

# The Five Minds of the Modern Strength and Conditioning Coach: The Challenges for Professional Development

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## ABSTRACT

STRENGTH AND CONDITIONING COACHING IS A COMPLEX COMPI- LATION OF ACTS DRAWING ON MULTIPLE FORMS OF KNOWLEDGE. COACHES NEED TO DEMON- STRATE A WIDE RANGE OF APPLIED SKILLS TO BE EFFECTIVE. WHILE EFFECTIVE COACHES APPRECIATE THE NEED TO LEARN THROUGH- OUT THEIR CAREERS IN ORDER TO IMPROVE, PROPER SELECTION OF WORTHWHILE LEARNING OPPOR- TUNITIES CAN BE A DAUNTING TASK. THE PURPOSE OF THIS ARTI- CLE IS TO EXAMINE AND EXPAND OUR UNDERSTANDING OF EFFEC- TIVE STRENGTH AND CONDITION- ING COACHING USING GARDNER'S "5 MINDS" FRAMEWORK. A SEC- ONDARY PURPOSE IS TO CON- NECT THIS FRAMEWORK TO THE LITERATURE IN COACH EDUCATION FOR COACHES TO SELECT CORRESPONDING LEARNING OPPORTUNITIES.

## INTRODUCTION

Effective strength and conditioning coaching is generally acknowl- edged as an integral aspect of an effective athletic performance

enhancement program (5). This has led to the acceptance and growth of strength and conditioning as a profession that currently provides a range of employment opportunities for coaches hoping to pursue a career in the field. Concurrently, this has led to an increase in the demand for appropriately qualified and skilled coaches from potential employers (24). Potential coaches therefore need an appropriate career pathway of profes- sional development to provide them with the knowledge and skills to deliver effective coaching. As a result, there has been a proliferation of educational opportuni- ties for potential and existing strength and conditioning coaches (22). For example, coaches are now able to earn bachelor's and master's degrees specifi- cally in the field, although many more sports-related bachelor's degrees include strength and conditioning modules as part of their program of study. Similarly, there has been a growth in the number of courses, conferences, and educational events aimed at strength and condition- ing coaches. Additionally, coaches are able to undertake formal internships and mentoring opportunities. All these opportunities provide coaches with an extensive menu of potential professional development activities (22).

However, what is less clear is how effectively these opportunities are pre- paring coaches for the challenges they face in the field and whether the breadth and depth of knowledge and skills required for effective coaching are adequately addressed. Given this, coaches need to consider carefully whether the learning opportunities they undertake meet their individual needs. This can be quite a daunting task because strength and conditioning coaching encompasses a number of complex roles and responsibilities. This article will examine and expand our understanding of effective strength and conditioning coaching through the lens of Gardner's "5 minds" (12) framework, allowing coaches to select appropriate learning opportunities that best meet their individual needs.

## TYPES OF PROFESSIONAL DEVELOPMENT

Despite the wide range of develop- ment opportunities, learning sources for coaches can be classified under 3 broad categories: formal, nonformal,

## KEY WORDS:

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or informal education (26). Formal coach education typically involves following a core curriculum and the delivery of a defined quantity of information that often culminates with standardized assessments to evaluate competency (32). These are usually mediated activities, where the coach is directed to information by another individual or group (30). Typical activities include university-based courses, coach education courses, etc. Nonformal educational opportunities involve a more eclectic mix of educational activities, which while formally organized, by definition, lie outside formal education. Activities such as conferences and clinics fall into this category. Informal educational activities include mentoring, observation, reading, and peer group discussion. These experiences will largely be self-directed and based on a coach's perception of their needs at any given time.

Learning experiences have been further classified using 2 metaphors (27). The first classification is labeled "acquisition," which involves the transfer of knowledge from a teacher to a student and is the principal type of activity associated with formal and nonformal learning. The second classification is labeled "participation," where learning occurs through active engagement (i.e., experiential learning) in the coaching context (6). These types of activities facilitate internal learning and thinking. These may not involve new information but may involve a reconsideration of existing ideas and can be facilitated by informal learning activities (30). Although each experience has advantages and disadvantages, it is likely that coaches will benefit from a mixed approach that takes into consideration individual needs (6). Therefore, it is important that coaches base their professional development on a critical analysis of their capabilities, with a focus on opportunities that provide the greatest impact on effective practice. To do so, coaches need to understand the nature of effective strength and conditioning coaching.

