



A Pitch for Diversity: Teaching Tactical Creativity in Sports and Other Domains with Dr. Daniel Memmert

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Abstract

Our guest for this article was Dr. Daniel Memmert, Professor and Executive Head of the Institute of Exercise Training and Sport Informatics at the German Sport University Cologne, Cologne (Germany). A lifelong sports player and enthusiast, Memmert's research is at the intersection of human movement science (cognition and motor activity), sport psychology (attention and motivation), computer science in sports (pattern identification and simulation), talent, children and elite research (Trainings-/PE-Curricula) and research methods.

Keywords Creativity · Teaching · Tactical creativity · Sports psychology · Game intelligence

“Ninety percent of this game is half mental.”
- Yogi Bera

“[It's] not a gift, creativity. You can develop that. You can train this. It's more the environment and more what you do in the practice than a gift.”
- Dr. Prof. Daniel Memmert

Introduction

This article series explores current knowledge around a triad of related issues: creativity, technology and learning. We do

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this through interviews with notable creativity researchers across a range of disciplines: design, business, psychology, writing and the arts (Cain et al., 2020; Henriksen & Mishra, 2018; Warr et al., 2018). The diversity of our interview subjects offers unique and nuanced perspectives, in addition to some common themes—providing a complex, detailed and emergent picture of current creativity research. In this particular article, we explore creativity from an angle that it is not frequently considered across many creativity research discourses, that of creativity and sports.

Our guest for this article was Prof. Dr. Daniel Memmert, Professor and Executive Head of the Institute of Exercise Training and Sport Informatics at the German Sport University Cologne, Cologne (Germany). A lifelong sports player and enthusiast, Memmert's research is at the intersection of human movement science (cognition and motor activity), sport psychology (attention and motivation), computer science in sports (pattern identification and simulation), talent, children and elite research (Trainings-/PE-Curricula) and research methods.

Prof. Dr. Memmert began his career studying physical education for high school teaching (PE, math, sport, and ethic) and he has trainer licenses in soccer, tennis, snowboard, and skiing. He later received his PhD (on basic cognition in team sports) and habilitation (creativity in team sports) in sport science from the Elite University of Heidelberg. In addition to his duties at the Institute of Exercise Training and Sport Informatics, he holds a visiting assistant professorship at the University of Vienna (Austria). In Memmert et al., 2010, he

was awarded third place for the renowned German Olympic Sports Confederation (DOSB) Science Award in recognition of his significant contributions to sports psychology. His research has studied some of the most renowned European and World Cup players—and through this he has informed the design of sports programs across the world, including the Canadian women’s soccer team as well as more than a dozen elite soccer clubs in Germany. And, he believes these elite creative skills can be acquired and learned, suggesting that there are ways in which this tactical creativity can be intentionally developed.

Our interview with Prof. Dr. Memmert focused on his work on teaching, developing, and understanding different forms of creativity in organized sports settings. During our conversation, we discussed his interest in helping athletes develop their capacity for divergent thinking—that is, thinking outside of routines, processes, and norms (which all relate to convergent thinking)—in real-time competitive situations, leading to what is generally referred to as ‘tactical creativity.’ As Memmert noted:

We all know what tactical creativity is, it’s flexible, effective, original solutions in a given time and situation...we borrowed the framework from Guilford, a kind of operationalization of divergent thinking, this fluency, this flexibility. We borrowed that and transferred that to the world of sport.

Memmert points to an important turn in the conceptualization of creativity, and one that drove its development as an important subject for study and development. In the 1950’s, psychologist J.P. Guilford (1956, 1967) hypothesized that every mental task was made up of separate parts, which ultimately led him to propose the notion of “divergent thinking,” as a unique set of mental tasks, central to creativity, that allow for the production of lots of diverse ideas. His work suggested that creativity was not one abstract concept, but rather a category of concepts, tasks or skills (Guilford, 1967). Guilford’s approach opened up the possibility for other researchers to look at creativity in this way—and this idea of creativity as a collection of intersecting skills, abilities and tasks is also key to Dr. Memmert’s approach to creativity within the field of sports.

