FROM THE FIELD ARTICLE

Creation of a Sport Performance Enhancement Group Using a Benefits-based Programming Model

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ABSTRACT
The application of sport science is crucial to athlete performance development. However, the frequent disconnection among sport scientists, coaches, and athletes often leads to miscommunication and increased potential for performance barriers. The creation of sport performance enhancement groups (SPEGs) can help with the professional integration and communication among all personnel involved in the training process. However, SPEG formation faces a number of barriers in the current coaching landscape. The application of a benefits-based programming (BBP) model may aid in the formation of an SPEG and the dissemination of education for coaches, athletes, and administrators. A field experience involving the BBP model and SPEG creation in a National Collegiate Athletic Association (NCAA) Division II school is presented with multiple model iterations

Key Words: Sport Science, Coach Education, Training Team
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Improving athlete performance has long been a goal of all coaches, and they depend on a variety of tools to do this. Athletic trainers, team doctors, strength-and-conditioning coaches, nutritionists, sport scientists, and others are often called upon to support the coach in his or her attempt to improve performance. Research findings suggest that coaches may want to incorporate sport science information into training, but typically find it impractical to do so (Reade, Rodgers, & Spriggs, 2008). Communication problems arise as coaches and sport scientists begin to work with these different groups of professionals. Advice from group members to athletes can often go unheeded, and as a result, athlete or team performance declines.

Ideally, numerous professionals work together to reach the common goal of athletic success and physical improvement, but in practice this can be exceedingly difficult. Effective communication requires message receivers to interpret messages as they were intended by the message sender (Johnson, 2006). Therefore, it is important to minimize interference with information dissemination to the coach. A lack of communication, or miscommunication, may result in greater potential for fatigue and overtraining, increased need for recovery time, and possible increases in injury rates. Moreover, a lack of integration and communication between coaches, team doctors, athletic trainers, strength-and-conditioning coaches, nutritionists, physical therapists, massage therapists, psychologists, and other support personnel may hamper athlete performance. Together, this team of professionals, referred to as a sport performance enhancement group, or SPEG (Stone, 2009), can greatly enhance athlete and team success.

Reade et al. (2008) noted that in order to increase knowledge transfer between coaches and sport scientists it is important to provide data that are easy to understand and apply. They also suggested increased communication (specifically verbal) between coaches and performance professionals. According to Williams and Kendall (2007), there has been little evidence of successful relationships between coaches and members of the scientific community. The purpose of this paper is to describe the creation of an SPEG using a benefits-based programming (BBP) model to increase member communication and dissemination of performance data to coaches.

Literature Review

Sport Performance Enhancement Groups

Sport performance enhancement groups are coach-driven, and they typically involve a five-phase process (see Figure 1; Stone, 2009). The initial phase involves preliminary interactions between coaches, sport scientists, trainers, strength coaches, and other performance-related professionals to determine goals and desired outcomes. Although this process is preferably coach-driven, a sport scientist may well serve as the hub, or organizer, for this group and can provide information about the SPEG formation process. Following the coach’s input, an SPEG is then formed with the performance professionals in place to deliver the needed components (e.g., strength, power, nutrition, psychology, sport medicine) to increase sport performance.
The SPEG members work together to design and implement periodized training plans in the second phase. These plans involve the sequencing of training volumes and phases over a year’s time with the overall goal of creating physiological adaptations specifically related to a particular sport (Bompa & Haff, 2009; Hornsby, 2010). In places where sport performance has been a priority, such as the University of Notre Dame, Purdue University, and the University of Dayton (Read, 2011), SPEGs have been permanently formed within the athletic department and are used by all sport programs. After program implementation begins, a monitoring and data collection phase ensues to provide data for the evaluation phases. The fourth and fifth phases are data analysis and immediate data return to the coach. This information can be used by the coach in making decisions about training and performance at both the individual and team level. Note that this is an ongoing process that provides continuous feedback to the coach. Potential benefits of the holistic approach used by SPEGs include increased communication, increased training effectiveness and efficiency, improved dissemination of research-proven techniques, and reduced injury rates (Stone, 2009).

