KLiC Activity Scenario Template

TEACHER and STUDENTS NOTES

Activity title:

Gymnastics, motion analyses single bar, stride rotation forward

Subject:

Sport Didactics, Gymnastics, Physical Education Teacher Training Programme, 4th semester of

Student age:

>19 Teacher students

Estimated duration:

90 + 90 min

Phase 1 (Stage 1 – 2): 90min (gym/sport hall)

- 20 min: Introduction. Purpose and learning objectives are presented. Brief presentation of the software to be used (KLiC and Skill Capture). Presenting technology tools to be used (laptop, DV Cam, Accelerometers) Grouping. Roles and responsibilities are distributed. Time for questions is given.
- 10 min: warm up + pick and set up equipment
- 15 min/group and "station" x 4 = 60 min

(Stage 3) Between phase 1 and 2 students are required to:

- Download personal video from the Skill Capture Software
- Convert it into a Quicktime file and make a 6 picture sequence (see below)
- Fill in the motion analysis chart (Se below)

Phase 2 (stage 4 – 5): 90 min (classroom with Internet access, computers, presentation tools)

- 15 min: feedback and recapturing
- 45 min: group work to conduct further data analyses and discuss and compare motion analysis chart. Make a short 1 – 2 slide presentation
- 30 min group discussion and presentations of motion analyses

Science content

Sport didactics and biomechanics

The didactic questions form the basis for a critical analysis of the use of technology for measuring acceleration and video feedback

Learning objectives

1. Students should be able to perform a stride rotation forward on a single bar
2. Students should be able to conduct a motion analysis using the Skill Capture System (video recording) to explain the general concept of an ideal rotation
3. Students should be able to explain the significance of the centre of gravity forward displacement.
4. Students should be able to understand and explain the importance of acceleration between the front and rear leg in the rotation.

5. Students should be able to understand and explain acceleration of the movement is expressed in x, y and z-axis by interpreting the graphical interface of the KLIC system together with Skill Capture video recording of the movement.
6. Students should be able to show a deeper understanding of the basics of acceleration in biomechanics by formulating a research question based on acceleration and its impact on the performance of a stride rotation forward
7. The students will be able to critically define the advantages and disadvantages of the use of video feedback and the accelerometers in gymnastics

Inquiry-based character

Stage 1: Work in groups of 6 – 8 students. Allocate roles and responsibilities within the group as shown below:

Roles and responsibilities:
4 Demo gymnasts (DG)
2 Technicians (T)
2 Coaches for spotting (C)

A. Lap top start up with KLiC System Software (T)
B. Apply the accelerometer sensors at the ankle of each foot. Note which accelerometer is placed on right and left foot. (C)
C. Check communication to the base station. (T)
D. Test 1: Execute a stride rotation forward on the

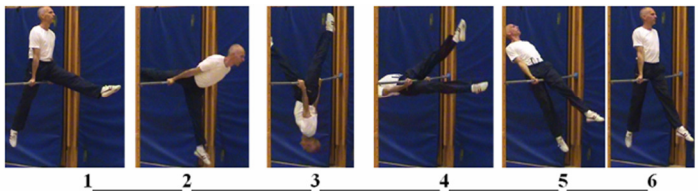


Figure 1 Example of ideal sequence

Definition of phase 1 start and finish (T2-T1=ΔT) of the swing and rotation of front and back leg

Resources:

Skill Capture (open source soft ware):
http://video4coach.com

KLiC system software:

Use various videos on YouTube to acquire understanding of how high bar is used in competitive gymnastics :
i.e:
http://www.youtube.com/watch?v=fUnKGpb27CY&feature=related (Virtual gymnasts)
http://www.youtube.com/watch?v=Ngs4ZWQweLY&feature=related (Olympic 2008)

single bar (DG)

E. Check if Check if adequate data is sampled (T)
F. Start the Skill Capture system (DV Cam and laptop with software. Prepare motion capture in test 2. (T)
G. Test 2: Execute a stride rotation forward on the single bar (DG)
H. Check that videoclip is stored and that KLiC data for acceleration is stored (DG + C)

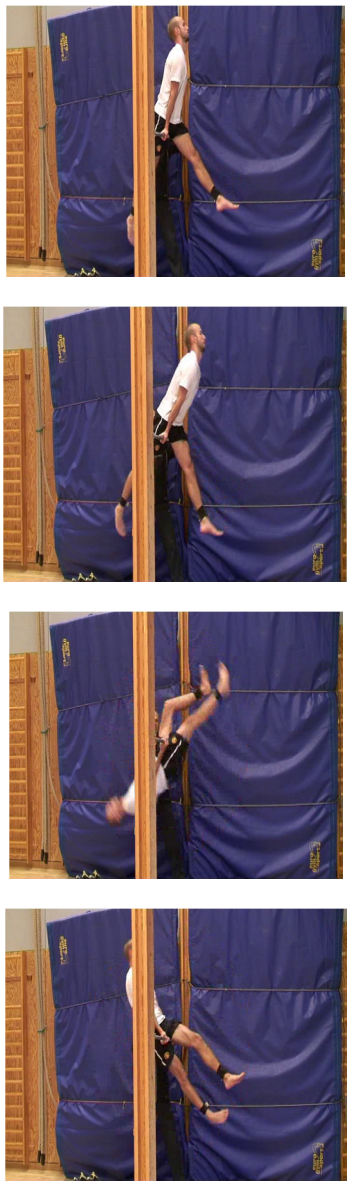


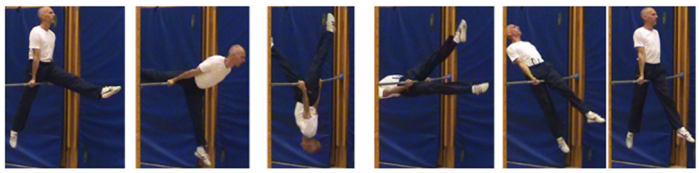
Figure 2 Student wearing accelerometer on left and right foot. Conducting stride rotation forward

