

## **Powerlifting through the lens of the Universal Design for Learning**

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## ABSTRACT

**Purpose:** The purpose of this article was to demonstrate how to use the principles of the Universal Design for Learning to teach skills-based powerlifting. Powerlifting is a sport that has applications for inclusion of all students by using the Universal Design for Learning (UDL). The UDL guidelines include using multiple means of engagement (the why), representation (the what), and action and expression (the how). These UDL guidelines are clear, adjustable, and provide for skills-based learning for all abilities of students. *Multiple Means of Engagement* are used to motivate athletes with themed workouts, a choice in the session, and feedback from both internal and external sources. *Multiple Means of Representation* help teach the athletes through the use of videos, posters, verbal and audio cues, foot/hand placement stickers, and metaphor examples. With *Multiple Means of Action and Expression*, students are challenged to demonstrate what they have learned through mock competitions, developing training programs, providing judgment on peer lifts, or explaining/ writing/ drawing how lifts are performed. Additionally, authentic assessments can be completed through social activities like social emotional learning, team competitions, and festival themed workouts and photo opportunities.

**Keywords:** weightlifting, Halsted method, coaching

## **1. INTRODUCTION**

Squat, bench press, and dead lift are the three exercises that compose the sport of powerlifting. At the high school level, the popularity of this sport has rapidly increased in the United States. In the state of Louisiana, roughly 2500 high school lifters competed in 2023 (Wages, 2024). The skills needed to perform these lifts include listening to commands, performing lifts to a preset standard, and knowing the rules of the sport. Due to such higher ordered skill required for powerlifting, modifications to make it more accessible for all are needed.

Unlike many sports, powerlifting is an individual sport that relies on internal and external feedback. Specifically, internal feedback includes feeling the knees stretch during the squat, tension building in the chest and shoulders during the dissenting portion of the bench press, and strain of pulling in the arms and back during the deadlift. External feedback includes coaching about squat depth and locking of knees prior and after squat attempts, locking of elbows prior to and upon completion of the bench press, and the locking of the legs at the top of the deadlift. Feelings of success are a subjective experience through feeling the proprioceptive changes in posture and bar path.

Success is determined objectively by judges who award white or red lights for successful or unsuccessful attempts based on form and following commands (USAPL, 2024). There are several commands from powerlifting judges that are followed during competition that must be practiced. These include 2 commands in the squat (squat and rack). Three commands for the bench press (start, press, and rack) that are easy to teach but can be hard to follow when anxious for a competition. Finally, one command is given in the deadlift (down). Judges score attempts during competitions based on 11 individual weight classes for young men and young women (LHSPLA, 2024). These subjective and objective activities can create a challenge for inclusion. Powerlifting could be modified and taught under different instructional approaches since competitions are held at the junior level all the way through the master's level athletes can compete at the para and special Olympic levels.

The Universal Design for Learning (UDL) offers a strong framework to address the multitude of challenges in this learning environment and could facilitate lifelong skills beyond the sport. The UDL is a method of instruction that provides guidelines on how to best teach those with different learning styles. The UDL guidelines are for teachers/ coaches to provide multiple means of engagement, multiple means of representation, and multiple

means of action and expression to support learning. Multiple means of engagement are the “why” of learning that include activities that get learners to “buy-in”. For example, allowing learners to have a choice, reflect on personal interests, and having learners engage in different roles as peers, evaluators, and presenters. Multiple means of representation are the “what” of learning to present instruction. Types of instruction may include visual, auditory, and tactile form so that learners can use their preferred or developed learning style. Multiple means of action and expression are the “how” of learning refers to having choices and challenges that allow learners to engage in self-directed assessment and performances that develop a sense of competence. The purpose of this article is to demonstrate how to use the guidelines of the UDL to teach skills-based powerlifting. A case study, teaching framework, and coaching/environmental cues highlight the integration of UDL in powerlifting.

## **2. UNIVERSAL DESIGN FOR LEARNING AND SKILLS-BASED POWERLIFTING**

The guidelines of the UDL can be applied to the sport of powerlifting. A series of activities will be presented including see one, do one, and teach one framework using the Halsted Model (Cameron, 1997) within the below case study (see Figure 1) The strategies align with the UDL by providing multiple means of engagement, representation, and action/expression. Also, they promote an inclusive environment that enhances lifter choices and motivation through structured and informal activities.

Kate is a high school freshman who wants to compete in powerlifting. Her flexibility is limited and she often drifts forward onto her toes at the bottom of the squat. This is a bad biomechanical position as it forces her to perform more work on her lower back than she would if her form was better.

Sadie, Kate’s coach, uses a technique for teaching called see one, do one, teach one.

### **See One**

Kate’s coach, Sadie, notices Kate struggling with her posture during the squat. She describes and demonstrates what was happening. Then Sadie demonstrates a correct squat and what Kate was having trouble with.