A recent article in *Athletic Management* suggested that only a few colleges and universities currently employ SPEGs (Read, 2011). The lack of SPEG adoption may in part be due to the lack of performance-related education for coaches. Currently there is a disconnection between sport performance research and its translation into practice. One issue is that many coaches at all levels of sport do not have a sufficient scientific background to use the sport science research and to communicate effectively with those in the sport science community (Stone, Stone, & Sands, 2005). The inability of the sport science community to articulate effectively the importance of SPEG formation to coaches, administrators, and even the student-athletes themselves compounds this issue.

![Figure 1. Sport performance enhancement group process (adapted from Stone, 2009).](image-url)
A practicing sport scientist recently commented on his observations of SPEG formation. He suggested that change can be a tumultuous process, and coaches as well as other members of a potential SPEG are sometimes apprehensive about the change from a traditional athlete-development approach to a holistic-training approach. Some of the potential roadblocks to SPEG formation are fear of collaboration, the need to increase lines of communication, the blurring of divisions or boundaries, and the increased time and resource commitment for the process. Individuals may feel that they are relinquishing some control in an SPEG, and so they increasingly resist the change (Mark South, personal communication, Mark South, February 6, 2012) For many reasons coaches, too, may resist change. These reasons could include coaches’ desire to maintain the status quo and fear of the unknown (Lussier, 2005). Rynes, Brown, and Colbert (2002) suggested that other barriers to change could include learning anxiety, or fear of having to learn new things. Coaches who are micro-managers may have difficulty trusting individuals who lack high levels of sport-specific knowledge or experience. Coaches may also face the challenges of scarce resources and inexperienced staff. For example, a coach may work with assistant coaches who possess few years of experience. Moreover, some coaches work with inexperienced graduate assistants who provide athletic training and/or strength and conditioning services. In these instances, it is very easy for a coach to have doubts and be reluctant to involve others in the decision-making process involving performance training (Guy Hornsby, personal communication, February 6, 2012). Coaches may be even more reticent to trust noncoach members of an SPEG (e.g., psychologist, nutritionist, athletic trainer). Coaches do not typically control the hiring of these professionals, and these individuals may have little sport-specific knowledge. In order for coaches to relinquish some control over team performance to another professional, they must establish trust (Guy Hornsby, personal communication, February 6, 2012).

While these concerns seem valid, the benefits may outweigh the costs. For example, the SPEG approach provides the coach with a steady influx of data that can aid objective evaluation. Using data to drive coaching practice can lead to improved decision-making. In fact, a sport coach (who is currently involved with an SPEG) showed appreciation for the data provided when he stated, “Athlete monitoring is most useful for me when looking back year to year and making changes to my training plans. It can give me an idea of what changes need to be made based on performances in the lab as well as [in competition]” (personal communication, October 23, 2012).

In addition, it is widely recognized that strength performance variables (e.g., rate of force development, muscular strength/endurance, peak power output) are related to sport-specific performance (Harris, Stone, O’Bryant, Proulx, & Johnson, 2000; Paavolainen, Hakkinen, Hamalainen, Numela & Rusko, 1999). It is also commonly accepted that improvements in sport-specific skills are related to in-game performance (Bastiaans, van Diemen, Veneberg, & Jeukendrup, 2001; Paavolainen et al., 1999). There is no direct evidence to indicate that improved athlete performance directly translates into wins and losses. However, it seems logical and reasonable to assume that improving performance variables can lead to improved player performance. These improvements can increase the likelihood of winning.
Several researchers recently examined the relationships between an interdisciplinary SPEG approach and training, performance, and injury data in a NCAA Division I baseball team (Hornsby et al., 2011). The results showed that over the course of a three-year period of training with an SPEG model, injury rates decreased from the three years immediately prior (without an SPEG in place). In addition, the team saw significant gains in isometric peak force (a performance variable). Data collected over a three-year period indicated that the rate of force development correlated with home runs, batting average, slugging percentage, and doubles. In addition, force production at 50 ms, 90 ms, and 250 ms during an isometric, maximal effort, mid-thigh clean pull positively correlated with home runs, slugging percentage, and doubles (Hornsby et al., 2011). Force production at 90 ms and 250 ms were also positively correlated with batting average (Hornsby et al., 2011). Beyond strength increases and a reduction in injury rates, the team also enjoyed an increase in both win percentage and total team home runs (Gentles, Johnston, Hornsby, MacDonald, & Stone, 2011).

