

Exploring Virtual Coach Education in USA Lacrosse

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In 2020, USA Lacrosse moved all coach training workshops to a virtual format in response to the COVID-19 pandemic. Knowing that in-person coach training has been heavily studied regarding the motivation of the coaches who participate, the shift to virtual delivery of coach education prompted the researchers to examine how the workshops themselves supported the basic needs, motivation, and engagement of coach learners. Aligned with self-determination theory's conception of motivation and the three basic needs of autonomy, competence, and relatedness, the researchers drew upon observation and survey data that were collected to determine the success of the virtual training. Using this information, the researchers found that the coach trainers used a variety of need-supportive behaviors and very few need-thwarting behaviors. Surveys revealed that the coaches displayed high levels of autonomous motivation, low levels of controlled motivation, and favorable engagement. These results are discussed in conjunction with the literature that is focused on in-person training programs as well as best practices in technology-enhanced learning to provide input into how virtual programming may be of benefit to coach learners and how coach trainers can best support coaches' needs in a virtual environment.

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For coach developers, coaches, and administrators, the COVID-19 pandemic created serious engagement challenges. Researchers have noted how much the pandemic impacted daily coaching practices. In moving quickly to virtual formats, Glen et al. (2020) found that technological issues were a constant struggle for coaches and their teams. Coaches reported being forced to adapt and include more modeling, videos, and screenshots to help their athletes understand. Coaches in this study also expressed how they were more focused on supporting their athletes' well-being, maintaining motivation, and being more creative than prior to the pandemic (Glen et al., 2020). Coach developers faced many of the same challenges as coaches, having to learn how to provide coaches with the professional development opportunities they needed without meeting face-to-face. Callary et al. (2020) noted that the duties of coach developers rapidly evolved from creating quality content and mastering delivery to supporting and caring for the coaches and teams with which they worked.


There is little doubt that the changes made to coach development were highly impacted by the pandemic, both in shifting to virtual delivery of programs and a general refocusing on what content to cover in sessions. The findings of Callary et al. (2020) and Glen et al. (2020) were echoed in the experience of USA Lacrosse's transition to virtual coach development. Within this paper, the researchers will highlight both the content presented in these newly developed workshops, behaviors displayed by the coach trainers, and the potential impact the workshops had on the motivation and engagement of the coach learners. This includes a brief explanation of how the pandemic forced major changes in curriculum delivery as well as a more detailed account of the successes and areas of growth within the transition.

The Impact of COVID-19 on USA Lacrosse Coach Training Programs

On Tuesday, March 10, 2020, the USA Lacrosse Leadership Team decided to forgo the 2020 season due to the escalation of the COVID-19 global pandemic. At that time, many lacrosse programs in the United States at the college, high school, and youth levels were in progress. From a training and development standpoint, USA Lacrosse had been hosting in-person coach development clinics since October 2019 and had 1 month of scheduled training sessions left to complete—all of which were immediately canceled. The importance of continuing to offer some sort of training program was paramount, as coaches are required to go through specific training programs to obtain Level 1 and Level 2 certifications to coach at any level associated with USA Lacrosse.

Not knowing the extent of the pandemic in terms of severity and duration, the Sport Development Team at USA Lacrosse quickly realized the need to stay relevant with their members and to provide them valuable training in anticipation of a return to play. The challenge intensified in the face of an extended global shutdown and the reality of a season completely lost. With no immediate necessity for lacrosse coaches to engage in training, work began on developing a strategy and tactics for alternative engagement methods. The global acceptance and application of virtual communication technology provided USA Lacrosse with the platform to engage with its members.

Over the next 6 months, the USA Lacrosse Sport Development Team developed course content, based on educational theory. Then, they trained 40 of their 160 Coach Development Program (CDP) trainers to use the Zoom platform to deliver the new “virtual workshops” in early August 2020. It is important to note that these 40 CDP trainers self-selected into the program, with many already having teaching experience from their full-time jobs or previous careers. Training the CDP trainers involved several steps, including familiarizing them with the content to be taught and how to best teach it as well as how to engage coaches in a virtual space using

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Zoom. Next, the Sport Development Team conducted pilot sessions with current and former CDP trainers and previously certified USA Lacrosse coaches, allowing the newly trained CDP trainers to become more proficient in content delivery and the use of Zoom. The slides associated with the workshops were reviewed in detail as was information on how to utilize key functions of the Zoom platform (including breakout rooms, letting coaches in from the waiting room, and conducting polls). Each CDP trainer experienced at least one of the workshops as a participant and then delivered another as a trainer. Feedback was given after each training session to improve delivery. Throughout this preparation, CDP trainers were also reminded of specific learner-centered behaviors to use within the workshops, including encouraging as much interaction as possible and gathering the perspectives of the coaches in the workshops.

After training was completed, two new virtual workshops were successfully launched on October 17, 2020. In conjunction with the launch of these workshops, the decision was made to allow these workshops to take the place of the existing Level 1 and Level 2 in-person coach certification requirement components. This decision was met with an overwhelmingly positive reaction from USA Lacrosse coaches and organizational leaders in terms of the flexibility provided to continue training and development. As of August 2022, over 4,000 coaches have continued to stay engaged with USA Lacrosse through their virtual training offerings.