Kate notices that Sadie's squatting posture was off (she was leaning forward too far) and wasn't sure how to correct the issues.

Then, Sadie gave Kate coaching tips. The first tip was to keep her back straight and keep her heels on the floor. This allowed Kate to reflect on her own cues for the lift. Then Kate was asked to perform a squat again using the new coaching tip. Kate can also use visual aids (like posters) and short instructional videos of the squat with a peer performing the lift using a straight back and heels on the floor.

### **Do One**

Sadie requested for Kate to perform another squat and she did a little better, however, it was not perfect. Then Sadie ask Kate to look up into the mirror for feedback. Also, the coach videotaped her squat and Kate was able to view the video and reflect on what adjustments needed to be made. By looking up in squat, posture is often self-corrected and the lifter typical is better able to stay on their heels during the descent and ascent from the bottom part of the squat. This external and internal feedback helped some. Finally, Sadie recommended that Kate keep her elbows pointed down as she holds the bar. This typically places the lifter in a better position to stay balanced on their feet and not drift forward during the ascent of the squat from the bottom position. This use of internal feedback from proprioception led to the biggest improvement so far.

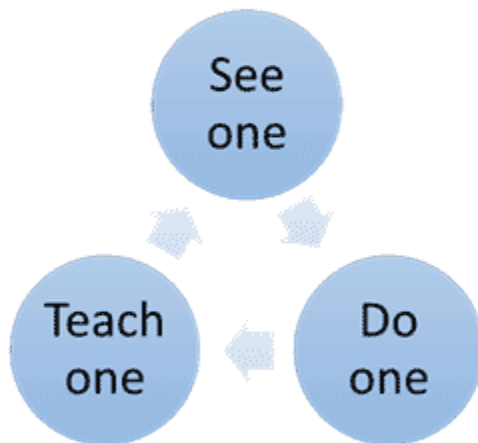
### **Teach One**

Next, Sadie asked Kate to teach another lifter about proper form. Kate felt a sense of confidence knowing that she had watched and done the squat correctly. Tips had also been given and enacted, so Kate felt more at ease as a future coach. By teaching others, Kate also was able to reflect on what she could do to help others. See Figure 2.

In this case, not all things were corrected for the lifter, Kate. However, the example demonstrated some of the principles of the UDL. Multiple measures of representation were used through demonstration and mirror feedback. Multiple means of engagement were used as Kate's taught and demonstrated the skill. Multiple means of action/expression were integrated through video feedback, multiple attempts, and self-correction.

**Figure 1**

*Halsted Model*

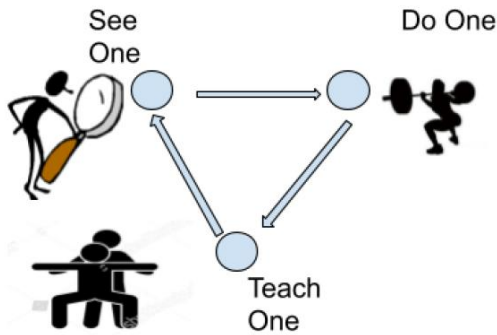


### **3. MULTIPLE MEANS OF ENGAGEMENT**

Elaborating on more techniques of engagement lead powerlifting activities to broader populations. One of the guidelines according the UDL is for the teacher or coach to use multiple means of engagement which is to motivate and to provide choices among the learner to develop autonomy. Within the case study, multiple means of engagement were enacted by encouraging the lifter to engage in the teaching process. This is a critical component of helping the student learn the lift and reinforce the patterns of movement (Universal Design for Learning Guidelines, 2023). Other means of engagement include motivating the athlete, providing a choice, active participation as a lifter, critical observation as an observer, external feedback from the coach, internal feedback from proprioception, and reinforcing coaching tips as a teacher.

**Figure 2**

*See One, Do One, Teach One*



Motivating the athlete is an important component of engagement. This can include fun music, themed lifts, motivational sayings/ visuals, and bringing in elite powerlifters. Music can be chosen by the athletes to create a motivating environment. Athletes can take turns selecting their playlists. Themed lifting can match the season or the holiday, or birthdays/special events that allow individual athletes to create joyful experiences and sustain motivation. A novel motivator could include bringing in role models from the community like an elite powerlifter or Special Olympic athletes to speak with the athletes. By taking on different roles, the powerlifter learns about self-empowerment, active engagement in the process, outcome of successful lifting, and learning and practicing skills that will carry over to other sports or environments. See Figure 3.

