

# The Availability and Utilization of Information and Communication Technology for Officiating Sports in Nigeria

**Aribamikan Collins Gboyega**

Department of Human Kinetics and Health Education, Bamidele Olumilua University of Education, Science and Technology, Ikere Ekiti, Nigeria

**Email address:**

[aribamikan.collins@bouesti.edu.ng](mailto:aribamikan.collins@bouesti.edu.ng)

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**Abstract:** In the developed world's sports industry, the use of information and communication technology (ICT) for officiating sports has acquired widespread acceptance and use. However, the level of availability and utilization of ICT by sports officials in Nigeria while officiating sporting events in Nigeria was observed to be low. In light of this, the purpose of this study was to investigate the availability and use of ICT for sports officiating in Nigeria. The investigation was carried out using a descriptive survey research technique. The study focused on a total of four thousand (4,000) sports administrators in Nigeria, with eight hundred (800) respondents being sampled. Seven (7) states plus the Federal Capital Territory (FCT) of Abuja were chosen for the study using a purposive sample technique, totaling eight (8) states. One hundred sports officials in each state were selected through a simple random sampling technique using balloting without replacement. Only seven hundred and twenty six (726) respondents who duly completed the instrument were included in the study. The mean and Product Moment Correlation Coefficient (PPMC) were used to analyze the data. It was found that ICT equipment were not available for sports officiating and that availability would lead to the utilization of equipment for officiating. Based on the conclusions, it was therefore recommended that ICT equipment for sports officiating should be provided in all sports through government funding, private and corporate sponsors and sports federations in Nigeria for sports officiating to move to digital instead of analogue. ICT equipment for Sports officiating could be improvised for use to provide for sound officiating and accurate judgments during sports competitions.

**Keywords:** Officiating, Sports, ICT, VAR

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## 1. Introduction

Sports are organized competitive activities that include substantial physical exertion or the use of rather complex physical abilities by participants who are driven by personal satisfaction and external incentives [13]. Activities that require competition, use of physical skills and observance of rules and regulations cannot be viewed only as play or recreation, as the description also fits into professional sports where participants earn their living. Along with this development, athletes, coaches and officials earn their living through the activities they engage in the various sporting outfits. It is in this respect that sports officiating comes into play. In the context of the explanation above, sport

officiating, therefore, is the act of enforcing the rules and regulations guiding games and competitions to bring about an excellent performance and personal fulfillment on the part of the competitors, joy and happiness on the part of the spectators. The wave of information technology blowing across the world cannot be under estimated in every sphere of life, from tourism to governance, to marketing and sports officiating. It has made the world become a global village, in which, with the tap of a button on the computer, data is readily made available on any issue per time. This has greatly made work hitherto cumbersome less strenuous and motivating for those who are compliant [4]. ICT facilities that could be used to facilitate sports officiating include computers, projectors, CD-ROMs, digital cameras, internet,

World Wide Web (www), fax machines, email, telephone, multimedia, photocopiers, and scanner, electronic scoreboard, wind gauge apparatus, earpiece, video assistant referee (VAR), hawk eye, photo finish equipment and so on. The projector and large television screens can be used to display performances to the spectators.

In athletics, the researcher observed that at the start of races, the starter usually encounters problems because the starting gun most times seizes when it is to be fired. This hampers the commencement of races by runners because the starting gun is connected to computers, photo-finish judge equipment and an electronic scoreboard. This has made starting of races cumbersome, tiring and boring for athletes and even spectators who expected a smooth start race. The researcher observed this had been happening since the 1998 Mobil track and field championship and still occurred in 2020 during the 1st Athletics Federation of Nigeria (AFN) Classics Competition held at the Oluyemi Kayode Stadium in Ado Ekiti, Ekiti State from 29th February to 1st March 2020 and solution has not been found to it by procuring starting gun that is connected to speakers and starting block. ICT refers to any device that can store, retrieve, manipulate, transmit, or receive data in a digital format. Personal computers, digital television, email, and robotics, for example [9]. The availability and frequent utilization of ICT tools for sports officiating and processes will no doubt lead to accomplishments in judging athletes' performance effectively and efficiently. The study investigated the availability and use of ICT for officiating sports in Nigeria given this context.