Defining the Success of the Permanent Change to a Virtual Learning Approach

The quick transition to a virtual format gave USA Lacrosse a chance to serve its members in addition to trying new ways of approaching theory-driven coach development. Because of an already existing partnership, USA Lacrosse called upon sport coaching researchers to evaluate the virtual workshops. Within the partnership, successful coach learning was already being examined from the lens of coach participants' (hereafter referred to as coaches) satisfaction with and engagement in the training as well as motivation to coach. The researchers were using self-determination theory as a framework to provide the Sport Development Team with feedback. Understanding that these new coaching workshops were not fully tested before full implementation, the USA Lacrosse Sport Development Team asked the researchers to examine the content of the workshops in addition to how CDP trainers might be influencing the motivation and engagement of coach learners. The success of the program was defined by how satisfied the coaches were after the training, how supported they felt by the CDP trainers, how motivated they were to coach, and how well they engaged with the training itself.

Allan et al. (2008) discussed the importance of implementing theory-driven CDPs, stressing the importance of individualizing training for coaches. Considering this, recent research has identified best practices for coach development and learning, including how workshops should be structured, key elements to cover, and how best to support coach learners. Paquette and Trudel (2018) emphasized the importance of a learner-centered approach and using trained facilitators whose performance is regularly evaluated. In addition, Nash and Sproule (2012) studied U.K. coaches' perceptions of coach education workshops and found that coaches want to feel supported and valued. They preferred group work, clarity, and transparency from their trainers.

Aligned with these best practices, McQuade and Nash (2015) have examined the role of the coach developer in education workshops. They found that these roles are composed of many different facets including mentoring, leading, facilitating, assessing, and designing. They are responsible for relaying relevant information to coaches in a way that is effective and impactful. This is best done through active learning experiences including discussion, role-play, problem-solving activities, and guided discovery. Taking this into account, the researchers assert that the coach developer's role is essential to the success of the training itself. As such, examining how coach developers implement curriculum and interact with learners was paramount to revamping USA Lacrosse's coaching workshops in the virtual environment.

Within the last 2 years, added attention to virtual coach education is beginning to appear in the literature. Recently, Grant et al. (2020) examined USA Lacrosse coaches' perceptions of a virtual mentoring program. They found that mentors and mentees were able to quickly engage in respectful and friendly conversations face-to-face, but the technical difficulties associated with connecting virtually hampered the overall success of the program. In other studies, such as Kubayi et al. (2016), a preference for online learning opportunities is noted. Most studies addressing online learning tend to cover injury concepts including concussion education (Perlin & Kroshus, 2020) or anterior cruciate ligament injury prevention (Russomano et al., 2020). The investigation into the effectiveness of virtual programs, however, is not as widely covered. Further, in addition to examining course content, it would be ideal to also evaluate the psychological impact of the virtual learning environment as well, since a major aspect of the learner-centered approach is evaluating learner perceptions of all aspects of the training program (Paquette & Trudel, 2018).

Virtual Coach Development From a Theoretical Perspective

To provide coach development opportunities that encompass the learner-centered approach suggested by many researchers (Allan et al., 2008; McQuade & Nash, 2015; Nash & Sproule, 2012; Paquette & Trudel, 2018), coach developers can rely on theories of motivation, such as self-determination theory (SDT), to guide the design and implementation process. As a framework of human personality and motivation, SDT (Ryan & Deci, 2019) considers individual needs as a precursor to motivation. Although not an inherent learning theory, SDT helps to provide context and explanations to *why* learners engage in the learning process, which can be directly tied to the influence an instructor has over the learning process. The theory examines the motivational process, starting with the behaviors displayed by a leader or influential person, how those behaviors support or thwart basic psychological needs, and how the satisfaction or frustration of those needs influences motivation. Motivation then influences outcomes, such as overall well-being, learning, or engagement in activities, all of which are outcomes of learner-centered environments as well (Álvarez et al., 2009; Paquette & Trudel, 2018).

As a key tenet of the theory, satisfying the three basic human needs of autonomy (control over decisions and activities), relatedness (building relationships with others), and competence (feeling confident in what is being learned) will lead to improved well-being, and increased intrinsic motivation (Deci & Ryan, 2000). In educational contexts, the satisfaction of the three basic needs, as provided through the need support of the instructor, has a strong

and positive influence on motivation as well as various types of engagement across learning environments (Reeve, 2012). Thus, investigations have centered on the impact of instructors' need support on motivation and other important outcomes (Meyer et al., 2014; Stroet et al., 2015).

Motivation, as measured by SDT, includes several regulatory styles to explain why individuals engage in tasks or activities (Ryan & Deci, 2019). Autonomous motivation includes intrinsic motivation (engaging because the activity is fun or enjoyable) as well as identified and integrated regulation. Both identified and integrated regulation involve the engagement in an activity because it aligns with personal goals, but integrated regulation is more autonomous; the individual engages because they see the inherent value of the activity as well. Controlled motivation includes introjected motivation (engaging in an activity out of guilt or for ego involvement) and external motivation (engaging in an activity for an external reward or prize). Finally, amotivation, which does not fall within autonomous or controlled motivation, indicates a lack of motivation.