**Figure 3**

*Youth Athlete Squat with Motivational Visuals*



By having a consistent routine for practice, namely see one, do one, coach one, the athletes have a structure for practice. They can also practice judge commands, like squat, press and rack. These are verbal cues that aid in successful attempts during competition. Athletes are also encouraged to practice preparing for lifts. They self-check by questioning their performance: Are my knees locked to start the squat? Are my elbows locked before I start the bench press? Am I waiting for the judge to say start for the bench press? Did I bring the bar to my chest and wait until it was motionless, to listen for the judge to say "press"? Did I wait to rack the bar until the judge said rack during squat? Did I lock my knees and not stop during my deadlift?

Self-check questions can be in reflection of internal feedback provided by proprioception and viewing their own technique in the mirror. Additionally, such self-check questions can be provided in a visual or audio tape to athletes of different abilities so they can best prepare for a performance. Although there are more technical elements to lifting, these overarching goals can easily be incorporated into the UDL framework to facilitate physical literacy. Also, these questions help improve techniques to build self-efficacy, self-awareness, and self-regulation during practice.

#### **4. MULTIPLE MEANS OF REPRESENTATION**

Another way for teachers/coaches to meet the UDL guidelines is to use multiple means of representation. Representation is how teachers/coaches present the information or instructions and this should be done in a variety of ways. These could include videos, hand/foot placement stickers, visual pictures, verbal cues posted, and metaphors. We often encourage our lifters to video their successful lifts in practice and watch themselves. By form checking, seeing success, the lifters often see the representation or modeling of form. This is video modeling, which has been established as a technique to enhance self-efficacy for many decades (Bandura, 1977). Sometimes, lifters who want more feedback, will ask fellow lifters to watch and provide feedback on their form as well. This enhances a shared collective of success. Powerlifting is particularly collaborative because few athletes compete against fellow teammates because of the multiple weight classifications.

A common athlete error in novice powerlifters is foot and hand placement on the bars and on the floor. Using multiple means of representation can be achieved through use of placement stickers to support athletes in this process (see Figure 4). For example, two feet stickers can be placed on the ground under the bar about shoulder width apart with toes

pointed slightly outward. This will help those understand proper foot placement when performing the squat. To support athletes in the bench press and deadlift, hand placement stickers can be placed on the bar and for the feet. These could be color coded at different distances so a variety of athletes can use them (i.e., taller athletes will place arms farther apart).

**Figure 4**

*Foot and Hand Placement Stickers*



Additionally, box squats or curb feelers (placed on the inside of the squat rack) can be placed behind the athlete to give tactile feedback to gauge depth of a squat. This is common during training and has been helpful in teaching kinesthetic awareness. Partial repetitions help the athlete with control and bracing of the trunk when descending in the squat.

Other forms or representation could include a printed list of verbal cues posted and used to help athletes correct their own and teammates' technique. These cues are tempered with the idea of verbal overshadowing, ironic mental processes, and optimal feedback (Flegal & Anderson, 2008; Laasko, 2021; Otte et al., 2023). Verbal overshadowing is the use of too much description to allow for cognitive processing. Interestingly, overshadowing can interfere with learning. Also, ironic mental processes

(Janelle, 1999) suggest that introducing new thoughts during automatic motor performance can be disruptive. Therefore, it is appealing to heed the axiom of “say enough to help, but as little as possible” (Laasko, 2021). The notion is that a verbal cue is given once, the athlete is allowed to experiment with the cue and performance, then once mastered, another cue can be given. Another method to prevent verbal overshadowing is to present these cues on posters throughout the gym so athletes can read them as they choose to support learning (see Figure 5). This strategy affords powerlifters the opportunity for self-paced learning as part of UDL.

Examples of Verbal cues given once:

Squat verbal cues

- Feet shoulder width apart
- Toes slightly pointed out
- Place bar on your upper shoulder blades
- Stay back on your heels
- Look up when you descend and ascend in the squat
- Elbows point down (pretend to bend the bar) as you come up from the bottom of the squat
- Breathe out after the sticking point (once you have reached three quarters of the squat on the way up)
- Stay tight in your core (brace)

Bench Press verbal cues

- Bring the bar down under control
- Push your elbows in as you push the weight up
- Push your feet into the floor
- Arch your back by squeezing your gluts into the bench
- Make straight bar path from your chest to lock your elbows out

Deadlift verbal cues

- Start by looking up and bending from your ankles, knee and hips to pick up the bar
- Have it touching your shins
- Big breath in and exhale after you past half way
- Scrap your shins (on your long socks) as you pull up
- Lock out your knees and push your hips forward

Sometimes metaphors and movement representations help in the coaching process as well. For athletes that prefer systemic representations for imagery or learning, metaphors are often a quick way to engage students through visual-spatial representations. In order to accommodate a variety of athletes, for multiple means of representation, coaches should have a library of varying cues to help athletes perform and correct the three lifts. Cues can

also be presented in a variety of ways (i.e., pictures, video, audio recordings, written, peer verbalized). Cues can be made to emphasize the intensity/intention/speed of the movements as well. Coaching can include priming words like fast, explode, or drive. Some common examples are:

Squat-Imagine there is a pole that travels from the floor to ceiling and keeps your heels in contact with the floor. Now move in a straight line up and down. Drive out from the bottom of the squat. This keeps the lifter from traveling forward.