Benefits-based Programming

An argument has been made about the potential benefits for student-athletes, coaches, athletic departments, and universities in adopting an SPEG model. Despite the potential benefits, implementing the SPEG process is still difficult. One way to address this challenge is through the application of the BBP model (Rossman & Schlatter, 2011), which has its roots in the field of recreation. The poor economy has led to an increased demand to justify financial support of recreation and sport programs. The BBP model has been used by organizations to measure the benefits of their programs with tangible evidence and to confirm the quality of services (Ammons, 1996). The BBP model has served as a tool to plan purposeful outcome-based programs in recreation and sport. This process has also been a useful vehicle for the creation of an SPEG by offering a model whose aim is to provide transparency in documentation and decision-making processes, to increase understanding, and to highlight outcomes and opportunities for input from a variety of SPEG professionals.

The first outcome-based model developed was the Planning, Programming, and Budgeting Systems (PPBS; Hatry, 1999). First used in the military in the 1960s, the PPBS was designed to analyze outcome quality and differences in comparison to previous systems which solely on numerical outcomes (e.g. number of participants, money made, etc.) (Hatry, 1999). A three-phase benefits-based management model was later developed for the purposes of directly measuring benefits of recreation participation and managing the facilitation of said benefits (Allen, 1996; Allen & McGovern, 1997). The phases included (1) identification of benefits and opportunities, (2) implementation, and (3) evaluation and documentation.

Subsequently, Rossman and Schlatter (2011) changed the model to a four-stage iterative model (see Figure 2). The first stage of this model is an identification of the target issue that needs to be addressed. In the second phase, goals and objectives are outlined. The program is implemented and data are collected and analyzed in the third phase. The results are then provided to stakeholders in the fourth phase. The model is iterative, so after reporting the findings, data-driven decisions may be made and the target issue refined so the process can begin again.

An example of this model might be a school program aimed at reducing childhood obesity. The level of physical activity in a school setting is the target issue as identified in stage one. In stage
two, goals would be set for the program. These might include educating teachers on the importance of physical activity, lowering body mass index (BMI) scores, and increasing daily physical activity minutes. Once the program is implemented, data are collected (e.g., pretest/posttest scores of teacher education, BMI scores, minutes of physical activity) and analyzed in stage three. The findings would then be reported to program administrators, teachers, school administrators, parents, and any other relevant stakeholders in the final stage. After a review of the findings, it might be noticed that while both teacher education and physical activity levels improved, BMI numbers stayed constant. A decision is then made to alter the program to include nutrition information for the students to help them make healthy food choices. Note that unplanned findings may be recognized. In this example, teachers may notice a positive change in classroom behavior or improved academic performance. This may lead to changes in the second and third stages by adding new goals and objectives as well as actively measuring these outcomes.

The BBP approach to recreation services is centered on understanding participants’ desired and achieved benefits. The process includes designing programming opportunities to aid participants in realizing these benefits as well as measuring actual benefit achievement (Allen, Stevens, Hurtres, & Harwell, 1998). Often, organizations need to alter their programming structure and philosophy to develop a program that has outcome-oriented goals. This is important for ensuring that the program is effective in achieving its intended outcomes.
Numerous studies have documented positive results using a BBP model in a variety of areas. Examples include the development of resiliency (Allen, Stevens, & Harwell, 1996; Cooper, 2003), positive developmental skills (e.g., confidence, connection, character, competency, compassion; Sehn, 2008), fitness activities (Rudick, 1998), and in therapeutic recreation activities (Hill & Sibthorp, 2006). Other benefits-based programs have involved recreation resource management functions including managing outdoor recreation activities (Stein & Lee, 1995) and landscape planning (Stein & Anderson, 2002). Sport applications of the model, thus far, have been limited to youth sport and have focused on elements of sportsmanship (Wells & Arthur-Banning, 2008; Wells et al., 2008; Wells, Ellis, Paisley, & Arthur-Banning, 2005) and life skills (Carson, 2010).