## THE STRENGTH AND CONDITIONING COACH

Despite the fact that the term "strength coach" lies at the heart of the original formation of the National Strength and Conditioning Association (NSCA) (24,28), there is currently a paucity of literature as to what constitutes effective strength and conditioning coaching (13). Even in the broader realm of coaching, where a far greater research base exists, effectiveness or expertise is still ill defined. This provides a challenge to making universal recommendations for coach education and development programs (3).

A starting point in understanding effective strength and conditioning coaching begins with an analysis of the roles coaches take up and the essential skills required for effective practice (11). Strength and conditioning coaches are primarily concerned with improving athletes' physical, mental, and emotional performances (5). This normally entails a diverse range of skills, including the effective planning, delivery, observation, evaluation, adaptation, and recording of training (21). Effective performance requires the ability to work effectively in each of these areas. Additionally, as athletic performance depends on the interplay of a wide range of factors, a strength and conditioning coach requires an immense and versatile knowledge base across various subject areas to be optimally effective (4). Coaches who perform at a high level in one aspect of performance may be less proficient in another (13). Professional development for an individual coach is likely to be diverse and able to address a wide range of competency areas. In this article, effective strength and conditioning coaching is viewed through the lens of Gardner's "5 minds" (12) framework to attempt to gain a deeper understanding of the many complexities of strength and conditioning coaching. This allows a coach to identify a range of areas that could potentially influence their level of performance. The following section will detail this approach, along with implications for coach education.

## THE 5 MINDS OF THE MODERN STRENGTH AND CONDITIONING COACH

Gardner (12) has outlined 5 key areas of intelligence that he claimed would affect the capacity of individuals to achieve consistent success in a range of professions and that are at a premium in today's world. (12). Although Gardner (12) did not directly relate these "minds" to coaching, applying this framework to a coaching context may offer new insights into effective strength and conditioning coaching and coach education. It is reasonable to apply this framework because coaches need to demonstrate highly developed capacities across a range of competency areas to improve athletic performance in a dynamic social context (21).

The 5 minds presented by Gardner (12) are as follows:

1. The disciplined mind, which "has mastered at least one way of thinking—a distinctive mode of cognition that characterizes a specific scholarly craft or profession."
2. The synthesizing mind, which represents the "ability to take information from a range of disparate sources and through objective understanding and evaluation, put this together in a way that can be understood by a range of groups."
3. The creative mind, which "builds upon synthesis and discipline to break new ground, put forth new ideas, pronounce new ways of thinking and pose unfamiliar questions."
4. The respectful mind, which "involves the ability to understand and work well with others."
5. The ethical mind, which ensures that "work serves purposes beyond self-interest and works to the furtherance of the greater good."

Strength and conditioning coaches could draw on this framework when planning their education and professional development to ensure they improve their effectiveness. Within the limits of this article, a complete analysis of the application of each mind or a comprehensive analysis of professional

development opportunities cannot be fully developed. Instead, the article aims to highlight potential areas that can influence coaching practice and encourage coaches to take a wider view of their practice.

## THE DISCIPLINED MIND

According to Gardner, the disciplined mind involves the development of effective practice via the application of the skills associated with a scholarly profession (12). Given the diverse nature of strength and conditioning coaching, it is unlikely that coaching can be completely mastered from the viewpoint of a single discipline (21). A challenge for the coach is to identify the disciplines required to master the profession and ensure that they become skilled in each of these. Here, it is illuminating to look at the realm of coaching in an attempt to understand further the requirements for disciplinary mastery. Werthner and Trudel (30) classify the knowledge required for effective coaching into 2 types: sport-specific (content) knowledge and coaching pedagogical knowledge. If this is applied to strength and conditioning, content knowledge can be thought of as the principles underpinning the various training methods used; in other words, what scientific evidence recommends. Coaching pedagogical knowledge on the other hand looks at the quality of teaching and instruction used in delivering the training input. Undoubtedly, both elements need to be addressed if a coach is to be effective.