Creativity in Sports

Sports comprise an area rich in creative possibilities, but they may not necessarily get the attention of other fields when it comes to creative thinking or creativity in teaching and learning—given that creativity is often associated with psychology and the workings of the mind, while sports is often associated with physicality and the body (Wiggins & Bhattacharya,

2014). Professional sports such as soccer and basketball are often dominated by narratives of profoundly talented athletes—men and women who seem almost physically preternaturally gifted to play the game at its most competitive levels. Their performances can take on an almost mystical quality, challenging viewers to make sense of how they do what they do so well. Top athletes and athletic performances are often characterized by their innate sense of timing, poise, and remarkable demonstrations of talent under intense pressures and unlikely odds of success. Within this view about the naturally ‘gifted’ athlete, consistently creating ways to win is a trait that many people assume cannot be taught. Interestingly, this aligns with certain popular ‘myths’ about creativity itself, in which most people do not see creativity as a learnable or developed skill or a way of being in the world, but rather as an inherent gift (Cropley, 2016). Scholars have noted that this myth persists despite years of research that suggests the potential to develop the creativity in all of us (Runco, 2003). Thus, the intersection of creativity and athleticism inherently tends to fall within the view of being in an area of inherent “giftedness.”

At the same time, professional sports are also characterized by discipline, focus, and years of intense practice. Many athletes provide accounts of the thousands of hours of practice they have dedicated to their game, and how they have tried to translate those hours into game-winning performances. Youth leagues and early training and development camps exist to help train and develop athletes to reach professional-levels of skill and performance. And for young aspiring athletes, the pressure to commit to a single sport can be felt at increasingly early ages, and with it, the need to commit to specific training regimes that focus on specific skill sets. Often this focus comes with a consequential choice—the choice to either participate in multiple sports and gain strong but generalized athletic ability, or concentrate on one sport and develop skills specific to that game where one can truly excel and stand out.

This intersection between natural talent and years of practice is where Dr. Memmert has devoted most of his attention and scholarship. He is a recognized expert in the research of tactical creativity, a field of creativity that emphasizes flexible, effective, and often unique methods to create solutions to challenges that exist under competitive, intense, often time-sensitive conditions. Problem solving in those contexts can be as much about creative thinking and ‘reading the situation’ as it is about training and procedure, and there are professional and scholarly ‘tactical vs technical’ debates about which methods and approaches are most effective in developing creativity in players.

At the heart of his research is the notion that athletes can develop their divergent thinking (and hence, tactical creativity) through diversity in the athletic activities and regimes created by their coaches and trainers. This notion of tactical creativity as a developed mental ability aligns with the thinking and scholarship of other creativity scholars we’ve encountered

in this series (Henriksen & Mishra, 2018)—we are encouraged to see this thematic cohesion occurring in the world of sports and sports psychology as well.

Strategic and Tactical Creativity

To understand the foundations of Dr. Memmert’s research, it is helpful to talk about differences between strategy and tactics, and how creativity is thought to influence the practice and goals of each. Strategy is often defined as “a contingent plan of action designed to achieve a particular goal” (Casadesus-Masanell & Ricart, 2010). Generally speaking, strategies are developed to achieve relatively long-term goals and objectives. Broadly speaking, there are two sides to strategy: strategic planning and strategic thinking. Strategic planning is “an analytic process aimed at programming already identified strategies. Its outcome is a plan.” (Liedtka, 1998, pg. 121). Strategic creativity, on the other hand, is a mindset meant to challenge assumptions embedded in strategic planning. The goal of strategic creativity is to look at how current contexts exist in relation to strategic plans as a way to create new ones. Rather than being an exercise to consider possible outcomes, strategic creativity instead uses inversion, pattern-seeking, analogies, qualitative similarities, etc. to develop new ideas, paradigms, and perspectives (Liedtka, 1998). Entrepreneurs, administrators, athletes, researchers, and instructional designers, among many other professionals, all can be said to be engaging in some form of strategic creativity when they set out to discover new approaches, strategies, and solutions to their work. Understanding the difference between the analytical approach of ‘strategic planning’ and the synthesizing, generative approach of ‘strategic creativity’ is helpful to understanding differences between strategic and tactical creativity.

Tactics, on the other hand, are the set of methods and actions available from a particular strategy. As Casadesus-Masanell and Ricart (2010) put it, tactics are “residual choices” open to a person, player, team, or organization based on the strategy they chose to adopt. The range of actions, or tactics, available for use are a function of strategy, and are as open or constrained as the strategy allows. As with strategy, we can think about the development of tactics from two different perspectives. One perspective emphasizes developing and practicing techniques that have strong alignment with a proven strategy, or at least a strategy that has been used effectively in the past. The goal of developing this form of technical expression of tactics is to improve the skills and resources necessary to effectively carry out a given strategy, and it generally involves extensive training, drills, and/or practice.

Memmert’s research focuses on the second kind of tactical expression—tactical creativity. Tactical creativity is the ability to make new and effective decisions that reflect current, and

possibly rapidly changing conditions or opportunities. In sports, the goal in developing tactical creativity is to help players quickly assess game conditions, switch tactics, and/or make decisions or plays that capitalize on new or emerging opportunities. Tactical creativity is different from strategic creativity and technical skills in that it takes mental and physical awareness that happens in the field of play, in the moment, as it were, through the immediate decisions taken by the players.