Need support, as provided by instructors, involves the use of specific behaviors that support autonomy, competence, and relatedness. When instructors provide need support, need satisfaction can be felt by the coaches. Conversely, instructors can display need-thwarting behaviors, which work to undermine the learners' basic psychological needs. The connection between need support/thwarting and need satisfaction/frustration is widely studied in sport coaching. For example, Coatsworth and Conroy (2009) found that autonomy-supportive coaches positively impacted youth swimmers' motivation, self-esteem, identity, and well-being. Training coaches to be more need-supportive has also produced successful outcomes, with athletes of trained coaches reporting higher levels of autonomous motivation and engagement in their sport (Reynders et al., 2019). Conversely, Meyer et al. (2014) found that physical education teachers' provision of controlling behavior (related to need-thwarting) was linked to more controlled forms of motivation and amotivation.

Although educational contexts typically rely on outcomes such as grades or content assessments, engagement can provide a much more meaningful understanding of the learning process. Further, examining content assessments in coaching education may not be the most reliable way of determining how likely a participant is to apply the information learned. Reeve (2012) highlighted four different types of engagement, which have been used in several general education and physical education contexts. Behavioral engagement involves the direct attention and effort that a learner exhibits during a task, while emotional engagement involves the internalization of a positive attitude toward learning and an absence of anxiety. Cognitive engagement refers to the strategies that learners use to remember and internalize information. A more recent type of engagement, as proposed by Reeve (2012) is agentic engagement, which refers to the direct contribution of the learner to the learning process. This can include providing input and discussing what they are thinking during an activity.

Knowing that in-person coach training has been heavily studied regarding the motivation of coaches who participate, the shift to virtual delivery of coach education prompted the researchers and the Sport Development Team at USA Lacrosse to investigate how successful the workshops were within the context of supporting basic needs as well as motivating and engaging coaches in the learning process. This was measured through coaches' perceptions of how well instructors supported their basic needs (basic psychological need satisfaction), influenced their motivation

to coach, and engaged them in the learning process. In addition, the researchers wanted to be able to provide constructive and thorough feedback on the need-supportive behaviors that the CDP trainers used. This was measured using a novel systematic observation instrument. As observing and recording coaching behaviors has been a crucial part of coach development for years (Cope et al., 2017), systematic observation allowed the researchers to quantify what behaviors the CDP trainers were using and how they might match up with coaches' basic psychological need satisfaction and engagement.

Structure of the New Virtual Workshops

Each virtual workshop lasted 2 hr and covered athlete- or team-centered coaching concepts. The coaches attended these workshops as a requirement for USA Lacrosse coaching certifications. The athlete-centered coaching workshop (ACC) began with an introduction and explanation of how to use Zoom as well as a review of the workshop objectives. CDP trainers emphasized a learner-centered approach by encouraging interaction between and among coaches in addition to providing encouragement along the way. Learning to be an athlete-centered coach, utilizing modern teaching techniques for engagement, and applying an ACC philosophy to lacrosse coaching were discussed. Next, USA Lacrosse's lifetime engagement model and core values were covered, and ACC philosophies were discussed. After that, Maslow's Hierarchy of Needs and Bloom's Taxonomy were then applied to coaching to help attendees understand how to develop a caring orientation toward their athletes and how it might impact skill execution. Next, nonlinear pedagogy (an instructional model that emphasizes learning through constraints; Chow et al., 2021) and guided instruction techniques were reviewed, and the coaches completed a few activities to supplement the lecture. After a 5-min intermission, the CDP trainers further focused on nonlinear pedagogy, discussing constraints, and teaching progressions as ways to modify skill learning to be more athlete-centered. Then, coach-athlete relationships were discussed, and a final breakout session wrapped up the workshop. Throughout presenting these concepts, attendees were asked to interact with the large group and in several small group discussions and activities. This resulted in a high level of interaction, where coaches were able to relate content to previous experiences.

The team-centered coaching workshop began with a brief introduction, a presentation of workshop objectives, and a brief review of the athlete-centered workshop, including USA Lacrosse's lifetime engagement model and core values, Maslow's Hierarchy of Needs, and Bloom's Taxonomy. Following the layout of the ACC workshop, the CDP trainers went over coaching philosophies and briefly discussed developing team culture, encouraging coaches to interact in all aspects of the workshop. This was followed by the presentation of three keys to team development and positive team culture. Then, CDP trainers discussed teaching respect and leading by example. Next, instructional strategies such as building understanding gradually (the coaching "B.U.G.") and three keys to building team culture (effectively engaging athletes, building and maintaining positive relationships, and keeping it fun and athlete-centered) were covered and the coaches went into breakout rooms to discuss how they would apply these concepts in their own coaching. Practice plans were then discussed in breakout rooms to help facilitate the further application of the specific team-centered concepts presented. The session concluded with attendees sharing something they had learned.

