

The Application of Multimedia in Promoting Players' Learning of Soccer Skills

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Abstract Recommending a particular learning tool often requires proper consideration of its effectiveness to the context of learning. Much attention has been devoted lately to the potential of multimedia utilization in promoting players' skill development. This is because regulating the learning process of certain skill with the animation of its characteristic would help acquire the knowledge for performing it. Hence, this paper reviews the current learning practices based multimedia to help us understand its feasibility for learning soccer skills.

Keywords Life-Long learning, Soccer game, Sport education, Psychomotor theory, Multimedia learning

1. Introduction

The use of different multimedia elements into the learning and teaching of sport has opened the doors for further considerations of its effect on players various dimensions. Since psychomotor learning links between cognitive functions and physical movement, multimedia elements such as video can be used as an extension for boosting the learning of skill [1]. Soccer skills such as technical, tactical, physical skills can be administrated based on the actions in fine motor skills in terms of using precision mechanisms for the purpose of increasing motor skills such as athletic performance [2]. It consists of different domains such as organization, adaption, complex overt, mechanism, guided response, set, and perception. Soccer is amongst the most thoroughly researched area in sport education, which often directly studies the soccer learning development based on examining the potential of training sessions. Soccer analysis includes, analyzing the physiological demands on players in the course of training along with match, and strategies regarding acquisition associated with skill along with interventions to maintain skill efficiency [3].

However, enhancing soccer player's skills requires deep understanding of the process for acquiring it by addressing the lack of knowledge associated with the action of that skill [4]. As such, some technical and tactical skill in soccer game requires multimedia to help clarify the sequence of movements involves in performing one action [5].

The limited focus in literature of using certain segmentation techniques into the presentation of multimedia

content has led to gap in understanding its effects on developing soccer skills. This is because incorporating segmentation principle to learn soccer skills would offer the necessary conditions for acquiring, rehearsing, or enhancing a physical skill whereas motor movements of the body are not necessary required. Hence, building soccer player's mental practice with multimedia use can offer alternative mental imagery, mental rehearsal, symbolic practice, and implicit practice confirmed by many previous researchers [6]. This mental practice can be delivered to players in video format that combines visual and sound. In all cases, Hsu and Lu [7] stated that players can experience a state of concentration from the exploratory behaviour to the details in which it help them to build the essential cognitive state during the player's engagement with learning activity. Based on this, segmented video can act as a representation method for alerting cognitive state of players to be motivated based on the concept of mental practice. Practice is different from learning in which players are required to reflect their knowledge into the field through a problem or activity.

Current research in sport education highlighted the need for effective mental imaginary for obtaining effective mental practice to enhance the learning of psychomotor skills [8, 9]. Through soccer match, the player needs to manage to read the opponents' motives and perform the best technique to achieve better control and conquer opponent's actions. Research on superior efficiency indicates that lots of elements from the cognitive skills, decision making along with motor expertise strongly influence activity, especially with sport tasks through which individuals are necessary to temporal and spatial restrictions [10].

On the other hand, the design of multimedia applications to learn soccer skills must be flavored with the main movements of that skill. This can be reasoned to that the role of players' movement differs from one position to another

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Published online at <http://journal.sapub.org/sports>

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based on the nature of the task [11]. As such, we highlighted the role of multimedia tools in sport education in the next section.

2. Multimedia in Sport Education

Presenting the movements of a skill using multimedia elements can contribute to the development of players' ability to perform it in the field. Physical education teachers nowadays are becoming more familiar with the use of computer aided multimedia applications as a mean for enhancing students learning performance [12, 13]. Lvhua [14] acknowledged the effectiveness of using multimedia tools to assist 10th grade students to research their football game strokes by using biomechanical principles via measurement in movement. In addition, other studies like Leser, et al. [15] examined how multimedia technology impacts individual learning performance in the area of sport to which it linked to the player cognitive skills to process information and take actions in changing situation. However, little is still known on how such intervention impacts student outcomes in the motor domain. Only some studies on motor skill learning with emphasis on multimedia use were published so far. For instance, Chu and Chen [16] offered the use of multimedia applications in physical education and sport learning. They acknowledged the needs for more efforts on design and development of the contents of multimedia that sufficiently represent the connection between cognition and skill performance on motor learning.

Vernadakis, et al. [17] investigated the effect of multimedia computer assisted instruction, traditional instruction and combined instruction methods on learning the long jump event. The combined method tended to be the most effective for cognitive learning and skill development, whereas pure multimedia computer assisted instruction resulted in significantly lower skill test scores than the other groups. Later, Vernadakis, et al. [18] studied student attitude and learning outcomes of multimedia computer-assisted versus traditional instruction in basketball. They found that students had significant differences in learning the skills of shooting and changing position with the multimedia aid.

After all, our review of the literature yield on some evidence about the potential of videos in promoting player's learning of soccer skills. In order to gain more insights about this, we explored the past research related to multimedia utilization in sport education in the next section.

3. Previous Studies

Multimedia-assisted teaching and learning have become standard forms of education. In sports, multimedia material has been used to teach practical aspects of courses, such as motor skills. Leser, et al. [15] explored the potential of multimedia technology in effecting players learning based on motor skill acquisition. A total of 35 students were used in a university soccer class who separated into two groups. The

first group was taught traditionally with no assistance of multimedia while the second group was taught with multimedia-assisted instructional units. The authors considered the ability of players to perform a specific passing test and a tactical assessment. They assessed the potential of multimedia by using questionnaire. The result showed no significant differences, neither concerning the results of the technique test nor concerning the tactic test. However, the results of the questionnaire showed a positive agreement among the participants in the usability and assistance of multimedia for the sports practical course.