Another area of information and communication technology in officiating is the use of an electronic scoreboard which could be used as a medium of disseminating athletes' performance and can also be used for instructing athletes, coaches and officials. It affords an opportunity in that the athletes, coaches and spectators have the opportunity to view their performances live. Audio visuals like television, radio and video can be utilized to instruct officials whereby matches or events are recorded and reference is made later for playback in order for officials to review how they officiate. This also affords the opportunity to correct mistakes for enhanced officiating. Also, the use of earphone and radio set in football matches started at the 2006 world cup in Germany. It affords the referee and his assistants the opportunity to communicate with each other during game situations in order to limit wrong calls by the center referee and also to intimate the referee with offenses that may escape his attention. This helps in ensuring that players or teams are not unjustly punished [3]. Goal line technology assists football referees in ascertaining whether the ball actually crosses the goal line for it to be declared a valid goal. The Video Assistant Referee (VAR) was officially introduced in the 2018 FIFA world cup held in Russia and has been incorporated into the English Premiership Football. It helps to determine valid goals, penalty decisions, direct red card incidents and mistaken identity such that wrong decisions were not made by the referee. In Handball, spider cam, overhead cam and goal cam are used in European

Handball Federation to assist in officiating the game. Advanced video technology is being utilized in Volleyball to improve how officials call out faults during a match. Video replays and shot clocks are the ICTs utilized for officiating in Basketball. The third umpire, with access to television replays to advise central umpires in decision making as well as Decision Referral System (DRS), is utilized for officiating in Cricket [12]. There are now available stopwatches, electronic starting blocks, electronic score timing scoreboard, photo finish equipment and wind gauge for precision, while electronics devices now measure distances in the throws in athletics [2].

### ***1.1. Statement of the Problem***

The trend in sports is that the world has become a global village whereby ICT is the key to being an effective player. Various ICT gadgets are now being used in officiating sports which has changed the outlook of all sports. It, therefore, follows that sports officials in Nigeria should acquire and use ICT equipment to effectively officiate sports in Nigeria. The researcher observed that generally, sports in Nigeria have not benefited from ICT in the area of officiating. ICT has become a blessing to sports, ensuring better performances through officiating using ICT by developed nations, unlike Nigeria where ICT has not been properly utilized. National Sports Federations (NSFs) and State Sports Councils have not been officiating using ICT. The use of ICT in officiating sports is lacking; as observed by the researcher that even in football leagues in Nigeria, the earpiece has not been used for communication by referees and assistant referees, not to talk of the recently introduced Video Assistant Referee (VAR). In Athletics, only the Athletics Federation of Nigeria (AFN) uses ICT for officiating but states sports councils do not have ICT equipment for officiating.

Athletes, coaches, and management are always looking for methods to improve their performance, and one of the ways to do so is through appropriate officiating using ICT, which allows athletes to realize their maximum potential. Officiating is one important process that athletes need to determine whether there is an improvement in their performances. This must be done timely and accurately as athletes' performance in any recognized competition at the national, regional, or world level may be his best performance or even break a world record. This needed to be judged, computed, disseminated to the public, and stored for future reference. This could only be achieved where ICT is utilized for officiating. It is against this background that this study was conducted to investigate the availability and utilization of Information Communication Technology for officiating sports in Nigeria.

### ***1.2. Research Questions***

The following research questions guided the study:

1. Are ICT equipment available for officiating sports in different games in Nigeria?
2. Will there be a relationship between the availability and utilization of ICT for officiating sports in Nigeria?

### 1.3. Hypothesis

One hypothesis was generated for the study:

There will be no significant link between the availability and utilization of ICT for officiating sports in Nigeria.

