The effect of animated model observation and verbal instruction on motor learning of handstand balance skill

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ABSTRACT: The purpose of this research was to identify the effect of animated model observation and Verbal instruction on motor learning of handstand balance skill. 30 male students (Mean age 21.03 ± 1.7), were assigned in two experimental groups randomly: observation of animated model/ Verbal instruction. Subjects practiced handstand balance skill for three weeks (per week three sessions). Pre test, performance test and retention test was performed in three groups. Subjects' scores get by calculating average scores of two gymnastic referees based on specific norm. The results of ANOVA with repeated measures showed, there is a significant effect of the two methods on learning of handstand balance skill. Also the results showed there is significant difference between the animation model and Verbal instruction groups in re-test. In the whole results suggest observation of animated model is a useful modeling method in learning of handstand balance skill.

Key words: observational learning, animated model, verbal instruction, handstand balance

INTRODUCTION

Teaching of motor skills often involves the use of various guidance techniques such as verbal information, physical guidance, and visual demonstration (model demonstrations or observational learning), (Dallas, et al., 2008). Verbal instruction is one of the most elementary forms of human expression and communication. It is important during the initial phase of motor learning, when an individual is becoming familiarized with the basic movements. It may include descriptions of the basic characteristics of movement, explanations of concepts, rules, inferences, definitions of models and the like. An instruction may be in the form of a conversation, where questions and answers are not determined beforehand. It may also be a discussion, a debate or an argument where different opinions, viewpoints, attitudes, arguments and counter-arguments are put forward. Good instruction is the cornerstone of successful motor learning that most instructors use this method as traditional teaching in various skills instruction (Coh, et al., 2004). Observational learning (modeling) is the process whereby an observer attempts to replicate a behavior that has been demonstrated by another individual (Breslin, et al., 2006). It is commonly held that the acquisition of a new motor skill can be accelerated through observational learning (Hayes, et al., 2010). Observation facilitates learning of a motor skill by permitting the observer to determine the key spatial and/or temporal features of the task, which spares him or her need to create a cognitive representation of the action pattern through trial (Rohbanfard, et al., 2011).

According to Perspective of social cognitive theory (Bandura, 1986) which states that Observer, the skill information is encoding as a symbolic when viewed then Learner can apply this symbolic information to guide done Acts. According to this theory, modeling as a means to convey information about a motor skill (Magill and Schoenfelder-Zohdi). Bandura (1986) suggested that there are four sub-processes involved in observational learning: attention, retention, ability, and motivation. Research has shown that the model attributes such as model skill level, model situation and models similarity and training variables affect on Attention (Hars, et al., 2007). To help a learner in order to acquire of each observational learning processes, there are several common techniques such as using the real model (expert or novice model) and video modeling (movies, animations, and photos). The use of computers for educational purposes has become increasingly common (Ayres, et al, 2009). The development in software capability has introduced the possibility to use pedagogical agents to replace the presence of ‘real humans’ (Moreno, et al., 2001). Animations and video modeling are often designed to information present that involves change over
time, in such a way as to aid understanding and facilitate learning. (Ayres, et al, 2009). Hofflr and Leutner (2007), in a review, was found when the animations were highly realistic and procedural-motor lead to superior learning. Therefore investigation the effect of animation observation as a modeling method is important in motor skills. On the other hand, Comparison of the new method and traditional method of Verbal instruction effects seems important in motor skills teaching. Results of researches in this area are inconsistent. For example, Wilkinson .et al (1999) in volleyball, Siskos .et al (2005) in Physical fitness and Vernadakis .et al (2008) in the basketball shot showed the multimedia computer-assisted instruction (MCAI) tended to be the most effective than the traditional instruction that used from verbal descriptions on learning. Wiksten, et al (2002) and Antonio, et al (2003) Vernadakis, et al (2004) did not obtain such an advantage for computer-assisted instruction. In these researches the animation model is used as one of the parts of computer instruction and effectiveness of this method compared with Verbal instruction has not been separately. Therefore, the researcher intend to achieve more definitive finding about the impact of animation, compared animated model with the traditional method of Verbal instruction Only. So the purpose of this study was the comparison of the effects of animation model observation and Verbal instruction on motor learning of handstand balance skill.