People Involved

For the time frame the researchers examined, 842 coaches participated in a total of 25 workshops between February 1 and March 31, 2021. Across these 25 workshops, 28 of 40 of the CDP trainers delivered content. Due to time and personnel limitations, the researchers were able to examine videos from 10 of those workshops in addition to receiving feedback from 149 coaches via surveys. Among the coaches involved in the training program, many worked with a variety of age groups. The most commonly reported age group was 10U (37.6%), followed by 12U (35.6%), 8U (24.2%), and 14U (24.2%). A smaller percentage coached youth club or select teams (14.1%) or high school varsity teams (14.1%). Fourteen percent worked with college-level, club, or varsity teams. The coaches represented 29 states, with the majority from New Jersey and New York.

Systematic Observation of Need-Supportive and Need-Thwarting Behaviors

To examine the CDP trainers' need-supportive behaviors, the researchers utilized behaviors seen in several preexisting systematic observation instruments focused on need-supportive and need-thwarting behaviors in a variety of contexts. These ranged from traditional classroom settings (Stroet et al., 2015), on-field sport training (Smith et al., 2015), and physical education classrooms (Haerens et al., 2013; Meyer et al., 2014). These instruments gave a comprehensive overview of need-supportive and need-thwarting behaviors in educational and sport contexts, which mirror the unique environment of virtual coach training. To ensure the reliability of the coding process, two raters were trained to use the new instrument, and both raters had experience in using systematic observation in the past. After completing an initial training session, the two raters watched 2 hr of recorded workshop video and were able to achieve and maintain an interobserver agreement of 90%. Any coding that did not match was discussed until consensus was reached.

Participant Perspectives

Within 1 week of the workshop, the coaches completed a single survey that contained demographic information and measures of basic need satisfaction and need frustration, motivation, and engagement. The survey data were collected as part of the larger goal to determine the success of the workshops. The demographic information consisted of the age groups coached, their location within the United States, and overall ratings of the CDP trainers and workshop content. The general ratings given are part of the normal postworkshop survey given by USA Lacrosse but were examined alongside the SDT-based survey measures to enhance the researchers' understanding of the coaches' perspectives. Although the information was only collected at the end of the workshop, understanding participant perspectives alongside the observation data helped the USA Lacrosse Sport Development Team determine if the training was successful and aided in planning future workshops.

Three measures aligned with SDT in educational contexts were used to explain the reason why the coaches engaged in virtual workshops. Basic psychological need satisfaction and frustration were measured by Chen et al.'s (2014) Basic Psychological Need Satisfaction and Frustration Scale. Information gleaned from measuring need satisfaction and frustration was used to examine

potential alignment with the need-supportive and need-thwarting behaviors observed by the CDP trainers. Coach participant motivation was assessed using McLean et al.'s (2012) Coach Motivation Questionnaire, which measures six forms of motivation (amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic regulation). Behavioral and emotional engagement (Skinner et al., 2008), as well as agentic and cognitive engagement (Reeve, 2013), were examined to better understand how coaches involved themselves in the learning process. Types of engagement can be directly tied to the need-supportive or need-thwarting behaviors displayed by instructors, in this case, the CDP trainers (Reeve et al., 2004). Constructs from all surveys presented here reached an acceptable Cronbach alpha reliability of .71 or higher, except for relatedness frustration, which was at .60. This indicates strong internal consistency within constructs (Cronbach, 1951).

Program Successes

Evaluating success in the program included examining the number of need-supportive and need-thwarting behaviors provided by the CDP trainers. In addition, mean values of need satisfaction and frustration, motivation, and engagement of the coaches were also examined in addition to the content of the workshops themselves. The data indicate that the CDP trainers used a variety of need-supportive behaviors and kept need-thwarting behaviors to a minimum. In addition, it appears that training sessions with the highest levels of behaviors per minute were those that included more experienced CDP trainers (see Table 1).

Across the 10 sampled sessions, the highest number of behaviors observed were autonomy-supportive, followed by relatedness-supportive, and competence-supportive. These values remained consistent across sessions. Of note, the CDP trainers provided 326 *opportunities for coach input*; 264 instances of *listening and responding to coaches' feelings, thoughts, perspectives, and complaints*; and 213 instances of *meaningfully connecting the learning activity to a goal that is of personal value to the coach*. The CDP trainers also gave *constructive, noncomparative feedback focused on helping coaches gain control over valued outcomes* 264 times; *ensured coaches were included in activities* 170 times; and *monitored coaches' ability to live up to the verbal instructions given* 157 times. The researchers noticed that both provisions of competence support were high within the observations and that competence satisfaction among coaches had the highest mean value of all the basic needs assessed. Within relatedness support, 187 instances of *showing warmth, demonstrating interest, and fostering a sense of connectedness* were observed along with the *use of names* 393 times. The full list of behaviors and frequencies is located in Table 2.