Lessons from the Field

**BP Framework for SPEG Formation**

While sport scientists, progressive coaches, forward-thinking administrators, and others may see the importance of an SPEG, convincing skeptics in a meaningful way is difficult. Therefore, the following case illustrates the application of a BBP model in a college sport setting. At a small college competing in NCAA Division II, a newly hired assistant track and field coach (also trained as a sport scientist) was put in charge of strength and conditioning for the track team and wanted to establish a performance-monitoring program to obtain objective feedback on changes in strength and power. Change is often resisted by coaches, athletic trainers, administrators, and student-athletes, so gaining trust and having good lines of communication are keys to orchestrating successful changes. Establishing a performance-monitoring program typically requires good integration between many different professionals and appears to be rare in collegiate sport settings.

The assistant coach’s primary objective for the track and field program was to improve strength and power levels (and subsequently performance) in the student-athletes through strength and conditioning. A scientifically based strength and conditioning program was developed, and steps were taken to gain the trust of student-athletes, trainers, and other track coaches. The assistant coach met individually with trainers and student-athletes, and with the track staff as a group, to learn more about the existing framework for how these entities were working together. An emphasis was placed on listening to others about concerns, hopes, frustrations, and ambitions. Furthermore, if items were discussed that the assistant coach could immediately work to correct (e.g., high rate of shin splints), then efforts were made to work
toward that goal (e.g., include remedial exercises to strengthen the lower leg). Acting to correct such issues strengthened the belief that the coach could be an active and valuable partner in making positive changes. To garner trust from the rest of the track staff, the assistant coach constructed an annual periodized training plan for several event groups on the team and described to the track coaches the rationale and goals of this plan while asking for their input. This helped to ease fears that the new assistant coach might lack the skills or knowledge to train the team, as well as making it clear that collaboration was critical and all opinions were valued.

At the end of the year, the assistant coach knew that the training program needed to yield results to gain credibility; therefore, training needed to be evaluated in a way that would be meaningful for everyone involved. The assistant coach needed to find a way to clearly explain the training program, the intended results, and the ways that success would be measured. To make good measurements, new equipment and permission to perform tests were needed. The resulting actions stemming from this objective followed the steps of the SPEG process using the BBP model to articulate issues, goals, methods, and results.

Initial Interactions and SPEG Formation

The assistant coach corresponded with various groups, listened to their experiences working with the track and field team, and gauged the interest of the exercise science department in contributing expertise and resources. The assistant coach was the central hub for information exchange and was the driving force behind the SPEG creation (see Figure 3). The assistant coach also met with the exercise science department chair and explained how a performance-monitoring program might benefit students and faculty in the department. It would help students get hands-on experience in the laboratory, and it would give interested faculty an opportunity to collect data for research. The chair gave permission to use the exercise science laboratory for testing and agreed to purchase a contact mat for vertical jump testing that could be used by the track program to collect accurate vertical jump data.
The assistant coach then met with the head athletic trainer, listened to his frustrations about working with coaches, and asked him what he would like to see change in the track and field program. The suggestions were relayed to the head track coach and subsequently incorporated into the track team’s training program specifically to minimize commonly treated injuries. The trainer was eager to see the change and was very enthusiastic about improving communication.

While the head track coach was interested in improving track performance, he was, like most coaches, somewhat resistant to change. He had some long-held beliefs about strength training that did not fit with the new training philosophy. He agreed to allow significant changes to the training, but did so with some trepidation and an expectation of results. Improved strength and power are keys to success in track and field, but these qualities alone are not enough to ensure improved track performance, as the events are highly technical. The new assistant track coach suggested that assessing the strength and power improvements in the track athletes by using objective data, not just by examining track performance, was critical to the staff’s ability to maximize performance. The result of these initial meetings was the creation of an SPEG, which included the coaching staff, the sport medicine department, and the faculty and chair of the exercise science department.
The assistant coach met with the entire track staff in the late fall and, using the BBP model format (see Figure 2), clearly explained the intended outcomes of the annual training program and proposed how these outcomes could be measured. The first iteration of a BBP model used in our experience can be seen in Figure 4. If the results showed that the majority of student-athletes were making improvements, training would continue as planned. If the majority of athletes were not improving as expected after any testing session, the training program would be examined, the coaches would meet, student-athletes would be consulted, and all parties would agree on appropriate changes. If injuries increased from previous years, training would also be reexamined. The track staff agreed to the implementation of a performance-monitoring program for the year, and the trainer was excited to see a new training plan for the student-athletes.

