PROMOTING SECONDARY SCHOOL STUDENTS' LEARNING OF SOCCER SKILLS THROUGH SCIENCE PROCESS SKILLS

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Abstract

Science is important to the world today and also to the future. However, the use of different skills in teaching and learning of Sport can help learners to take responsibility for their learning. Soccer is among the most thoroughly researched areas in sport education which often includes among other things, the physiological demands on players as well as skill acquisition and interventions to maintain such skills. Consequently, enhancing players' skill which can be tactical, technical and physical requires thinking procedures which is available by science process skills. Therefore, this study suggests science process skills acquisition by these future soccer players to develop effective mental attitude and aptitude during training. This is a quasi-experimental study that made use of Science Process Skills Assessment Procedure (SPSAP) to check for the impact of science process skills on soccer players. The study involves the Eight (8) public secondary schools in Ikere local government area of Ekiti State. Four (4) of the schools were randomly selected and their football team was also considered as the main sample of the study while the first eleven (11) of each school formed the subjects of the study. In all, forty-four (44) junior secondary school students participated in the study. The four (4) schools were randomly assigned to two experimental and two control groups. Pre-test was administered and the experimental groups were trained with the aid of science process skills while the control groups were trained based on traditional football training sessions for eleven (11) weeks. Thereafter, the two (2) groups were made to engage in football competitions and the posttest was administered. The three (3) research hypotheses generated for the study were tested using T-test statistics to determine whether there is a significant difference between the means of the groups in acquisition and demonstration of science process skills while ANOVA statistics were used to compare variation in the mean scores obtained and the source of variation where exists. The result of data collected on the pre and posttest basis revealed significant differences in the mean scores of the groups, also those in the treatment group performed better in practice. It was therefore recommended that schools and clubs soccer teams should adopt the use of science process skills to enhance soccer skills acquisition in Nigeria.

Keywords: Science, Sport, Soccer, skills, Attitude, Education

Introduction

Science is an important part of human activity and it will continue to advance and affect human life through discoveries, innovations, and inventions. Moreover, science is everywhere and it helps us to keep our environment changing for a better future and to live cleverly with the changes that take place within ourselves and our environment. Furthermore, science holds

our lives together and explains everything from why what goes up must come down, to why we need oxygen to live.

However, like any human endeavor, science affect changes that evolve in sports over time by the provision of better kit made with loftier materials, better information about nutrition and training, and improvements in records generation as well as analysis that can help in pushing the limits of athletic fitness. Globally, according to Ahmadi (2010) and Woods (2011) sports form a vital part of the society's culture, and participating in sports is an important aspect of every child's development that has many benefits such as social co-existence, community development, financial gains, and international unity.

Moreover, sports improve the health status of participants and as well foster the acquisition and development of fundamental skills that are important in real works of life. Sports are platforms to encourage participants to develop life skills that are useful universally (Woods, 2011). These skills were classified by Obanya (2014) as hard skills, such as; self-expression, logical reasoning, computational, manipulative and conceptual while, soft skills are, character formation, intra-personal, life-long and perseverance, and go-getting skills which involves, creative thinking, ideational fluency, opportunity seizing, experiential learning, and idea-to-product skills.

Similarly, sports bring about the development of self-image and confidence although, with the numerous benefits of sports, it also has some negative effects which can be avoided more often than not by skills. However, the impact of science on learning and teaching of sports suggests further considerations of its effects on players' learning of soccer skills. The sport of soccer also known as football according to Nelson (2020) is considered to be the world's most popular sport. Soccer is played by two teams of eleven players on a large grass field with a goal post at each end. The object of the game is to get the soccer ball into the opposing team's goal post. However, the key to soccer is that, except for the goalkeeper, players cannot touch the ball with their hands, but they can only kick, knee, or head the ball to advance it or as well score a goal.

