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Video Demonstration as a Teaching Method

Ivan Vrbik[1] and Andrea Vrbik[2]
[1]*University of Applied Health Sciences Zagreb*
[2]*First Archery Club Zagreb*

Abstract

The advancement of technology and an easy access to it have contributed to everyday use of different technical aids in all aspects of human society as an essential work asset. In the area of education, especially within the area of physical exercise, when a new task is introduced, the most frequently used method is "live" demonstration, which enables smooth information transfer to students. A video demonstration is also very interesting as a means of information transfer. Model learning cannot be considered a simple imitation within a specific area of motor behavior, since it is a process in which a subject observes the model behavior and adjusts it to his/her performance, as a result of interaction (Horn & Williams, 2004). It is an effective method used for learning simple and complex motor tasks. If observation is combined with physical performance of the task, it significantly contributes to the learning of the observed skills (Wulf, Shea, & Lewthwaite, 2010). An expert video demonstration or direct demonstration is the most common way of giving instructions when learning motor tasks (Doussoulin & Rehbein, 2011). The use and practical application of expert video demonstration was confirmed in other areas as well. Research on video demonstration effectiveness in learning different skills, as well as comparison with other ways of learning, has been conducted on different samples of respondents: medical students, nurses, children with developmental difficulties when learning social skills, students with emotional problems in behavior, 12-18 months old children. The main goal of this paper is a review of literature considering video demonstration as a means of information feedback for facilitated learning of certain motor tasks in a particular field of kinesiology.

Key words: *education; new technologies; teaching; students.*

Introduction

The advancement of technology and an easy access to it have contributed to everyday use of different technical aids in all aspects of human society as an essential work asset. That facilitates a faster access to information, exchange of information with others and enhances work productivity. Nowadays, when technology and all its versions are dominant in all aspects of life and are used as a means of work, as is well known to most people and especially to children and adolescents, the question arises: why not use it in all fields of education, including physical education? In the area of education, especially within physical education, for information transfer and familiarizing with the new task at hand, the most common way of introducing a new task is live demonstration. A video demonstration is especially interesting as a means of information transfer. It is widely known that people learn by observing others (Hodges, William, Hayes, & Breslin, 2007), and when describing the process of observational learning, there are several concepts and terms in use. Increased awareness and greater knowledge about effective methods of learning bring us to the question of the validity of the usual methods and the importance of innovative techniques, which are used in order to enhance learning. Numerous techniques have been developed as an additional help for learning and knowledge retention, although only a few studies were found to test the value of these techniques, according to Miller and Gabbard (1988).

Model learning cannot be considered a simple imitation within a specific area of motor behavior, since it is a process in which a subject observes the model behavior and adjusts it to his/her performance, as a result of interaction (Horn & Williams, 2004). It is an effective method used for learning simple and complex motor tasks, and observational practice, if combined with physical performance of the task, significantly contributes to the learning of the observed skills (Wulf, Shea, & Lewthwaite, 2010). One way to transfer information, e.g. introduce a certain motor task, is video demonstration of an expert performing a task. An expert video demonstration or direct demonstration is the most common way of giving instructions while learning motor tasks (Doussoulin & Rehbein, 2011). Magill (1993) and Magill and Schoenfelder-Zohdi (1996) demonstrated in their study that subjects can learn a skill by observing an expert without any kind of additional feedback. Ram, Riggs, Skaling, Landers, and McCullagh (2007) define modeling as an intervention in which an external stimulus is used, such as live demonstration or video demonstration, during which an observer receives a confirmation of the correct performance of a motor task. Boyer, Miltenberger, Batsche, and Fogel (2009) stated that video modeling includes a video clip in which an expert performs a certain motor task and demonstrates it to an athlete or a pupil. Information feedback provides a complete feedback about performance and uses a model as a demonstration of correct performance by which a standard way of learning and retention are being enriched by adding visual component to the verbal