Bench press- When pressing up, image you are turning your thumbs toward the wall as you press up. Once the judge says "press", explode to the top of the lift. This keeps the lifter's elbows from flaring out and the lifter engages the back muscles.

Deadlift-Imagine your shoulders are point A, your hips are point B, and your knees are point C. All you want to do is move B forward. This keeps the lifter's shoulders back, and the lifter's knees from traveling too far forward, while engaging hip extension.

## Figure 5

*Use of Peer Feedback, Visual Cues, and Grip Placement Stickers*



## **5. AUTHENTIC ASSESSMENT & MULTIPLE MEANS OF ACTION & EXPRESSION**

The final guideline to the UDL is for teachers/coaches is to use multiple means of action and expression. This is for the learner to have choice in the manner in which they demonstrate that they have mastered the skill. Traditionally athletes are challenged to demonstrate what they have learned through mock competitions, developing training programs, and judging peers' lifts. Through the UDL, multiple means of assessment could be utilized such as requesting athletes to teach the lifts to their friend or a peer, correct a fellow athlete's performance, verbalize how to perform the lift using cues, and self-video performance of the lift. Other unique assessments could have an athlete create a written description or drawing of how to perform the lift.

The mock competitions begin in practice. Lifters are separated into groups of 3-5 and take turns squatting. They are asked to perform as if they were in a meet and are expected to hold all standards as if the competitions were occurring but at a light load on the bar. These are called criterion-based repetitions. During the criteria-based repetitions in practice, the athletes practice listening for commands. Each lifter is assigned as a spotter, judge, or participant. This allows for groups to build and be supportive. The videos are also used as an authentic assessment of squat depth, deadlift form, and bench press. Often watching your own image becomes a habit and many of the lifters ask for feedback afterwards on their form or strength changes.

Training theories related to powerlifting (Travis et al., 2020) are often discussed related to concepts such as overload. Progressive overload and periodization are two of these important concepts. It has been impressive to hear lifters watch videos of other lifters and talk about trends of the sport. Equally impressive is how quickly they pick up information that might or might not be valid. Subsequently, posting a workout plan and discussing strength progressions challenges lifters to decide on one or two lifts within the workout. This process allows the lifters ownership in the training process that can be empowering. Critical to UDL, meeting learners "where they are" rather than one prescribed plan, gives learners and coaches power to strategize for unique individuals.

Finally, it is important to understand what would disqualify a lifter during an attempt. The lifters take turns judging and finding issues with form. If they are a new lifter, they watch the veteran lifters and ask questions. Simple things can be fixed like waiting for the commands, locking knees out in the squat and deadlift, and waiting for the press and rack

commands during the bench press. By engaging in authentic assessment like being a judge, lifters learn to self-correct and feel an enhanced sense of self-efficacy.

Means of Action & Expression are done through social activities like social emotional learning, team competitions, and festival themed workouts and photo opportunities. These are often the larger goals of lifting programs that can continue to be built upon as the season finishes.

Examples of social activities, team competitions, and festival themes workouts and photo opportunities:

- *Rock, paper, scissors tournament so that the losing team gets extra abdominal work.*
- *Plank holds for time, with the incentive that they can challenge the coach to a lift of their choice.*
- *Happy Platesgiving (Thanksgiving), scary squats for Halloween, and superhero day celebrating by having team pictures with hats, and holiday symbols. It is common during these days to work out and have themed lifts like stuffing squats, turkey trap bar deadlifts, or superhero holds.*
- *Helping in the community with food deliver and fundraising*

## 6. CONCLUSIONS

The purpose of this article was to apply the UDL guidelines to powerlifting. The three areas of engagement, representation, and actions and expression were described and a case study was provided. The take-home message is to encourage practitioners to provide learners with a choice, use a variety of motivators (i.e., music, themed workouts), visual pictures, video modeling, hand/foot placement stickers, verbal cues, and variety of assessments (i.e., written, drawing, performing). The Halsted Model (Cameron, 1997) of see one, do one, teach one provided a framework to engage some of these guidelines. Teachers and coaches who integrate powerlifting into their curriculum should use these examples as tool to support a variety of different learning styles.

In conclusion, with training and practice, skills-based educators and coaches can enhance their pedagogical repertoire and help provide a fruitful environment for lifters who apply the Universal Design for Learning when planning, assessing, and instructing. These are not comprehensive but

should serve as a spark for future physical literacy professionals to develop unique and creative ideas to apply UDL.

## 7. ACKNOWLEDGEMENTS

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None.

### 7.2. Conflict of Interest

The authors have no conflicts of interest to declare.

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