Tactical creativity is in the moment, when a player makes a move, comes up with a solution on the field, and his peers, players, the coaches and viewers all agree that that “is a unique, seldom, but also adequate solution he could take.” This, Prof. Dr. Memmert’s says, is “game intelligence.” The best players have it. And his research conducted within the top echelons of soccer (studying European and World Cup players) shows that tactical creativity is key to success and in winning games. His work has informed the design of sports programs across the world, including the Canadian women’s soccer team as well as more than a dozen elite soccer clubs in Germany. And, he believes these kinds of skills can be acquired and learned, suggesting that there are ways in which this tactical creativity can be intentionally developed.

Diversity in Practice (and Play) Can Enhance Creativity

Right from the outset of our conversation, Dr. Memmert shared his research on the nature and development of tactical creativity in children for sports and sports-related activities. In response to the question of how he defined creativity, he referenced the results from one of his most cited publications—“The Effects of Non-specific and Specific Concepts on Tactical Creativity in Team Ball Sports” (Memmert & Roth, 2007). In it, he and his co-author Prof. Klaus Roth studied the effects of deliberate practice and deliberate play on tactical creativity in team sports. As he noted:

“In [Memmert & Roth, 2007], we found that we can develop tactical creativity with the Ball School concept over two years, and that different diversity approaches worked much better [in enhancing tactical creativity] than if you only play soccer or only play handball, only play field hockey. It was a very important result.”

Memmert was referring to *Ball School Heidelberg*, a concept developed by Prof. Klaus Roth at the Institute of Sports and Sports Science at Heidelberg University, Germany, in 1996. This approach to sports instruction and practice emphasizes gathering game and game-like experiences in multiple sports. Framed in response to a disappearing “culture of playing in the streets” (Memmert

& Roth, 2007), Ball School Heidelberg has been used in Germany and elsewhere as a scholastic approach to promoting holistic, and more natural athletic development in children. Thus, Memmert operates from a holistic perspective on creativity, in which inspiration for the novel/effective solution emerges out of diverse experiences.

This notion of being primed for creativity by developing a wide breadth of experience and knowledge across genres, resonates well with a transdisciplinary perspective on creativity (Root-Bernstein & Root-Bernstein, 2013). Regular readers of this series know we often refer to the “(in)disciplined” nature of creativity and creative acts (Mishra et al., 2012). This term acknowledges that creativity can be expressed across disciplines and thus benefits from varied experiences, ideas or genres. Yet, creativity often finds its most complete expressions *within* a discrete discipline, which has specific norms, tools, skill sets, and constructs that help shape and define creativity within its boundaries. An interesting connection to consider here may be to Ericsson et al.’s (1993) notion of deliberate practice. While this idea is not exclusive to sports, it reveals how in many areas of expertise, people begin early in life with a regimen of effortful activities (deliberate practice) designed to optimize improvement. Individual differences, even among elite performers, are connected to deliberate practice; and characteristics once thought to reflect innate talent are often the result of intense practice extended for many years. There is more than repetition in this, yet practice of any kind has some elements of that—but also some elements of Schön’s (1989) notion of reflective practice (e.g., reflecting on performance both in action, and also reflecting on action).

In comparing results between players that deliberately practiced in only one sport (say soccer) vs. players that deliberately played in a variety of sports (soccer, plus handball, basketball, etc.), Prof. Dr. Memmert’s research shows that deliberate practice does not have the kind of impact on tactical creativity as people might assume. That is, increased time players may spend on practicing a narrow range of drills and scenarios that coaches consider probable in game situations did not translate into increased tactical creativity. Rather it was a diversity of play-type experiences—deliberate play—that had more of an effect on players’ expressions of tactical creativity. In other words, the more time players spent in unstructured game situations, with no coaches, no trainer, no instructions before, during, or after play, the more tactical creativity they demonstrated in actual game situations. This means recognizing more opportunities to score, or rapidly diagnosing opposing teams’ or players’ vulnerabilities.

While coaches and sports psychologists may still debate about the ratios of practice to play in developing young athletes, Memmert says the results of his study were a positive beginning to investigating this area in more depth. “It gave us a good feeling and scientific

evidence that a diversity concept at the beginning of children’s experiences when they start to play sports, team and directed sports, could be a very useful tool to develop and to foster tactical creativity.”

Memmert also believes his study can put to rest certain notions about inherent talent and “naturally” gifted players that excel on physical attributes alone. “That is not a gift, creativity. You can develop that. You can train this. We show that in children. We can train athletes, 20 years old. They become more creative. So yeah, it’s more the environment and more what you do in the practice than a gift.”