feedback (Buggey & Ogle, 2012). The use and practical application of expert video demonstration was confirmed in other areas as well. Research on video demonstration effectiveness in learning different skills, as well as comparison with other ways of learning, was conducted on different samples of respondents, including: medical students (Dilullo, Coughlin, D'Angelo, Mcguinness, Bandle, Slotkin, Shainker, Wenger, & Berray, 2006; Porte, Xeroulis, Reznick, & Dubrowski 2007), nurses (Grierson, Barry, Kapralos, Carnahan, & Dubrowski, 2012), children with developmental difficulties while learning social skills (Goodwyn, Reid, & Durrant, 2013; Gul & Vuran, 2010; Palechka, 2009), students with emotional and behavioral problems (Goodwyn, Hatton, Vannest, & Jennifer, 2013), 12-18 months old children (Barr, Muentener, & Garcia, 2007), and in rehabilitation (Banz, Bolliger, Colombo, Dietz, & Lünenburger, 2008; Molier, Prange, Krabben, Stienen, van der Kooij, Buurke, Jannink, & Hermens, 2011).

The main objective of this paper was a review of literature considering video demonstration as a means of information feedback for facilitated learning of certain motor tasks in a particular field of kinesiology.

Literature Review

In the literature review search the main goal was to focus on studies which used in their protocol video demonstration of the task as a means of information source in learning certain motor tasks, and in defining the effectiveness of such feedback. For the purpose of better classification, and considering the orientation, the studies are divided in the following way: the studies investigating the effectiveness of video demonstration by a model/expert, studies in which the effects of video demonstration of self-performance and other ways of feedback were explored, as well as the effects of video demonstration as feedback during performance analysis.

The Effectiveness of Video Demonstration by a Model/Expert

Boyer et al. (2009) tested the effects of video demonstration of gymnastics elements by an expert combined with video feedback information of self-performance on the development of three complex gymnastics elements. The results showed that exposure to that kind of feedback enhanced the ability to learn faster than with the coach, and that the gymnasts retained a high level of performance even after the intervention. Hayes, Hodges, Scott, Horn and Williams (2007) conducted a set of three experiments using a bowling element to compare children and adults in order to answer the question about the quality of the information transferred to the subjects during demonstration. They concluded that regardless of the demonstration, adults showed no differences in performance, while in children, who watched point light demonstration, the repetitions of the elements were significantly poorer than of those children who watched a video demonstration. Ishikura (2012) explored the effects of video performance of the moves of the dance choreography by a model, considering

the perspective of observation (front/back). The results showed significantly better results in observing the model from the back, than from the front perspective. Al-Abood, Davids, and Bennett (2001) used a sample of 24.4-year-old men to explore the influence of visual demonstration and verbal instructions on retention in explored movement (aiming with modified dart on the ground). The subjects were randomly divided into 3 groups: the model (video demonstration), verbal and control groups. The model group, in comparison with the verbal group, significantly approached the model, but they did not achieve better results. Horn, Williams, Scott, and Hodges (2005) explored observational learning in students aged 22.5 years, leaning on the model without knowing the result. They performed a new task, kicking the football over an obstacle, while getting different information. The results showed that the video demonstration group achieved better results and their performance was closer to the model demonstration. In 2008, Laguna wanted to find out if the type of the task (simple or complex) used different sources of information among students who were randomly distributed into 12 groups. The results showed that the combination that uses three sources of task-relevant information leads to better spatial accuracy than other combinations, except when applying all models of demonstration. In their study, Guadagnoli, Holcomb, and Davis (2002) explored the efficacy of video feedback information in comparison with the verbal feedback and self-interpretation of performance during golf putt. The results showed that in terms of retention, the groups that received feedback also had better performance in comparison with the groups with self-interpretation of performance, while at the same time the group in which video demonstration was used had the best performance. Emmen, Wesseling, Bootsma, Whiting, and Wieringen (1985) explored the effectiveness of video information on a tennis serve among beginners. During the experiment there were three groups: video model, feedback video information and information of self-performance. The results showed that there were no clear advantages in learning tennis serve among beginners. Hodges, Chua, and Franks (2003) investigated the role of video demonstration for easier observation and performance of the new coordination movement. The group with video feedback showed better results in performance during learning and retention in comparison with the group without feedback. Atienza, Balaguer, and Garcia-Merita (1998) conducted a pilot survey to investigate the effects of video demonstration of performance and visualization of performance of a given activity during 24 weeks, regarding the performance of tennis serve among girls aged 9 to 12. The results showed progress after the application of the video demonstration method. In their own research, Rodrigues, Ferracioli, and Denardi (2010) compared the learning of a complex ballet task using point light demonstration and model video demonstration. The variability between the trunk and the head, coordination irregularities in comparison with the model and time differences of the movement were measured. All measures showed similarities in both groups. Parsons and Alexander (2012) believed that an inadequate jump after the jump in volleyball was