Lonsdale, et al. [19] examined the main psychometric properties in cross-cultural context. They used the Perceived Locus of Causality Questionnaire (PLOCQ) and the Situational Motivation Scale (SIMS) for assessing soccer motivation and perception based on the main concept of self-determination theory and are commonly employed in physical education research. The authors asked 300 secondary school students from the United Kingdom and 342 from Hong Kong to respond to the questionnaire. The analysis result showed that students' motivation and perception were highly associated with self-determination theory regarding the internal consistency of the external and introjected regulation PLOCQ items in the HK sample. The author also noticed that soccer regulation and intrinsic motivation were not distinguishable in either culture in either questionnaire. They also addressed the possible difficulties in the measurement of contextual and situational motivation in HK Chinese students in which the authors called up for need to conduct more research to understand how students from different cultures respond to items intended to tap controlling forms of motivation.

Cox, et al. [20] conducted their study to highlight the potential of perceptions to self-determined motivation in physical education. They deeply examined the perception of teacher based on the aspects related to their perceived emotional support. They also investigated how such aspects correlate with the peer in terms of acceptance, friendship quality and their impact on feelings of relatedness, motivation, and affective responses in junior high physical education students. A total of 411 were used to do so whereas the result showed that perceived relatedness mediated the relationship between variables and self-determined motivation and related directly to the amount of enjoyment and worry students experienced. Having this in mind, the authors also acknowledged that possible relationships with both teachers and peers are important for students' relatedness perceptions, motivation, enjoyment, and worry in physical education.

Zacks and Tversky [21] explored the effect of different interface design and the way for organizing information on user learning. They explained the role of cognitive principles from basic theory and research in which they viewed cognitive design principles from 2 domains, event cognition and media, were applied to the design of interfaces for teaching procedures. They illustrated that effects of media, adding appropriate graphics to text instructions can be used

in order to enhance users' learning and memory. This include structuring the content in a way that ensure user's understanding which found to be supported by assembling a musical instrument and building a model. Although both top-down principles were effective in guiding interface design, they were not sufficient. As such, the authors suggested that future research should look at the effects of such principles in other domains.

Cairncross and Mannion [22] Investigated the role of applying sequential model of motivation in soccer. A total of 379 players were used to assess this potential. Authors considered examining autonomy-support, need satisfaction, motivational regulation, and enjoyment/boredom. The authors reported support for a link between autonomy-support from coaches and the satisfaction of the basic needs. The research revealed that if considering the players viewpoint, players can be easily take suitable decisions whereas it can enrich coach control of players' feelings of autonomy, relatedness as well as competence. They also addressed the fact that satisfaction was positively linked to more self-determined types of motivation. study by Castagna, et al. [23] was found to support such findings to the sport domain, showing that the behavior of a coach appear to be associated with need satisfaction, allowing for more self-determined motivational regulations.

Ntoumanis and Standage [24] investigated the relationship between players' autonomy-supportive environment and need satisfaction to indirectly predict sportsmanship based on the level of motivation gained throughout the learning stages. The authors suggested that such relations can be predicted by motivation due to the athletes being more likely to play by the rules, as they wish to enjoy the activity and hold some intrinsic interest towards it. Other aspects related to players' feeling and emotion were found not necessarily impact players skills.

Álvarez, et al. [25] used the foundation of self-determination theory to investigate the sequential relationships between perceived autonomy support, psychological need satisfaction, self-determined motivation, and enjoyment/boredom. The mediational roles of psychological need satisfaction and self-determined motivation claimed to influence enjoyment and boredom by the authors. A total of 370 young male soccer players were participated in their study to examine the proposed model. Total mediation was supported in the case of the psychological need satisfaction in the relationship between autonomy support and self-determined motivation, and partial mediation for self-determined motivation in the links between psychological need satisfaction and enjoyment (positive) and boredom (negative). This relation can open the door for new research to determine the effect of motivation in improving players' ability to perform better.

Khacharem, et al. [26] studied the potential of using multimedia tools like animation on soccer players' performance. They conducted two experiments to determine how animation of play (soccer) should be designed in order to avoid the high cognitive load due to the fleeting nature of

information. For this purpose, they used static pictures and altering the animation's presentation speed in order to offer players effective way for reducing their cognitive load. Players in the first scenario were introduced to decide the impact of static vs. animated presentations on learning. The experiment results showed that novices benefited more from the static presentation whereas experts benefited more from the animated presentation. Meanwhile, players in the second scenario were asked to decide the impact of low vs. normal vs. high levels of presentation speed on learning. The experiment result showed that novices profited more from the low presentation speed while experts profited more from the normal and high presentation speeds. This implies the effect of multimedia in improving novice players understanding of game. Hence, it can be concluded that multimedia provides the interactive elements essential for engaging in a learning task. This engagement is believed to be the main driver of players' interest to learn the skill by watching paying more attention to the movements associated with that skill.

4. Suggestions

Some suggestions are proposed in this paper related to the utilization of multimedia elements to learn soccer skills. These are:

1. Embedding the characteristics of a skill by coordinating the movement of an actions.
2. Increase players' control of the presentation by isolating the skill into segments.
3. Consider more than one multimedia elements when introducing complex learning activity.
4. Ensure a reasonable length of media when describing the tactical skills which involves more attention by players to understand the constant actions among group of players.

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