**Monitoring and Data Collection**

Weighted and unweighted static and countermovement jump tests were selected for monitoring purposes. Before the testing occurred, it was made clear to the coaching staff, the trainers, and the student-athletes that the tests were carefully selected to measure explosive strength and would help in assessing whether student-athletes were progressing. Testing of the sprinters, jumpers, and throwers began during the indoor track season.

**Analysis and Reporting**

After collecting baseline data on the track team in the winter and retesting in the early spring (the beginning of outdoor season), the assistant coach presented the results of the testing to the track staff. The results demonstrated that almost all student-athletes were increasing muscular strength and were becoming more explosive. Examining data from all four testing conditions—static unweighted (SJ0kg), static weighted (SJ20kg), countermovement unweighted (CJ0kg), and countermovement weighted (CJ20kg)—showed the majority of athletes making improvements in jump height. For the men, 11 of 15 showed improvements, and for the women, 8 of 12 improved. As expected, the rate of improvement varied, as individuals training for three years made smaller improvements than athletes who were in their first year of strength training. Changes in mean jump height for males and females under all conditions, as well as individual data for 2 males and 2 females, are presented in Tables 1 and 2.

A consultation with the trainer revealed that the training staff was pleased with the training plan and saw its promise in limiting injuries. They also had not seen a spike in new injuries, as coaches sometimes suspect when leery of changing strength-training programs. The staff focused on adjusting the training of the small number of student-athletes that were not improving as expected. It is in discussing these cases that one really sees how much coaches believe in the training program and performance monitoring. In these situations there are always questions as to whether the coaches are going to make decisions that acknowledge the testing results or shrug them off as inaccurate or uninformative. There may even be accusations if there are accusations of blame or deferred culpability when progress is not realized as expected. In this case, even though the track staff was still a bit reluctant to fully rely on these new tests for information, they...
worked together to make small alterations to training and to meet with those athletes that did not improve to learn more about what may be going on in their training or personal lives. The coaches reported this to be highly informative as they learned about outside life stress (e.g., family illness, heavy course load) that was affecting track and testing performance. Overall, they were pleased to see measurable progress, and the student-athletes were buying into the new training due to the tangible benefits outlined in the BBP model.

Table 1
Group and Selected Individual Data Showing Changes in Male Athlete Jump Performance Between Winter and Spring Testing Sessions

<table>
<thead>
<tr>
<th>Male Athletes</th>
<th>SJ0kg Jump Height (cm)</th>
<th>SJ20kg Jump Height (cm)</th>
<th>CJ0kg Jump Height (cm)</th>
<th>CJ20kg Jump Height (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in mean (n = 15)</td>
<td>3.6</td>
<td>2.2</td>
<td>5.1</td>
<td>3.3</td>
</tr>
<tr>
<td>NCAA qualifying jumper</td>
<td>5.3</td>
<td>7.7</td>
<td>7.0</td>
<td>4.1</td>
</tr>
<tr>
<td>Upperclassman sprinter</td>
<td>2.4</td>
<td>2.3</td>
<td>1.0</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Table 2
Group and Selected Individual Data Showing Changes in Female Athlete Jump Performance Between Winter and Spring Testing Sessions

<table>
<thead>
<tr>
<th>Female Athletes</th>
<th>SJ0kg Jump Height (cm)</th>
<th>SJ20kg Jump Height (cm)</th>
<th>CJ0kg Jump Height (cm)</th>
<th>CJ20kg Jump Height (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in mean (n = 12)</td>
<td>1.9</td>
<td>1.5</td>
<td>1.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Freshman jumper</td>
<td>5.5</td>
<td>7.5</td>
<td>0.9</td>
<td>2.8</td>
</tr>
<tr>
<td>Upperclassman thrower</td>
<td>5.1</td>
<td>2.4</td>
<td>10.8</td>
<td>5.4</td>
</tr>
</tbody>
</table>

Second Iteration

The following year, a second iteration of the BBP process was introduced, expanding on the original model to reflect the new goals and updated testing opportunities (see Figure 5). The track team continued to allow the new assistant coach to implement training and to conduct testing sessions. The returning student-athletes were expected to continue to make modest improvements in strength and power, and the new student-athletes were expected to make considerable gains in strength and power. Testing occurred in the fall, during indoor season, and after the outdoor season. In addition to the vertical jump tests, hydration testing was done with newly purchased equipment from the exercise science department. Sport performance declines when athletes are dehydrated, and hydration testing presented another opportunity to educate the track coaches about the contributions of sport science to performance and to educate student-
athletes about proper fluid intake and nutrition. The number of student-athletes who were hydrated when they came to testing sessions increased as the year progressed, and the coaches began to stress hydration more to the student-athletes.