the main reason of the injury of the frontal cruciate ligament in the knee. Therefore, they investigated if giving video and verbal feedback to female volleyball players aged 12-14, could lead to a better jump technique, and to fewer injuries as well. The results showed that more feedback lead to more positive changes in biomechanics of the jump while performing specific athletic skills, and also to relatively simple and economic prevention training at that age. Cheraghidocheshmeh, Yaghoob, Darush, and Mojtaba (2009) conducted a survey with the goal of determining an efficacy of video instructions in comparison with verbal instructions on learning and performing a discus and hammer throw on an outdoor track. The results showed significantly higher results in the distance of the throw (both discus and hammer) in both groups, with video group having better performance and greater shift size than the verbal group. Haguenauer, Fargier, Legreneur, Dufour, Cogerino, Begon, and Monteil (2005) wanted to investigate if giving verbal feedback instructions with video demonstration and task performance enhanced early learning of the complex motor tasks in ice-skating. The subjects had prior knowledge of the skill or several parts of the skill. The subjects were 11 years old and were divided into three groups: two groups received verbal feedback after video demonstration, and the third group was the control group in which only video demonstration was applied. The results showed that verbal feedback combined with video demonstration did not affect their performance. Maleki, Nia, Zarghami, and Neisi (2010) wanted to see the effects of the three different ways of giving information while learning and retention of the gymnastic element. The conclusion was that observing a model video demonstration with verbal instructions helped and enhanced the learning of the element, while observation without verbal instructions had no effect on the learning process. Horn, Williams, and Scott (2002) investigated in their survey the visual strategy of searching while watching a video and point light demonstration by the model, as well as the influence of the mentioned methods of giving feedback on learning enhancement. The task result and movement pattern were monitored. The task was the football kick over the 0.35 m obstacle to a specific area. The groups which observed the model were closer to model performance. The point light group used much more selective visual search than the video group, and both groups became more selective in searching strategy, task observation with the number of trials and duration, and the number of needed observation rounds respectively. Magill and Schoenfelder-Zohdi (1996) investigated how two sources of information, the model demonstration and the knowledge of performance, influence the learning process of a new complex motor task among beginners. The results showed that 22.2 years old female students benefited from video demonstration and that it enhanced the development of the appropriate coordination pattern for complex motor tasks. Miller and Gabbard (1988) compared the effects of additional visual aids on learning the selected tennis skill - the forehand and backhand strokes. The results did not show significant differences between the groups, although empirical evidence suggested that the usage of repeated video and watching of model

video demonstration contributed to better characteristics and could be used for instruction. Doussoulin and Rehbein (2011) wanted to investigate the efficiency of exercising based on an imagery demonstration of a motor performance in comparison with other techniques among elementary school pupils. The survey was conducted on the sample of fourth grade pupils aged 9 - 10, and the task was to run and throw the ball towards a given target using the dominant arm. The results showed enhancement in all groups, but the results in video demonstration group and the imagery group of the motor performance were significantly higher in comparison with the practical group. Vrbik, I., Trklja, & Vrbik, A. (2015) wanted to examine the efficacy of learning based on a model video demonstration in combination with verbal information and the standard method of demonstration by the teacher on the sample of fifth grade elementary school pupils during the learning process of a new volleyball element. The conclusion was that both methods of teaching led to significant enhancement of the performance. Vrbik (2015), in his study, wanted to determine the effect of two different metrical protocols, the standard and the new protocol with video demonstration, on the result assessment while establishing the motor status of the pupils in primary education. The study confirmed the hypothesis that the suggested new protocol with video demonstration of the given motor task lead to significantly better results in comparison with the standard way of testing.