Soccer is played at all levels throughout the world from small children leagues to professional and international teams. Soccer is one of the most-watched events in the world, and perhaps the most famous soccer tournament is the World Cup which takes place every four years in a competition among countries all over the world. Soccer game is interesting and competitive, and so popular because it only takes a ball and a flat open area to play. Also, children throughout the world will make up fields and goal posts just about anywhere and start playing the game. Soccer according to Mack (2011) is a great form of exercise that teaches the development of teamwork, physical and social skills and also, a good test of dexterity and a great way to learn balance. Therefore, many people consider soccer at its highest level to be so beautiful as to be practically an art with skills at which great players and great soccer teams work the ball, strategize, and flow as one can be an awesome thing to watch. Soccer is the biggest global sport and it is a fast-growing multibillion-dollar industry (Park & Huh, 2017). Soccer is a well-researched area in sport education according to Mitchel, Oslin and Griffin (2013), and mostly it is to focus on physiological demands of players in the course of training even at contests, as well as the acquisition of associated skills with interventions to sustain

the skills. Players spend most of their time in practice to improve skills because the acquisition of soccer skills is central to the spectators' pleasure and the attainment of expertise in the game (Williams & Hodges, 2005). However, soccer skills according to Al-Asadi and Bin Umar (2016) could be technical, tactical, and physical which as such will require scientific thinking to develop.

Scientific thinking and decision making consist of the science process skills which improves learning at any rate (Yumuşak, 2016). Also, they are set of broadly transferable abilities that are essentially practiced to understand how scientists investigate and answer their questions about nature. However, Santos and David (2017) claim that science process skills are tools that scientists use to do science and could also be useful in training children to develop their talent and be relevant in a world of uncertainty. Similarly, Mandor (2002) posits that science process skills have an added quality of contributing to the learners' abilities to explore their environment, answer questions, and solving challenging problems.

Science process skills range from basic to complex and it has been classified by scholars (Padilla, 2011; Zeidan & Jayosi, 2015; Ekon & Eni, 2015) as basic science process skills which includes observation, communication, classification, measuring, inferring and prediction while integrated science process skills are controlling of variables, operational definition, hypothesizing and testing, data gathering, and Interpretation, experimenting and Modelling. However, when students are encouraged to use science process skills, they are indirectly developing skills that they will use in the future in every area of their lives. Therefore, this study investigated the possible impact of science process skills on learning of soccer skills among secondary school students in Ikere local government area of Ekiti State.

Research Hypotheses

HO_1. There is no significant difference between the mean scores of the treatment groups during practice.

HO_2. There is no significant difference between the mean scores of the control groups during practice.

HO_3. There is no significant difference between the mean scores of the treatment and control groups during practice.

Research Design

This is a quasi-experimental study that employed Science Process Skills Assessment Procedure (SPSAP) to check for the impact of science process skills on soccer players.

Research Instrument

The instrument is a seven steps cycle of practice which involves;

Step 1: Instruction on skill acquisition

Step 2: Identification/description of science process skills

Step 3: Demonstration of skills (basic science process skills)

Step 4: Record of findings

Step 5: Review of findings

Step 6: Analysis of findings

Step 7: Feedback/Instructions

The six (6) basic science process skills; observation, communication, classification, measuring, inferring, and prediction were used in this study as the pre-requisite for integrated science process skills. The instrument was adapted from Chabalengula, Mumba, Hunter and Wilson (2009) with its scoring from 0 to 3 where 0 = not applicable, 1 = cannot demonstrate but needs more instruction and practice, 2 = demonstrate but with limited proficiency and so needs

more practice, and 3 = proficient performance. In other words, every participant can score as low as 0 and as high as 18 at every rating. The instrument was subjected to content validity with the help of experts in the field of measurement and evaluation. The reliability of the procedure was determined by trial testing of the instrument on a non-participating football team from a school within Ikere local government area of Ekiti State. It has a reliability coefficient of 0.85, which is consistent for the study.

Population and sample

Participants were chosen from the Eight (8) public secondary schools in Ikere local government area of Ekiti State. Four of the schools were randomly selected and their football teams were also considered as the main sample of the study while the first eleven (11) of each school formed the subjects of the study. In all, forty-four (44) junior secondary school students participated in the study. The four (4) schools were randomly assigned to two experimental and two control groups while the Pre-test was administered. The experimental groups were trained with the aid of science process skills while the control groups were trained based on traditional football training session for eleven (11) weeks. Thereafter, the two (2) groups were made to engage in football competitions and the posttest was administered.

