# Influence of Guidebow's utilization like kinesthetic tool that improve the learning and the technical perfection on canoeist. A experimental study.


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## Introduction

Learning and technical perfection of the athletes in differents sports, demand a lot of cognitive attention, incentive, external help and a bit of knowledge. So the movement replay, the external feedback (display, reading) and a lot of time are the most ussual elements to learn a technical sport movement.

Guidebow is technical tool who delimit the flexion, extensión or lock the elbow articulation in the angle who trainer or athlete be considerated opportune to optimize his technical movement. In addition, Guidebow has a mechanism that permits feel inside the limit of the movement, providing a internal and momentary feedback to athlete.

The objective of the present study was analyze the effects that produce the use, during one minute, of Guidebow about the technique of spadeful in a kayakergometer.

## Material and Method:

In order to make this study we have 3 canoeist men (between 20-17 years old) and 3 women (between 17-16 years old). The participants and his guardians gave his consent for the realization of this measurings.

We analyze the elbow´s flexion that athlete has assimilated during the shovelful before, with guidebow and after, without guidebow.

We used a kayakergometer and a videocamera at four metres distance, in lateral position to canoeist, perpendicular to kayakergometer and taking like point of reference for the first photo the beginning of the seat in his lower metallic part. The camera is a SONY, model PMW EX3, the size of the image sensor is ½ ¨ optics 5.8-81.2 and focal distance 17mm. We recorded at 25 f.p.s

so we toke three frames on the trot. The recording was produced on the right side of the canoeist.

The analysis of the frames has been registred with kinovea software 0.8.15 Copyright2006-2011- Joan Charmant&Contrib.

## Protocol:

At first, we recorded the athletes without previous contact with Guidebow. After that, we put Guidebow in his arm delimiting the maximum flexion of the elbow in 90· (if you force the flexion, you can get some little degree more). They could make at complete the extension of the arm.

Finally, a third recording whitout Guidebow to confirm the transference. All the action was continuous.

The time of the shovelfuls in each recording was approximately one minute and the researchers notified that they had to shovel in confort.

Afterwards, we used the programme Kinovea to process the images and analyze the frames whit the previous protocol, picking the third first frames when the shovel was passing for the lower metallic point of the seat in the kayakergometer.

We made a stadistical and descriptive analysis of the angles of maxim flexion of elbow in the traction part of the shoveful in a kayakergometer. This analysis be appropiate at same in the three recording made before in continuous.

The hypothesis of normality was analyzed by the test Shapiro-Wilk. A analysis of variance (ANOVA) was used to compare the angles of maximum flexion of the elbow before, during and after the use of Guidebow. If we get a significant *p*-valor to the principal effect of ANOVA, we proceed to realice a comparision for pair(pos hoc) using the correction of Bonferroni to multiple comparisions, fitting the judgement in a valor of 0,016. The analysis of the dates was realised by the computer package SPSS to Windows versión 20(SPPS Inc. Chicago, IL, USA). The analysis of the frames was realised by the software Kinovea 0.8.15 Copyright 2006-2011- Joan Charmant & Contrib.

## Results:

We observed a change of angles on the máximum flexion of the elbow, in the evaluates situations. In the first recording(before the utilization of Guidebow), the angles of flexion were more acute thanks to liberty in the action of the brachial bíceps during the traction, making the propulsive gesture. With the limitation that Guidebow provide, this angles increase and before, the average of the angles in the third recording became to have changes statiscally significant too in comparision with the first situation(table 1).

This dynamic of reduction of angles of the first frame to third, happen in all the situations(before, during and after).

