

Halla Kim V00910696
Colby Holt V00964621
Stef Pienaar V00933204
Ben Croyle V00909248

EDCI 355 Interactive Learning Resource Final Draft (Learning Pod 10)

- **Topic Title:**

The essentials of biomechanics to consider in order to perfect your natural golf swing and avoid injury.

- **Topic Definition / Description:**

There are very few elements to actually consider when perfecting your golf swing. While the ball position and setup are important, the biomechanics of the swing are composed of four essential steps: the backswing, the transition, the downswing and impact, and the follow through [1]. Every golfer's swing is extremely unique, however, it doesn't need to look like the perfect swing in order to gain control of your ball flight. As long as one follows the key essentials of the biomechanics associated with the golf swing so that their muscles and joints work together, a consistent swing is easily attainable [2].

- **Common Misconceptions:**

Two misconceptions about the game of golf is that it is an easy and leisurely sport, and it is a game of luck. These are both not true as it is an intricate game which requires very precise movements. These movements require many hours of practice and it takes many years to perfect your skills.

- **Our Rationale:**

We have two reasons for developing our learning resource around a golf swing. Each of our members enjoy playing golf, so we have intrinsic motivation for creating the interactive learning resource. Additionally, a golf swing has complex fundamentals for beginners. It is crucial to break down golf swing basics for new golfers. This is also true for more experienced golfers as there are always areas of improvement for each and every player.

- **Description of Target Audience & Specific Learning Needs:**

Our target audience consists of adult learners ranging from beginners to intermediate-level golfers. The learners' age group spans from young adults in their early 20s to mature adults in their 60s and beyond. As a diverse group, they come with varying interests, lifestyles, and prior knowledge and experience in golf.

Considering this diverse audience, the learning design should focus on adaptability and flexibility by providing multiple learning pathways, such as video tutorials, written instructions, and interactive practice sessions. Additionally, incorporating closed captioning for video content and clear visual cues for demonstrations can accommodate learners with hearing or visual impairments.

Skill Levels: The learners are a mix of novices who have little to no experience in golf and some intermediate-level golfers who have played casually but want to improve their swing mechanics for better performance.

Interests: We are expecting our target audience to have varying levels of enthusiasm towards the game of golf. Typical high enthusiasm learners will be keen on honing their skills and advancing their game. Less enthusiastic golfers see the sport as a social activity and an opportunity to network. Our goal is to target all golfers on the spectrum of enthusiasm, from very high interest to low interest.

Lifestyle and Social Factors: The learners have different lifestyle commitments, including full-time employment, family responsibilities, and other hobbies. Variances in lifestyles for the target audience will affect the time that each learner can dedicate to learning golf swing mechanics.

Physical Considerations: Some learners may have specific physical considerations, such as joint stiffness, limited mobility, or back issues, which could impact their ability to execute certain golf swing techniques.

Special Needs: Among the learners, there might be individuals with specific learning needs, such as color blindness, hearing loss, or ADHD, requiring instructional materials to be accessible and engaging.

Language Proficiency: While English is the primary language of instruction, some learners might have English as their non-learning language, necessitating clear and straightforward communication in the learning resources.

Access to Technology: The learners have varying access to technology. While some may have smartphones, computers, or tablets, others might have limited access or no access to technology at all.

Motivation and Learning Goals: Learners come into the assignment with different motivations and learning goals. Some seek to improve their swing for recreational purposes, while others might be preparing for competitive golf events.

Considering this diverse audience, the learning design should focus on adaptability and flexibility. To address the learners' varying needs and constraints, providing multiple learning pathways, such as video tutorials, written instructions, and interactive practice sessions, would be beneficial.

Additionally, incorporating closed captioning for video content and clear visual cues for demonstrations can accommodate learners with hearing or visual impairments.

- **A description of a platform where your interactive learning resource/course will be hosted:**

The interactive learning resource is delivered through a Microsoft Word document, with visual aids through the use of figures. In this interactive learning resource deliverable, a theoretical outline of a more interactive learning resource is outlined below. A key part of this golf swing course is the biomechanics required for a successful golf swing. With learning that revolves around sport and movement, it is very important for both the student and the instructor to be able to visually review the movements of the student. So, while this is an online learning resource, video instruction and feedback of the students performance will be an important part of the learning experience.

The learning for this course will hypothetically be an online platform with written instruction and video review of student performance, hosted on a website. This learning platform will involve written instruction that gives students the material to work on. After being given the opportunity to review and practice the material, the student will film and upload their golf swing to the learning platform. The video then can be reviewed by an instructor and discussed on how it can be optimized to improve performance. The videos can also act as progress to see how the student improves on their swing over time.