### 1.4. Design of the Study

The research design for the study was the descriptive survey research. The survey research enables information to be obtained from a representative sample of the population so as to describe situation as they exist.

### 1.5. Population of the Study

Four thousand sports administrators (4000) from all 36 states of Nigeria, as well as the Federal Capital Territory of Abuja, took part in the study. For this study, a total of 800 people were asked to participate. Purposive sampling was employed to choose seven (7) states plus the Federal Capital Territory (FCT) of Abuja, for a total of eight (8) states, from which one hundred Sports Administrators were chosen using a simple random sample approach with no replacement. Only seven hundred and twenty six (726) respondents who duly completed the instrument were included in the study.

## 2. Procedure

A research questionnaire tagged as 'Sports Officiating Questionnaire' (SOQ) designed by the researcher was used to collect data for the study. The instrument consisted of two

sections. The first section dealt with socio-demographic variables of respondents, while the second section elicited responses that dealt with the variables of the study. The researcher sought the assistance and guidance of five (5) experts, three (3) in the field of Sports Administration and two (2) experts in ICT, in ascertaining the content validity of the instrument. A pilot study was conducted utilizing the test-retest method of determining reliability coefficient to determine the questionnaire's reliability and appropriateness to the Nigerian environment. In the pilot test, the questionnaire was administered to twenty (20) staff of Ekiti State Sports Council, Ado Ekiti, at two weeks intervals. The scores from the two sets of responses were correlated using Crombach alpha. A correlation coefficient 0.83 was obtained, showing that the questionnaire was stable and appropriate to be used for data collection for the study. The data collected were analyzed using descriptive and inferential statistics. The descriptive statistics included percentages, frequency counts and mean scores, while inferential statistics included Pearson Product Moment Correlation (PPMC). The hypothesis for the study was tested at a significance level of  $\alpha = 0.05$  ( $P < 0.05$ ).

## 3. Results

### 3.1. Research Question 1

ICT equipment available for officiating sports in different games in Nigeria?

**Table 1.** Availability of ICT equipment for officiating sports in different games in Nigeria.

	ICT Facilities	Adequate	Fairly Adequate	Inadequate	None	Mean	SD
A	Electronic Scoreboard	276 (38.0%)	158 (21.8%)	197 (27.1%)	95 (13.1%)	2.85	1.074
B	Spider Cam, Overhead Cam and In Goal Cam in Handball	173 (23.8%)	164 (22.6%)	183 (25.2%)	206 (28.4%)	2.42	1.135
C	Video Replays in Basketball	167 (23.0%)	161 (22.2%)	179 (24.7%)	219 (30.2%)	2.38	1.141
D	Ear Piece for Football Referees	179 (24.7%)	158 (21.8%)	230 (31.7%)	159 (21.9%)	2.49	1.088
E	Internet/E-Mail/World wide Web	226 (31.1%)	221 (30.4%)	190 (26.2%)	89 (12.3%)	2.80	1.013
F	Electronic Speakers/Starting Gun in Athletics	213 (29.3%)	235 (32.4%)	200 (27.5%)	78 (10.7%)	2.80	.980
G	Goal Line Technology for Football	170 (23.4%)	168 (23.1%)	209 (28.8%)	196 (27.0%)	2.48	1.072
H	Video Assistant Referee (VAR)	153 (21.1%)	168 (23.1%)	209 (28.8%)	156 (21.5%)	2.38	1.095
I	Hulk Eye for Tennis	152 (20.9%)	153 (21.1%)	177 (24.4%)	244 (33.6%)	2.29	1.140
J	Photo Finish Equipment for Athletics	202 (27.8%)	203 (28.0%)	195 (26.9%)	126 (17.4%)	2.66	1.062
K	Shot Clock in Basketball	188 (25.9%)	206 (28.4%)	198 (27.3%)	134 (18.5%)	2.62	1.061
L	Third Umpire with access to Television Replays in Cricket	164 (22.6%)	129 (17.8%)	208 (28.7%)	225 (31.0%)	2.32	1.136
M	Advanced Video Technology in Volleyball	145 (20.0%)	151 (20.8%)	204 (28.1%)	226 (31.1%)	2.30	1.110
N	Decision Referral System in Cricket	143 (19.7%)	145 (20.0%)	203 (28.0%)	235 (32.4%)	2.27	1.114
O	Large Television Screens for display of performance and results	167 (23.0%)	157 (21.6%)	253 (34.8%)	149 (20.5%)	2.47	1.059
P	Desk Computers/Laptops for Scoring in Boxing	161 (22.2%)	156 (21.5%)	215 (29.6%)	194 (26.7%)	2.39	1.104