METHODOLOGY

The research sample included 30 students of Islamic Azad university in Ahar Branch (mean age 21.03± 1.7) that had no formal training on learning the skill of handstand balance. Participants were randomly assigned to one of the two experimental groups: animation model, verbal instruction. After groups’ organization, participants completed the pre-test. Subjects were executing six try of handstand balance skill in pretest and Using a Panasonic digital camera (P- 900) were recorded of the subjects performance. Two gymnastic referees scored to the best performance's subject based on the specific norm of gymnastics federation and referees average scores were recorded for every subject. After the pre-test, the subjects practiced the balance skill in their groups for three weeks and three sessions per week (9 sessions). The animation group watched a handstand balance animation in practice phase. Subjects were observed Animation through the laptop Dell 1535 model. In order to provide of handstand balance animation the common methods of animation makes used for. Practice and observation protocol were conducted in form of combination in animation group. Based on This protocol were conducted five exhibitions pre-practice and five exhibitions alternatively to physical effort (one exhibition and 4 physical efforts). Each session includes 10 exhibitions and 20 physical efforts. In verbal instruction group, participants after verbal explanation and verbal feedback was provided by the coach, 20 physical efforts were performance of handstand balance skill. At the end of last session, performance test and 72 hours later, delayed retention test performed as pre-test. Collected data were analyzed with Two-way analysis of variance (ANOVA), with repeated measures on the last factor in α< 0.05.

RESULTS

The score average of groups in per test can be seen in figure 1. Two-way analysis of variances (ANOVA), with repeated measures on the last factor, were conducted to determine effect of method groups (observation of animated model, Verbal instruction) and tests (pre-test, post-test, re-test). A significant main effect was noted for the tests, F(2, 28) = 45.49, p<0.05. Bonfrrony Post hoc test were conducted to follow up the significant test main effect. Differences in mean rating of tests were significantly different between pre-test and post-test, MD = -2.37, p<0.01 and between pre-test and re-test, MD = -1.75, p<0.01. A significant main effect was not for the group, F(1,28) = 2.39, p>0.05. Finally, interaction between group and test was significant, F(2, 28) = 4.92, p<0.05. So t-test was conducted to determine of different in each test. Non-significant different were founded between verbal and animation groups in pre-test t(28) = 0.068, MD = 0.04 and post-test t(28) = -0.623, MD =-0.24, but, difference was significant in re-test t(28) = -3.717, MD =-1.48.
DISCUSSION

The purpose of this research was to identify the effect of animated model observation and Verbal instruction on motor learning of handstand balance skill. The results show that Verbal instruction group conducts to significantly increase on motor learning of handstand balance skill. The study by Cheraghidocheshmeh, et al (2009) confirmed this result. They showed Verbal instruction had significant effect on motor learning distance of hammer and discus throwing. Also this result consistent with Guadagnoli, et al (2002) finding that showed Verbal instruction had significant effect on learning the golf swing. These results can be explained so that Verbal instruction has a positive effect on learning skills. This effect occurs in two forms: influence on cognitive representations of skill and the impact of on the subject's attention to perform the skill. The verbal codes facilitate retention, because they include a great deal of information in an easily stored form (Kampiotis, et al, 2006).

The results show, there is a significant effect of animation observation on motor learning of handstand balance. This result consistent with Wilkinson and et al (1999), Wiksten, et al (2002), Vernadakis, et al (2004) studies that showed computer instruction (animation) influence on sport skills learning. Also the results is adjusted with Arguel and Jamet (2009), Wong, et al (2009) and Ayres, et al (2009) studies that showed animation model observation had significant effect on learning non-sport motor skills such as manipulation skills (completing a puzzle and tie knots) and the technique of first aid.

This finding is in contrast with cognitive load theory (CLT). CLT have argued that instructional animations are generally ineffective because they often create high extraneous loads and the transitory information effects. But consistent with of my findings, Hoffr and Leutner (2007), in a review, was found when the animations were highly realistic and procedural-motor lead to superior learning. Our result supports these finding. Neurological approach proposed that the transitory information effects in animations is less a problem if the learning focus is related to human movement, because of the mirror-neuron system. Mirror-neuron system allow humans to engage in imitative learning (Ayres, et al, 2009)

Results showed that the animation group had better performance than verbal instruction group. Haguenauer and et al (2005) in their investigation has concluded, verbal instruction seems to be ineffective if done in too early the course of learning and if there was visual demonstration. Also Cheraghidocheshmeh and et al (2009) showed video-modeling group had had better performance than Verbal instruction group on motor learning distance of hammer and discus throwing. The results of these studies are consistent with our results. Animation observation could help learners build a more relevant internal representation of the content presented, in such a way as to aid understanding and facilitate learning. Of course, these finding is in conflict with Wiksten, et al (2002) and Antonio et al (2003) Vernadakis and et al (2004) studies. The difference in results is probably the method of instruction. In previous research, computer instruction, including animated models with static images. Static images are likely to cause attention split in the learners and was effective in reducing the performance of this computer training group than verbal instruction.
CONCLUSION

Our results showed that both verbal instruction and animation model lead to improving learning and perform in handstand balance but the range of improving in animation model group was better than verbal instruction group. The study provides evidence supporting an increased role of Educational technology or instructional technology on learning in exercise technical skills in athletes particularly amateur athletes.

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