Furthermore, the learning materials should emphasize practical application, providing learners with ample opportunities for hands-on practice and self-reflection. Including modified exercises and drills for individuals with physical considerations can ensure inclusivity in the learning process.

- **A description and rationale for the learning theory upon which your resource will be based (behaviorism, cognitivism, or constructivism):**

The learning resource for teaching the mechanics of a golf swing will be designed based on the constructivist learning theory. Constructivism emphasizes active learning through hands-on experiences, interactions, and reflections. In the context of teaching golf swing, constructivism aligns perfectly with the nature of the sport, which demands learners to engage in physical practice to enhance their skills. Instead of simply providing instructions, our resource encourages learners to explore and experiment with various aspects of the golf swing on their own. Hands-on activities will help players grasp the fundamental principles of a successful golf swing in a mechanical and muscle memory way rather than purely instructional. Instructor feedback will be available from the uploaded videos from the student to provide direct feedback. Embracing constructivism in our teaching approach will allow for a deeper understanding of the golf swing, enabling players to develop a swing that caters to their body type and play style. This approach acknowledges the individuality of learners and recognizes that there isn't a one-size-fits-all solution for all golf players.

- **A description and rationale for the learning design you chose (inquiry, project-based, direct instruction, etc.):**

For our teaching of the mechanics of a golf swing to a variety of players, a project-based learning design would be an effective choice. Project-based learning involves engaging learners in real-world, hands-on projects that allow them to explore a topic in-depth and apply their knowledge and skills to solve authentic problems. In the context of teaching the golf swing, project-based learning can provide learners with practical learning experiences on the golf course. Through project-based learning, players can work with players at their local course or individually to analyze their swings, identify areas for improvement, and design personalized practice routines. They can also research different techniques, watch instructional videos, and seek guidance from their coaches to improve their understanding. By taking ownership of their learning and setting their goals, players will develop a deeper understanding of the mechanics of the golf swing and actively apply their knowledge to enhance their performance on the course. This learning design allows for personalized learning experiences, catering to the wide variety of skill levels within different players.

- **Our Rationale:**

Our rationale for developing our learning resource around a golf swing is because not only is it something that each of our group members enjoy doing but we also understand the complexity of the swing and how crucial it is to break it down into the basics for new golfers. This is also true for experienced golfers as there are always areas of improvement for each and every player.

- **Alignment: Subtopics with brief commentary and essential questions about each**

Backswing:



Figure 1: Backswing Phase [3]

The backswing is the most important part of the golf swing, as it lays the foundation for the rest of the swing, including the angle of the clubface and controls the path of the club on the downswing. It is essential to have a straight lead arm and a balanced stance to ensure proper rotation of the shoulders and hips, such that sufficient clubhead speed can be generated through impact. The essential questions about the golf backswing are listed below:

- What are the key components of a proper backswing in a golf swing?
- How does the backswing contribute to generating power and clubhead speed?
- What are the common mistakes to avoid during the backswing?
- How can a golfer achieve consistency and proper sequencing during the backswing?
- How does the length of the backswing affect the overall swing mechanics and shot outcome?

Learning objectives (referenced to the above set of essential questions):

- Identify and explain the key components of an effective backswing in a golf swing.
- Analyze how the backswing contributes to generating power and maximizing clubhead speed.
- Recognize common mistakes and faults during the backswing and describe strategies to avoid them.
- Demonstrate the ability to achieve consistency and proper sequencing during the backswing through practical application.
- Evaluate how the length of the backswing impacts overall swing mechanics and influences shot outcomes.

Transition:



Figure 2: Transition Phase [4]

The transition of the golf swing occurs in between the backswing and the downswing. A proper transition results in the appropriate transfer of energy, where the transfer is initiated by the lower body (hips) and followed thereafter by the upper body. An appropriate transition is essential in order to correctly set up the golfer's biomechanics to achieve the optimal swing path for a powerful and efficient downswing. The essential questions about the golf swing transition are listed below:

- What is the transition phase in a golf swing, and why is it crucial for a successful shot?
- How does the transition facilitate the change of direction from the backswing to the downswing?
- What are the essential movements and positions to focus on during the transition?
- How can a golfer maintain proper tempo and rhythm during this phase?
- What are some common challenges faced by golfers during the transition, and how can they be addressed?