Criterion mean = 2.50.

Table 1 presents the availability of ICT equipment for officiating sports in different games in Nigeria. The result shows that using a criterion mean score of 2.50 for the rating scale, all the items had mean scores below the cut-off point except electronic scoreboard (mean=2.85), internet/e-mail/world wide web (mean=2.80), electronic speakers/starting gun in athletics (mean=2.80), photo finish equipment for athletics and shot clock

in basketball (mean=2.62), i.e., five (5) out of sixteen (16) representing 31.3% of the entire items. This implied that ICT equipment are not available for officiating sports in different games in Nigeria. Ranking the availability of ICT equipment shows that Electronic Scoreboard (mean=2.85) is the most available ICT equipment for officiating sports in different games in Nigeria. This is closely followed by Electronic

Speakers/Starting Gun in Athletics (mean=2.80), Internet/E-Mail/Worldwide Web (mean=2.80) and Photo Finish Equipment for Athletics (mean=2.66), while Decision Referral System in Cricket (mean=2.27) is the least in the ranking order.

### 3.2. Research Question 2

Will there be a relationship between availability and utilization of ICT for officiating of sports in Nigeria?

**Table 2.** Relationship between availability and utilization of ICT for officiating of sports in Nigeria.

S/N	ITEMS	SA	A	D	SD	MEAN	SD	RANK
a	For determining performance of athletes	340 (46.8%)	288 (39.7%)	53 (7.3%)	45 (6.2%)	3.27	.847	1 <sup>st</sup>
b	To determine winners in competitions	280 (38.6%)	325 (44.8%)	67 (9.2%)	54 (7.4%)	3.14	.869	2 <sup>nd</sup>
c	Ensures officials are impartial	290 (39.9%)	295 (40.6%)	75 (10.3%)	66 (9.1%)	3.11	.924	5 <sup>th</sup>
d	To improve athletes performance	220 (30.3%)	307 (42.3%)	119 (16.4%)	80 (11.0%)	2.92	.950	6 <sup>th</sup>
e	To communicate results of competitions to the outside world	271 (37.3%)	322 (44.4%)	81 (11.2%)	52 (7.2%)	3.12	.871	3 <sup>rd</sup>
f	To ensure that officials are accurate	274 (37.7%)	317 (43.7%)	73 (10.1%)	62 (8.5%)	3.11	.900	4 <sup>th</sup>

Criterion mean = 2.50.

Table 2 presents the relationship between the availability and utilization of ICT for officiating sports in Nigeria. The result shows that using a criterion mean score of 2.50 for the rating scale. All the items had mean scores above the cut-off point. This implied that there was a relationship between the availability and utilization of ICT for

officiating sports in Nigeria.

### 3.3. Hypothesis

There is no significant relationship between availability and utilization of ICT for officiating of sports in Nigeria.

**Table 3.** Pearson Correlation of availability and utilization of ICT for officiating of sports in Nigeria.

Variable	N	Mean	SD	r	p
Availability of ICT facilities	726	39.93	12.86	0.664*	0.000
Utilization of ICT facilities	726	18.67	4.26		

$p < 0.05$ .