Much of the current formal education in strength and conditioning is based around exercise science (14) and which is seen by coaches as essential for effective strength and conditioning coaching (24). The discipline of science includes the skill sets facilitating the systematic analysis of experimentally derived data to draw conclusions. This enables the coach to analyze information and data effectively to make informed training decisions (21). Science as a discipline, together with the subject areas traditionally associated with strength and conditioning such as anatomy,

physiology, and biomechanics (5), has had an enormous impact on the field of strength and conditioning. This knowledge forms the basis of many educational programs, and it is generally assumed to be of importance in the education of a strength and conditioning coach (24). Undoubtedly, our current understanding of human performance has significantly influenced the methods used by strength and conditioning coaches, and the disciplined mind of science allows a coach to make rational decisions when faced with training challenges (21). Scientific knowledge is also associated with evidence-based practice, a key tenet of the strength and conditioning profession supported by the NSCA. Indeed, it could be argued that coaches without this knowledge will be unable to differentiate the quality of information (12).

Whether science alone is sufficient to enable a coach to master their craft fully is unlikely, although open to debate (21). Athletic performance depends on the interaction of a large number of interconnected factors. It cannot be explained by a simple systems approach, where a given input will result in a given output (20). In this way, it must always be remembered that effective strength and conditioning coaching is not simply about programming. What is also crucial is the quality of teaching and instruction that underpins the program. It is commonplace for coaches to become obsessed with sets, reps, loads, and other program design variables and ignore the day-to-day delivery of the program. Knowing “what to do,” coaches need to become highly skilled at “how to do it.” In recognizing these strengths and limitations, it should be evident that a need exists for coaches to develop pedagogical knowledge to supplement scientific knowledge. Indeed, competency in these skills was seen as critical by experienced strength and conditioning coaches in establishing competence within the profession (24). It can be argued that mastery in this area is crucial to the strength and conditioning

coach; indeed, many leading coaches attest to the importance of teaching in their work (31). Given the importance of pedagogical features for effective strength and conditioning coaching, it can be argued that pedagogy should be an integral part of all professional development programs.

What is clear is that strength and conditioning coaching cannot be mastered from a single disciplinary standpoint and that a multidisciplinary approach is required to enable a coach to fulfill their potential. The development of such interdisciplinary skills allows for the conceptual blending of knowledge from a range of disciplines and subject areas (23). A coach with interdisciplinary skills will have an enhanced ability for critical thinking when looking at a given problem and greater options for problem solving. However, this can only happen when the coach is able to integrate this range of knowledge effectively, which requires the development of the skills associated with the synthesizing mind.

## THE SYNTHESIZING MIND

The synthesizing mind takes information from a range of sources, evaluates that information objectively, and puts it together in a way that is understood and applied by others (12). This ability reflects a key role of a strength and conditioning coach, who draws on multiple sources of information to construct and deliver training programs in a dynamic social setting with diverse people. Success in this role requires the development of the skills associated with the synthesizing mind.

Individuals desire coherence, integration, and the ability to synthesize information (12). The ability to draw connections between seemingly disparate disciplines results in the development and application of training systems that can consistently deliver results (12). Indeed, the ability to synthesize is crucial to coaching effectiveness, allowing for an integrated and systematic approach. Although the synthesizing mind has always been important, it is likely that the synthesizing mind will

have ever-increasing importance as the amount of accumulated knowledge in the field of strength and conditioning continues to grow.

Although some of the skills of the synthesizing mind are addressed in formal development opportunities, limitations continue. The topic of program design, for example, highlights a potential disconnect between the academic study of strength and conditioning and the practical delivery of strength and conditioning in complex training environments. Academic study of strength and conditioning will often encourage students to integrate the latest findings of empirical research, with less emphasis on the logistics of delivery. Coaching, unlike laboratory research, does not occur in isolation and cannot be reduced to a few discrete variables. Mere synthesizing of empirical research, it could be argued, does not prepare a coach to negotiate daily challenges, such as time, resources, and different personalities. It has been argued that context, where practices are put into execution, is necessary to bring to light the limitations of research, ideas, and systems (16). Furthermore, a coach's understanding of effective practice will only truly be understood through the practical delivery and evaluation of the program. In this way, each program becomes a unique challenge and learning experience. Here, experiential learning and reflective practice are crucial in developing the synthesizing mind, which allows a coach to respond to the constant flux of the training environment. In practice, the plans and programs used by coaches often differ from formal education's controlled and unproblematic scenarios where complexity often needs to be reduced to ensure a deliverable result (21).