Learning objectives (referenced to the above set of essential questions):

- Define the transition phase in a golf swing and its significance in achieving successful shots.
- Illustrate how the transition facilitates the change of direction from the backswing to the downswing.
- Perform essential movements and attain key positions during the transition phase to optimize swing mechanics.
- Apply techniques to maintain proper tempo and rhythm during the transition for improved shot execution.
- Diagnose and address common challenges faced by golfers during the transition to enhance their performance.

Downswing:



Figure 3: Downswing Phase [5]

The downswing is the final part of the golf swing before the clubface compresses the ball from releasing all of the potential energy built up throughout the wide-arc backswing and proper transition. The downswing is initiated by the lower body (hips) turning, followed by the mid body (core) and finally by releasing the shoulders and the arms. It is essential that a lagging angle between the forearms and club shaft is formed in order to create a higher club head speed at impact when the club is released at impact. The essential questions about the golf downswing are listed below:

- What are the key elements of a well-executed downswing in a golf swing?
- How does the downswing translate into power and maximizing shot speed?
- What are the primary movements and sequencing required for a consistent downswing?
- How can a golfer achieve a shallow or steep downswing path to influence ball flight?
- How can the downswing help improve ball striking and minimize slicing or hooking?

Learning objectives

- List and describe the key elements of a well-executed downswing in a golf swing.
- Evaluate how the downswing generates power and maximizes clubhead speed for greater distance.
- Execute the primary movements and sequencing required for a consistent and accurate downswing.
- Demonstrate the ability to achieve a shallow or steep downswing path to influence ball flight according to specific shot requirements.
- Implement downswing techniques to improve ball striking and minimize slicing or hooking tendencies.

Impact:



Figure 4: Impact Phase [6]

The impact is where all of the potential and kinetic energy formed during the golf swing is transferred to the golf ball through compression with the club head at fast speeds. The trajectory of the golf ball in terms of impact is solely determined by the speed, direction, and angle of the club head. It is crucial to understand these factors at impact, as they are direct results of your swing shape, allowing one to make adjustments to their swing techniques. The essential questions about impact of the golf swing are listed below:

- Why is the impact position considered the most critical moment in a golf swing?
- What are the ideal body positions and alignments to achieve at impact?
- How does the clubface angle at impact affect the ball's trajectory and spin?
- What role does hand and wrist positioning play in achieving a solid impact position?
- How can golfers practice and refine their impact position to enhance ball control and distance?

Learning objectives

- Justify why the impact position is considered the most critical moment in a golf swing.
 - Identify the ideal body positions and alignments to achieve at impact for optimal shot outcomes.
 - Analyze how the clubface angle at impact affects the ball's trajectory and spin.
 - Demonstrate proper hand and wrist positioning to achieve a solid impact position.
 - Engage in purposeful practice to refine and enhance the impact position for better ball control and increased distance.
- **An assessment plan for each of the learning outcomes that you identified:**

Backswing:

- Cognition: as an introduction to learning the backswing, the first step will be introducing the student to the four following topics: How to generate power, backswing length, how to be consistent and mistakes to avoid.
- Observation: a video review of student performance. To review the combination of the topics outlined in the cognition stage, the student will be asked to submit multiple videos, all at different speeds and backswing lengths. This will allow for a comparison of the students' backswing quality at different speeds and lengths. The level at which errors arise can be reviewed and worked upon.
- Interpretation: because the student is submitting multiple videos of their backswing, there will be the opportunity for iterative feedback on the fine tuning of adjustments.

Transition:

- Cognition: the main goal of this learning objective is to introduce the concepts of tempo and rhythm in a golf swing. After achieving this learning outcome, students will understand what good rhythm and tempo looks like for them and what movements and body positioning they need to do to achieve this.
- Observation: the main goal at the assessment stage would be to get the student to feel what good tempo and rhythm looks like. Video review of the student swing, along with interactive instructional video would be used in these stages.
- Interpretation: in the transition, the learning process would be a very iterative one. Feedback on the data gathered in the observation stage would be used for further improvements for the student, and this process would be repeated until there is an adequate comfort level for the student in their ability to understand these concepts.

Downswing:

- Cognition: Similar to the assessment plan of the backswing, the goal at this stage is for the student to learn how to generate power, how to be consistent, how to influence flightpath and how to avoid slicing and hooking. The aspects of consistency and power are secondary goals to flightpath control and slicing/hooking. Those two goals will be analyzed separately, and consistency and power will be used as evaluation for the goals.
- Observation: flightpath is achieved through the path of the downswing. Changes in the approach angle in the downswing influence the flightpath. The assessment stage will ensure that students understand this concept, and further, have the capability to change their approach angle to change the flightpath. For the avoidance of slicing and hooking, students will be expected to identify what in their golf swing causes slicing and hooking when it occurs, and what changes to do on the next swing to avoid slicing/hooking.
- Interpretation: at this stage, the student is expected to know how changes in their golf swing affect the path of the ball, and can identify when these changes occur. So, at this stage, the inferences for the performance assessment would be mostly up to the student, so they can understand where their errors derive from. When they struggle with this identification, the instructor can help out.

