winning by using more predictable strategies.

Alongside successes, that is, what works in action research, insights about challenges and resistance are crucial to inform future practice (Casey, 2013; Cook, 2009). This study may help coaches anticipate and handle the conceptual, pedagogical, cultural and political tensions that may occur when adopting creativity-nurturing coaching principles. Indeed, the complete exploitation of the emancipative potentials of creativity may require wide changes of practice. Further, the potentials and obstacles could be used as tackles to interrogate personal beliefs and shared practices. Inspired by Windschitl (2002), this study points out a range of questions that coaches tempted to adopt creativity-nurturing approaches could ask themselves and their peers and communities: Which kinds of creativity are suitable? Is my

training environment supposed to be a collection of individuals working towards efficient surprises or a community of curious, sovereign and flexible inquirers who invent solutions and game plans? Why is it important for me to nurture creativity? What abilities and strategies are necessary? How do my experiences of what is appropriate and achievable prevent me from grasping the potentials of creativity? How can we transcend traditional coaching routines and engender new agreements with our players about what kinds of actions we value and recognize? How can I gain others' support?

The theoretical and empirical support to facilitate creative actions is growing. However, as exposed by this study, implementing creativity may be challenging for coaches and players alike, and elicit resistance in the community. Future research to elucidate the potentials and dissolve the obstacles of translating conceptual frameworks to practice is vital to qualify the development of coaching at all levels of sport participation. Further, more inquiries are needed to invent new ways to facilitate creativity and explore the potentials of doing so, with emphasis on the players' perspectives. Paraphrasing Fardilha and Allen (2019), future studies should explore sporting environments that have genuinely adopted the philosophical underpinnings of creativity instead of treating it as an appendix.

Acknowledgements

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CE1: Individual task. Each player moves around a disc cone with a soccer ball, first clockwise then counterclockwise, and then move to another cone (several cones spread in the target area) where they should use another solution. The target was to solve the task in as many ways as possible.
CE2: Repeated 3v2 situation. Three players improvise different possibilities (no options demonstrated). A playmaker starts 12m from a player acting as a fictive goal. A forward and "the third man" (joker), starts around two lines that divide the area into three zones. One shadow defender is placed on each line. The task is to play past defenders with both the forward and the third man joining the combination.
CE3: 4v3 game scenario on the last third. Four attackers plan how to score against a 2-1 formation. They play 2-2 and one could penetrate the target area where 3v2 situations can be created. Depending on the negating actions and unforeseen possibilities, they have to adapt or even break the plan.
CE4: 8v4 possession game where a point is given for 10 consecutive passes. For each pass, the player receiving (or passing) the ball must state a number from 1 to 5, dictating a fixed amount of touches he should use; i.e., if calling "1", the ball is to be passed on the first touch, if "2", second touch, etc.
CE5: 2v1 overlap scenario. The defender calls out a challenging "cue", specifying a body part (e.g., heel, toe, inside, outside, chest, thigh, shin, head, etc.) that should touch the ball during the attackers' combination. As a progression, combinations between two or three body parts could be called.
CE6: 6v6 match. Each player is delegated a unique role based on the coach's perception of their routine style of play, forcing them to move away from standard actions in connection with receiving, dribbling or passing (e.g., do a pre-feint before receiving, do a turn before passing, or pass-and-sprint each time).

CE7: 6v6 match with a card game. The number, color and suit dictate each player's number of touches (i.e., 1 to 4), passing direction (i.e., red ahead, black behind) and technique (i.e., clubs use heel).
CE8: 4v4 interval game with "ball-roulette". Each time a turn ends, a different kind of ball is set in play, e.g. a foam tennis ball, an American football, a normal soccer ball, a futsal or a triangular ball.
CE9: 8v8 match. Each team has to accomplish a special task (e.g., three one-touch passes in a row; Cole/Yorke combination; first touch pass behind the supportive leg) to be allowed to go for the goal.

Table 1: Creativity exercises that were applied during one of the practice experiments. Before most exercises, the teams can form line ups and discuss tactics and, afterwards, questions can be asked about how the creative ability targeted could transfer to the real game.

Design principle	Description
Play with quantity	Solve a repeated, technical task by trying as many variants as possible, even those that are not useful in matches (see CE1).
Improvised scenarios	Rotational speed games with a recurrent game scenario (see CE2). The players are encouraged not to use the same solution more than once. No specific solutions should be demonstrated or requested.
Plan and break	Groups plan a new way to surprise and outplay opponents before each turn (see CE3). They can break out of or adapt the plan in action. Conditions can be added (e.g., number of touches/passes).
Instant problems	Modified games where the players act spontaneously on particular cues created by themselves, peers or coaches (see CE4 and CE5).
Unhabitualisation	Collective or individualized rules that block, interrupt or disturb the players' habitual (inter)actions (see CE6).
Secret missions	Creation of game situations for exploration of coach-identified rarities (see CE9, the result section on "The obstacles of conceptual clarity" and the discussion of "How is creativity delivered?").

Table 2: Design principles based on the creativity exercises that was designed and delivered during the action research process. These can be used by coaches to form new exercises.

Theme (potentials)	Condensed description
Support autonomy and ownership	Coming up with their own suggestions and solutions is fun
Revitalize curiosity	Inspire the players to individually search for and try new ideas
Contribute to de-robotization	Prevent that elite structures lead to stereotypical playing styles
Support the evolution of trademarks	Help the players develop unique ways to use their abilities
Form a playful atmosphere	Breed a humorous and relaxed attitude towards inefficiency
Facilitate rare (inter)actions	Facilitate extraordinary solutions and "wow" moments

Table 3: Potentials of applying creativity exercises in U17 elite soccer practice.

Theme (obstacles)	Condensed description
The soccer-specific curriculum	Limited time to diverge due to many other agendas related to the club's advised week schedule and the team's comprehensive talent profile (cf. "the coach").
The tight tournament program	Alternative ideas deprioritized due to a busy match program with requirements for match analysis and preparation for the next opponent.
Result- and performance pressure	Unwillingness to attempt unfamiliar ideas without meaningful links to enhanced performance. A demand to conduct what peers and players recognized as efficient training, especially in periods with bad results.
Beliefs about quality coaching	The elite setting calls for high-quality coaching, focusing on learning goals based on the team's playing style. Many ideas lacked relevant tactical aspects.
Demands for a high transfer-value	A requirement that the exercises represented situations from the full game and match-irrelevant actions and situations should be avoided. Many ideas rejected since they were perceived to involve uncontrollable and unrealistic situations.
Coach perceptions of player preferences	A belief that the new ideas did not suit the players' desire to comAdam and make good decisions, and that these preferred ways to participate in soccer training neither could nor should be changed.
Requirements to integrate creativity in established practice	Requirements that the new ideas could not deviate too much from established practices. Only acceptable to adapt extant exercises, not to invent novel kinds. Demands to maintain competitive elements.
Soccer-specific views about creativity and its development	Coach preference to develop the team's capacity to appear creative in matches by means of tactical principles and agreements. A belief that the tools explored did not improve this capacity, and that creativity relies on fixed traits.

Table 4: Obstacles for the design and application of creativity exercises in U17 elite soccer.