In particular, the CDP trainers' use of behaviors that kept the coaches engaged throughout the training, providing clear structure to the activities they would be involved in, and giving constructive feedback to the coaches were among the strongest aspects of the training program. Further, the average number of supportive behaviors demonstrated per minute in the current study was on par with or higher than those seen in Haerens et al. (2013) and Smith et al. (2015). Compared with previous studies, Haerens et al. (2013) noted the most adopted behaviors among participants in their study included taking the perspective of students into account, giving clear verbal instructions, and monitoring students to make sure they followed the instructions given. Smith et al. (2015) did not provide detail of specific behaviors observed, but ratings

Table 1 Frequencies of Need-Supportive and Need-Thwarting Behaviors by Workshop

Workshop	Need-supportive behaviors per minute	Need-thwarting behaviors per minute
Athlete-centered coaching workshop #1	2.00	0.05
Athlete-centered coaching workshop #2	2.13	0.01
Athlete-centered coaching workshop #3	2.40	0.01
Athlete-centered coaching workshop #4	1.89	0.07
Athlete-centered coaching workshop #5	2.32	0.00
Athlete-centered coaching workshop #6	2.07	0.01
Athlete-centered coaching workshop #7	2.10	0.01
Athlete-centered coaching workshop #8	1.85	0.00
Team-centered coaching workshop #1	2.64	0.01
Team-centered coaching workshop #2	1.91	0.00
Team-centered coaching workshop #3	1.77	0.00
Total	2.04	0.01

indicated moderate mean levels of autonomy and relatedness support.

Because there is no study to directly compare to, it is difficult to say that the behaviors observed would be similar to face-to-face workshops of this nature. However, the average number of behaviors observed in the virtual environment could be due to the CDP trainers providing more opportunities for conversation and behaviors to be observed than in traditional physical education or sport practice environments. In other words, the exchange of ideas and activities moved at a quicker pace and there was little time spent demonstrating movement or physical activity compared to studies in physical education and sport environments. It is also possible that more verbal behaviors were observed because nonverbal behaviors can be more difficult to display in virtual environments. As the research on the use of verbal and nonverbal communication in virtual workshops such as these is sparse, it may be a worthwhile topic of study for future research.

The researchers also found that a higher emphasis was placed on autonomy-supportive behaviors than the other two basic psychological needs. This could be due to the nature of the content of the training session or could reflect the fact that the coaches were not face-to-face. It is possible that the structure of the virtual workshops may not support relatedness as much as the other basic needs, echoing previous studies regarding developing relationships between coach mentors and mentees in virtual spaces (Grant et al., 2020). Currently, studies do not clearly address this within virtual environments, but several studies do describe low reliability rates for relatedness support (Haerens et al., 2013) and a broader focus on observing autonomy-supportive behaviors of and structure (competence support) provided by instructors (Aelterman et al., 2014).

There were few instances of need-thwarting behaviors, including autonomy-thwarting, relatedness-thwarting, and competence-thwarting. Among the coaches, mean levels of need-thwarting showed very little was occurring among the CDP trainers. When analyzed per minute, autonomy-thwarting behaviors per minute were low, as were competence- and relatedness-thwarting behaviors. This result would be expected no matter the modality (virtual vs. face-to-face) since the workshop was based on a learner-centered approach involving a high level of interaction, related content to previous experiences, and provided heavy encouragement from the CDP trainers (Cushion & Townsend, 2018).

The researchers also noted the high levels of autonomous motivation (includes intrinsic motivation, identified regulation, and

identified regulation) and low levels of controlled motivation (includes introjected and extrinsic regulation) among the coaches. Engagement of all types was also favorable (see Table 3). Breaking these values down further, high levels of intrinsic motivation, integrated regulation, and identified regulation were observed. This indicates that the coaches were motivated by enjoyment, fully embracing the training as meaningful and aligned with their personal goals. Lower levels of external regulation and amotivation were also seen. In other words, the coaches were minimally motivated by external demands or rewards. Interestingly, levels of introjected regulation were high among this sample. As part of controlled motivation, the levels of introjected regulation observed indicate ego-driven motivation or to preserve self-worth.

Within the types of engagement, the coaches indicated high levels of behavioral and emotional engagement, with slightly lower agentic and cognitive engagement. As measured, the coaches perceived themselves to be attentive and put forth an effort to learn (behavioral engagement) while also internalizing a positive attitude about the learning with low anxiety (emotional engagement). The coaches also felt that they used strategies to help better remember the information received in the workshop (cognitive engagement) and directly contributed to their overall learning (agentic engagement). Overall, the data collected suggest that virtual workshops have the potential to positively engage coaches in behavioral, cognitive, emotional, and agentic ways.

Although many factors could have contributed to the coaches' motivation and engagement, the researchers believe that motivation and engagement could have been influenced by the need support provided by the CDP trainers, which agrees with previous research in other contexts (Benlahcene et al., 2020; Park et al., 2012; Reeve & Shin, 2020) in addition to the levels of autonomous motivation (intrinsic, identified, and integrated regulation) reported by the coaches. It is important to reiterate that the training program is a required part of the coaching certification process for USA Lacrosse. The ACC workshop is required to obtain the Level 1 certification along with passing a background check and completing a self-paced virtual course. Level 2 requires an additional self-paced virtual course and the team-centered coaching workshop (USA Lacrosse, 2021). Many of the coaches were in pursuit of the Level 1 certification to be able to coach. Therefore, motivation and engagement could have been influenced by this, which could explain the high levels of intrinsic, identified, and introjected motivation. The coaches had chosen to pursue a