Table 3 shows that the computed r-value (0.664) is significant at  $p < 0.05$  level of significance. The null hypothesis is rejected. This implied that there was a significant relationship between the availability and utilization of ICT for officiating sports in Nigeria. The relationship between availability and utilization of ICT for officiating sports was moderate and statistically significant in a positive direction.

## 4. Discussions

Findings from research question one revealed that ICT equipment for sports officiating were not available. Only six (6) thus electronic scoreboards, internet/e-mail/world wide web, electronic speakers/starting gun in athletics, shot clock in basketball and desktop/laptops computers for scoring in boxing were available while eight (8) such as Spider Cam, Overhead Cam and In Goal Cam in Handball, Video Replays in Basketball, Ear Piece for Football Referees, Goal Line Technology for Football, Video Assistant Referee (VAR), Hulk Eye for Tennis, Third Umpire with access to Television Replays in Cricket, Advanced Video Technology in Volleyball, Decision Referral System in Cricket and Large Television Screens for the display of performance and results were not available. This result is compatible with the fact that information and communication technology for sports administration was not available in Nigeria [5]. ICT facilities should be used to facilitate sports officiating and communicate the official results of competitions to the world

[6]. Recently available researches support the use of ICT to make it possible for athletes to get the opportunity to attain maximal performance through better officiating facilitated by ICT gadgets [8, 1].

Findings from research question two and hypothesis one, it was revealed that availability will enhance the utilization of ICT equipment for sports officiating in Nigeria. Respondents agreed that utilization of ICT in sports officiating will enhance determining the performance of athletes, determine winners in competitions, communicate results of competitions to the outside world, ensure that officials are accurate ensures officials are impartial and improve athletes' performance. This is consistent with the findings of [5], who discovered a significant link between ICT availability and use in sports administration.

Professional sports in the USA now utilize ICT in sports officiating, which has changed the outlook of their sports. Sports officials in Nigeria require the use of ICT equipment to effectively officiate sports in Nigeria [10]. ICT has become a blessing to sports, ensuring better performances through officiating using ICT by developed nations, unlike Nigeria where ICT has not been properly utilized [11]. It is possible to command greater efficiency in the sports officiating sports in Nigeria if information and communication technology are provided, made available and utilized to help propel the development of sports in Nigeria [5]. This supports the fact that there will be efficiency on the part of sports officials in Nigeria, too, if ICTs are available and utilized for officiating in Nigeria.

To utilize ICT for officiating, it is essential that the officials have the required knowledge and operation of the equipment. Knowledge is a predictor of information and communication technology usage among sports managers in Nigeria [7]. Teachers, coaches, athletes, sports administrators, and officials must keep up to date on the newest developments in the use of ICT in sports in order to assist students in performing more efficiently and successfully. The media has contributed to disseminating information on the latest equipment and new officiating techniques through television, online videos, and live matches, including officiating, where analyses are shown to spectators and viewers in support of right or wrong calls by officials. The Internet is a tool for determining the correct laws and regulations, as well as information on all sporting activities. The advantage is that officials have a ready-made medium in which they get up-to-date news through the Internet for the exchange of ideas and information with colleagues from different parts of the world [3].

## 5. Conclusions

The study found that there was no ICT equipment available in Nigeria for officiating sports. It was also revealed that the availability of ICT will lead to utilization for sports officiating in Nigeria. The level and extent to which ICTs are readily available and utilized for sports officiating in Nigeria when compared with Europe, America and other countries of the world are still very low.

## 6. Recommendations

1. ICT equipment for sports officiating should be provided in all sports. This can be achieved through federal and state government funding, private and corporate sponsorship and sports federations in Nigeria for the officiating to move to digital instead of analogue. National Sports Federations (NSFs) and State Sports Councils should key into the utilization of ICT equipment for sports officiating.
2. ICT equipment for Sports officiating could be improvised for utilization. This will provide sound officiating and accurate judgments during sports competitions. For instance, the video camera can be connected to big-screen television to act as VAR. Also, cameras could be placed at the finish line in track events to serve as photo finish equipment.

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