Undoubtedly, current knowledge and modern advancements in training should be integrated into training programs where appropriate, but a simplistic transfer from research to practice should be done, for the reasons already provided, with caution and skepticism. Coaches need to develop a critical awareness of their practices and

constantly evaluate their positive and negative effects in practice. Developing this awareness is enhanced by the skills of the synthesizing mind, and the development of these skills must be a key part of any professional development program. This puts an onus on educators to ensure that acquisition forms of education are supplemented by participation formats, where the coach is able to apply their work directly into the real-world environment.

### THE CREATIVE MIND

Whereas the role of the synthesizing mind is to use current knowledge to set up effective working practices, the goal of the creative mind is to "extend knowledge, to ruffle the contours of the genre, to guide a new set of practices along new and hitherto unanticipated directions" (12). Strength and conditioning coaches have claimed that the creative process lies at the heart of coaching, and it can be argued that the creative mind has been evident throughout the development of the strength and conditioning profession (10, p. 11). It is likely that much of the practice currently used within the strength and conditioning programs originated from athletes and coaches experimenting with training methods, constantly refining them in response to their perceived impact. These creative practices were not initially guided by published empirical studies but instead by the coach's own intuition and observation, which in turn developed through practice and continued creative experimentation. This was carried out despite the fact that there once existed a consensus that athletes should avoid heavy resistance training because it would lead to loss of flexibility and running speed (28). These coaches actively pushed the boundaries of training knowledge into previously uncharted territory. They also demonstrated that creative coaching minds use both formal means of measurement, such as performance testing and record keeping, and informal means, such as qualitative observation of the impact these practices had on athletes' performance in training and matches (28).

Creativity still plays an important role in the everyday work of the strength and conditioning coach. One of the challenges in the training environment is the monotony of the training situation and the law of accommodation, where the productiveness of any training input will decrease over time (33). Coaches are required to provide training inputs over extended periods and face not only the physiological accommodation but also the psychological challenge of maintaining the motivation and development of athletes. Similarly, coaches are faced with the challenge of developing athletes who present with a host of unique challenges, such as acute and chronic injury, training aversions, postural challenges, technical deficiencies, and lack of motivation. In these situations, the ability to be creative within the training environment is essential. The importance of creativity has been emphasized by the New England Patriots head coach Bill Belichick, as cited in Halberstam (18, p. 249), who stated, "[You've] got to keep doing what you're doing, but you've got to find different ways of doing it and finding ways of making it fun."

However, creativity should not be seen as a random attempt at something new. Creativity requires a base of disciplinary knowledge, which allows creative solutions to be grounded in logic. Yet, innovation often lies at the boundaries of disciplines (23), and coaches grounded in a single disciplinary approach may not be able to adapt to a more creative mind-set when needed (12). This again stresses the advantage of the multidisciplinary mind outlined previously. Creativity in the training environment requires a coach to evaluate their methods constantly, and this will often mean questioning long-held philosophies and beliefs, in the constant search for a better way. In this way, the search for more productive methods of training will often lie at odds with the evidence-based principles of the scientific discipline, which is founded on published empirical evidence. Yet, this ability needs to be integrated into educational opportunities.

This can be a major challenge, as in many instances where new approaches are attempted; direct evidence to support an approach may be unavailable. This can be discomfiting for many coaches who fear the consequences of challenging conventions and being seen to do something new and something that may be criticized and challenged by their peers. However, provided that coaches are careful to ensure that their work is appropriately tested and validated (12), creative solutions to training problems should be encouraged, allowing for far more flexibility when faced with the constantly changing challenges of the training environment.

Despite the need for creativity, the ability to generate creative solutions and the ability to push boundaries can be difficult for many coaches. It can be argued that the creative mind works, “effectively with uncertainty, surprise, continual challenge and disequilibrium, which often lies at odds with the synthesizing mind, where the motivation comes from order, closure and equilibrium” (12). Despite the divergent nature of the creative and synthesizing minds, it is argued here that effective coaching should be developed through a multiple mind approach.