Table 2 Mean, SDs, and Total Behaviors Observed

Need-supportive or thwarting dimension	Behavior	<i>M</i>	<i>SD</i>	Total <i>N</i>
Autonomy supportive	Offers choice to trainees (e.g., choice in the order of the exercises, choice in materials, choice on which level of difficulty they engage in an exercise)	3.30	2.45	33
	Meaningfully connecting the learning activity to a goal that is of personal value to the trainee(s). May ask questions about interests, problems, wishes, or values to enact relevance	21.30	2.21	213
	Listening and responding to trainees' feelings, thoughts, perspectives, and complaints	26.40	6.45	264
	Encourages initiative taking by offering the opportunity to experience problems, practice independently	1.50	1.78	15
	Provides rationale for tasks/requests/constraints	3.90	3.84	39
	Provides opportunity for trainee input	32.60	8.26	326
Competence supportive	Providing constructive, noncomparative feedback focused on helping trainees gain control over valued outcomes	26.40	7.49	264
	Provides clarity by providing an overview of the content and structure of the lesson, communicating consistent guidelines, and being available when trainees have questions	10.40	6.28	104
	Fostering noncompetitive learning structures, fostering views that success in learning activities depends on internal controllable factors rather than inborn talent and demanding effort	.90	1.29	9
	Ensures trainees are included in drills/activities/exercises	17.00	4.00	170
	Monitors if the trainees consequently live up to the (verbal) instructions	15.70	3.92	157
	Responding and being available for trainee questions	2.10	1.60	21
Relatedness supportive	Uses variation between and within exercises	5.70	2.41	57
	Engages in noninstructional conversation with trainees	4.40	3.24	44
	Showing warmth, demonstrating interest, fostering a sense of connectedness by encouraging empathy and prosocial behavior, and treating trainees fairly and as important	18.70	2.98	187
	Uses trainees as positive role models	0.40	0.70	4
	Offers help during exercises	0.60	0.84	6
	Addresses trainees by their first name when the opportunity occurs	39.30	6.78	393
	Shows unconditional regard	0.00	0.00	0
	Shows care and concern for trainees	0.20	0.63	2
	Takes the perspective of pupils into account, is empathic	0.30	0.68	3
	Being available to all trainees in class, offering support, and showing commitment to trainee learning	0.70	0.82	7
	Offers expectations for learning	0.50	0.71	5
Autonomy thwarting	Pays attention to what the trainees are saying (how well is the trainer capable of listening to the pupils)	1.40	4.43	14
	Demonstrates the tasks himself, serves as a "model" for the trainees	1.00	0.94	10
	Puts effort and energy into the lesson	0.00	0.00	0
	Control, keeping possession of the learning material, providing solutions before trainees have time to reflect by themselves, exerting pressure, or disrupting trainees' natural rhythm by not allowing them to realize their action plans	0.20	0.42	2
	Uses extrinsic rewards	0.00	0.00	0
	Actively attempting to compel trainees to do things they find boring or meaningless or connecting the learning activity to an extrinsic goal	0.00	0.00	0
	Uses relies on intimidation	0.10	0.32	1
	Disrespect not allowing differences in opinion, complaints, or negative affect	0.10	0.32	1
	Demonstrates negative conditional regard	0.00	0.00	0

*(continued)***(Ahead of Print)**

Table 2 (continued)

Need-supportive or thwarting dimension	Behavior	<i>M</i>	<i>SD</i>	Total <i>N</i>
Competence thwarting	No clarity, no clear organization, or not being available when trainees have questions on task management	0.50	0.71	5
	No guidance, not being available to answer questions on content and clearly not monitoring or adjusting to trainees' level of comprehension	0.00	0.00	0
Relatedness thwarting	Devalues athletes' perspective	0.00	0.00	0
	Fostering competitive learning structures, fostering trainees' views that success in learning activities depends mostly on inborn talent, not demanding effort, or treating poor performance judgmentally	0.00	0.00	0
	Providing comparative feedback focused on evaluating trainees' performance, or feedback with a controlling locution, e.g., "Good, you did just as you should"	0.00	0.00	0
	Talking in an unfriendly tone, showing lack of interest, communicating that trainees do not belong, or treating trainees unfairly and as unimportant	0.00	0.00	0
	Showing no understanding of what is of importance for the trainees	0.00	0.00	0
	Not being available to (all) trainees, e.g., appearing occupied with other things or walking out of the classroom	0.00	0.00	0
	Restricts opportunities for interactions and conversation	0.10	0.32	1
	Shows a lack of care and concern for athletes	0.00	0.00	0
	Clearly not being available to offer support and showing no commitment to trainees' learning	0.00	0.00	0
	Belittles (makes an attempt to embarrass) athletes	0.00	0.00	0
	Adopts a cold communication style	0.00	0.00	0

Note. Means and *SDs* for each behavior were calculated across workshops.

