

Differential learning in shot put

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Most often the acquisition and improvement of complex movement techniques is achieved by many repetitions of specific exercises in order to reduce the degrees of freedom during the learning process. Such ‚drills‘, in the sense of Dewey (1905), seem to be questionable concerning the extremely small probability of two identical movements (Schöllhorn 1999). In the present investigation the efficiency of a new learning concept which is rather based on differences between two subsequent exercises than on the number of repetitions is compared with a traditional approach exemplarily on a rather “closed movement”: the shot put.

In a pre-post-test-design 2 x 12 students (age: 22.1 ± 3.8) without any experience in shot put participated. Both groups trained four weeks, twice a week. Two and four weeks afterwards 2 retention tests were carried out. The test was a shot put without approach, whereas the post-test was carried out after the 8th training session. From each subject the average of three trials per test was given into the statistical analysis. During the intervention-phase group T trained with a traditional conception based on methodical constant knowledge. Group D trained according to the new conception of the differential learning-approach. In this conception no exercise is repeated at all (appr. 280 exercises in 8 training sessions) and all exercises are trained within the boundaries of possible solutions (Schöllhorn 1999). The statistical analysis was carried out by means of the Wilcoxon and the Mann-Whitney-U-Test.

	1 st week	2 nd	3 rd	4 th week	5 th	6 th week	7 th	8 th week
Training-phase	8 training-sessions				(no training)			
Tests	Pre	-	-	Post	-	Retention 1	-	Retention 2
Group T	6,52m (5,18-7,93)	-	-	6,70m (5,61-8,07)	-	6,51m (5,30-7,90)	-	6,51m (5,39-7,86)
Group D	6,51m (5,36-7,71)	-	-	7,07m (5,76-8,59)	-	7,16m (5,97-8,63)	-	7,23m (5,98-8,58)
differences between the groups	n.s.	-	-	h.s. (p=0,01)	-	h.s. (p= 0,01)	-	h.s. (p= 0,01)

Tab. 1. Representation of the experiment, the test-results and of the statistical differences (n.s.= not significant, h.s.= highly significant)

Due to the comparable starting conditions of both groups, there are clear indications of attributing the significantly better results of the differential learning group in the post and retention tests to the training contents (Tab.1). Whereas the decrease of performance in group T during the retention period can be assigned to memory effects, the most intriguing improvement in group D demands for further research. Overall, the differential learning approach seemed to provoke learning in a literally sense, by not only changing behaviour over outlasting time but even seems to imply learning to learn.

Bibliography:

Dewey, J. (1916) *Democracy and Education*. New York: Macmillan Company.

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