## THE RESPECTFUL MIND

The respectful mind is associated with the ability to understand and work effectively with others (12). It must always be remembered that strength and conditioning practitioners coach people, not programs. It is likely that the quality of the strength and conditioning coach-athlete relationship will affect athlete performance and subsequently the overall success of the program (15). Indeed, there may be little to modest differences between the training plans and methods across coaches; yet, the results could vary considerably. An often overlooked, but critical, feature is the execution of the training plan, which involves elements that depend on the coach’s pedagogical skills. These skills include the presentation and explanation of the plan, the quality of instruction and feedback, the quality of error detection, the

acceptance of the plan by the athletes and the athlete’s motivation in carrying out the plan (21). As Vince Lombardi lucidly pointed out, “coaches who can outline plays on a blackboard are a dime a dozen; the ones who win get inside their players and motivate” (29, p. 100). In this way, the skills associated with the respectful mind are critical to effective strength and conditioning coaching.

A key skill of a strength and conditioning coach is the ability to develop an environment that encourages athletes to achieve. Inspiring athletes to reach higher levels, while relating to them at their current level, is a challenging task, which requires the skills of the respectful mind. Interestingly, and quite contrary to the scientific mind, many decisions athletes make will be based on emotional rather than rational reasons, and coaches who are able to work on these emotional and rational levels can have a major advantage. Walsh et al. (29, p. 195), for example, suggest that players tend to respond best to a coach who demonstrates a “definite ability and willingness to help them achieve their particular goals and aspirations.” Similarly, in other spheres of coaching and in business, knowledge alone cannot predict success, which suggests that the greatest problems facing professionals do not relate to their technical competencies but to relationships (19). In this way, failure to address the skills of the respectful mind could ultimately restrict a coach’s success. Despite the importance of the respectful mind to strength and conditioning coaches, these are seldom well covered in strength and conditioning coach education and certification programs.

An implication of this gap for coach education and policymakers is to explore the efficacy of professional development in relational skills, such as communication, motivation, management, and leadership. Future research could explore how best to improve the respectful mind in coaches across learning sites, such as through formal, nonformal, or informal education. Indeed, it could be argued that the skills of the respectful mind become even more critical as a strength

and conditioning coach progresses in his or her career and assumes higher positions within an organization. Increasingly, the coach will be providing leadership to a program and will be required to communicate with a far wider number of people, spanning a number of levels and across a range of departments. Critical to the success of an organization, effective leaders draw on and develop the skills of the respectful mind to outline a clear vision and build effective working relationships and structures enabling staff to work together toward the realization of that vision (25).

## THE ETHICAL MIND

The ethical mind is associated with making decisions that are in the best interest of society as a whole rather than self-interest (12). The success of a strength and conditioning coach and a sports organization will depend on its ethical standards and values as well as its athletic success. Many promising coaching careers and reputations have been brought down with issues relating to the ethical mind. This requires that coaches, and coach educators, set the highest standards of ethical behavior. It is often said that the character of an organization will closely reflect the character of the leader (25), and similarly, the strength and conditioning program will ultimately reflect the character, beliefs, and philosophies of the coach (21). Strength and conditioning coaches are in leadership positions (1), and as leaders of athletes (often young people and students), the strength and conditioning coach needs to model ethical behavior.

Although this may seem self-evident, it can be a challenge in cultures that value winning, fame, and fortune and that can tempt or coerce coaches into unethical behavior. It is important that coaches reflect on the ethical principles guiding their actions and truly align with an athlete-centered philosophy. Unethical actions will always negatively affect athletes and other “clients,” the long-term credibility of the coach, the reputation of the program, and subsequently the profession (21). As Coach Wooden (31, p. 20)

aptly pointed out, “There is no more powerful leadership tool than your own example.”

## PROFESSIONAL DEVELOPMENT FOR THE MODERN COACH

Expert coaches are those who exhibit consistently superior performance on tasks in the critical areas of a domain (i.e., coaching) (9). As the acquisition of skilled performance requires deliberate practice on improving a specific aspect of performance (8), a critical starting point for any professional development plan is an awareness of one’s current performance across all critical areas. Effective reflection allows the coach to identify potential areas for enhanced practice, facilitating the identification of professional development activities that foster his or her growth to a higher level of performance (2). Whereas the typical strength and conditioning coach development would focus around the development of content knowledge revolving around science and/or the development of capacities related to the delivery of specific types of training (e.g., weightlifting, plyometric technique), the 5 minds approach allows for the utilization of a far wider framework to improve coaching knowledge and skills. In the remaining section, the author outlines how this 5-mind framework can be used to enhance coach learning.