Table 3 Means, *SDs*, and Cronbach Alpha for Perceived Need Satisfaction, Motivation, and Engagement

Variable	<i>M</i>	<i>SD</i>	Cronbach alpha
Autonomy satisfaction	4.28	0.56	.73
Autonomy frustration	1.75	0.77	.78
Relatedness satisfaction	3.73	0.84	.89
Relatedness frustration	1.58	0.59	.60
Competence satisfaction	4.46	0.54	.85
Competence frustration	1.46	0.58	.71
Intrinsic motivation	6.34	0.84	.84
Integrated motivation	5.18	1.04	.87
Identified motivation	5.28	1.38	.85
Introjected motivation	4.15	1.44	.72
External motivation	2.46	1.38	.84
Amotivation	1.53	0.92	.86
Behavioral engagement	6.23	0.80	.90
Emotional engagement	6.16	0.83	.90
Agentic engagement	5.02	1.15	.88
Cognitive engagement	5.75	0.98	.90

coaching certification and were invested in the process, which could also explain why extrinsic motivation was lower. Motivation and engagement may also have been influenced by the fact that at the time of this study, only virtual coach training was an

option within USA Lacrosse. In-person workshops did not begin again until Spring 2022.

In looking closer at the relationship between need-supportive behaviors and engagement, Jang et al. (2010) noted that specific need-supportive behaviors contribute to participant engagement. Highlighting these behaviors, the workshops evaluated in the current study were interactive and required the participation of everyone in the room. A variety of instructional activities including group sharing, short lectures, breakout rooms, and applied activities seemed to help the coaches to engage and work with the information they learned. In addition, the unique structure of the workshop allowed the CDP trainers to conduct activities that tapped into the coaches' motivation, providing clear instructions and detailed expectations to the coaches. These practices align with those recommended in previous reviews of implementing need-supportive behaviors in sport settings (Berntsen & Kristiansen, 2019; Su & Reeve, 2011).

Information gleaned from the observations and surveys corroborated the coaches' written assessment of the workshop, with the majority reporting that the content covered was appropriate to their level, both in amount and depth of information covered. When rating their CDP trainers, most of the coaches also rated the CDP trainers' knowledge of the material, enthusiasm, and ability to keep the coaches engaged at either an above average or excellent level. Table 4 shows the frequencies of workshop satisfaction questions.

The researchers believe that the level of success achieved in the virtual workshops was due to a variety of factors, which could include the educational experience of the CDP trainers and the Sport Development Team as well as the need for certification. The process for training the CDP trainers was detailed, both in learning the content presented and ensuring that the CDP trainers

Table 4 Frequencies of Workshop Satisfaction Questions

Question	Excellent	Above average	Below average	Poor
Trainer's knowledge of material	87.20	12.80	0.00	0.00
Trainer's enthusiasm	89.90	9.40	0.70	0.00
Trainer's kept the participants engaged	87.20	12.80	0.00	0.00
Trainer's answered questions knowledgeably	89.30	10.70	0.00	0.00
Amount of content covered	71.70	26.80	1.30	0.70
Content taught to a level appropriate for you	75.20	22.80	2.00	0.00
Depth at which content was taught	72.5	25.50	2.00	0.00
Preclinic communication	74.5	22.80	2.00	0.70
Comfortable e-learning environment	83.20	16.80	0.00	0.00
Ease of logging in	86.60	13.40	0.00	0.00
Clinic duration	73.20	20.80	5.40	0.70
Activity quality	73.20	23.50	2.70	0.70
Discussion quality	75.20	20.80	4.00	0.00
	Four stars	Three stars	Two stars	One star
Clinic overall	79.20	18.10	1.30	1.30

understood the capabilities of the Zoom platform. In total, the CDP trainers spent at least 10 hr in training sessions to demonstrate their ability to deliver content virtually. The CDP trainers themselves also had education experience outside of USA Lacrosse, either as current or former K–12 teachers/administrators. It is believed that the CDP trainers who self-selected into the program were comfortable doing so because of this prior teaching experience. In addition, the workshop and training materials were prepared by the Sport Development Team, who also have varied and extensive experience in K–12 education.

Areas of Improvement

Despite the overwhelming number of need-supportive behaviors, the researchers noted a few areas of improvement. First, some workshop content was not clearly understood. For example, using Bloom's Taxonomy and Maslow's Hierarchy of Needs to better understand what athletes need to learn and how they learn was complicated. These theories are beneficial for educators; however, they might not align with the common goals of youth sport coaches, who might rarely engage in creating objectives for practices and games based on the taxonomies presented.

The second area of improvement would be the energy levels of some of the CDP trainers. Many were enthusiastic and upbeat, however, some appeared more apathetic and monotonous. Upon further conversation with USA Lacrosse, it seemed that some of the CDP trainers were more comfortable with the virtual space, while others did not thrive. One trainer who lacked energy in the virtual environments was reported by the Sport Development Team at USA Lacrosse to be the exact opposite in face-to-face training that occurred prior to the pandemic. Although the literature provides information about comparisons between face-to-face and virtual learning, little to no information was found to help explain the impact of instructor enthusiasm in virtual environments specifically. However, instructor enthusiasm in video lectures has been shown to have an impact on knowledge acquisition in college students (Huangfu et al., 2022). Frommelt et al. (2021) also found significant relationships between teacher enthusiasm, need support, and behavioral engagement in students. Understanding that

instructor enthusiasm could also have an impact on motivation and learning in the virtual workshops, the researchers suggested that the Sport Development Team provide more training on this, particularly in how to cultivate it in virtual environments.