The Effects of Video Demonstration of Self-Performance and Other Ways of Feedback

Zetou, Tzetzis, Vernadakis, and Kioumourtzoglou (2002) conducted a survey with the goal of establishing how two different ways of video demonstration of performance and knowledge of performance affect learning and retention using two volleyball elements (serve and digging). The study was conducted on 11.77-year-old elementary school pupils. The conclusion was that model video demonstration and feedback on performance from the teacher affected the learning in the best way, and these were recommended for further practical use. Jennings, Reaburn, and Rynne (2013) wanted to explore the efficiency of the use of self-video performance among road cyclist beginners during the performance of starting position and self-image of performance. The application of such method affected the enhancement of self-performance and self-image of performance. Baudry, Leroy, and Chollet (2006) in their study investigated if video demonstration of performance in gymnasts can affect the enhancement of double circle on pommel horse. The procedure combined the expert demonstration, self-performance demonstration and the analysis based on the performance data. The study showed that direct video demonstration can help in correcting the performance of a complex motor task. Kelley (2014), in her Master's thesis, explored the influence of video feedback on enhancement of horseback riding among advance beginners. The results showed that video feedback on the performance of a certain task enhances the technique and correct riding position of female subjects,

advanced beginners. Also, a questionnaire was given to the coaches and riders, and the answers showed satisfactory results with this kind of practice in both groups. Benitez Santiago (2011) explored the influence of video feedback information on enhancement of three elements in capoeira. The results showed better performance when video feedback of the performance was used along with the standard practice, and the moves were learned more quickly. Aiken, Fairbrother, and Post (2012) investigated the effects of two different ways of giving feedback to pupils on the element of free throw in basketball. The experiment confirmed the enhancement of motor learning in the group that watched the video of their own performance after any trial they decided on during retention, which also had an impact on the result during transfer.

The Effects of Video Demonstration as Feedback During the Performance Analysis

On a sample consisting of young professional football players, Groom and Cushion (2005) explored how video feedback on their performance and performance analysis affected their performance and performance of the team. The results of the video analysis suggested that such method may be a significant aid in enriching a player's knowledge and understanding of the game, although this method is beyond a simple way of providing feedback. Nelson, Potrac, and Groom (2014) conducted a survey in order to offer a better insight of how an elite hockey player reacts to instructions given by the coach during video feedback on his performance. The results showed that adequate analysis of performance is far from consistent and unproblematic process. The subjects' understanding and respect for the coach affect the way of learning during video demonstration and feedback on performance. Tanaka, Murakami, Kakoi, Wada, and Takahashi (2014) introduced a practice applied in the National Institute of Fitness and Sport in Kanoy, which includes video demonstration during PE lessons. All activities performed during school class were recorded on video. The recorded video was available to the students via e-learning, but was also used as instant video feedback. Based on the stated facts, it can be very useful to use video for enhancement of motor skills and for learning sports skills in students.

Conclusion

The results of the related literature point out a few main facts. Firstly, over the last ten years, the use of video demonstration of motor tasks as a learning aid has been more widespread. Research results (Aiken et al., 2012; Atienza et al., 1998; Boyer et al., 2009; Benitez Santiago, 2011; Cheraghiodocheshmeh et al., 2009; Guadagnoli et al., 2002; Hodges et al., 2003; Horn et al., 2005; Kelley, 2014; Laguna, 2008; Parsons et al., 2012; Rodrigues, Ferracioli, & Denardi, 2010; Zetou et al., 2002) prove that video demonstration has a positive influence on the process of learning specific motor tasks, as well as their retention. Also, in comparison with some other methods, video demonstration helps learners perform new tasks with enhanced results, close to the

model performance. However, some research findings (carried out by Emmen et al., 1985; Hauguenauer et al., 2005; Jennings et al., 2013; Miller et al., 1988) indicate that video demonstration of the task did not lead to better performance and results.