According to Greene (16), the pathway toward mastery of a craft should take an ordered route through 2 distinct phases, the apprenticeship phase and the creative-active phase. Under these 2 phases, clear goals and corresponding activities can be identified for professional development. During the apprenticeship phase, the aim is to develop the knowledge and skills that will lay the foundation for a coach’s future development. Coaches entering the profession initially need to develop the key disciplinary knowledge and skills required for effective strength and conditioning coaching (both content knowledge and coaching pedagogical knowledge), and this can be facilitated by formal means of education.

Using the 5 minds approach, the vast majority of current formal development opportunities in strength and conditioning are currently focused on the disciplined mind, emphasizing the development of knowledge. Additionally, the majority of these are focused on subject areas within the discipline of physical science, such as physiology, biomechanics, etc. However, it would seem that there is less emphasis on the pedagogical aspects of strength and conditioning coaching; yet, this is seen as a critical component of effective practice by coaches (24). It clearly makes sense to include pedagogy as a cornerstone of all formal education routes, but with additional and extensive time spent on experiential learning (5). Research supports this conclusion with a recent case study on one expert strength and conditioning coach who reported that he only partly acquired his disciplinary knowledge from formal education and that a far greater knowledge base was developed over many years of practice (5). This is substantiated in research in general coach education, which reports that coaches perceive that formal coach education courses are of relatively little importance to their development (7).

As practical coaching knowledge is predominantly gained through experience (5,17), mastery of the coaching craft requires repeated exposure to the strength and conditioning environment and will take considerable time to achieve (12). Therefore, the apprenticeship phase of learning must include numerous hours of experiential learning. This will help coaches develop a better understanding of the skills required for continued success in the profession (16). During the apprenticeship phase, mentoring is often cited as one of the most important methods of enhancing a coach’s development (6). This mentorship should initially offer the mentee opportunities for deep observation, as many of the key skills of the coach are subtle and difficult to verbalize. Deep observation provides the opportunity to learn through close proximity to the mentor. It is likely that the best mentors will be those who possess

multidisciplinary knowledge across all the 5 minds (16) and who have extensive experience in the delivery of strength and conditioning practices. In this way, they will be able to evaluate and advise coaches in their capacities across all 5 minds, resulting in a well-rounded coach. As the mentorship develops, the coach should have the opportunity to practice under the guidance of the mentor, who can provide timely and informative feedback (16). Finally, the mentorship needs to culminate to the experimental mode where the coach is provided with numerous opportunities to test out elements of their coaching.

It is important that the coach does not feel that learning is complete after the mentorship. The creative-active phase stipulates that coaches remain open to new multidisciplinary knowledge and skills. To manage the challenge of staying up to date with the breadth and depth of information, coaches could engage their peers to discuss trials, insights, and approaches to problems (6). Self-reflection on current performance has been identified as being central to experience-based learning theories by facilitating the transfer of experiences to coaching knowledge (30) and should be an essential part of a coach’s work during this phase of development.

During the creative-active phase, the emphasis of learning should shift from the accumulation of knowledge to a process of challenging conceptions and continually evaluating and refining practice. Here, the skills of the creative mind will be crucial. Although disciplinary knowledge is the base on which the creative mind can act, an issue at this stage of development can be that existing ways of thinking may become a barrier. Rather than seeking out new or disconfirming knowledge and practices, coaches may become content with, or over-rely on, the evidence that reinforces their current practices (16). During the creative-active phase, coaches should be searching for unfamiliar or unsettling knowledge. Indeed, the ability to learn from unfamiliar environments and philosophies is a critical lifelong skill on the pathway to mastery (16).

## CONCLUSIONS

Effective strength and conditioning coaching is a complex series of actions that require competencies across a wide range of areas. Cushion et al. (3) assert that it is time to extend our conception of learning how to coach if we are to develop imaginative, dynamic, and thoughtful coaches. The 5 minds approach supports this view by providing a structure around which current practice can be evaluated and through which professional development opportunities can be identified. Correspondingly, coach education needs to extend beyond typical content knowledge approaches and incorporate the key aspects of all 5 minds that ultimately affect coach and athlete performance. This approach may also allow a coach to evaluate their professional development plans critically against a broader canvas of knowledge and skills. Future research could then explore the relationships among professional development events, coaches' knowledge, and effective practice.

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