Figure 4: Case Study BBP Model: First Iteration.
Figure 5. Case study of BBP model, second iteration.

Target Issue:
An identified need to develop explosive strength in Track & Field athletes (sprinters, jumpers, & throwers).

Goals:
1. To develop an advanced annual training plan for returning SAs
2. To implement plan for incoming SAs.

Data Collection Tests:
1. Countermovement vertical jumps (CMVJ) at 0k and 20k
2. Static jumps (SJ) at 0k and 20k
3. Injury rates
4. Body mass
5. Hydration testing

Reports developed for SPEG personnel, Administration, and SAs
Results:
1. Increase in strength and explosive power for both new and returning SAs
2. Reduction in injuries
3. Increase in hydration
4. Anecdotally recorded increase in self-confidence
The results from each of the strength and power testing dates showed that the vast majority of new and returning student-athletes were getting stronger and more powerful. The track staff and the student-athletes were feeling much more comfortable with the new training, and they looked forward to the testing sessions. Psychologically, the student-athletes were buoyed by data showing improvements in their strength and power, and they were reinvigorated by knowing that these improvements would likely translate into better track performance. Additionally, by the second year of the new strength-and-conditioning program, the head trainer reported fewer injuries in the male track student-athletes than in previous years. He was pleased with the results and that his input continued to be sought by the new assistant coach. He inquired more about the specific changes (e.g., organization of lifting and practice schedules, inclusion of exercises such as Olympic style lifts, weight lifting/pulling based movements and overhead squats) made to the track team’s training program so that he might suggest similar changes to other teams. The trainer wanted to work with the new assistant track coach to make changes on a larger scale to the way coaches at the school designed training. He believed that most coaches lacked the education and scientific background to maximize performance and minimize injuries.

**Program Expansion**

With the track program enjoying success in the weight room and on the track, coaches in other programs became curious as to what the track program was doing differently. This provided an opportunity for dialogue (and coach education) as well as development and implementation of new BBP models that ultimately led other programs to embrace some of the new training and performance testing. Currently, BBP models are being developed to help educate personnel and student-athletes in almost all sports at the university, and the SPEG model is rapidly expanding to address performance issues across the athletic department. More coaches are seeking information, asking for help with training plan development, and keeping a more open dialogue with other SPEG members.

The support of the athletic administration was critical to the perpetuation and proliferation of the monitoring program and the promotion of coach education. The athletic administration was impressed by the positive attitudes of all SPEG parties, as well as student-athletes, and strongly encouraged other programs to use the new assistant coach as a resource for training plan design. Additionally, the athletic administration heavily promoted and advocated for coaches to take courses such as the USA Weightlifting Sport Performance course to enhance their knowledge and skills. Unfortunately, with fiscal challenges facing intercollegiate athletic programs, university officials hesitate to hire additional staff or provide further resources for the testing program. With coaches more knowledgeable about weightlifting instruction and periodization and more open to collaboration, it is expected there will be a reduction in injuries related to overtraining and an improvement in athlete performance.

In these field experiences, each partner in the SPEG played key roles in facilitating the creation of the SPEG and helping to create an environment where an SPEG could thrive. The exercise science department provided equipment, lab space, and student assistance, and it saw value in the goals of a sport performance enhancement team. The athletic trainers provided valuable feedback to the coaching staff about the nature of new and preexisting injuries in the
track athletes. This was done through regular meetings with the track coaches. Incorporating this feedback into training-plan design helped to keep athletes healthier and better able to train. Perhaps the most significant contribution to the formation of the SPEG was the athletic administration’s openness to change. The administration demonstrated this by their continued support for coaches willing to engage in continuing education, improved communication, and collaboration between all coaches on staff. Members of the track staff were leaders in the formation and success of the SPEG by demonstrating their willingness to coordinate their practices with the strength-and-conditioning plan and support this dramatic change in the training process. The new assistant coach/sport scientist brought together all the parties to form an SPEG, spearheaded the creation and implementation of a periodized training plan, and organized and executed testing sessions.