Impact:

- Cognition: the learning outcome of the golf swing impact would focus on the golfer's body position, hand position and wrist position at the moment of impact of the golf ball.
- Observation: The method of performance assessment will focus on what key metrics the student needs to keep in mind at the moment of impact. Example metrics are wrist stiffness, hand position, hip movement and shoulder angles. All these metrics are variables that affect the impact of the golf ball and the quality of the swing.
- Interpretation: in this assessment plan, there are a lot of learning parts for the instructor and student to be aware of. The inferences in the assessment plan would be quite extensive to cover all the different body positioning components.

- **List of resources for learners to review:**

- Youtube Video
 - “Exercise Science: Biomechanical Principles In a Golf Swing”
 - <https://www.youtube.com/watch?v=TO13xXT05H8>
- Article: Includes information on each of our subtopics.
 - “Biomechanics of a Golf Swing”
 - <https://studiousguy.com/biomechanics-of-a-golf-swing/>
 - “Biomechanical Analysis of the Modern Golf Swing”
 - <https://seancochran.com/biomechanical-analysis-modern-golf-swing/>
- *Optional:* In-Depth Analytical Report
 - “Basic Biomechanics for Golf - Selected Topics”
 - <https://www.philcheetham.com/media/Basic-Biomechanics-for-Golf-Selected-Topics-by-Phil-Cheetham-2014.pdf>

- **Technology tools our learners need:**

Technology which our learners will need access to will be a golf simulator and a practice net. Utilizing this resource learners can test their new skills and observe real time what works and what doesn't. This resource also allows for learners to progress their skills in a private area as learning to golf can be an intimidating task. We will set up a blog on wordpress which includes the tools that we talk about in the lessons for learners to access at their convenience.

- **An overview of your plans to design for the inclusion of diverse learners you identified in your “ learning context/target audience/learners,” using the UDL Guidelines and specific CAST principles:**

Designing an interactive learning resource on the mechanics of a proper golf swing with inclusion in mind requires careful consideration of the diverse learners in my target audience. By utilizing the Universal Design for Learning (UDL) Guidelines and specific principles from the Center for Applied Special Technology (CAST), we can create an accessible and engaging learning experience for all learners.

Learning Context and Target Audience:

Our target audience consists of individuals with varying abilities and prior knowledge of golf. Some learners may be experienced golfers seeking to refine their skills, while others may be beginners eager to learn the fundamentals of a proper golf swing. Additionally, we must consider potential barriers such as visual or auditory impairments, language differences, and cognitive challenges.

UDL Guidelines:

a. Multiple Means of Representation:

To accommodate diverse learners, our goal is to offer the instructional content in various formats. This resource will include video demonstrations of the proper golf swing with audio narration, text-based descriptions, and visual cues. Closed captions and transcripts will be provided to ensure accessibility for individuals with hearing impairments.

b. Multiple Means of Engagement:

Engaging learners through interactive elements is crucial; thus, we will incorporate quizzes, interactive simulations, and practice exercises to reinforce the learning of different swing techniques. Additionally, learners can choose the level of difficulty for practice activities based on their skill level.

c. Multiple Means of Expression:

Learners will be given various options to demonstrate their understanding of the mechanics of a golf swing. They can choose to submit video recordings of their swings, written reflections, or audio explanations of how they are progressing. Providing these options ensures that each learner can express themselves in a way that aligns with their unique strengths and preferences.

Specific CAST Principles:

a. Provide Options for Perception:

To assist learners with visual impairments, the video demonstrations will be accompanied by audio descriptions, explaining the key movements and positions during the swing. Additionally, visuals will be designed with high contrast and clarity to enhance visibility for all learners.

b. Support Executive Functions:

Clear and concise instructions will be provided at each stage of the learning resource. Learners will have access to step-by-step guides and checklists to help them practice and refine their golf swings effectively.

c. Foster Collaboration and Communication:

An online forum or discussion board will be integrated into the interactive learning resource. This platform will facilitate learner interaction, where they can share their experiences, seek advice, and engage in peer-to-peer learning. They will also be permitted to upload videos and photos of their progress to garner feedback from the instructors and their peers.

d. Promote Self-Regulation:

We will include self-assessment tools and checklists that learners may use to evaluate their progress and identify areas for improvement. Goal-setting activities will empower learners to set personalized learning objectives and track their development over time.