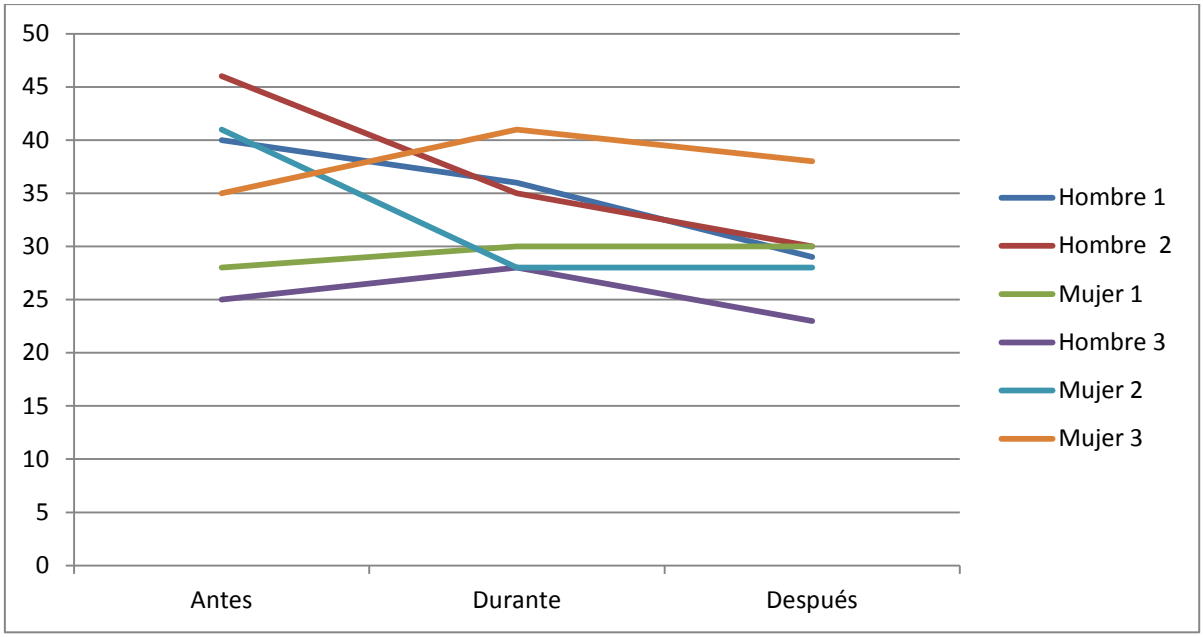
The graphic 1 show the evolution of the angles´s average of the canoeists in each situation. We emphasise this graphic like summary of the flexion angles´s evolution that produce between the first situation and the last (after using Guidebow).

The table 1, among all the dates collect, show the average of the angle that produce like consequence of the three provide frames in each situation. We emphasise this dates in color for you can see with clarity.

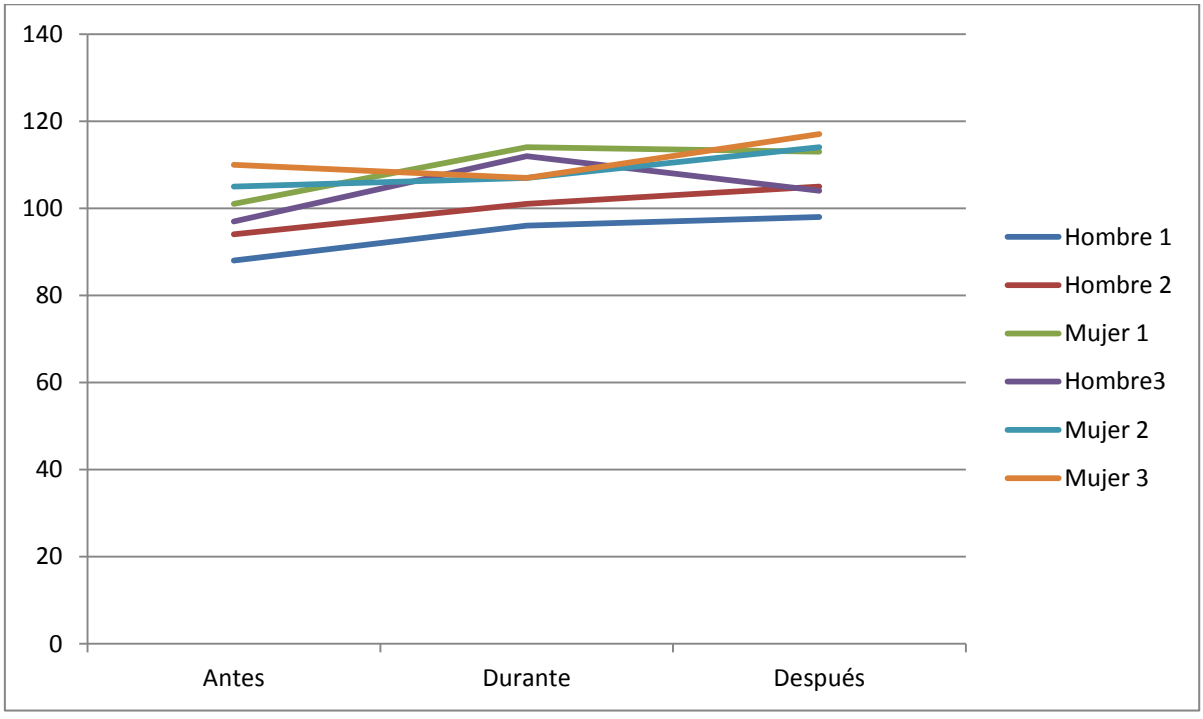
GRAPHIC 1. Evolution of the angles´s average for each canoeist in each situation of the study.(before,during and after).