Although the CDP trainers were instructed on how to explain concepts similarly, not all explained concepts in the same way. This created some inconsistency in the explanation of some content. While the content was different than what is typically presented in USA Lacrosse's in-person workshops, the authors believe that content delivery should remain consistent from in-person to virtual environments. In other words, no matter what the content is, the CDP trainers should be explaining concepts in a similar way to avoid confusion and increase understanding. Another area of growth was the timing of the workshop. The researchers believe that the workshop itself was not timed well enough to provide an action-oriented takeaway for the coaches. More specifically, the breakout sessions were not long enough for the coaches to adequately discuss course topics and develop an appropriate response. In addition, the ACC and team-centered coaching workshops were relatively repetitive and contained very similar information.

Recommendations for Other Programs

Understanding that the USA Lacrosse coach training program's purpose was not directly tied to improving need-supportive behaviors among the coaches, the current study and previous literature help to better understand how need support contributes to delivering effective coach education virtually. In terms of the current study, the CDP trainers already possessed many of the need-supportive behaviors that these interventions have cultivated, even though they were not trained to do so. The CDP trainers also refrained from making demands of coaches, showing conditional regard, and keeping full control of the learning materials and discussions, all of which would be considered need-thwarting behaviors. The use of need-supportive behaviors aligned with the learner-centered approach could have had an impact on the coaches' motivation and engagement in the workshop itself.

Examining the coach learning literature more broadly, it is known that coaches, especially those in the early stages of their

careers, tend to rely on previous experiences more so than their formal training (Lemyre et al., 2007). These informal experiences, as Cushion and Townsend (2018) suggest, can be more influential than formal experiences because they tend to be more applicable to specific situations. Considering this, need support in learning environments, including virtual ones, could help to reinforce these previous experiences if they are congruent. As the coach learner becomes more experienced, they might focus their attention on what they learn in these workshops. This is, of course, if the pedagogical approach used in the formal learning environment is sufficiently tied to educational theory and best practices. Offering the technology, in this case, virtual workshops, will most likely not produce favorable outcomes on its own (Cushion & Townsend, 2018).

Understanding how influential need-supportive behaviors are on learners, it can be assumed that exhibiting these behaviors, as was done in the virtual workshops, can help to support motivation and engagement for learning. Cushion and Townsend (2018) note that engagement, as measured in several studies reviewed, tends to be more tied to the pedagogical approach than the technology used to enhance learning. In essence, since it is the pedagogical approach that is more important than the modality, engaging in learner-centered behaviors such as these could be beneficial in any learning environment. This is encouraging, especially as formal coach learning continues to be offered in virtual and blended formats.

Beyond this, virtual workshops that promote these supportive behaviors could also contribute to the overall well-being of coach learners. As is indicated in Stebbings et al.'s (2011) investigation, need support is tied to a coach's integration of coaching into their own sense of self. Reflecting specifically on the behaviors used by the CDP trainers in this study, encouraging input from the coaches, valuing their comments and concerns, and meaningfully connecting the content to the coach learners' experiences could have impacted the way they internalize being a coach as part of their identity. Although further investigation into this internalization is needed, there is some preliminary evidence in the literature to support the idea (Soenens & Vansteenkiste, 2011).

Regarding the specific behaviors observed, other programs could be successful in implementing virtual coach training workshops by taking need-supportive behaviors into consideration. This would align with what Nash and Sproule (2012) reported about coaches wanting to be supported and valued in training sessions. Our observations indicate that virtual learning, especially in live sessions, should include a variety of mechanisms to engage learners in conversation and reflective thought in a way that is meaningfully connected to the coach learners' previous experiences. Even in a larger group, having learners discuss personal experiences as it relates to content, in addition to challenging them to re-examine the way they approach athletes supports their basic psychological needs. These small and simple suggestions could go a long way in encouraging coaches to feel more connected to their learning, possibly increasing their intrinsic motivation to do so. Some specific behaviors of note that were highly observed include addressing the coaches by their first name to support their need for relatedness as well as listening and responding to the feelings, thoughts, perspectives, and complaints of the coaches to promote a sense of autonomy. Providing coaches with constructive, noncomparative feedback would also support their need for competence.

Final Thoughts

Overall, the researchers found that the USA Lacrosse CDP trainers used many need-supportive behaviors and few need-

thwarting behaviors. The coaches had high levels of autonomous motivation and low levels of controlled motivation along with favorable engagement. The level and amount of teaching experience that the CDP trainers had outside of USA Lacrosse might have contributed to this result, especially since many teacher education programs stress the importance of a learner-centered approach (Pierce & Kalkman, 2003). As research in the area of virtual coach learning environments is relatively new, further investigation of workshops in this manner is suggested, gathering observed trainer behaviors in addition to participant perspectives. Observation of behaviors can give coach developers the ability to give concrete and research-based feedback to their trainers, which could ultimately have an impact on the coaches they train. Given the current state of the COVID-19 pandemic and the changes it has necessitated, virtual training platforms could be a more permanent aspect of training in the future. There is also a strong possibility of virtual training sessions being used as part of a blended course format. Therefore, investigations into the alignment between virtual and face-to-face training sessions also require further study.

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