Results of Findings

HO_1. There is no significant difference between the mean scores of the treatment groups during practice

Table 1: Independent T-test statistics of pre-test and posttest mean scores of treatment groups during practice

Group	N	Mean	SD	Df	t-Cal.	t-Crit.	P
A	11	12.42	2.98				
				23	2.042	0.980	0.000 (p<0.05)
B	11	13.19	3.54				Sig
Total	22						

Table 1 revealed that the mean difference of 13.19 and 12.42 shows a significant difference between the mean scores of the treatment groups during practice. It was further confirmed by (t-Cal = 2.042 > t-Crit =0.980), (p<0.05), and so concluded that there was a significant difference between the mean scores of the experimental groups during practice.

HO_2. There is no significant difference between the mean scores of the control groups during practice.

Table 2: Independent T-test statistics of pre-test and posttest mean scores of control groups during practice

Group	N	Mean	SD	df	t-Cal.	t-Crit.	P
A	11	9.84	1.189				
B	11	10.71	1.260	21	1.853	0.980	0.001 (p<0.05)

Total	22			Sig.

Table 2 revealed that the mean difference of 10.71 and 9.84 shows a significant difference between the mean scores of the control groups during practice. It was further confirmed by (t-Cal= 1.853 > t-Crit =0.980), ($p<0.05$), and so concluded that, there was a significant difference between the mean scores of the control groups during practice.

HO_3. There is no significant difference between the mean scores of the treatment and control groups during practice.

Table 3: Analysis of variance showing the mean scores of the treatment and control groups during practice

Group	N	Mean	SD	Sum of Square	df	Mean Square	F	P
Experimental	22	33.09	1.688	1977.841	1	1977.841	465.137	0.000 Sig.
Control	22	19.68	2.378	178.591	42	4.252		
Total	44			2156.432	43			

Table 3 presents the analysis of variance statistics showing the mean difference between the experimental group (2.37), the control group (1.68). It was further confirmed by ($F(1, 42) = 465.137$, $P=0.000 < 0.05$). Consequently, there was a significant difference between the mean scores of the experimental and control groups during practice.

Discussion

Results of the independent T-test statistics show a significant difference between the means of the experimental groups, and between the means of the control groups during the practice of soccer skills. Also, the analysis of variance revealed a significant difference between the mean scores of the treatment and control groups during the practice of soccer skills. However, the outcome of this research confirms the ability of science process skills to improve the learning of skills to be relevant in the twenty-first century (Santos & David, 2017).

More so, the game of soccer is an opportunity to exhibit transferable skills like the science process skills which includes observation, communication, classification, measuring, inferring and prediction while integrated science process skills are controlling of variables, operational definition, hypothesizing and testing, data gathering and Interpretation, experimenting, and Modelling (Padilla, 2011; Zeidan & Jayosi, 2015; Ekon & Eni, 2015).

Science process skills improve learning and as well give opportunities to be actively involved in learning. More so, Safaah, Muslim, and Liliawati (2017), claims that activities that are designed with science process skills seems to be reliable, repeatable, and meaningful. Therefore, this research further confirms the submission of Yumuşak (2016) that science process skills are based on scientific thinking and decision making which is capable of improving learning at any rate.

Conclusions

This study aligns with many benefits that soccer players can gain in their active involvement in the game. Moreover, training with science process skills enhances the players' attitude, and aptitude in such a way that they develop self-confidence and improved social skills in training to have control of soccer events. It was concluded that players in the treatment group performed better in practice.

Recommendation

Based on the findings, it was therefore recommended that schools and clubs soccer teams should adopt the use of science process skills to train prospective soccer players in order to enhance soccer skills acquisition in Nigeria. More so, science process skills can be combined with school curricular to stimulate learners' talent in order to be relevant in a dynamic world.

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