| | Angles recorded when the blade reaches the seat height the first photo (side image) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Before of Guidebow | | | | with Guidebow | | | | After of Guidebow | | | |
| Canoeists | foto 1 | foto 2 | foto 3 | Media | foto 1 | foto 2 | foto 3 | Media | foto 1 | foto 2 | Foto 3 | average |
| H1 | 109 | 88 | 69 | **88** | 115 | 95 | 79 | **96** | 114 | 97 | 85 | **98** |
| H2 | 116 | 96 | 70 | **94** | 118 | 102 | 83 | **101** | 120 | 105 | 90 | **105** |
| M1 | 116 | 101 | 88 | **101** | 129 | 116 | 99 | **114** | 129 | 111 | 99 | **113** |
| H3 | 110 | 98 | 85 | **97** | 126 | 112 | 98 | **112** | 116 | 104 | 93 | **104** |
| M2 | 126 | 105 | 85 | **105** | 126 | 110 | 85 | **107** | 128 | 114 | 100 | **114** |
| M3 | 128 | 109 | 93 | **110** | 127 | 109 | 86 | **107** | 136 | 117 | 98 | **117** |
| Valores medios | 117,50 | 99,50 | 81,67 | 99,17 | 123,50 | 107,33 | 88,33 | 106,17 | 123,83 | 108,00 | 94,17 | 108,50* |

* $p < 0.016$ respect a situation before of Guidebow.




Graph 1. Comparison of the number of degrees between frames 1 to 3 between the three situations studied (before, during and after).




Graph 2. Evolution of the mean of degrees by each palista in each situation of the study (before, during and after).

## Conclusions:

At first place, we emphasise that according to dates of the table we achieve the premise that we look for prove, about like Guidebow only in a minute have influence in a unconscious way on the athlete for changue the angle of the elbow in his technical movement. Is confirmed in the table like the angle don't coincide in the first situation and in the third so there are here a transference of Guidebow.

The utilization of Guidebow do significant changes in the angulations of the máximum flexion of the elbow, shoveling during one minute in a kayakergometer. This situation indicates that Guidebow could use in real situation on kayak to work technical facet of the canoeist. So the pattern of technical movement so assimilated for athletes, is changeable with the correct utilitation of Guidebow.

At least, in the graphic 1, confirma all the previously exposed, with a general increase of the angles´s average of elbow in the third situation(after of Guidebow) in relation to third situation(before of Guidebow) getting a movement whit less flexion of elbow and more lock of the elbow to implicate the back's muscles that are bigger.

## Gratitudes:

We gratitude the colaboration to Galician Canoeing Federation, to As Torres de Catoira Club and, of course, to all canoeist that with disintered way access to this study.

## Images

Image 1 : Comparative before-after a use during one minute of Guidebow. (Model 1 Man).

Image 2 : Comparative before-after a use during one minute of Guidebow. (Model 2 Man).

Image 3 : Comparative before-after a use during one minute of Guidebow. (Model 3 Woman).

Image 4 : Comparative before-after a use during one minute of Guidebow. (Model 4 Man).

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