

## **Nonlinear Pedagogy for Improved Motor Learning in Archery**

My background is in experiential and adventure education and, therefore, I have an affinity for instructor/facilitator delivery methods that allow learners to explore, develop questions, problem-solve, and achieve desired outcomes. Furthermore, I constantly assess my own coaching to identify how I can be more effective and efficient with my delivery. Upon recent reflection of how I teach the step of Set Up to beginning archers I realized I was satisfied with the results while simultaneously being frustrated with how many words I use and how specific I can get with the guidance I provide. I knew I could be more efficient, and I was eager to try a new delivery approach.

I decided to take a risk and apply nonlinear pedagogy (NLP) specifically to the process of teaching Set Up. Or should I say, facilitate the learning of Set Up? Set Up comes relatively early in the shot cycle and consists of a dynamic movement pattern that includes raising of the bow, torso rotation around the spine, scapular depression on the draw side, and the maneuvering to a specific position known as Barrel Of the Gun (BOG). BOG is the term used to define the alignment of the bow side wrist, bow side shoulder, and draw side shoulder. Breathing, and maintenance of hook and grip, posture, and intensity control all play critical roles as well.

### **Nonlinear Pedagogy**

Nonlinear Pedagogy involves presenting athletes with a goal or desired end point and then allowing athletes time to problem-solve ways in which to achieve that end point. For an overly simplified example that I will build external cues into later, “Here is what BOG looks like at the end of Set Up. Explore going from Set to the end of Set Up in a way where you end up in BOG.” Task simplification is a key concept with NLP; minimize the coach’s words to maximize athlete ownership over the experience. NLP allows space for the learner to explore, discover, and adapt on their way to finding functional movement solutions that solve the problem presented to them by the coach. Practices aligned with NLP also encourage learners to manipulate their environment and equipment, and bend rules (not safety rules). With NLP, each learner arrives at their own functional movement solutions and may be more likely to experience higher levels of motor skill retention, autonomy, physical literacy (Rudd, et al., 2020), and sense of accomplishment. The process is athlete-centered as each athlete creates their own roadmap for how to move consistently through space to execute a specific skill (Lee, et al., 2014; Chow, et al., 2016; Rudd, et al., 2020).

Guidance, compared to abandonment or professing, is a key concept with NLP. Simply providing athletes with a desired position and then allowing for movement pattern exploration without a defined timeframe, standards, or constraints will likely lead to unproductive outcomes. An important part of NLP is the allocation of time spent on playing to find movement solutions to a desired position. Consider marking out a trip on a road map; It is helpful to have waypoints to assist you in knowing you are headed in the proper direction. These waypoints act as constraints to make sure you, the traveler, does not get too far off track. Athletes need waypoints/constraints, especially when faced with more dynamic movement patterns such as Set Up in archery. In the field of motor learning, these waypoints are called constraints. Coaches artistically and skillfully create and apply constraints to guide athletes without over complicating the task. The subject of constraints is much larger than I will

get into for this paper. The way I apply constraints here allows for a group of new archers to explore, discover, and adapt their way towards finding BOG, each in their own way, while having the result look relatively homogenous across the group. In other words, athlete A is not going to look wildly different from Athlete B, C, or D. However, I frequently observe each athlete communicate differences in *how* they accomplished the task of achieving BOG. I have several specific constraints I apply when teaching Set Up that I will explain later.

### **Linear Pedagogy**

On the other hand, Linear Pedagogy (LP), involves directly communicating a prescriptive set of detailed steps for how to perform a movement pattern that, ultimately, leads the athlete to a desired position. LP typically assigns repetitive drills where NLP assigns opportunities to explore-discover-adapt with specific constraints to assist with skill acquisition. To be clear, these opportunities may look repetitive but are not prescriptive. LP inherently suggests that there is one way to perform a movement pattern (Rudd et al., 2020). Fear of being wrong, feeling unwilling to take risks essential to the learning process, over thinking, and added levels of stress are just a few of the negative consequences I have witnessed when athletes think there is only one right way to do something; These experiences debilitate the learning process and interrupt rather than inform the motor learning process.

### **Practical Application: Nonlinear Pedagogy & Set Up in Archery**

The best way to understand how NLP can be applied directly to archery is to see it in action. I created a supplemental video, here, to accompany this paper. The video reveals me working with a group of 14, first-time, adult, recurve archers. Ten of the 14 spoke Spanish as a first language and seven of those spoke very little English. I don't speak Spanish, sadly. I use an abundance of analogous cues and a mix of linear and nonlinear pedagogy to move this group towards discovering *how* to achieve Barrel of the Gun.

For bonus points, in case anyone is counting, I applied Nick Winkelman's (2021) communication loop structure of Describe, Demonstrate, Cue, Do, to organize my coaching delivery. However, I did not capture the debrief on video, so that part is missing. Can you pick out the DDCDD communication loop in my coaching?

### **Summary**

NLP can be used throughout the shot cycle and across sports. Providing space and time for athletes to explore, discover, and adapt is a central concept to NLP. With NLP, athletes discover how to arrive at the desired position and the Coach provides constraints to guide athletes within acceptable parameters. On the other hand, linear pedagogy tells athletes how to perform a task. Coaches are encouraged to keep instructions short and simple for NLP. Long instructions probably indicate the coach is explaining the *how*, rather than the desired end position. The Barcode Cue not only acted as an analogous external cue to assist with protecting the draw side shoulder from shoulder impingement, it acts as a constraint, a waypoint, for athletes to assess their own progress by. NLP inherently encourages play and evidence indicates it supports improved physical literacy because athletes are given permission to explore and discover. NLP implies that there is more than one correct way to arrive at a desired position, while LP implies there is one correct position and one correct way of achieving it.

Athletes engaged in NLP experience stronger motor learning and demonstrate a heightened ability to adapt to situations compared to their linear counterparts. NLP is likely more impactful in terms of motor learning than LP because the learner has to be engaged in order to explore, discover and adapt functional movement solutions.

### References

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