By implementing the UDL Guidelines and specific CAST principles in the design of this interactive learning resource on the mechanics of a proper golf swing, we aim to create an inclusive and learner-centered experience. Regular feedback from learners and continuous evaluation of the resource's effectiveness will allow for ongoing improvements, ensuring that the learning resource meets the diverse needs of all golf enthusiasts.

- **A rationale for your technology choices:**

The technology tools chosen for our golf swing learning resource aim to provide learners with an informative and accessible platform for their learning. The golf simulator and practice net offer a controlled environment for learners to test and improve their abilities. By utilizing these tools, learners can receive real-time feedback on their own swing mechanics, enabling them to identify strengths and areas for improvement. This immediate feedback is vital for skill development, encouraging learners to experiment and refine their techniques.

Additionally, an online platform allows learners to upload videos of their golf swings for personalized feedback from instructors, even outside of scheduled lessons. This asynchronous communication allows for continuous improvement and ensures learners receive individualized attention for addressing specific concerns. The combination of these tools creates an engaging and effective learning experience, empowering learners to progress in their golf swing abilities.

- **Link to Peer Reviews:**

<https://eastkootenayeducator.opened.ca/2023/08/10/feedback/>

- **A rationale for why we did or did not incorporate our peers' recommendations into our final resource:**

- “One small suggestion I’d like to make is referring to “English as a second language (ESL)” as “English language learners (ELL)” instead. The latter is starting to be used more – especially in the field of education – as it is more inclusive of learners who are acquiring a new language.”

We have incorporated this feedback into the areas of our resource that mention ESL.

- “I’m just a little unclear as to whether they will absolutely need access to a golf simulator or not? It’s mentioned that they can simply go to their local golf club to practice their swing but then later it states that a simulator is required. If that’s the case, I would maybe consider mentioning that at the beginning of your resource to make it crystal clear as to what the learners will need from the beginning.”

As access to a golf simulator is highly beneficial, practicing at a driving range has most of the same benefits. Having access to a golf simulator allows players to practice their skills at a

simulated golf course rather than primarily observing distances and ball trajectory at a driving range.

- “Having photos of the details of each swing (like what club to use, what kind of shoes to wear, etc.), would be very helpful and would allow me to follow the instructions better. There are many keywords that I don’t know, so referring to them and explaining it to a beginner would be amazing (I’m sure the videos would have a visual reference and might explain but having this would make it easier to follow).”

Photos of the backswing, transition, downswing, and impact were added to the learning resource.

- “Would you be able to include an image for the four different phases of the golf swing so that I could have a visual to understand what you are referring to? Perhaps a still shot of someone performing these? I like visuals because they help create a mental image that I can refer to while I read.”

Photos of the backswing, transition, downswing, and impact were added to the learning resource.

References

- [1] Bourgain, M. et. al., "Golf Swing Biomechanics: A Systematic Review and Methodological Recommendations for Kinematics," 9 June, 2022. DOI: <https://doi.org/10.3390%2Fsports10060091>. [Accessed on: 22 July, 2023].
- [2] S. Cochran, "Biomechanical Analysis of the Modern Golf Swing," *Sean Cochran Sports Performance*, 8 Mar. 2023. Available at: <https://seancochran.com/biomechanical-analysis-modern-golf-swing/>. [Accessed on: 22 July, 2023].
- [3] H. Haney, "The Correct Golf Backswing from Start to Finish". Golfswing, <https://www.golflink.com/tipsvideos/video.aspx?v=23634>. Accessed August 15th, 2023.
- [4] T. Stickney, "Which of these 6 Downswing Transitions is Right for You" GolfWRX, <https://www.golfwrx.com/366210/which-of-these-6-downswing-transitions-is-right-for-you/>. Accessed August 15th, 2023.
- [5] M.L. Rose, "How to Soften Arms to Create a Lag in the Downswing". Alamo City Golf Trail, <https://alamocitygolftrail.com/how-to-soften-arms-to-create-a-lag-in-the-downswing/>. Accessed August 15th, 2023.
- [6] Golf Loopy, "Golf Swing 502. Downswing: The Perfect Golf Impact Position". <http://www.golfloopy.com/golf-swing-downswing-perfect-impact-position/>. Accessed August 15th, 2023.