Secondly, most of the research conducted involved students and adults, while little research has been conducted involving primary school children (Atienza et al., 1998; Boyer et al., 2009; Cadopi et al., 1995; Doussoulin & Rehbein, 2011; Hauguenauer et al., 2005; Lirg & Feltz, 1991; Parsons et al., 2012; Vrbik, 2015; Vrbik et al., 2015; Zetou et al., 2002). Thirdly, model video demonstration was applied and its effects were compared with other protocols in learning and retention of certain sports. These include: gymnastics (Boyer et al., 2009; Baudry et al., 2006; Maleki et al., 2010), basketball (Aiken et al., 2012), horseback riding (Kelley, 2014), golf (Guadagnoli et al., 2002; Smith, 2004), tennis (Atienza et al., 1998; Emmen et al., 1985; Miller & Gabbard, 1988), volleyball (Parsons & Alexander, 2012; Zetou et al., 2002), handball (Nahid, Zahra, & Elham, 2013), athletics (Doussoulin & Rehbein, 2011), ice-skating (Haguenauer et al., 2005), football (Horn et al., 2002), cycling (Jennings et al., 2013). In some surveys complex motor tasks were used (Al-Abood et al., 2001; Hodges et al., 2003; Laguna, 2008; Lirg & Feltz, 1991; Magil & Schoenfelder-Zohdi, 1996).

Based on all of these studies, it is obvious that nowadays, in all spheres of social life, technical aids have become imperative. Therefore, kinesiology, with all its fields, is no exception. The use of video demonstration has been confirmed as an effective method of learning in all fields of kinesiology. The video demonstration is time effective and carries a lot of information when model video demonstration is at hand. Also, it enables an easier transfer of information when a teacher or a coach are not capable of, or are not in a position to demonstrate a specific task.

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Ivan Vrbik
University of Applied Health Sciences
Mlinarska ulica 38, 10000 Zagreb, Croatia
ivan.vrbik@gmail.com

Andrea Vrbik
First Archery Club Zagreb
Svetog Roka 16, 10000 Zagreb, Croatia
nea1370@hotmail.com

Videodemonstracija kao način poučavanja

Sažetak

Napredak, pristupačnost i sve veće mogućnosti tehnike doveli su do svakodnevne primjene tehničkih pomagala kao sredstava za rad u svim područjima društvenog života. Prilikom prijenosa informacija, odnosno upoznavanja s novim zadatkom, osobito kod tjelesnog vježbanja, najčešće se koriste opis i „živa" demonstracija. Posebno je zanimljiva sve veća primjena videoprikaza (videodemonstracija) kao načina prijenosa informacija. Učenje promatranjem modela ne može se smatrati jednostavnom imitacijom unutar specifičnog prostora motoričkog ponašanja, već je to proces u kojem ispitanik promatra ponašanje modela i u interakciji ga prilagođuje vlastitoj izvedbi (Horn i Williams, 2004). To je djelotvorna metoda učenja rješavanja jednostavnih i kompleksnih motoričkih zadataka, a promatranje izvedbe, ako je povezano s izvođenjem zadatka, značajno doprinosi učenju promatranih vještina (Wulf, Shea i Lewthwaite, 2010). Videoprikaz izvedbe eksperta ili izravna demonstracija najuobičajeniji je oblik davanja instrukcija tijekom učenja motoričkog zadatka (Doussoulin i Rehbein, 2011). Uporabu i praktičnu primjenu videodemonstracija ima i u drugim područjima. Istraživanja učinkovitosti videodemonstracije prilikom usvajanje raznih vještina provedena su kod studenata sestrinstva, kod učenja socijalnih vještina, najčešće kod djece s poteškoćama u razvoju, studenata s emocionalnim poteškoćama i poteškoćama u ponašanju, kod djece u dobi od 12 do 18 mjeseci, i kod djece koja su u postupku rehabilitacije. Cilj je ovog rada prikazati istraživanja u kojima je primjenjivana videodemonstracija kao način pružanja informacija za olakšavanje usvajanje određenih motoričkih zadataka u pojedinim poljima kineziologije.

Ključne riječi: *edukacija; kineziologija; nove tehnologije; poučavanje; učenici.*