Stage 2

Define the lowest common denominator in the movement that contributes to a good technique. Study the Ideal picture sequences. Study the motion analysis scheme and develop one or two appropriate hypothesis i.e.is there any difference at the start and finish in the below parameters?

i. ΔT

ii. Average/peak velocity
iii. Vertical displacement
iv. centre of gravity forward displacement.



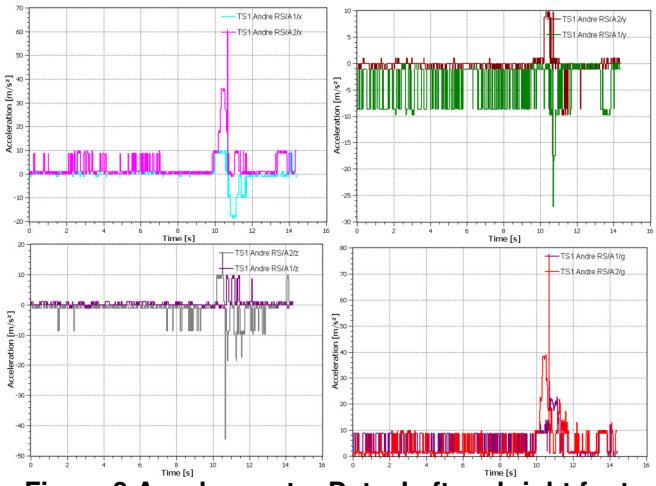
Stage 3 Do home assignments :

- Download personal video from the Skill Capture Software
- Convert it into a Quicktime file and make a 6 picture sequence (see below)
- Fill in the motion analysis chart

Motion Analyses Scheme for students

Analysis points to be highlighted	*Extra training needed for*	*Motion techniques analysis: Describe cause and effect*	*Proposal on oral feedback and assistance exercises*
Body position in starting position (Stride support). Centre of gravity displacement (Fig. 1)			
The initiation of the stride rotation forward			
Center of gravity of the different body segments (torso, legs) and its distance from the center of rotation in the start and middle position (Figure 2-3)			
Rear axle oscillation of the front leg in the swing after the upside down position (bottom-position) (Figure 3-5)			
Body position in the up swing (Figure 4-5)			
Center of gravity of the different body segments (torso, legs) and its distance from the center of rotation in the up swing phase (Fig. 4-6)			
Body position and balance in the final stages of The stride rotation forward (Fig. 6)			

Body Position refers to the body's position relative to the room and / or equipment and posture

Stage 4 Work in groups. Make further data analyses and discuss and compare the motion scheme with KLiC Data and Video sequences. Prepare a presentation (i.e. ppt) with embedded video. Students could, if they whish, add the video clip to YouTube, Vimeo or other open sources.	 **Figure 3 Accelerometer Data. Left and right foot**  Student picture sequence for analyses
Stage 5 Presentation and group discussions. A on-line course evaluation is available for all students with specific question concerning the systems used within this scenario.	Please, visit Vimeo for video demos of student works: Group: KliC Project Direct link: http://vimeo.com/32915599

Applied technology (if any)

Digital video camera

Materials needed

- Laptop with Internet Connection
- KliC system Software
- Setting: Single bar, video camera connected to the laptop (See guide at Skill Capture)

Discussion guide

Type of Learning: Inquiry based learning utilising a collaborative structure with problem solving activities. Construct of questions, data analysis, comparisons
Activity: Collaborative in group
Learning Sequence: Define, explore, discuss, explore, discuss and redefine
Establishing a common understanding- Students are organised into groups and have different roles and responsibilities in a collaborative explorative learning environment.

The experiment: See guidelines for stage 1 - 4
Conclusion, assessment and evaluation- Each group should present their result with following discussions where their future professional role as PE teachers should be put in forefront.

- Technology for enhanced learning and understanding
- Design discussion environment based upon the didactical key questions:
- What, When, Where, Why, How, Who and for whom?

Seven friends I have
for whom I really care
"What?" "How?" and "Why?"
"When?" "Who?" and "Where?"
Seven, aren't they supposed to be?
"Whom?" is missing out on me?

Assessment

On line course assessment for students.

STUDENT WORKSHEET

Activity title:

Motion analyses in gymnastics using single bar: movement to study: stride rotation forward

Introduction

See learning objectives above

Thinking about the question

Se notes above.

Materials needed

Laptop, DV cam, gymnastic single (high) barn

Safety

Routine safety in gymnastics. Mat under bar, Look for suitable cable connection to avoid long cables on the floor.

Investigation

See learning outcomes

Analysis (SWOT)

Technology enhanced learning. SWOT after final presentation

Further investigation

Progression – where, when, what and how?

Assessment

Regular course assessment