Conclusion

Part of the difficulty in implementing effective training similar to the experiences presented in this article is some coaches’ lack of knowledge of sport science principles. Understanding scientifically based training programs and instructing technical Olympic lifting movements require a knowledge base that is missing in the formal education of many coaches. Formation of an SPEG creates opportunities for improving coach education by offering a nonthreatening, collaborative environment where coaches feel more comfortable asking questions about training. Additionally, the process of training-plan design and implementation, as well as testing and data interpretation provides valuable opportunities to discuss principles of training, periodization, and athlete monitoring. As a part of the SPEG, the knowledge base of coaches is expanded, and when positive results are seen from the training plan, coaches become eager to learn more. A coach who participated in this field experience had the following comments about the SPEG formation:

I am always interested in hearing different perspectives about athletes or training. There are many aspects of training or general athlete care that I am not completely well versed in, so to have people around me who can add new insight is invaluable. Coaches are coaches, not nutritionists, doctors, scientists, trainers, or anything else. But working within groups of these people can give coaches a foundation of knowledge so they can be better when dealing with their athletes. (personal communication, October 25, 2012)

SPEGs provide opportunities for success for all parties vested in athletic performance including coaches, student-athletes, athletic trainers, and administrators. Elite-level sport relies heavily on integrated sport-performance-enhancement teams. The health and success of athletes can be improved as the SPEGs develop in college sport and other settings. The formation of an SPEG should be coach-driven, and the coach should seek to enlist all available resources to assist (see Figure 6).
Ideally, the coach working to bring groups together should be an excellent communicator and listener, as well as open to change. In trying to spread the formation of SPEGs beyond a handful of sports at a particular school, it would be ideal to partner with the athletic administration in working to promote opportunities for professional development among athletic staff. If the department feels it is valuable, then it may encourage coaches to seek more knowledge and use on-campus resources.

As coaches learn and work together to maximize sport performance through the formation of SPEGs, the use of a performance-monitoring programs, and periodized training plans, it is anticipated that many sports can enjoy higher levels of performance and a reduction in injury. However, to do this requires a paradigm shift towards a holistic-coaching model. This is something that the BBP model was designed to do. The model can be effective in efforts to justify the creation of a SPEG and to outline the steps for data collection and analysis useful in validating the training process. By following the model shown in Figure 2, coaches can (1) identify their team and athlete needs, (2) set their goals and objectives and outline what activities are going to help them achieve those goals, (3) conduct their data collection and analysis, and (4)
report analyses to the athletes and SPEG members and use those results to make data-driven decisions for subsequent iterations of the model.

The BBP model can also develop enthusiasm for learning in coaches, student-athletes, and administrators. If eager SPEG members make a concerted effort to learn, share, and improve, then optimism is high for having SPEG development become the norm for intercollegiate athletics in the near future. It is recognized that this is a new development and that this case represents just one way in which an SPEG was developed. Coaches or coach education practitioners who are interested in applying the SPEG process or developing an SPEG may want to experiment with the BBP model as a way to find common ground with athletes, coaches, trainers, strength-and-conditioning coaches, nutritionists, administrators, and other potential SPEG members. The BBP model can be the roadmap used to provide a unified direction for interested parties and can help coaches elucidate their training needs, goals, and objectives.

From a research perspective, it is understood that our application of the BBP model for SPEG formation happened in a specific environment. Further research on the use of BBP for SPEG formation is needed. Research projects aimed at determining whether this process can work in other settings for new SPEG formation and also to see how this process compares to other places that have SPEGs in place would be valuable. Additionally, it would be useful to measure the psychological and educational benefits for athletes and coaches involved with an SPEG. Qualitatively, it would be interesting to undertake a post hoc analysis of other SPEGs to determine whether their development incorporated BBP components informally. In our case we found value in the use of a BBP model for SPEG formation. While more field testing is needed, further validation of the process may establish its widespread use for SPEG formation and may help bridge the gap between coaches and sport scientists.
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Authors’ Note

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