Play, Attention, Creativity

Prof. Dr. Memmert’s research has echoed the insights and findings of other creativity scholars and researchers, albeit from the unique instructional context of organized team sports. One area that has had potential for trans-disciplinary applications is his research on connections between attention and tactical creativity. Having an awareness of, and paying attention to existing, emerging and evolving details is a hallmark of effective problem-solving behavior. In other words, the more details a person can attend to mentally in-line with a certain problem-solving task, the more information is available for that person to use in formulating effective solutions. Utilizing activities and instructional designs to leverage increased attention is a key strategy for instilling creative and flexible mindsets in learners.

In the case of sports activities, players are constantly applying their critical thinking, situational awareness, and technical skills to test the strengths and weaknesses of the opposing side. According to McBride (1991), critical thinking in physical education may be defined as “reflective thinking that is used to make reasonable and defensible decisions about movement tasks or challenges” (p. 115). Prof. Dr. Memmert’s research has explored how increasing players’ awareness and attention to emerging game conditions can lead to more tactically creative plays and outcomes. In particular, he and his colleagues have looked at the relationship between creativity and *breadth of attention*, defined as “the number and range of stimuli that a subject attends to at any one time” (Memmert, 2007). He referenced one of his exploratory studies (Memmert, 2007) that looked at how the attention of players can be influenced by the amount of in-game instruction they receive. Among its findings, the study indicated that players who received less in-game verbal instructions and directions from coaches demonstrated broader attention to game developments; players who received more verbal instruction demonstrated narrower attention, often in line with the verbal input from the coaches. Memmert’s research has found that age is a factor when training athletes and players for tactical creativity and game intelligence. He noted:

We found that there's a strong connection between attention performance and tactical creativity. More importantly, as in other attention tasks, for example, in development psychology research, we've found that there's a lack of a curve. At the [earlier ages], creativity is much more improved. [This is] a very important time in the development of creativity, at the beginning. Then when you are 12 and later, it's a little bit more constant. That is a very important message for us as well, to train tactical creativity at the beginning of the life of children, and not at the end.

Dr. Memmert is quick to note that training for broader attention has shown positive results in relation to developing players' capacities for tactical creativity, but that it takes time, or 'incubation'. "Incubation means you need time to adapt and to develop yourself," he notes. He believes the results of his studies are not just lessons learned about how children can develop game intelligence and tactical creativity in game situations. His research points to the importance of effective designs for practice scenarios (what he calls 'game forms'), as well as the role of coaches and trainers in fostering creative behaviors and mindsets. In a study on players' performances in relation to different levels of coaching input, Memmert (2007) found that more instruction can lead to decreased attention to wider game elements. As he described it:

"[We used] the same game forms, but one group would get a lot of instructions from the coaches, and in the other group, they were just playing. [And we found] it's when the coaches [give instruction] all the time that the players' attention narrows. If the coaches don't say anything, [the players] see so many things, teammates, what to do. And we demonstrate that the group attention, with a widened focus, develops and fosters tactical creativity better or more than the narrow attention focus group."

This finding would seem to have implications not only for research on working memory, but in the application of constructivist learning strategy. Constructivist perspectives have long warned that an overemphasis on in-the-moment, direct instructional input can affect learners' capacity to focus on more holistic factors and issues (Baumann, 1988; Moore, 1973; Smerdon et al., 1999; Spaaij & Jeanes, 2013). Learners that are allowed the freedom and time to develop their own understanding of contexts and situations will develop a more intuitive sense of the factors, issues, and dynamics at play. This has implications for how instructors might design for learning environments that aim to foster creativity, as well as related concepts like learner autonomy.

Conclusion and Implications for Creativity in Instruction and Learning

Dr. Memmert's research and findings in sports psychology and creativity are important. When it comes to considering design strategies for online teaching and other educational contexts that aim to encourage creativity and learner autonomy, perhaps less is more. There are times when detailed and explicit instruction is necessary to help students focus on the fundamentals of assignments and tasks. However, students are more able to develop their capacities for flexibility, creativity, and learner autonomy when the exact methods and approaches to completing assignments is left up to them (Henriksen et al., 2018). This is not to say that outcomes should not be well-structured—just as the outcome of a soccer match is defined by the rules and parameters of the game, assignments and tasks should also have parameters that help students and instructors assess performance. Rather, it is open-mindedness and restraint in the ways instructors participate in the enactment of task behaviors that can help shape students' expressions of skill, knowledge, and understanding and leave them free to individualize, experiment, and create.

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